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INTERIM MEASURES REPORT FOR REMOVAL AND BIOREMEDIATION OF MINE FILL A MATERIAL NSWC CRANE IN
10/1/2000
NAVFAC SOUTHERN

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Interim Measures Report
Removal and Bioremediation of Mine Fill A Material

NSWC Crane
Crane, Indiana

Revision: 0

Unit Identification Code: N00164
Contract No. N62467-93-D-1106

October 2000

Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina
29419-9010

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RESPONSES TO COMMENTS ON
DRAFT INTERIM MEASURES REPORT
REMOVAL AND BIOREMEDIATION OF MINE FILL A MATERIAL
NAVAL SURFACE WARFARE CENTER CRANE, INDIANA
DATED JUNE 2000

Commentor: Peter Ramanauskas - United States Environmental Protection Agency

Comment 1: In the second paragraph of Section 2.1, in addition to the explanation of the reactivity characteristic, note if tests were done on the soils to determine other hazardous waste characteristics (i.e., corrosivity, flammability, and toxicity).

Response 1: Section 2.1 has been revised to reflect that corrosivity and flammability were not performed based on review of in-situ soil analysis. Toxicity analysis has been performed on SWMU specific contaminants and others identified by the US EPA on a total basis with a correction factor of 20 used to check if the values were below the toxicity characteristic leaching procedure (TCLP) regulatory limits.

Comment 2: In sections 3.1.2 and 3.1.3, reference is made to totals/arsenic results not exceeding "20 times the TCLP limit." This should be clarified to state that the totals results multiplied by an estimation factor of 20 did not exceed the TCLP regulatory limit. If the TCLP limit is exceeded, the material is classified as possessing the hazardous waste characteristic of toxicity. As it is currently written, it would appear that the multiplication factor of 20 is improperly being applied to the TCLP regulatory limit.

Response 2: Text in Sections 3.1.2 and 3.1.3 have been revised to clarify how the estimation factor of 20 was used.

Comment 3: In Section 5.1, please provide a brief description of the hydroseeding process and why it was unsuccessful at the permanent storage areas near Building 154 and 157.

Response 3: Section 5.1 has been revised with the following text:

Hydroseeding was performed at Crane using a seed and cellulose binder mix. This mix was sprayed directly onto the compost mixture. The cellulose binder holds the seeds in place and prevents erosion, and should decrease the rate of water evaporation from the soil. However, hydroseeding at the first permanent storage areas, north of Building 154 and around Building 157 was unsuccessful. The hydroseeding was attempted in the summer when it was hot and dry, so insufficient watering may have caused poor germination. Also, there is a possibility that it may have been a bad batch of seed or not enough seed was applied. Both of these areas, in addition to a third area near Building 152, were subsequently seeded and watered. Grass is now growing at all of these locations.

Comment 4: Generally, throughout Section 6.0, the Navy cites results for soil VOCs which were undetectable, or negligible compared to soil screening levels. Efforts were made in early 1998 to incorporate the concepts of Norm Niedergang's Directive for Change (December 1997) memorandum for using Method 5035 for reporting soil VOCs data. Accordingly, the approved QAPP contains references to use of EnCore samplers for performing proper

VOCs sample collection and the field SOP was modified to include the use of EnCore samplers.

However, the Southwest Laboratory seems not to have been updated to include Method 5535, Section 8.8 of this SOP, written for analysis of soils, describes the Method 5030 technique, which is the one that Method 5035 effectively replaced in June of 1997. The Southwest SOP is dated July 23, 1997. We would like to verify that Southwest Laboratories have analyzed EnCore samples appropriately even though the SOP does not reflect this. Please document how the soil VOC data has, and is, being generated by Southwest Laboratories.

Response 4: Southwest incorporated method 5035 into their SOP in September of 1998. All Initial Characterization Samples (ICS) and Post Excavation Samples (PES) collected during full scale operations were collected using EnCore samplers. Appendix A to the lab SOP which incorporates provisions for VOC analysis based on a closed system purge and trap GC/MS method has been attached for your review.

Comment 5: Metals results were frequently imprecise. The Navy is referred to the 1996 memorandum by Dave Payne on the improvement of soil samples intended for metals analysis by sample particle reduction and homogenization prior to sample digestion (Appendix Q of the Region 5 Model QAPP).

Response 5: Precision of the laboratory for metal compounds were assessed through the analysis of laboratory duplicates and the calculation of RPD. RPD criteria was established at 0 - 25% for soils and compost.

In the evaluation of ICS, 14% of the batches (or 28 batches) had levels which exceeded this 25% for soil. In the 200 batches of samples for metals analysis, there were 617 samples and 4570 actual separate metals analyzed. Only 241 metals compounds were flagged as exceeding the RPD criteria which represents 5% of the metals reported. Of course, only one replicate is performed in a batch, and all results of that batch are flagged accordingly. Similar evaluation of PES finds comparable numbers. There were 299 samples analyzed for PES metals, which represents 1702 different metal results reported. Of these, only 89 resulted in "*" flags which represent RPD values in excess of 25%.

The recommendation which Dave Payne makes in his memorandum is for drying soil samples prior to collecting aliquots for analysis. This recommendation provides some interesting ideas for "wet" soil samples, however, most ICS samples and PES samples do not usually contain a sufficient amount of water which would alter the precision of the result to a significant level.

Comment 6: While numerous paragraphs throughout Section 6.0 indicate that there were cases where QC acceptance ranges were exceeded for certain analyses, there is very little indication

as to how far out of range the off spec QC data actually was. Please provide further definition of the ranges for off spec data.

Response 6: Additional data has been provided throughout Section 6.0 to provide data ranges for the small percentage of data which was out of QC specifications.

Comment 7: Please submit the following data sets for EPA review:

1. Initial characterization samples MFA1CS503, MFA1CS519, MFA1CS570, and MFA1CS574FD for explosives compounds (8330 analysis). Include sample collection documentation sheets/holding time information, extraction logs, continuing calibration results, raw data and chromatograms including confirmatory column data, and all supporting sample QC data (including field duplicates) for respective sample data groups.

2. Initial characterization samples MFAICCS588, MFAICCS589, and MFAICCS590 for metals analysis (including mercury), Data should be provided for all analytes and all supporting QC sample data (including field duplicate data) for the respective metals.

3. For Post-Excavation Samples MFAPES274, MFAPES276, and MFAPES278, submit data packages as outline in item #1 above for the explosives parameters.

4. For Windrow #13, submit sample data constituting the "Day Last" determination (i.e., all the individual cross-sections that were analyzed) for the explosives determination. Level of QC documentation should be at the level of item # 1 above.

5. Submit the sample data package for BIO-S-061 "Day Last" [Day 8] (i.e., all the individual cross sections that were analyzed) for the explosives determination. Level of QC documentation should be at the level of item # 1 above.

6. Select 3 of the 7 Windrow Monitoring samples reported as estimated values as described in the third paragraph of page 6-10, Section 6.2.5.2. Submit the explosives data packages as outlined in item #1 above.

Response 7:

1. ICS samples for explosives has been provided for EPA review in the following order:
   a) MFAICS503 and associated Rinse Blank
   b) MFAICS519
   c) Rinse Blank (CRAR0406) associated with sample MFAICS519
   d) Field Duplicate (MFAICS555)associate with MFAICS503 and MFAICS519
   e) MFAICS570 and MFAICS574FD

f) Rinse Blank (MFAICSRB042498) associated with samples MFAICS570 and MFAICS574FD

2. MFAICS588 and MFAICS590 have been provided for your review for metals analysis. Note however, sample MFAICS589 was only analyzed for Volatiles. The remaining samples from the analytical batch have been included for your review for metals including mercury (MFAICS582, MFAICS584, MFAICS585, MFAICS587, MFAICS591, and MFAICS593).

3. Data has been submitted.

4. Data has been submitted. Analytical data package contains a field duplicate and a rinse blank.

5. Data has been submitted.

6. Data has been submitted.

Comment 8: In sections 6.2.4.1 and 6.2.5.2, it is mentioned that noted temperature blank exceedances (i.e., exceeding 4 degrees C) should not impact results. However, this may not be true, especially in the case of Method 8330 nitroaromatic or volatile aromatic compounds. In these cases, it would be of interest to know what the overall holding time was from time of sample collection to time of analysis (or extraction). Perhaps some of this data could be flagged as "low bias" as well.

Response 8: Section 6.2.4.1 pertains to PES soil samples collected by MK. There were 41 of 209 samples that were received at a temperature range between 6.2 and 6.8°C. These samples did not remain at this temperature from time of collection to time of extraction. They left the site, iced and cooled to approximately 4°C, but by the time they reached the laboratory were at temperatures greater than 6.0°C. The lab would have then stored these samples in a refrigerator bringing their temperature back down to approximately 4°C. The samples were analyzed for metals by Method 6010B, Explosives by Method 8330, and/or Volatiles by Method 8260. Method 6010B makes no provisions for temperature preservation of samples, therefore; the metal results are not impacted by the elevated temperature. The first step in the preparation of soil samples for analysis by Method 8330 requires samples to be dried at room temperature or colder to a constant weight. The lab air dries samples at room temperature, approximately 21°C, so receiving samples between 6.2°C and 6.8°C will not affect this analysis either. VOC analysis by method 8260 would be affected by temperature, however the impact of 0.8°C outside of temperature limits seems negligible when considering that all analytes were at least four orders of magnitude below the cleanup objectives.

Section 6.2.5.2 pertains to the Windrow samples collected by Toltest for the analysis of Explosives. As stated above, the first step in the preparation of soil samples for analysis by Method 8330 requires samples to be air dried at room temperature or colder to a

constant weight. The lab air dries samples at room temperature, therefore, the samples are not maintained at 4± 2°C once they reach the lab so the slightly elevated temperature of the samples when received would not likely impact the analytical results.

Comment 9: In Section 6.2.4.2, it is stated that only one rinsate blank was collected for the field samples. The Navy must follow the rinsate blank collection frequency noted in the approved QAPP Section 4.6.2.

Response 9: The required frequency of one rinse blank for every 20 samples has been followed. There were 105 PES samples collected by Toltest, of these 14 were trip blanks, 1 was a rinse blank, 10 were field duplicates (which are not included because they don't require a separate rinse between samples), and 41 were collected by Encore samplers that are considered disposal equipment. Therefore, 39 Toltest samples collected with non-disposable equipment, which requires rinsing between samples are included in this report. Rinsate blanks are collected every 20 samples (ie. After sample 20, 40, 60, etc.). The next PES sample collected for analysis (40th sample) is scheduled to have a rinse blank collected with it.

Comment 10: On page 6-11, the third paragraph mentions that surrogate recoveries were low in cases where high TNT concentrations were found. These results are attributed to a matrix effect. However, if the samples had to be diluted, what is the possibility of this being an effect of dilution?

Response 10: In many of these cases, TNT concentrations were still within the linear range of the instrument, and subsequent dilutions were not required. As an example, the results of analysis for sample BIOS06100032 have been included for your review. From the primary column chromatographic report it is apparent that the surrogate; 3,4-DNT suffers from interference from the TNT peak. Both compounds have response times within 0.61 minutes of each other. Second column confirmation has retention times that do not provide as much overlapping of peaks, however, the lab consistently reports all surrogate recoveries from the primary column, thus resulting in the elevated surrogate recovery when high concentrations of TNT exist.

Comment 11: Please provide a brief description of the rationale for the Initial Characterization Sampling around buildings 151 and 160 as these areas are not included in the Soil Excavation Plan for Mine Fill A (FSOP Appendix E1) dated 02/09/1998.

Response 11: Characterization Sampling near Building 151 and Building 160 was done at the Navy's request on 3/30/98. Due to construction activities scheduled near those buildings, characterization sampling was performed using the grid sampling procedure in areas of potential contamination: near vents, roof drains, and swales. This was not done to characterize the entire building, but rather to identify possible sources of contamination in

the area before other site work could be performed.

Comment 12: Please provide figures in Appendix J showing final disposition of Windrows 9, 11, 13, 14, 24, and 36. Also provide a figure showing location of the staging area containing Windrows 92, 93, 98, 101, and 102.

Response 12: Windrows 9 and 36: Drawing J1 page 1 of 4 has been revised to reflect the placement of these windrows.

Windrows 11, 13, 14, and 24: These four windrows were field applied. As stated in Section 5.1, "some compost material was field applied to promote vegetative growth." Compost was added to the front berm at Building 154 and to the area near Building 158 prior to seeding in the spring. The disposal and field application of these four windrows took place on 3/21/99.

Windrows 92, 93, 98, 101, and 102: These windrows were staged at the temporary staging area, and at this time are still awaiting final placement. Until final placement is made, or the temporary staging area is re-identified as the final staging area, these windrows will not be placed on the figures.

Comment 13: Figure J1 (Page 1 of 4) shows the Grid #40 has been backfilled with Windrow #97. However, as noted on Figure G1 and in Table 3-2, Grid #40 is still awaiting excavation along with 16 other grids. Please clarify this. Note that the remaining grids (23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, 173) may be excavated and processed at the Navy's discretion.

Response 13: Initially, Windrow 97 was placed in the permanent placement area. However, it was later dug out and put on the berms at B-154 as top cover. This was done because the original compost which was placed in the berms had settled down approximately twelve inches. Windrow 97 was placed on top to bring it back up to the desired grade. The grids that it covered were initially reported as Grids 1, 2, 3, 13, 14, 39 and 40. However upon re-evaluation, it has been determined that Windrow 97 was placed on top of grids 1, 2, 3, 13, 14, & 122 - 127. Figure J1 has been corrected.

RESPONSES TO COMMENTS
DRAFT INTERIM MEASURES REPORT FOR REMOVAL AND BIOREMEDIATION OF MINE FILL A MATERIAL, NSWC CRANE, CRANE, INDIANA – DATED JANUARY 2000

Commentor: Bill Gates, Southern Division RPM

Item No.	Section/ Page	Comment	Response
1.	Page 3-1, Section 3.1.1	Figures C1 - C4 are referenced for grid locations. Figures C1 - C4 are labeled soil sampling results. These figures are referenced during a discussion of initial characterization samples. Clarify that Figures C1 - C4 reflect post-excavation sample results.	Figures C1 through C4 in the January 2000 draft IMR were Post-Excavation Characterization Sample Results. These figures have been moved to Appendix G, re-numbered as Figures G1 through G4, and renamed to clarify that they are post-excavation sample results. Appendix C now contains newly generated figures (C1 through C6) showing Initial Characterization Sample Results.
2.	Figures C1 - C4	Include reason per grid why soil exceeding all remedial goals was left in place. Footnote?	A new table (Table 3-2) has been generated to provide explanations for areas that exceeded remedial goals. A note has been added to Figures G1 through G4 to reference this table.
3.	Appendix G	One page, Summary of Windrow Sampling, was provided prior to Windrow 01. It included Windrow S-001 - M-050. Like information for Windrows 51 - 102 was not provided.	The information included in Appendix G in the January 2000 draft IMR has been moved to Appendix I. The Summary of Windrow Sampling table has been expanded to include all windrows.

Commentor: Christine Freeman, NAVSURFWARCENDIV Crane

Item No.	Section/ Page	Comment	Response
General	Various	Remove quotation marks from the "A" in Mine Fill A (and "B" in Mine Fill B) throughout the plan.	The quotation marks have been removed throughout the plan.
1.	p. iv	The correct acronym for Rockeye is RKI. Please make change throughout plan.	The Rockeye acronym has been revised on the Acronyms page and in the text.
2.	p. 1-1 §1 ¶3	Rewrite last sentence as, "MFA ~~(SWMU 12/14)~~ and the …" (previously identified in ¶2).	The requested change has been made.
3.	p. 1-2 §1.1	a) ¶1 Delete the sentence, "Production was resumed in 1980, and MFA currently produces 2,000-pound aerial bombs." b) ¶2 In metals of concern add Mercury ¶3 Rewrite second sentence as, "Concentrations of ~~individual constituents~~ RDX in the soil range from non-detect to 15,300 mg/kg ~~(RDX)~~."	The requested changes have been made.

Item No.	Section/ Page	Comment	Response
4.	p. 1-4 §1.2	Last bullet should read, "Transportation and ~~disposal~~ backfill of the ..."	The requested change has been made.
5.	p. 1-4 §1.3	Rewrite first sentence as, "... is organized into ~~nine~~ eight sections..."	The revised report has nine sections, therefore, this change was not made.
6.	p. 1-5 Table 1-1	a) FCR-FS-002 In the description column, add a void notation for this FCR. b) FCR-FS-008 Add revisions 1 and 2. c) FCR-FS-009 Add no final approval given (could not find a signed approval copy). d) FCR-FS-011 Add that only approved portion of FCR was the removal of PETN requirement on all samples except initial characterization. e) FCR-FS-016 Mark the "no" box in the Regulator Approval/Notification Recommendation section. f) FCR-FS-018 Add revision 1 and include approved signature page (copy of the FCR is provided with these comments). g) FCR-FS-021 Add revision 1. h) Add FCR-FS-025 Rev 1 1/19/00 for Disposition of reject rocks from screener site (copy of the FCR is provided with these comments). i) Add FCR-FS-027 2/1/00 for Consolidate excavation completion report and compost completion report (copy of the FCR is provided with these comments). j) Table 1-1 Note should read, "FCRs 4, 5, 19, 20, 22, 24, and 26 did not affect ..."	a) The requested change has been made. b) The table has been revised to include revisions 1 and 2. c) A note was added to the "Description" column of the table to indicate that no final approval was given for this FCR. d) A note was added to the "Description" column of the table to indicate that only the removal of the PETN requirement was approved. e) The "no" box has been checked. f) The table has been revised to include revision 1 and the approved signature page has been included in Appendix A. g) The table has been revised to include revision 1. h) FCR-FS-025, Rev. 1, has been added to Table 1-1. i) FCR-FS-027 has been added to Table 1-1. j) Table 1-1 Note has been revised as requested. Additional text has been added to this note as described in the Response 22.
7.	p. 2-1 §2.1 ¶1	The first phrase is not a sentence.	Disagree – it is a sentence. "On-site bio-treatment" is the subject and "complied" is the verb.

Item No.	Section/ Page	Comment	Response
8.	p. 2-1 §2.1 ¶5	Rewrite paragraph as follows, "~~Based on the classification of the soils to be treated as non-hazardous waste,~~ ~~t~~The Biofacility and buildings were designed and built to meet hazardous waste applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility meeting the applicable codes, standards, and regulations.	The Biofacility was not built to meet all applicable hazardous waste codes, standards and regulations. It meets most of the requirements, however, due to the lack of secondary containment in some areas (buildings, asphalt, ponds), all hazardous waste requirements are not met. The referenced sections were re-written as follows: "The Biofacility and buildings were designed and built to meet, or exceed, all applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility."
9.	p. 3-1 §3.1.2	a) ¶1 In the next to the last sentence, should the word "some" by "same" in reference to where the locations of samples were to be collected? b) ¶2 These constituents of concern should be listed with section 1.1 so all parameters analyzed for are in one location. A table could be used if there is a concern over confusing reference from Halliburton and generator knowledge.	a) "Some" is the correct word in ¶1. It has been changed to "selected" to eliminate confusion. b) The constituents from ¶2 have been moved to section 1.1. The listing of compounds in section 1.1 have been split into "RFI" and "Generator Knowledge" for each class of compounds. Additionally, the compounds have been presented in columns for easier reading.
10.	p. 3-1 §3.1.3	In the second sentence replace "Initial characterization sampling" with "ICS" and the word "of" is in bold or a different font (or something, it looks different).	"Initial characterization sampling" has been changed to "ICS" as requested. The word "of" looked different due to a copier quality problem that affected the appearance of the text on the right side of the page. The problem has been corrected.
11.	p. 3-2 §3.2	a) ¶1 A description is made of how the trommel screener operated. Please add a description for the Powerscreen screener. b) ¶2 In the last sentence, Appendix H is mentioned before Appendices F and G. Is there anyway around this? Appendices should be in the same order they appear in the text.	a) The trommel screener and the Powerscreen unit that replaced it operated in a similar manner, with the primary difference being the increased production rate of the Powerscreen unit. Text has been added to Section 3.2 to clarify this. b) The appendices have been rearranged and additional appendices have been added. Appendices are now in the order that they are referenced in the text. Refer to the new Table of Contents for the revised listing and ordering of appendices.

Item No.	Section/ Page	Comment	Response
12.	p. 3.3 Table 3-1	a) Add a column for the cumulative amount of soil that was excavated and screened. b) When the quantity of material excavated/screened was added, it equaled 19,115 cubic yards, but the executive summary and §1.0 ¶5 states that there was approximately 20,000 cubic yards of soil that was excavated and screened. Please make these numbers consistent.	a) A column for cumulative volumes has been added to both excavated and screened tables. b) The amount of excavated material from both MK and Toltest has been converted to tons for consistency purposes. The amount of soil excavated is 20,209 tons and all references to excavated volumes are consistent with this value.
13.	p. 4-2 §4.2 ¶2	Rewrite first sentence as, "Each ~~C~~contract~~s~~ ~~were~~ was awarded…"	The requested change has been made.
14.	p. 4-2 §4.3 ¶1	a) Rewrite the third sentence as, "… homogenized each ~~mix~~ load by mixing…" b) Rewrite sentence eleven as, "…delivered to the compost windrow in covered trailers or by loader bucket." c) Delete sentence twelve, "… self powered hopper/conveyor…" or add that the use of the hopper/conveyor was stopped and the loader bucket used. d) Rewrite last sentence as, "… is summarized in Table 4-2 and Table 4-3 shows the quarterly cumulative amount of amendments used."	a) The requested change has been made. b) The requested change has been made. c) The sentence has been deleted. d) The requested change has been made.
15.	p. 4-2 §4.3 ¶2	Rewrite second sentence as, "…made at least two or three passes…"	The requested change has been made.
16.	p. 4-2 §4.3 ¶3 and ¶4 and all of §4.4	a) §4.3 ¶3 and ¶4 Add to these paragraphs the use of Building N half sized windrows. Reference and use FCR-FS013 for wording and descriptions as necessary. b) §4.4 The half sized windrow information should also be included throughout this section when sampling locations and number of samples are discussed.	a) The size and location descriptions for half-sized windrows have been added and a reference to FRC-013 has been made. b) Information regarding field sampling of half-sized windrows was added to section 4.4.

Item No.	Section/ Page	Comment	Response
17.	p. 4-3 Table 4-1	a) Add a column for the cumulative amount of soil that was processed. b) When the quantity of soil processed was added, it equaled 20,922, but §4.0 ¶2 states that there was approximately 20,000 cubic yards of soil that was processed. Please make these numbers consistent. c) In the Table 4-1 note section, state what was used as the cut off for each month (day last, day lab results were received, or when windrow was unloaded). I could not seem to find a pattern. d) Also when looking back at Quarterly Interim Progress Reports, windrows 49 and 50 are not recorded in a cumulative column in an MK or TolTest report. Were the windrows included in the cumulative for this report? e) How is it that more soil was processed (20,922) than was screened (19,115)?	a) Cumulative column has been added. b) The amount of processed material from both MK and TolTest has been converted to tons for consistency purposes. The amount of processed material is 21,174 tons and all references to the processed material are consistent with this value. c) A note has been added to Table 4-1 to explain the cut-off used. d) Values have been verified in order to ensure each windrow has been used in determining cumulative volumes. e) The quantities of soil processed and screened do not match exactly because one quantity (soil processed) is a field estimate and the other (soil screened) is an actual scale measurement. The quantities reported in the revised IMR are 21,174 tons processed and 20,209 tons screened. An explanation has been added to Table 4.1 to account for the disparity.
18.	p. 4-4 through 4-6 Table 4-2	a) Fill in missing disposal dates for Windrows 48, 49, 50, and 83. b) Fill in missing level attained and disposal locations for Windows 101 and 102. c) In the Total line, use some type of pattern fill or shading for the columns that remain empty (do not have totals).	a) The missing dates have been added to the table. b) The missing information has been added to the table. c) The empty cells at the bottom of columns have been colored black.
19.	p. 4-7 Table 4-3	a) Add columns/rows showing quantities of amendments that were used per quarter. b) Modify the title of Table 4-3 and text on page 4-2 §4.2 ¶1 to reflect a change in the contents of the table.	a) The table has been expanded to include the quantities of amendments used per reporting period. Quantities are included in tons and are taken from the recipe sheets for each windrow (included in Appendix I) with pounds converted to tons. Also, a note has been added to the table to indicate that quantities used are field estimates. Additional notes added to the table clarify which windrows are included in each reporting period. b) The title of Table 4-3 and the text in the referenced section have been revised to indicate that the table contains amendment quantities received and used.

Item No.	Section/ Page	Comment	Response
20.	p. 4-13 §4.6	a) This section, §4.6 Disposal of treated soil, should be renamed, §5.0 Disposition of treated compost soil. b) In the third sentence, it is discussed that the departing trucks are weighed to determine the weight of compost exiting the Biofacility. Please incorporate into text that FCR-FS021 deletes the requirement to weigh outgoing compost filled trucks. c) Discuss mulching and seeding operations by MK and TolTest, TolTest failed attempt at hydroseeding, and TolTest reseeding MK backfilled areas. d) Discuss staging area and permanent residential placement area.	a) The section has been re-numbered as requested and renamed "Disposition of Treated Compost Soil and Decontaminated Rocks." Subsequent sections have been re-numbered, as required. b) A sentence was added to indicate that the weighing requirement was removed with FCR-FS-021. c) Information regarding the mulching, seeding, and hydroseeding activities has been added to the newly named Section 5.0. d) Information regarding the staging area and the two permanent storage areas has been added to Section 5.0.
21.	p. 6-1 §6.2 ¶2	Reference FCR-FS015 deleting requirement for two time-integrated air sampling campaigns and replacing with visual monitoring.	The requested change has been made. Note that with re-numbering of the sections per Response 20, the referenced information is now in Section 7.1.
22.	Appendix A	a) FCR-FS-004 is included after FCR-FS-017 it should be after FCR-FS-018, but there should be some clarification as to why it is included since the Table 1-1 note states that it not included. b) Add the following FCRs to this appendix FCR-FS-018 Rev 1 signed approval page, FCR-FS-025 Rev 1, and FCR-FS-027 (copies of the FCR is provided with these comments).	a) FCR-FS-004 is included after FCR-FS-017 because it is an attachment to that FCR. Text has been added to the note in Table 1-1 to clarify that FCR-FS-004 did not affect MFA work but a comment to this FCR was the basis for the generation of FCR-FS-017. b) The referenced FCRs have been added to the appendix.
23.	Appendix B	a) p. B-1 Remove the reference, "(Awaiting files from field)". b) Include copies of the Contaminated Scrap Manifest that were submitted by TolTest.	a) The requested change has been made. b) Copies of the manifests have been included in Appendix B.

Item No.	Section/ Page	Comment	Response
24.	Appendix C	This appendix should be renamed "Initial Characterization Sampling Grid Location Drawings" and ICS marked on drawings. If ICS grid locations are not what are shown then they need to be shown here.	The appendix has been renamed as requested. Drawings showing the ICS results by grid have been generated and included in this appendix.
25.	Appendix D	This appendix needs a little explanation. For instance, Grid #1 of Appendix C shows grid #1 as 'meets industrial clean-up objectives' yet Appendix D shows that grid #1 was excavated. Which is right?	The drawing in Appendix C was correct. The drawings initially included in Appendix C were post-excavation sample results. These drawings have been moved to Appendix G and renamed to avoid being confused with ICS drawings. ICS drawings have been generated and are now located in Appendix C. Additionally, headings have been added to the table in Appendix D to clarify the types of samples.
26.	Appendix F	Where are the post excavation drawings showing areas that started as undetected or below residential, were excavated to residential or industrial, or contamination still remains above industrial? My point is that we need to see ICS grid before excavation started, then post excavation drawings showing what the result of the cleanup was, and then backfill maps showing where the soil was returned.	The drawings you requested are included as follows: • Appendix C: ICS grid before excavation • Appendix G: PES grid following excavation • Appendix J: Backfill maps showing where treated compost was placed.
27.	Appendix G p. G-1	Change the note in parenthesis from two binders to three binders.	The information in Appendix G has been moved to Appendix I. The information in this appendix is now on double-sided sheets and included in one binder. The note on the appendix cover sheet has been revised to reflect this.
28.	Appendix H	a) There were two permanent placement areas at MFA; additional information will have to be obtained from TolTest. b) TolTest also conducted additional backfilling in some MK areas at B-154 (used Windrow 97 to cover grids 1,2,3,13,14,39,&40) and B-158/159 (used windrows 99 & 100 to cover all grids) c) Where is the associated final survey information? d) Need to see locations where the rocks backfilled?	a) Additional backfill information has been obtained from TolTest. All TolTest backfill information has been transferred to the MK generated backfill drawings for consistency. Backfill drawings are now included in Appendix J. b) Additional backfill information has been obtained from TolTest and added to the appropriate drawings. c) Final survey drawings have been added in Appendix F. Reference to the final survey drawings has been added to Section 5.1. d) Figure J-4 in the revised report shows the location where the rocks were backfilled.

EXECUTIVE SUMMARY

This interim measures report has been prepared by Morrison Knudsen Corporation (MK) for Southern Division, Naval Facilities Engineering Command. This report documents the actions completed for the identification, removal, and treatment through bioremediation of explosives-contaminated soil near Buildings 152, 153/154, 157, and 158/159 at Mine Fill A (MFA) at Naval Surface Warfare Center (NSWC) Crane in Crane, Indiana, and the subsequent on-site backfill of the treated material. This report also covers investigation sampling at MFA Buildings 151 and 160, where no impacted soil exceeding cleanup criteria was identified. The report summarizes the work actions performed pursuant to the requirements of the approved *Full-Scale Operational Plan* [MK, 1998a] and the *Quality Assurance Project Plan* [MK, 1998b]. The field work was performed by MK from April 1998 to March 1999 and by TolTest, Inc. from April 1999 to September 1999.

The scope of work included the following:

- Collection and analysis of 617 initial site characterization samples from 203 grids of potentially-impacted soil at MFA.
- Excavation and screening of 20,209 tons of explosives-contaminated soil identified in the site characterization with limitations at some locations based on physical constraints such as buildings, railways, roads, etc.
- Collection and analysis of 299 confirmation samples at MFA that included sampling of excavations to verify that all soil exceeding the cleanup goals was removed (to the extent possible).
- Transportation of excavated, screened material to the on-site Bioremediation Facility for treatment.
- Treatment of the contaminated material at the Bioremediation Facility through composting to reduce the levels of the contaminants of concern to below the target cleanup goals.
- Confirmatory sampling of treated material to ensure cleanup goals were achieved. All treated material met either the industrial or residential cleanup levels for the constituents of concern.
- Transportation of the treated material back to MFA and backfilling the material or staging it for future use. A total of approximately 37,024 tons of compost was returned to MFA.

All interim measures work actions have been completed in accordance with the approved plans and approved field changes with the exception of work at 17 grid sections (23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, and 173) near Buildings 153/154 which have not yet been excavated. These areas will be addressed following completion of supplemental toxicity testing of previously treated compost, as agreed to with the United States Environmental Protection Agency. An addendum to this report will be prepared to address work in those areas. No further action is recommended for all other areas surrounding Buildings 153/154 and all designated areas around Buildings 151, 152, 157, and 158/159 at MFA.

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ACRONYMS

°C	degrees Centigrade
2A46DT	2-amino-4,6-dintrotoluene
24DNT	2,4-dinitrotoluene
26DNT	2,6-dintrotoluene
2NT	2-nitrotoluene
3NT	3-nitrotoluene
4NT	4-nitrotoluene
4A26DT	4-amino-2,6-dintrotoluene
ABG	Ammunition Burning Ground
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CAAA	Crane Army Ammunition Activity
CFR	Code of Federal Regulations
DOD	Department of Defense
DNB	1,3-dinitrobenzene
EPD	Environmental Protection Division
FCR	Field Change Request
FS-OP	Full-Scale Operational Plan
FS-QAPP	Quality Assurance Project Plan for Full-Scale Operations at the Bioremediation Facility
HMX	cycloteremethylenetetranitramine
IAC	Indiana Administrative Code
ICS	Initial characterization sampling
IM	Interim Measure
IMR	Interim Measures Report
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOQ	limit of quantitation
MFA	Mine Fill A
MFB	Mine Fill B
MK	Morrison Knudsen Corporation
MS	matrix spike
MSD	matrix spike duplicate
MSDS	material safety data sheets
NB	nitrobenzene
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
NSWC	Naval Surface Warfare Center
OSHA	Occupational Safety and Health Administration

ACRONYMS (continued)

PETN	Pentaerylthritol tetranitrate
PEL	permissible exposure limit
PES	post excavation samples
PID	photoionization detector
ppm	parts per million
PPE	personnel protective equipment
QAPP	Quality Assurance Project Plan
QC	quality control
RAC	Navy Remedial Action Contractor
RDX	cyclotrimethylene trinitramine
RKI	Rockeye Munitions Facility
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOP	standard operating procedure
SWMU	solid waste management unit
SZ	Support Zone
TLV	Threshold Limit Value
TNT	2,4,6-trinitrotoluene
TNB	trinitrobenzene
Tetryl	methyl-2,4,6-trinitro phenylnitramine
TCLP	toxicity characteristic leaching procedure
U.S.EPA	United States Environmental Protection Agency
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
VOC	volatile organic compound
WHC	water holding capacity

1.0
INTRODUCTION

This interim measures report (IMR) has been prepared by Morrison Knudsen Corporation (MK) for Southern Division, Naval Facilities Engineering Command. This report documents the actions completed for the identification, excavation, on-site treatment through bioremediation (composting) of explosives-contaminated soil, and on-site backfill/staging of compost at Mine Fill A (MFA) at Naval Surface Warfare Center (NSWC) Crane in Crane, Indiana. This IMR summarizes the work actions performed pursuant to the requirements of the approved *Full-Scale Operational Plan* (FS-OP) [MK, 1998a] and the *Quality Assurance Project Plan for Full-Scale Operations, Soils Bioremediation Facility* (FS-QAPP) [MK, 1998b]. The field work was performed by MK from April 1998 to March 1999 and by TolTest, Inc. from April 1999 to September 1999. Five progress reports were generated by MK and TolTest during this period to document the work completed during prescribed periods. Information provided in the progress reports and various field documentation were used in developing this IMR.

NSWC Crane, located in southwestern Indiana, provides support for equipment shipboard weapons systems and ordnance. This site also supports Crane Army Ammunition Activity (CAAA), which includes production and renovation, storage, shipment, and demilitarization and disposal of conventional ammunition. Explosive-compounds contaminated soil resulting from the above operations have been identified at MFA (also known as solid waste management unit (SWMU) 12/14), and three other SWMUs: (Ammunition Burning Ground (ABG) (SWMU-03/10), Rockeye Munitions Facility (RKI) (SWMU-10/15), and Mine Fill B (MFB) (SWMU-13/14)).

To reduce or eliminate the potential for contaminant migration, NSWC Crane evaluated its 31 SWMUs to determine which ones would be amenable to accelerated cleanup actions, otherwise known as Interim Measures (IM). NSWC Crane submitted a proposal to the United States Environmental Protection Agency (U.S. EPA) to conduct IM cleanup actions at selected SWMUs. MFA and the other three SWMUs mentioned above were identified for IM cleanup due to explosive contaminants in the soil.

Based on past success at other Department of Defense (DOD) facilities, as well as other factors (including cost and contaminated soil transportation requirements), excavation and on-site ex-situ bioremediation of the contaminated soils was selected as the preferred treatment alternative for the IM at MFA, ABG, RKI, and MFB. Bioremediation has proven to be successful at other sites having explosive contaminated materials [Weston, 1993]. SWMU 33/00 was identified as the treatment location of the affected soil (Bioremediation Facility). The Bioremediation Facility (Biofacility) was constructed by MK from March 1996 to June 1997. The Biofacility area is a 5½-acre complex located in the southwest quadrant of NSWC Crane near the Crane Landfill as shown on Figure 1-1. It is comprised of three compost buildings each measuring 300 feet long by 70 feet wide by 18 feet tall, a vehicle decontamination facility, two lined storm-water collection ponds, a diesel storage tank, amendment storage area, and a field laboratory and administration facility. A description of the facility is provided in Section 3.0 of the *FS-OP* [MK, 1998a] and the details of the facility are included in the *Construction As-Built Report* [MK, 1998c].

The first phase of the IM process consisted of a pilot-scale bioremediation operation that evaluated several mix recipes and provided lessons learned, a final recipe for full-scale operation, and cleanup goals for treated soil. Results and discussions of the pilot-scale operations are provided in the *Pilot-Scale Treatability Test Report* [MK, 1998d]. The second phase of the IM process consisted of excavating impacted soils and full-scale operation of the Biofacility for treatment of the soils. This IMR documents the identification, excavation, and treatment of 20,209 tons of impacted soil from MFA and the backfilling of the approximately 37,024 tons of generated compost.

1.1 SITE BACKGROUND

MFA is located in the west-central portion of NSWC Crane situated along Highway H-17, as shown on Figure 1-1. MFA consists of 29 buildings, which have been used to assemble mines, depth charges, rocket heads, aerial bombs, and projectiles. MFA began operation in 1942 with the loading of depth charge bombs. The area was also used during the Korean and Vietnam wars. Production rates are not available for other periods, but over six million bombs were manufactured at MFA and MFB during the Vietnam War [Halliburton, 1992]. MFA continued to produce ordnance until 1975, when production was suspended. Demilitarization activities that include ordnance disassembly and decommissioning are also performed in this area. Prior to 1980, a variety of liquid wastes were disposed of on-site without treatment. Explosive-contaminated wastewater was discharged into unlined ponds or into storm drains and ditches. Wastewater generated from cleaning operations was discharged into an unlined pond. Oily waters, battery acids, paint thinner, acetone, boiler blowdown, and solvents were dumped behind buildings or into ravines. Waste hydraulic oil was spread on dirt roads. Since the early 1980s, treatment plants have been built, wastewater streams have been connected to the sanitary sewer, and oils and solvents have been collected, segregated, and either recycled, sold, or disposed of properly [Halliburton, 1992]. As a result, the major sources of contamination were from wash-down operations prior to 1980 and the exhaust ventilation system.

The areas at MFA where soil was impacted by the waste discharges were around Buildings 152, 153/154, 157, and 158/159. Buildings 151 and 160 were investigated but no exceedances of cleanup objectives were identified. The constituents of concern for MFA include compounds that were identified in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Phase I Environmental Monitoring Report for MFA [Halliburton, 1992]. Additional compounds were added to those identified in the RFI based on generator knowledge and process operations at MFA to ensure that solvent-contaminated soil, or characteristic wastes, were not transported to the Biofacility for composting. Compounds identified from both sources include the following:

Explosives:

RFI

- Pentaerylthritol tetranitrate (PETN)
- 2,4,6-trinitrotoluene (TNT);
- cyclotrimethylene trinitramine (RDX)
- cycloteremethylenetetranitramine (HMX)
- tetryl; trinitrobenzene (TNB)
- 1,3-dinitrobenzene (DNB)
- nitrobenzene (NB)
- 4-amino-2,6-dintrotoluene (4A26DT)
- 2-amino-4,6-dintrotoluene (2A46DT)
- 2,4-dinitrotoluene (24DNT)
- 2,6-dintrotoluene (26DNT)
- 2-nitrotoluene (2NT)
- 3-nitrotoluene (3NT)
- 4-nitrotoluene (4NT)

Generator Knowledge - no additional compounds

Metals:

RFI

- aluminum
- barium
- cadmium
- chromium
- lead
- mercury

Generator Knowledge

- arsenic
- selenium
- silver

Volatile Organic Compounds (VOCs):

RFI

- Dichloromethane (methylene chloride)
- acetone
- methyl ethyl ketone (2-butanone)
- methyl isobutyl ketone
- toluene
- xylene (total)

Generator Knowledge

- Chloroform
- 1,2-dichloroethane
- 1,1-dichloroethane

Soil from MFA was used for the start-up of full-scale operation of the Biofacility due to its high concentrations of RDX, TNT, HMX and other explosive contaminant compounds. Concentrations of RDX in the soil ranged from non-detect to 15,300 mg/kg. TNT and HMX were reported as high as 3,790 mg/kg and 1,340 mg/kg, respectively. Soil samples were collected in 1985 around Buildings 153 and 158 with the highest concentrations of contaminants detected near Building 153 [Halliburton, 1992].

1.2 SCOPE OF WORK

The scope of work for the IM completed at MFA included:

- Initial site characterization by sampling and analysis of potentially contaminated in-situ soil to determine areas where contamination existed and to delineate the extent of the impacted areas
- Excavation of explosives-contaminated soil identified in the site characterization, screening of the material, and transportation of the screened soil to the Biofacility for treatment
- Field screening during excavation to assist in determining the extent of contamination
- Confirmatory sampling after excavation was completed to document site conditions
- Treatment of the contaminated soil at the Biofacility through composting, including process monitoring of the material during treatment
- Confirmation sampling of the treated material to ensure that it had met the cleanup objectives
- Transportation and backfill of the treated compost at MFA

Field clarification requests (FCRs) were generated to modify, clarify, and/or revise elements associated with the work. Copies of the FCRs are included in Appendix A. Table 1-1 summarizes the scope of each of the FCRs associated with the MFA operations.

1.3 REPORT ORGANIZATION

This report is organized into nine sections and includes ten appendices. Section 1.0 provides a brief introduction of the site and identifies the scope of work covered by this report. Section 2.0 identifies and discusses the applicable site and regulatory compliance issues associated with the work. Section 3.0 provides a summary of the work performed at MFA including the initial site characterization sampling, excavation activities, and confirmation sampling. A summary of the Biofacility composting operations is provided in Section 4.0. Information on disposition of treated compost soil is provided in Section 5.0. Details of the quality control (QC) checks performed during full-scale operations, including data QC, are included in Section 6.0. A summary of safety and industrial hygiene sampling and monitoring is provided in Section 7.0. Conclusions and recommendations of full-scale operations at MFA are summarized in Section 8.0. A list of reference documents is provided in Section 9.0.

Pertinent information is provided in the following appendices:

Appendix A -	Field Clarification Requests
Appendix B -	Waste Disposal Documentation
Appendix C -	Initial Characterization Sample Grid Location Drawings
Appendix D -	Grid Excavation Sampling Summary
Appendix E -	Initial Characterization Sample Results
Appendix F -	Surveyed Drawings
Appendix G -	Post-Excavation Sample Grid Location Drawings
Appendix H -	Post-Excavation Sample Results
Appendix I -	Windrow Recipes, Field Monitoring Results, and Day Zero/Day Last Sample Results Summary
Appendix J -	Backfill Grid Location Drawings

TABLE 1-1 SUMMARY OF MFA FIELD CLARIFICATION REQUESTS NSWC CRANE BIOREMEDIATION FACILITY		
FCR-FS-#	**Date Issued**	**Description**
001	1/12/98	Clarification on short term toxicity screening of compost
002	2/16/98	Revision of screener and procedure due to wet conditions and positioning requirements. Note: ***FCR VOIDED***
003	4/16/98	Revision of Section 5.4 of *FS-OP* to include use of front end loader to place soil in windrows during formation.
006	4/29/98	Clarification on remedial goal for TNT (Denied)
007	5/1/98	Clarification of remedial goal for TNT
008	5/7/98	Identification of temporary staging areas for treated compost in Bioremediation Compost Buildings or at Mine Fill A.
008 Rev. 1	5/27/98	Per direction from EPA in approval letter, additional details on transporting treated compost soil back to the site, with storage and maintenance requirements for the piles, and restoration of the storage area used.
008 Rev. 2	6/3/98	Additional details were added to 008 Rev. 1.
009	7/9/98	Modification to the covering of excavation areas causing moisture to be retained. Note: No final approval received for this FCR.
010	8/25/98	Clarifications to support process operational activities
011	8/25/98	Discontinue Day Zero sampling of windrows, and remove PETN requirement on all samples except initial characterization. Note: Only removal of PETN requirement was approved. Day Zero sampling continued.
012	3/29/99	Addition of Health & Safety Plan from TolTest to the Operational Plan
013	4/12/99	Clarification of building space to utilize small area in front of stockpile where a smaller windrow can be formed.
014	4/27/99	Modification of rock washing procedure
015	5/6/99	Modification to Health & Safety Plan to exclude requirement for two integrated air sampling events
016	6/15/99	Modification to Health & Safety Plan to include new officer
017	6/23/99	Ability to mix MFA and MFB soils into a single stockpile

TABLE 1-1 (continued) SUMMARY OF MFA FIELD CLARIFICATION REQUESTS NSWC CRANE BIOREMEDIATION FACILITY		
FCR-FS-#	**Date Issued**	**Description**
018 Rev. 1	6/28/99	Modification of decontamination requirements between MFA and MFB. Rev. 1 added details per EPA request.
021 Rev. 1	7/9/99	Clarification of treated compost weighing requirements
023	8/3/99	Clarification of reject pile from soil screening at MFA
025 Rev. 1	1/19/00	Revised handling procedure for rocks screened out of excavated soil.
027	2/1/00	Combines requirements for Excavation Completion Report and Compost Completion Report into one Interim Measures Report.

Note: FCRs 004, 005, 019, 020, 022, 024 and 026 did not affect MFA operations and are, therefore, not included in this table. FCR 004 did not directly affect MFA operations, but a comment by U.S. EPA on this FCR was the basis for FCR 017 and FCR 004 is an attachment to FCR 017.

2.0
REGULATORY COMPLIANCE

Various regulatory and site compliance issues were involved in the operations at MFA and the Biofacility. The following sections discuss the site and regulatory requirements associated with soil and treated compost media classification, waste management operations, storm water discharge, and excavation permitting.

2.1 CONTAMINATED MEDIA CLASSIFICATION

On-site bio-treatment of contaminated media complied with all relevant permitting and reporting requirements of RCRA (1976 *et seq.*). No hazardous waste was allowed to be treated in the Biofacility. Sampling and analysis of the soil to be treated was performed for the constituents of concern, and additional VOCs and heavy metals, that may have been present based on generator knowledge, to verify that material was non-hazardous.

Data obtained from in-situ soil samples from all excavation areas indicated that the contaminated soil did not contain Title 40 Code of Federal Regulations (CFR) 261 Appendix VIII hazardous constituents above the characteristic reactivity threshold as determined in 40 CFR 261.23. Contaminated soil containing reactive nitrated aromatics has been evaluated and it was determined that reactivity is not observable if the reactive constituents are present below concentrations of 10% (100,000 mg/kg) [Kristoff et al, 1987]. The site soil concentrations of nitrated aromatic compounds were below this concentration. Other hazardous waste characteristics including corrosivity and flammibility were not performed based on review of in-situ soil analysis. Toxicity analysis has been performed on SWMU specific contaminants and other compounds identified in the FS-QAPP[MK, 1998b] Table 1-2 on a total basis with a correction factor of 20 used to check if the values were below the toxicity characteristic leaching procedure regulatory limits.

Wash-out water from ammunition processing had previously been released to soil in various areas at NSWC Crane, including MFA. This wastewater was classified as KO47 (pink/red water from TNT operations). Per the regulations, KO47 waste becomes de-listed upon deactivation. The reactive level for TNT has been determined to be less than 10% as discussed above. The subject soils did not contain TNT concentrations greater than 10%, therefore the soil was acceptable for treatment at the Biofacility.

Review of in-situ soil analyses indicated that all soil at MFA were non-reactive and non-characteristic and therefore, were classified as non-hazardous waste.

The Biofacility and buildings were designed and built to meet, or exceed, all applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility.

2.2 WASTE MANAGEMENT

The NSWC Crane Environmental Protection Division (EPD) representative coordinated all waste management and disposal. The contractors complied with all NSWC Crane EPD requirements for management of all generated wastes.

Decontamination water generated from the cleaning of equipment and tools was collected and subsequently used as moisture additive for windrows. Stormwater was collected in retention ponds. When the ponds were nearly full, the water was sampled and analyzed as required by the *FS-OP* [MK, 1998a] and the FS-QAPP [MK, 1998b]. Based on sample results, the water was pumped either to the site drainage ditch or the site sanitary sewer. No generated water was taken off-site for disposal.

Specific waste containers (for acetone, field screening kits, PPE, etc.) were generated in response to operational needs. These materials were characterized by generator knowledge and Material Safety Data Sheets (MSDS). All filled waste storage containers were stored, labeled, and disposed of in accordance with the appropriate regulations listed in Section 2.6 below and NSWC Crane directives. Specifically, waste, such as acetone from the field test kits and some of the waste which was explosive-contaminated combustible material, was transported for treatment at the ABG. A *Contaminated Scrap Manifest - NSWCC 6280/4, Rev. 6-84* was filled out and submitted for approval by the NSWC Crane EPD. Upon approval, these specific wastes were transported to the ABG for treatment. PPE was disposed at the on-site landfill. Copies of waste disposal documentation are included in Appendix B.

2.3 STORM-WATER DISCHARGE

NSWC Crane obtained a Storm-water Discharge Permit [NSWC Crane, 1997] under Title 327 Indiana Administrative Code (IAC) 15, National Pollution Discharge Elimination System (NPDES) General Permit Rule Program. Operations were in compliance with the specifications in the *FS-OP* [MK, 1998a] that is consistent with the permit. The storm-water diversion and retention controls for the Biofacility are described in Sections 3.6 and 7.2.4 of the *FS-OP* [MK, 1998a]. Additional details on sampling procedures and analytical methodologies for storm-water discharge are provided in the *FS-QAPP* Section 4.3 [MK, 1998b].

2.4 LANDFILL PERMITTING

Soil excavated from MFA was treated and returned to MFA (SWMU 12/14). It was used as fill and cover in the existing excavations, therefore, no landfill permit was required.

2.5 EXCAVATION PERMITTING

A Digging Permit was obtained from the Public Works Officer for soil excavation at MFA.

2.6 SPECIFICATIONS, CODES, AND STANDARDS

Compliance in the material, examination, testing, inspection, and documentation included the applicable portions of the specifications, codes, and standards listed below.

- U.S. Navy and NSWC Crane guidance
- U.S. Occupational Safety and Health Administration
  - 29 CFR 1910, Occupational Safety and Health Standards
  - 29 CFR 1926, Safety and Health Regulations for Construction
- U.S. Army Corps of Engineers
  - EM-385-1-1, Safety and Health Manual
- U.S. Environmental Protection Agency
  - 40 CFR 257, Criteria for Classification of Solid Waste Disposal Facilities and Practices
  - 40 CFR 261, Identification and Listing of Hazardous Waste
  - 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
  - 40 CFR 264, Subpart S Corrective Action
  - 40 CFR 300, National Oil and Hazardous Substance Contingency Plan
- U. S. Department of Transportation
  - 49 CFR 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.

This part describes requirements for completing shipping papers; marking, labeling, and placarding; training; and emergency response.
  - 49 CFR 173, General Requirements for Shipments and Packaging. This part describes classification and packaging of hazardous materials.

- Indiana Department of Environmental Management
  - 327 IAC 15, NPDES General Permit Rule Program
  - 329 IAC 2, Solid Waste Management
  - 329 IAC 3.1, Hazardous Waste Management Permit Program And
  - Related Hazardous Waste Management
  - Department of Defense Explosives Safety Board explosive safety standard for construction equipment.

- National Codes and Standards
  - ASTM, American Society for Testing and Materials
  - ANSI, American National Standards Institute
  - NEMA, National Electrical Manufactures Association
  - NEC, National Electric Code
  - NFPA, National Fire Protection Association

2.7 ENVIRONMENTAL PROTECTION

All work was conducted in a way that minimized pollution of the air, water, and land. Noise and the disposal of solid waste materials were controlled to protect human health and the environment.

All excavations, stockpiles, access roads, and other work areas were maintained free from excess dust to avoid causing a hazard. Dust at the excavation sites and Biofacility was controlled with a wetting spray from a potable water source.

Temporary erosion control was used in excavation areas until permanent surface drainage was re-established. The amount of bare soil exposed at any time did not exceed three acres. Excavations were protected when work was not in progress.

All erosion control structures in excavation areas were built to conform to SWMU specific conditions. Generally, erosion control structures consisted of berms, ditches, sumps or straw bale dikes. These structures were maintained as often as required to minimize the migration of sediment into, or out of, exclusion zones. Potentially-contaminated stormwater contained and collected within the exclusion zones, was pumped to on-site storage tanks and handled as described in Section 2.3.

3.0
MFA SITE OPERATIONS

3.1 INITIAL CHARACTERIZATION SOIL SAMPLING

3.1.1 Sample Locations

Pre-excavation sampling was performed by MK at MFA around Buildings 151, 152, 153/154, 157, 158/159 and 160 to provide initial site characterization for the purpose of delineating the extent of contaminated soil requiring excavation in impacted areas and to establish that cleanup goals were met in areas where no excavation was required. The locations of potentially contaminated areas were based on previous sampling results as discussed in Appendix E1 (Soil Excavation Plan for MFA) in the *FS-OP* [MK, 1998a]. The subject areas were marked off with grids. The grid layout and boundaries were affected by the presence of buildings, railways, roadways, utilities, etc. Initially 121 grid sections were established as specified in Appendix E1 of the *FS-OP* [MK, 1998a]. Grid borders were flagged in the field.

Initial Characterization Samples (ICS) were collected from each of the 121 grid sections as described in Section 3.1.2 below. Sample results from these sections revealed exceedances of the cleanup goals in some of the outer grid sections. An additional 82 grid sections were added to the outer limits of the areas being characterized to delineate the horizontal extent of contamination. The locations of the 203 grid sections (original 121 plus additional 82) and the results of the ICS samples are shown on Figures C1 (Buildings 153/154), C2 (Buildings 158/159), C3 (Building 152) C4 (Building 157), C5 (Building 160) and C6 (Building 151) in Appendix C. Areas with exceedances of the cleanup criteria were identified at all Buildings except 151 and 160.

3.1.2 Sample Collection and Analysis

Samples were collected from each grid section for site characterization. Generally, sampling at each grid location consisted of three samples, including two composite samples that were analyzed for explosives and metals, and one grab sample that was analyzed for VOCs. The composites were collected at depths of zero to 12 inches and 24 to 36 inches and the grab sample was collected from a depth of 12 inches. Additional samples were obtained for VOCs analysis, as deemed necessary in the field, based on photoionization detector (PID) screening. Field duplicates and other appropriate field QC samples were also collected from selected locations as described in Section 3.1.2 of the *FS-QAPP* [MK, 1998b]. Table D-1 in Appendix D identifies all ICS collected at MFA by grid section.

Samples were analyzed by U.S. EPA SW-846 methods 8330 (explosives), 8260 (VOCs) and 6010/7470 (metals) for the constituents of concern identified in the RFI and additional compounds identified through generator knowledge and process operations at MFA. The analytes are identified in Section 1.1.

The analysis of the compounds identified from generator knowledge and process operations at MFA was performed to ensure that solvent-contaminated soil, or other characteristic wastes, were not transported to the Biofacility for composting. Analysis of these compounds was on a total basis. The totals results were divided by an estimation ~~with the correction~~ factor of 20 ~~used to check if the values were below~~ and compared with the toxicity characteristic leaching procedure (TCLP) regulatory limits. ~~If the total metals and total VOC results, with the correction factor, indicated that values were higher than the regulatory limits, then TCLP analysis would have been requested. However, a~~All totals results were significantly less than 20 times the TCLP limit~~, so no TCLP analyses were performed~~ so the material was classified as not possessing the hazardous waste characteristic of toxicity.

3.1.3 Sampling Data Summary

ICS results are summarized on Table E-1 in Appendix E. ICS QC sample results are on Table E-2, in

Appendix E. ICS from the 203 grid locations revealed 123 grid sections that exceeded industrial cleanup objectives and required excavation. Table D-1 in Appendix D summarizes the samples collected from each grid section and identifies which sections exceeded the cleanup goals and required excavation. After the ICS results were received, the horizontal boundaries of explosives contamination had been delineated by grids with no detectable levels of contamination, levels that were below cleanup objectives, or buildings, roads, railroad tracks or other physical limitations. No metals or VOCs were detected above cleanup action levels for SWMU-specific contaminants of concern in any of the samples. Arsenic, for which samples were tested specifically to ensure that material treated in the Biofacility was not a characteristic hazardous waste, was present in samples at various levels which exceeded industrial cleanup goals. However, no action was taken because arsenic was not a contaminant of concern for MFA, and none of the arsenic total results, when divided by an estimation factor of 20, exceeded ~~20 times~~ the TCLP limit (meaning the material did not possess the hazardous waste characteristic of toxicity) ~~no action was taken~~. The arsenic data has been included in this report to demonstrate that background levels of arsenic are present throughout the Crane area and will need to be considered in future sites of excavation where arsenic is a contaminant of concern.

3.2 SOIL EXCAVATION, SCREENING, AND TRANSPORTATION

Soil excavation was performed at Buildings 152, 153/154, 157, and 158/159. Surveyed drawings of these areas prior to excavation are included in Appendix F. Soil excavation and screening began in November 1997 at Buildings 153/154 prior to the actual start of full-scale operations of the Biofacility. The operation moved to Buildings 158/159 in search of drier soils, before Buildings 153/154 were completed. Contaminated soil was initially excavated from depths of zero to three feet using a backhoe/loader and a Bobcat skid-steer loader. Field screening was performed at this depth, as described in Section 3.3, to determine if additional soil was to be excavated. All excavated soil was screened to remove oversized material (1½-inch or larger) prior to transport to the Biofacility. This was to ensure that the soil to be treated was homogenous so that the composting operation would be effective. Excavated soil was loaded into the soil screening equipment using a backhoe or loader. Screening was initially performed using a trommel screener with a 50-ton/hour capacity. The screen was a standard portable design with a feed hopper and grizzly bars, fines stacking conveyor, and a reject (oversized material) discharge conveyor. In August 1998, a new soil screening unit, the Powerscreen, was purchased and put into operation to increase the quantity of soil screened. It was a larger unit that followed the same general procedure as the trommel screener and nearly doubled production. As a result, a substantial stockpile of screened soil was prepared prior to winter to allow for continued uninterrupted compost operation all year. After screening, the fines were dropped from the fines stacking conveyor into a loader and placed into a live-bottom truck bed for transport to the Biofacility. A step-by-step procedure for soil screening is provided in Field Standard Operating Procedure (SOP) 1.0 in Appendix D of the *FS-OP* [MK, 1998a].

Oversized material was separated into soil clods, vegetation, and rock. Soil clods were spread out, allowed to sufficiently dry, and then pulverized and re-screened. Vegetation was stockpiled on site and then relocated to the Biofacility where it was incorporated into windrows. The rocks were washed, as described in Section 3.6, and backfilled.

Table 3-1 shows the quantity of soil that was excavated and screened at MFA through August 1999. Excavation ceased at that point because of concerns raised by U.S. EPA regarding backfilling of the treated soil from the Biofacility due to the toxicity of the compost. The additional areas remaining to be excavated are near Buildings 153 and 154 and include grid sections 23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, 173. Per an agreement with the U.S. EPA in January 2000, the Navy will perform supplemental toxicity testing of treated compost soil to address U.S. EPA's concern. The toxicity testing procedure for the compost was submitted to U.S. EPA in April 2000 as a revision to Appendix G of the *FS-QAPP* [MK, 1998b]. Additional details were added to the procedure in June 2000 and currently the Navy is awaiting approval by U.S. EPA. Upon completion of the supplemental testing, the remaining grid sections will be excavated. An addendum to this IMR will be generated and submitted to U.S. EPA to detail the excavation, treatment, sampling, and backfilling of the material from the remaining grids.

TABLE 3-1 SOIL EXCAVATION AND SCREENING QUANTITIES NSWC CRANE MFA		
Month	**Quantity of Material Excavated and Screened[1] Through August 1999 (Tons)**	**Cumulative Quantity (Tons)**
March 1998	1,530	1,530
April 1998	183	1,713
May 1998	914	2,627
June 1998	126	2,753
July 1998	958	3,711
August 1998	1,520	5,231
September 1998	1,996	7,227
October 1998	1,671	8,898
November 1998	1,187	10,085
December 1998	586	10,671
January 1999	0	10,671
February 1999	1,047	11,718
March 1999	329	12,047
April 1999	841	12,888
May 1999	2,216	15,104
June 1999	2,617	17,721
July 1999	2,230	19,951
August 1999	258	20,209

Notes:

1- Quantities are taken from Quarterly Interim Progress Reports based on actual scale weights of soil trucked to the biofacility.

3.3 IN-PROCESS EXCAVATION SOIL SAMPLING

Soil samples were collected during excavation activities at MFA to assist the field crew in determining the extent of excavation required at each grid section. Field screening test kits were used to test TNT and RDX levels in the in-process soil samples to provide quick field screening results. Soil sampling during excavation was performed as specified in the Soil Excavation Plan, Appendix E of the *FS-OP* [MK, 1998a]. Two composite samples were collected from each grid section for field screening with the test kits. One sample was collected from the base of the excavation and one from the sidewalls. If the field screening indicated that concentrations of TNT and RDX were greater than industrial cleanup levels, subsequent layers of contaminated soil were removed until field screening indicated acceptable concentrations of explosives (below the industrial cleanup objectives) or physical impediments (buildings, railways, roadways, utilities, etc.) were encountered. Table 3-2 identifies the grid sections that were not excavated to the cleanup goals and the reason why there was no additional excavation.

3.4 POST-EXCAVATION CONFIRMATION SOIL SAMPLING

Post-excavation confirmation soil samples (PES) were collected, following excavation and field screening, to determine the levels of SWMU-specific contaminants remaining in the soil. PES were collected by both MK and TolTest. PES included one composite sample from the base of each grid section and one composite sample from the sidewalls of each grid excavation. Samples were analyzed for contaminants that were detected above the industrial cleanup objectives in the ICS. The samples were analyzed as specified in the Soil Excavation Plan, Appendix E of the *FS-OP* [MK, 1998a]. Analysis was performed by an off-site laboratory. Table D-1 in Appendix D identifies the PES collected from each grid. Appendix G includes grid location drawings that show the results of the post-excavation samples with respect to the cleanup goals. PES results are included in Appendix H.

3.5 EQUIPMENT DECONTAMINATION

After equipment was no longer required at MFA, it was decontaminated prior to being transported to another site (with the exception of equipment going to MFB from MFA since contaminants were the same - see FCR 18). All decontamination fluids were collected and used for moisture conditioning of windrows at the Biofacility.

3.6 ROCK WASHING

Initially, the *FS-OP* [MK, 1998a] specified washing and triple rinsing oversized material rejected from the soil screening process. The wash and rinse water were to be collected and analyzed as described in Figure 1.4 of the *FS-OP*. This procedure was labor intensive, generated excessive amounts of contaminated rinse water, and proved to be futile in attaining the cleanup standards established in the *FS-OP* for acceptable decontamination of the rocks [drinking water standards on the rinse water]. FCR 14 was generated to replace the original rock washing procedure. The revised procedure required that the rocks be washed with a high-pressure-low-volume sprayer to remove all visible soil contamination. The rocks were then returned to the bottom of an open excavation within the same SWMU and covered with no less than two feet of finished compost. This technique permitted more timely backfilling of the rocks back to the point of origin. Additionally, the rinse water was used for moisture conditioning of the windrows, thereby minimizing the quantity of generated waste requiring disposal.

TABLE 3-2 SUMMARY OF GRIDS NOT EXCAVATED TO CLEANUP GOALS NSWC CRANE MFA		
Grid Section	**Building Location**	**Reason Soil Not Excavated to Cleanup Goals**
2	153/154	Encountered blast wall footer
3	153/154	Encountered blast wall footer
4	153/154	Encountered utility lines
5	153/154	Encountered bedrock
10	158/159	Encountered blast wall footer
11	158/159	Encountered blast wall footer
12	158/159	Encountered utility lines
17	153/154	Railroad track prevented further soil removal
23	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
24	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
26	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
27	153/154	Soil left in place was structural support for a steam line
28	153/154	Soil left in place was structural support for a steam line
29	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
33	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
34	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
35	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
36	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
37	153/154	Encountered blast wall footer
38	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
40	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
56	158/159	Soil left in place was structural support for a steam line
58	158/159	Soil left in place was structural support for a steam line
59	158/159	Encountered utility lines
62	158/159	Encountered blast wall footer
63	158/159	Encountered utility lines
64	158/159	Encountered blast wall footer

TABLE 3-2 (continued) SUMMARY OF GRIDS NOT EXCAVATED TO CLEANUP GOALS NSWC CRANE MFA		
Grid Section	**Building Location**	**Reason Soil Not Excavated to Cleanup Goals**
65	158/159	Encountered blast wall footer
72	152	Encountered footer
103	157	Soil was excavated to a depth of 10 feet. Excavation ceased per direction from NSWC Crane ECOTR
106	157	Encountered overhead conveyor footers
126	153/154	Encountered lightning mast footers
127	153/154	Encountered blast wall footer
128	153/154	Encountered lightning mast footers
131	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
132	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
133	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
134	153/154	Encountered utility lines
135	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
149	158/159	Encountered utility lines
150	158/159	Encountered utility lines
171	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
172	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
173	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
200	153/154	Encountered bedrock
202	153/154	Encountered bedrock
203	153/154	Encountered bedrock

4.0
BIOFACILITY COMPOSTING OPERATIONS

Impacted soil excavated from MFA was treated in the Biofacility by composting to microbially degrade the explosive compounds in the soil. Organic amendments (chicken manure and straw) were mixed with the contaminated soil in windrows to form the compost. Section 4.1 describes maintenance and repairs of the Biofacility. Section 4.2 describes the supply and storage of the amendments. Section 4.3 describes the windrow construction process. The amendments in the compost served as a carbon source for the microorganisms in the material that were capable of degrading the explosives. The availability of organic material and inorganic nutrients (such as nitrogen and phosphorus), temperature, moisture content, pH, and oxygen availability in the compost were optimized in order to enhance the process. Section 4.4 describes the monitoring of various constituents/properties in the soil to ensure optimum conditions were maintained and to track the progress of the treatment. Section 4.5 describes the monitoring of explosives in the treated soil. Microbial activity in the soil was stimulated by heat that was generated and contained in the compost matrix. A full description of the composting operation process is provided in Section 5.0 of the approved *FS-OP* [MK, 1998a].

A total of 102 windrows of material excavated from MFA were treated in the Biofacility. All windrows successfully achieved either the residential or industrial cleanup goals for the constituents of concern. Table 4-1 shows the quantity of soil processed each month. Approximately 21,174 tons of soil were processed. The quantities of soil processed are field estimates based on number of loads of soil used to create each windrow, while quantities of soil excavated (Table 3-1) are actual scale weights. This accounts for the apparent treatment of more soil than was excavated.

The actual performance schedule for the treatment of the MFA soils was significantly ahead of the planned dates. This was primarily due to the relatively short biodegradation period. The average treatment period for MFA soils between Day Zero and Day Last was 9.2 days. The schedule planned this period to be thirty days. MK and TolTest closely monitored the bioremediation of the windrows with the use of available data, including field test kits, to determine when windrows reached cleanup goals and Day Last confirmation samples could be collected. This minimized the lengths of the biodegradation periods. Table 4-2 provides a summary of all windrows, including soil and amendment quantities, process duration, and treatment level attained (industrial or residential).

4.1 BIOFACILITY MAINTENANCE AND REPAIRS

Routine maintenance and housekeeping activities were performed at the Biofacilty. General building cleanliness was maintained during full-scale operations by using a front end loader and/or a skid steer loader to collect stray compost materials and reform the piles, as necessary. Brooms and shovels were used in inaccessible areas. Any ponded liquid inside the buildings was manually moved to the sump within 24 hours. Throughout operations, windrows were kept segregated, well-formed, and identified with signs containing the windrow number and date formed. Any ponded liquid on external asphalt surfaces was manually moved to the retention ponds within 24 hours.

Inspections of Biofacility buildings and associated structures were performed on a quarterly basis. Items found to be deficient were repaired or scheduled for repair at the earliest available period. Special attention was paid to specific items such as checking for settlement cracks in the Biofacility building floors and leaks in either storm-water retention pond liners or compost buildings. The Biofacility building floors and sumps were inspected for new cracks between building compost cycles in addition to the quarterly inspection. Any new cracks were scheduled for repair. Repair was performed by saw-cutting the crack as necessary to allow installation of Silkaflex 1a Polyurethane sealant, or equivalent sealant. A water line leak was identified under the asphalt in the process area. This was repaired by TolTest. All facility repairs were in accordance with the facility construction specifications [MK, 1997 and MK, 1998c].

TABLE 4-1 MFA PROCESSED SOIL QUANTITIES NSWC CRANE BIOFACILITY		
Month	**Quantity of Soil Processed[1] (tons)**	**Cumulative Soil Processed (tons)**
April 1998	0	0
May 1998	926	926
June 1998	253	1,180
July 1998	1,386	2,566
August 1998	866	3,432
September 1998	1,155	4,587
October 1998	1,155	5,742
November 1998	1,172	6,914
December 1998	1,165	8,079
January 1999	1,162	9,241
February 1999	682	9,923
March 1999	928	10,851
April 1999	1,856	12,707
May 1999	1,575	14,283
June 1999	2,135	16,417
July 1999	2,547	18,964
August 1999	2,117	21,081
September 1999	92.8	21,174

Note:

1 - Weights determined from Windrow Recipe Forms for each windrow that obtained Day Last status during the month specified. Quantities of soil processed are field estimates, while quantities of soil excavated (Table 3-1) are actual scale weights. This accounts for the apparent treatment of more soil than excavated soil.

TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
1	232.1	133	69.6	434.7	4/15/98	5/11/98	26	Residential	6/24/98	West Berm Bldg.159
2	232.1	115	58.9	406.0	4/17/98	5/8/98	21	Residential	6/25/98	West Berm Bldg. 159
3	236.5	122	58.0	416.5	4/22/98	5/7/98	15	Residential	6/26/98	SW Bldg. 157
4	220.0	109	62.9	391.9	4/24/98	5/8/98	14	Residential	6/30/98	West Berm Bldg. 159
30%	22.0	11	4.7	37.7	4/27/98	6/26/98	60	Residential	9/1/98	Reprocessed as soil
Control	5.5	3	1.4	9.9	4/25/98	5/20/98	26	NA	6/24/98	West Berm Bldg.159
5	231.0	128	51.2	410.2	6/3/98	6/18/98	15	Residential	7/2/98	SE Bldg. 157
6	231.0	120	60.1	411.1	6/17/98	7/1/98	14	Residential	7/14/98	Back Berm Bldg. 159
7	231.0	120	60.6	411.6	6/24/98	7/7/98	13	Residential	7/16/98	West Berm Bldg. 159
8	231.0	120	56.2	407.2	7/1/98	7/9/98	8	Residential	7/24/98	West Berm 153/154
9	231.0	113	60.4	404.4	7/8/98	7/16/98	8	Residential	7/28/98	NW Swale 153/154
10	231.0	116	61.7	408.7	7/17/98	7/27/98	10	Residential	8/7/98	West Berm Bldg. 159
11	231.0	122	58.7	411.7	7/22/98	7/31/98	9	Residential	3/21/99	Field Applied
12	57.2	29	14.9	101.1	7/28/98	8/4/98	7	Residential	8/17/98	South of Bldg. 157
13	132.0	70	34.3	236.3	8/4/98	8/11/98	7	Residential	3/21/99	Field Applied
14	231.0	119	68.8	418.8	8/6/98	8/14/98	8	Residential	3/21/99	Field Applied
15	220.0	116	78.7	414.7	8/12/98	8/19/98	7	Residential	9/4/98	Steam Line Bldg. 2793
16	225.5	116	72.0	413.5	8/15/98	8/21/98	6	Residential	9/8/98	Steamline Bldg. 2793
17	225.5	115	54.9	395.4	8/26/98	9/2/98	7	Residential	9/17/98	Steamline Bldg. 2793
18	231.0	112	70.5	413.5	8/28/98	9/3/98	6	Residential	9/18/98	NW Bldg. 153/154
19	236.5	116	60.9	413.4	9/9/98	9/16/98	7	Residential	9/15/98	NW Bldg. 153/154
20	231.0	114	65.0	410.0	9/11/98	9/18/98	7	Residential	9/28/98	Steam Line Bldg. 2793
21	231.0	111	59.9	401.9	9/18/98	9/25/98	7	Residential	10/6/98	NW Bldg. 153/154
22	231.0	114	64.7	409.7	9/23/98	10/14/98	21	Residential	10/27/98	RR Ditch Bldg. 153/154
23	231.0	115	63.1	409.1	9/30/98	10/22/99	22	Residential	10/23/98	Bldg. 158/159 Backside
24	231.0	117	65.2	413.2	10/2/98	10/12/98	10	Residential	3/21/99	Field Applied
25	231.0	118	62.8	411.8	10/9/98	10/16/98	7	Residential	10/29/98	Steam Line Bldg. 2793
26	231.0	117	73.1	421.1	10/24/98	10/30/98	6	Residential	11/14/98	NW Bldg. 153/154
27	242.0	122	67.4	431.4	10/28/98	11/4/98	7	Residential	3/17/99	West Berm Bldg. 153/154
28	231.0	117	65.8	413.8	10/30/98	11/20/99	21	Industrial	11/23/98	Back Berm Bldg. 159
29	231.0	116	66.5	413.5	11/5/99	11/12/98	7	Residential	11/24/98	NW Bldg. 153
30	236.5	120	70.9	427.4	11/18/98	12/8/99	12	Industrial	12/9/98	West Berm Bldg. 159
31	231.0	118	65.5	414.5	11/20/98	11/30/98	10	Residential	12/10/98	North Berm 152
32	232.1	119	61.6	412.7	11/25/98	12/2/98	7	Residential	12/11/98	NW Bldg. 153
33	232.1	119	68.1	419.2	12/2/98	12/8/98	6	Residential	12/22/98	North/East Bldg. 157
34	236.5	126	63.0	425.5	12/11/98	12/18/98	7	Residential	1/13/99	Back berm Bldg. 159
35	232.1	119	59.0	410.1	12/13/98	12/22/98	9	Industrial	1/7/99	Back berm Bldg. 159
36	232.1	118	68.6	418.7	12/15/98	12/28/98	13	Industrial	1/1/4/99	NW swale Bldg. 153
37	232.1	117	73.9	423.0	12/30/99	1/11/99	12	Industrial	1/21/99	West Berm Bldg. 153/154
38	235.4	120	57.5	412.9	1/12/99	1/19/99	7	Industrial	1/21/99	NW Berm Bldg. 153/154

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TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
39	231.0	122	64.6	417.6	1/15/99	1/21/99	6	Industrial	1/31/99	West Berm Bldg. 153/154
40	231.0	119	62.6	412.6	1/17/99	1/24/99	7	Industrial	2/8/99	West Berm Bldg. 153/154
41	232.1	123	55.5	410.6	1/24/99	1/31/99	7	Industrial	2/12/99	West Berm Bldg. 153/154
42	221.1	113	61.9	396.0	2/1/99	2/8/99	7	Industrial	2/19/99	SE Berm Bldg. 158/159
43	229.9	117	59.8	406.7	2/6/99	2/12/99	6	Industrial	2/25/99	North Berm Bldg. 152
44	231.0	116	62.7	409.7	2/11/99	2/18/99	7	Industrial	2/26/99	North Berm Bldg. 152
45	232.1	119	62.3	413.4	2/18/99	3/8/99	18	Industrial	3/20/99	North Berm Bldg. 152
46	232.1	116	57.6	405.7	2/22/99	3/10/99	16	Residential	3/20/99	1/3 North Berm Bldg. 152; 2/3 Field Applied
47	232.1	118	59.9	410.0	3/4/99	3/17/99	13	Industrial	3/20/99	N/NE Bldg. 157
48	232.1	118	62.6	412.7	3/6/99	3/23/99	17	Industrial	3/30/99	NE, NW and SW Bldg. 157
49	231.0	116	57.1	404.1	3/22/99	4/1/99	10	Industrial	4/8/99	S. side Bldg. 152; NE and SW Bldg. 157
50	232.1	122	59.2	413.3	3/24/99	4/2/99	9	Industrial	4/11/99	SE and S. Bldg. 152; NE Bldg. 157
51	232.1	117	54.7	403.8	3/29/99	4/12/99	14	Residential	4/17/99	SE side Bldg. 152
52	232.1	105	51.4	388.5	4/2/99	4/13/99	11	Residential	4/19/99	Storage Area
53	232.1	118	57.3	407.4	4/10/99	4/21/99	11	Industrial	4/26/99	SE side Bldg. 157
54	232.1	119	53.9	405.0	4/14/99	4/26/99	12	Residential	4/30/99	Storage Area
55	232.1	117	55.2	404.3	4/21/99	4/30/99	9	Residential	5/7/99	Storage Area
56	232.1	117	57.7	406.8	4/23/99	4/30/99	7	Residential	5/8/99	Storage Area
57	110.0	59	25.5	194.5	4/24/99	5/3/99	9	Residential	5/10/99	Storage Area
58	93.5	49	21.4	163.9	4/28/99	5/7/99	9	Residential	5/14/99	Storage Area
59	232.1	120	54.2	406.3	5/3/99	5/12/99	9	Residential	5/17/99	E. Bldg. 154
60	232.1	118	55.9	406.0	5/6/99	5/13/99	7	Industrial	5/20/99	SW Bldg. 157
61	232.1	117	54.0	403.1	5/11/99	5/19/99	8	Residential	5/26/99	E. Bldg. 154
62	232.1	116	53.3	401.4	5/14/99	5/20/99	6	Industrial	5/27/99	NW Bldg. 157
63	88.0	44	21.9	153.9	5/17/99	5/25/99	8	Residential	6/1/99	SE and SW Bldg. 157
64	232.1	109	54.1	395.2	5/19/99	5/27/99	8	Industrial	6/3/99	SE Bldg. 152
65	123.2	64	28.8	216.0	5/20/99	5/28/99	8	Industrial	6/4/99	NW Bldg. 157
66	232.1	91	42.5	365.6	5/21/99	6/2/99	12	Residential	6/8/99	E. Bldg. 154
67	232.1	109	47.6	388.7	5/27/99	6/3/99	7	Industrial	6/10/99	NW Bldg. 157
68	232.1	119	54.3	405.4	5/28/99	6/7/99	10	Residential	6/14/99	E. Bldg. 154
69	98.6	50	22.6	171.2	6/2/99	6/9/99	7	Industrial	6/16/99	NE Bldg. 157
70	232.1	123	53.6	408.7	6/4/99	6/11/99	7	Residential	6/21/99	E. Bldg. 154
71	98.6	49	22.8	170.5	6/5/99	6/14/99	9	Industrial	6/21/99	NE Bldg. 157
72	232.1	116	51.8	399.9	6/9/99	6/16/99	7	Residential	6/23/99	E. Bldg. 154
73	232.1	114	49.8	395.9	6/12/99	6/18/99	6	Residential	6/25/99	E. Bldg. 154
74	232.1	115	50.5	397.6	6/15/99	6/23/99	8	Residential	6/30/99	E. Bldg. 154
75	81.2	40	17.6	138.8	6/17/99	6/25/99	8	Residential	7/3/99	E. Bldg. 154
76	232.1	112	47.0	391.1	6/22/99	6/29/99	7	Industrial	7/6/99	N. Bldg. 152
77	232.1	107	44.8	383.9	6/24/99	7/2/99	8	Industrial	7/10/99	S. Bldg. 152
78	81.2	40	17.2	138.4	6/25/99	7/1/99	6	Industrial	7/9/99	S. Bldg. 152

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TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
79	232.1	113	48.2	393.3	6/26/99	7/6/99	10	Residential	7/13/99	E. Bldg. 154
80	232.1	120	51.5	403.6	7/1/99	7/8/99	7	Residential	7/15/99	E. Bldg. 154
81	98.6	50	21.6	170.2	7/3/99	7/9/99	6	Residential	7/16/99	E. Bldg. 154
82	232.1	108	47.7	387.8	7/8/99	7/14/99	6	Residential	7/20/99	E. Bldg. 154
83	98.6	49	21.3	169.0	7/9/99	7/15/99	6	Residential	7/21/99	E. Bldg. 154
84	232.1	115	48.1	395.2	7/10/99	7/16/99	6	Residential	7/24/99	E. Bldg. 154
85	232.1	108	48.8	388.9	7/13/99	7/20/99	7	Residential	7/27/99	E. Bldg. 154
86	232.1	108	47.6	387.7	7/15/99	7/21/99	6	Residential	7/27/99	E. Bldg. 154
87	81.2	41	17.5	139.7	7/16/99	7/22/99	6	Residential	7/28/99	E. Bldg. 154
88	232.1	112	50.5	394.6	7/21/99	7/27/99	6	Residential	8/2/99	E. Bldg. 154
89	98.6	49	21.2	168.8	7/22/99	7/28/99	6	Residential	8/2/99	E. Bldg. 154
90	232.1	104	45.5	381.6	7/24/99	7/29/99	5	Residential	8/4/99	E. Bldg. 154
91	232.1	113	50.3	395.4	7/27/99	8/2/99	6	Residential	8/9/99	E. Bldg. 154
92	232.1	109	49.2	390.3	7/28/99	8/3/99	6	Industrial	8/9/99	Staging Area
93	81.2	40	17.6	138.9	7/29/99	8/4/99	6	Industrial	8/11/99	Staging Area
94	232.1	110	47.2	389.3	8/3/99	8/9/99	6	Residential	8/16/99	E. Bldg. 154
95	81.2	40	17.8	139.0	8/4/99	8/12/99	8	Residential	8/18/99	E. Bldg. 154
96	232.1	138	47.7	417.8	8/5/99	8/11/99	6	Residential	8/17/99	E. Bldg. 154
97	232.1	112	50.0	394.1	8/9/99	8/16/99	7	Residential	8/23/99	E. Bldg. 154
98	232.1	113	50.0	395.1	8/10/99	8/17/99	7	Industrial	8/25/99	Staging Area
99	98.6	49	21.9	169.6	8/11/99	8/20/99	9	Residential	8/27/99	E. Bldg. 154
100	232.1	103	43.0	378.1	8/16/99	8/23/99	7	Residential	8/29/99	E. Bldg. 154
101	232.1	107	46.4	385.5	8/18/99	8/27/99	9	Industrial	9/3/99	Staging Area
102	92.8	46	19.9	158.7	8/19/99	9/2/99	14	Industrial	9/8/99	Staging Area
TOTAL	**21,174**	**10,612**	**5,238**	**37,024**			**Avg. 9.2[4]**			

Notes:
1) Windrows 1-48 constructed and processed by MK; 49-50 constructed by MK and processed by TolTest; 51-102 constructed and processed by TolTest.
2) Quantities are taken from the Record of Recipe Worksheets included in Appendix G with pounds converted to tons, rounded to the nearest ton.
3) Level Attained is for most commonly detected explosive contaminants (HMX, RDX, TNT)
4) Average does not include 30% loading windrow or Contol windrow.

NA - Not Applicable

The only damage to the Biofacility during treatment of the MFA soils was to seven panels on the south side of the north building. The damage occurred when the panels were hit by the discharge chute of a tub grinder. The panels were subsequently replaced.

4.2 AMENDMENTS SUPPLY AND STORAGE

The compost mix used in full-scale operations included chicken manure and straw amendments that were added to the soil. Amendments were brought to the site and stored in the asphalt-paved amendment storage bins at the Biofacility. Table 4-3 summarizes the quantities of amendments received and used.

Each contract was awarded to supply amendments for approximately one year of compost operations. All trucks were weighed off-site, and 20% of the trucks were verified prior to offloading of amendments on the truck scale at the entrance of the Biofacility. All amendments were stored in the asphalt-paved amendment storage area. Straw from the local area was trucked to the Biofacility for immediate use or stockpiled for later use. Straw was delivered in bales bound with plastic mesh which was removed prior to mixing.

Chicken manure was obtained from Wabash Valley Produce in Dubois, IN. It was trucked to the Biofacility on an as-needed bases. The manure was from hens and contained approximately 1% feathers, eggs, or other natural impurities and was free of bedding material. All manure was delivered in bulk to the amendment storage area within one week prior to loading the windrows to ensure quality of freshness of the amendment and to avoid potential odor and leaching problems.

4.3 WINDROW CONSTRUCTION AND MAINTENANCE

The compost mix used in the Biofacility full-scale operations consisted of 25% soil, 15% chicken manure, and 60% straw by volume. Amendments were loaded on a volume basis using a center-pivot loader into a tractor-powered grinder/mixer unit as described in SOP 3.0 of Appendix D of the *FS-OP* [MK, 1998a]. The mixer then homogenized each load by mixing for 10 to 15 minutes. Water was added for dust control. The amendment blend was unloaded from the grinder/mixer unit through a side-mounted discharge conveyer forming a windrow approximately six feet high and 12 foot wide. The grinder/mixer then returned to the amendment storage area for reloading. This process continued until a windrow approximately 250 to 270 feet long was formed. A second windrow, adjacent to and partially overlapping the first windrow was then loaded into the building. This formed a single, larger windrow approximately 20 feet wide with two peaks 6 feet high. A full description of the windrow formation procedure is provided in SOP 4.0 of Appendix D of the *FS-OP* [MK, 1998a]. After the amendment blend was loaded in the building and shaped, stockpiled screened soil was delivered to the compost windrow in covered trailers or by loader bucket. The soil was loaded on a volume basis. A full description of the transport and loading of soil into the windrow is provided in SOP 5.0 of Appendix D of the *FS-OP* [MK, 1998a]. Records of recipes for the formation of each windrow formulated with explosive compound contaminated soil are provided in Appendix I of this IMR. The quantity of amendments used in each windrow is summarized in Table 4-2 and Table 4-3 shows the quarterly cumulative amount of amendments used.

After the soil was loaded into the windrows, the windrow/compost turning machine (SCARAB®) mixed and reformed the windrow to a pile approximately 20 feet wide and four feet tall. The SCARAB® generally made at least two or three passes during initial windrow construction to assure thorough mixing. Following formation, windrows were turned on a daily basis as described in SOP 6.0 of the *FS-OP* [MK, 1998a]. Water was added, as needed, to maintain optimum moisture levels (see Section 4.4.3).

Full-scale windrows generally extended the length of the Biofacility building and were 250 to 270 feet in length. Occasionally lengths and total volumes of soil and amendments were modified for operational reasons. In the case of Windrow 13, a smaller windrow was formed after Windrow 12 because

TABLE 4-3 AMENDMENT QUANTITIES RECEIVED AND USED NSWC CRANE BIOFACILITY						
Quantities[1]	**First Quarter[2] April - June 1998**	**Second Quarter[3] July - Sep. 1998**	**Third Quarter[4] Sep. - Dec 1998**	**Fourth Quarter[5] Jan. - Mar. 1999**	**TolTest Operation[6] April - Aug. 1999**	**Cumulative**
Chicken Manure Received	1,034 tons	1,602 tons	1,492 tons	1,199 tons	4,691 tons	10,018 tons
Chicken Manure Used	981 tons	1,598 tons	1,663 tons	1,301 tons	5,069 tons	10,612 tons
Straw Received	636 tons	2,340 tons	0 tons	445 tons	2,612 tons	6,033 tons
Straw Used	484 tons	890 tons	932 tons	667 tons	2,253 tons	5,226 tons

Notes:
1 - Quantities of amendments received are actual scale weights while quantities of amendments used are field estimates. This accounts for the apparent use of more chicken manure than was received.
2 - Includes windrows 1 through 8, the 30% loading windrow, and the control windrow.
3 - Includes windrows 9 through 23
4 - Includes windrows 24 through 37
5 - Includes windrows 38 through 48
6 - Includes windrows 49 through 102

mechanical problems with the tub grinder hindered the completion of a full windrow for M012. As a result, two separate smaller windrows (12 and 13) containing the same amendment ratio were formed in the location of one full-scale windrow. Shortened windrows approximately 125 feet in length were used during full scale operations to utilize the unused east-end of the "N" building, opposite the contaminated stockpile of screened soil at the west-end. FCR-013 (Appendix A) discusses the details of these shortened windrows. Windrow 57, 58, 63, 65, 69, 71, 75, 78, 81, 83, 87, 89, 93, 95, 99, and 102 were formed in N building using half-sized windrow recipes.

The full scale windrows were monitored in 15 locations, as described in Section 4.4, in order to assess oxygen, temperature, pH and explosive concentrations. The 15 locations included five cross-sections through the windrow with three depths at each cross-section. Half-sized windrows were monitored in six locations to assess oxygen, temperature, pH, and explosive concentrations. The six locations included two cross-sections through the windrow with three depths at each cross-section as described in FCR-013 (Appendix A).

During full scale operations of MFA material at the Biofacility, 102 windrows achieved Day Last status. In addition, several special windrows were formulated for other studies. A windrow containing a 30% mixture of contaminated soil was formed and the results of this windrow are discussed in the *30% Soil Loading Batch Report, Full-Scale Bioremediation, NSWC Crane* [MK, 1998f]. A pilot scale size windrow containing uncontaminated soil was created and treated for the purposes of a control windrow for toxicity testing. The results of this windrow are discussed in *Toxicity Report, Full-Scale Bioremediation, NSWC Crane* [MK, 1998e].

4.4 WINDROW TREATMENT FIELD PROCESS MONITORING

Process monitoring of each windrow included the daily monitoring of oxygen and temperature both prior to and after windrow turning with the SCARAB®. In addition, moisture levels and pH were monitored periodically with field instruments to demonstrate acceptable conditions for biological degradation. Field test kits were used to monitor the levels of explosive contaminants in the compost. Monitoring locations and frequencies for each of these parameters are described in Section 6.0 of the *FS-OP* [MK, 1998a]. Monitoring locations were modified as described in FCR-013 (Appendix A) for half-sized windrows. All field instrumentation was calibrated daily prior to use. A summary of the monitoring data is provided, by windrow, in Appendix I.

4.4.1 Temperature

Temperature was monitored during soil treatment, as it is the primary indicator of successful thermophilic composting. The process goal was to maintain average windrow temperatures near 55°C during treatment. Temperature decreasing over time to below 50°C is viewed as an indicator that a windrow is nearing the end of its operation [Weston, 1993].

During full-scale operations, windrow temperature was monitored twice daily, before and after windrow turning. Temperature readings were taken using a hand-held temperature probe at six monitoring locations at each of the cross sections (3, 5, 7, 9, and 11) as described in Section 4.0 of the *FS-QAPP* [MK, 1998b]. Temperatures readings for half-sized windrows occurred at six monitoring locations at two cross sections (3 and 5). These locations were selected to provide representative temperature profiles for the inner core and outer near-surface conditions. Ambient air temperature and humidity inside the buildings were monitored daily using an alcohol thermometer and a hygrometer.

4.4.2 Oxygen

Oxygen levels approaching ambient atmospheric conditions, or about 20%, are preferred in a compost windrow, and 5% is considered the minimum for rapid compost degradation. Oxygen levels below 1% indicate anaerobic conditions. If sufficient oxygen levels are not maintained, proper microbial degradation may not occur, thermophilic temperatures may not be maintained, and putrefaction of

organic matter may occur. During pilot scale operations, it was found that anaerobic conditions commonly exist in a compost windrow throughout most of each day depending on the density of the compost and the moisture content. As the compost degrades, the porosity is reduced which reduces the available oxygen. The windrows were turned daily to help increase the oxygen levels in the compost. Like temperature, oxygen levels were also monitored twice daily during full-scale operations both before and after windrow turning was performed. A hand-held probe was used to measure oxygen at the same locations used for the temperature measurements.

4.4.3 Moisture

As discussed in the *FS-OP* [MK, 1998a], the operating goal for composting moisture content was 40 to 60% maximum water holding capacity (WHC). Moisture level monitoring was performed three times per week, prior to windrow turning, to determine if moisture addition was required to maintain the operating goals. One composite sample per cross-section, composed of three discrete samples, was collected for moisture level determination. These samples were analyzed to determine the maximum water holding capacity (WHC). The WHC is the ratio of the mass of water retained in the sample compared to the mass of water retained in the sample at saturation.

Based on the results of the moisture monitoring, water was added during the windrow mixing stage, as necessary, to maintain moisture conditions in the operating goals. Moisture was added to the windrows by either a spray manifold on the windrow turning machine or manually, using a hose. At no time during operations was leachate observed from any of the windrows.

4.4.4 pH

Samples for pH monitoring were collected weekly prior to turning. Samples were composites of three locations at each of the five cross sections. After the formation of Windrow 50, sufficient data had been collected to ensure that the proper pH (5.5 to 9.0 s.u) of the soil and amendment mixture from MFA existed and no pH adjustments were needed. Weekly monitoring of the pH was discontinued at this point.

4.4.5 Explosives

Field screening was performed at least weekly to monitor the RDX and TNT levels of each windrow being processed. Each sample represented a composite of the three sampling locations from each cross-section.

4.5 EXPLOSIVE CONTAMINANT LABORATORY SAMPLES

Explosives were the only contaminants that exceeded the industrial cleanup goals in the ICS, therefore, explosive compounds were the only parameters that required laboratory analysis during windrow treatment. Samples were collected for laboratory analysis when the windrow was constructed (Day Zero) and following treatment (Day Last). Day Last samples were collected to confirm that the cleanup goals had been achieved when field screening for explosives indicated RDX and TNT readings were below detectable levels. MK performed field screening for both RDX and TNT. TolTest's field screening included only RDX since they felt it provided the best indication of contaminant degradation. However, both MK and TolTest used field screening analysis only as an indication to collect Day Last samples for analysis at an approved off-site laboratory.

For each windrow, samples were collected from three locations in each of five cross-section areas across the windrow for a total of 15 locations. Samples were collected in glass jars, placed in a cooler or refrigerator and shipped to an off-site laboratory for analysis of explosives for confirmation purposes. Either Southwest Laboratories of Oklahoma or Quanterra of West Sacramento performed analysis by Method 8330 according to SOP provided in Appendix C of the *FS-QAPP* [MK, 1998b]. Shipping and handling procedures are detailed in Section 4.3.4 of the *FS-QAPP*.

Analytical results of all explosives analyzed on Day Zero and Day Last are included, by windrow, in Appendix I. Average results for HMX, RDX and TNT are summarized on Table 4-4, by windrow. Cleanup levels for these compounds are shown on Table 4-5. Residential or industrial cleanup levels for explosive compounds were achieved for all windrows. Table 4-2 identifies which windrows met industrial cleanup goals and which met residential standards.

TABLE 4-4
AVERAGE RESULTS FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #1		Windrow #2		Windrow #3		Windrow #4	
	Day 0	Day 26	Day 0	Day 21	Day 0	Day 15	Day 0	Day 26
HMX	151.1	2.1	82.3	2.3	41.4	2.2	151.1	2.1
RDX	1177.2	1.0	626.6	1.4	315.4	1.1	1177.2	1.0
TNT	116.7	0.4	39.5	0.3	11.9	0.3	116.7	0.4

	Windrow #5		Windrow #6		Windrow #7		Windrow #8	
	Day 0	Day 15	Day 0	Day 14	Day 0	Day 13	Day 0	Day 8
HMX	249.1	2.2	13.5	2.2	18.5	2.2	20.9	2.2
RDX	102.5	1.1	96.5	1.0	134.2	1.0	129.1	1.1
TNT	25.5	0.3	6.6	0.3	2.6	0.3	7.3	0.3

	Windrow #9		Windrow #10		Windrow #11		Windrow #12	
	Day 0	Day 8	Day 0	Day 10	Day 0	Day 9	Day 0	Day 7
HMX	4.6	2.2	14.3	2.2	14.9	2.1	30.5	4.9
RDX	24.3	1.8	86.6	1.0	85.6	1.0	83.7	1.6
TNT	0.7	0.5	0.8	0.3	12.9	0.3	0.4	0.4

	Windrow #13		Windrow #14		Windrow #15		Windrow #16	
	Day 0	Day 7	Day 0	Day 8	Day 0	Day 7	Day 0	Day 6
HMX	32.1	2.8	19.2	2.2	28.6	1.9	22.7	2.0
RDX	124.6	1.4	76.7	1.0	103.0	1.1	128.2	1.2
TNT	0.4	1.3	0.3	0.3	0.3	0.3	5.6	0.2

	Windrow #17		Windrow #18		Windrow #19		Windrow #20	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7	Day 0	Day 7
HMX	8.1	1.9	9.4	2.3	18.9	2.4	16.1	3.3
RDX	19.8	1.1	29.4	1.1	110.1	1.7	71.7	1.6
TNT	0.3	0.3	0.3	0.3	0.4	0.2	0.3	0.3

	Windrow #21		Windrow #22		Windrow #23		Windrow #24	
	Day 0	Day 7	Day 0	Day 21	Day 0	Day 23	Day 0	Day 10
HMX	26.7	2.6	31.3	2.1	59.2	4.5	36.5	2.6
RDX	143.1	2.5	181.8	2.3	511.0	3.3	237.7	2.0
TNT	1.4	0.5	2.5	0.3	6.7	0.3	4.0	0.4

	Windrow #25		Windrow #26		Windrow #27		Windrow #28	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7	Day 0	Day 21
HMX	17.8	2.5	15.4	2.4	15.3	1.9	24.1	2.8
RDX	117.0	3.0	73.5	2.3	46.0	1.7	195.4	5.9
TNT	2.0	0.2	0.5	1.0	27.9	0.4	24.5	1.5

	Windrow #29		Windrow #30		Windrow #31		Windrow #32	
	Day 0	Day 7	Day 0	Day 20	Day 0	Day 10	Day 0	Day 7
HMX	18.6	2.7	23.8	2.1	12.9	2.2	13.0	1.7
RDX	59.9	2.0	189.4	4.9	64.7	3.7	92.9	3.0
TNT	0.9	1.5	14.7	0.3	12.2	0.3	34.1	0.2

	Windrow #33		Windrow #34		Windrow #35		Windrow #36	
	Day 0	Day 6	Day 0	Day 7	Day 0	Day 9	Day 0	Day 13
HMX	10.5	2.0	18.1	3.1	19.2	3.7	26.0	2.8
RDX	57.7	2.8	106.8	3.2	167.0	6.2	231.8	4.2
TNT	13.9	0.7	49.8	1.5	12.4	0.5	29.0	0.3

TABLE 4-4
AVERAGE RESULTS[1] FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #37		Windrow #38		Windrow #39		Windrow #40	
	Day 0	Day 12	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7
HMX	13.5	2.8	10.1	3.9	16.4	5.2	29.0	5.8
RDX	89.0	6.8	69.0	7.2	120.4	13.1	208.6	5.2
TNT	16.6	0.5	53.4	11.0	18.5	1.2	6.8	1.1

	Windrow #41		Windrow #42		Windrow #43		Windrow #44	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7
HMX	33.9	5.5	42.4	7.1	32.1	2.9	27.8	4.7
RDX	238.3	8.9	299.0	13.9	247.9	8.3	182.5	7.2
TNT	5.4	0.3	4.4	0.4	5.5	0.3	9.7	0.3

	Windrow #45		Windrow #46		Windrow #47		Windrow #48	
	Day 0	Day 18	Day 0	Day 16	Day 0	Day 13	Day 0	Day 6
HMX	18.8	3.4	11.6	2.8	8.3	2.1	14.1	2.4
RDX	121.3	4.4	59.8	2.9	49.6	1.5	88.2	2.1
TNT	17.0	0.3	4.0	0.3	2.7	0.3	6.3	0.3

	Windrow #49		Windrow #50		Windrow #51		Windrow #52	
	Day 0	Day 10	Day 0	Day 9	Day 0	Day 14	Day 0	Day 11
HMX	9.5	2.0	15.7	2.6	19.3	2.1	20.4	2.9
RDX	50.9	1.4	97.7	2.8	131.3	1.2	124.0	2.0
TNT	3.7	0.3	6.5	0.3	7.7	0.2	1.4	0.3

	Windrow #53		Windrow #54		Windrow #55		Windrow #56	
	Day 0	Day 11	Day 0	Day 12	Day 0	Day 9	Day 0	Day 7
HMX	8.0	3.0	22.4	2.1	12.1	2.1	6.6	1.9
RDX	57.0	6.7	140.8	1.1	74.5	1.4	44.5	2.2
TNT	21.0	5.8	6.6	0.2	8.8	0.3	5.7	0.2

	Windrow #57		Windrow #58		Windrow #59		Windrow #60	
	Day 0	Day 9	Day 0	Day 9	Day 0	Day 8	Day 0	Day 8
HMX	13.1	2.2	9.7	2.1	5.0	2.0	4.1	2.0
RDX	54.1	2.1	57.5	1.0	50.4	2.8	45.3	4.9
TNT	14.9	4.6	9.4	0.3	21.1	0.4	31.1	0.4

	Windrow #61		Windrow #62		Windrow #63		Windrow #64	
	Day 0	Day 8	Day 0	Day 6	Day 0	Day 8	Day 0	Day 8
HMX	6.0	2.1	5	2.2	2.7	2.2	4.1	2.6
RDX	54.6	3.6	40.0	6.3	21.9	3.5	38.6	12.4
TNT	17.9	4.5	15.4	0.7	62.3	0.4	14.0	1.8

	Windrow #65		Windrow #66		Windrow #67		Windrow #68	
	Day 0	Day 8	Day 0	Day 11	Day 0	Day 7	Day 0	Day 10
HMX	4.2	2.0	3.5	2.1	3.8	2.1	4.9	2.2
RDX	31.8	5.3	26.7	1.9	29.9	4.2	44.2	3.0
TNT	8.3	1.3	10.6	0.3	7.3	0.8	5.9	3.6

	Windrow #69		Windrow #70		Windrow #71		Windrow #72	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 9	Day 0	Day 8
HMX	3.7	2.2	4.1	2.1	17.2	2.2	8.4	2.1
RDX	22.3	6.8	28.5	3.0	94.0	1.0	30.2	1.7
TNT	1.8	2.2	6.0	0.4	45.7	22.7	14.3	0.2

TABLE 4-4
AVERAGE RESULTS[1] FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #73		Windrow #74		Windrow #75		Windrow #76	
	Day 0	Day 6	Day 0	Day 8	Day 0	Day 6	Day 0	Day 7
HMX	6.7	2.0	3.5	1.9	2.3	2.0	8.3	1.8
RDX	58.0	2.4	12.8	1.5	17.3	3.5	41.5	4.3
TNT	16.9	5.9	2.2	0.4	2.4	0.2	14.3	0.3

	Windrow #77		Windrow #78		Windrow #79		Windrow #80	
	Day 0	Day 8	Day 0	Day 6	Day 0	Day 10	Day 0	Day 7
HMX	6.7	3.7	4.9	3.9	3.5	2.5	5.6	2.2
RDX	38.0	7.9	29.9	8.0	18.0	4.0	29.4	3.3
TNT	17.1	0.4	6.1	0.5	5.3	0.2	1.7	0.5

	Windrow #81		Windrow #82		Windrow #83		Windrow #84	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	3.8	2.1	12.7	2.6	7.5	1.7	6.2	2.5
RDX	17.8	1.8	37.3	1.8	34.7	2.4	2.7	1.8
TNT	5.3	0.2	2.2	0.2	1.9	0.5	1.3	0.2

	Windrow #85		Windrow #86		Windrow #87		Windrow #88	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	2.4	2.3	5.5	1.9	5.0	2.3	4.4	2.6
RDX	10.1	2.3	19.2	1.4	21.1	2.1	21.0	2.3
TNT	0.2	0.4	0.5	0.2	2.2	0.2	0.3	0.2

	Windrow #89		Windrow #90		Windrow #91		Windrow #92	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	17.7	2.2	5.5	2.4	4.4	2.4	6.8	2.4
RDX	77.8	1.7	28.0	3.5	21.6	1.1	16.8	4.4
TNT	2.0	0.7	0.8	0.2	4.2	0.3	1.3	0.3

	Windrow #93		Windrow #94		Windrow #95		Windrow #96	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 8	Day 0	Day 6
HMX	3.9	3.3	7.9	2.8	2.5	2.1	5.8	2.8
RDX	15.8	5.5	32.4	1.9	2.7	1.3	24.9	1.3
TNT	0.4	0.5	0.4	0.2	0.2	0.2	0.4	0.2

	Windrow #97		Windrow #98		Windrow #99		Windrow #100	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 9	Day 0	Day 7
HMX	8.0	0.9	7.2	2.2	9.0	1.1	9.2	1.6
RDX	32.2	2.8	30.1	5.3	26.8	0.5	27.0	1.9
TNT	2.8	1.9	33.6	0.2	1.4	0.3	11.0	0.2

	Windrow #101		Windrow #102	
	Day 0	Day 9	Day 0	Day 14
HMX	8.9	2.4	26.6	2.9
RDX	48.8	6.5	258.1	16.3
TNT	2.6	1.1	19.7	0.9

Note:
1 - Results provided are in mg/kg (ppm)

TABLE 4-5 CLEANUP GOALS FOR SELECT EXPLOSIVE COMPOUNDS NSWC CRANE MFA		
Compound	**Residential Cleanup Goal (mg/kg)**	**Industrial Cleanup Goal (mg/kg)**
HMX	3,300	34,000
RDX	4	17
TNT	15	64

5.0
DISPOSITION OF TREATED COMPOST SOIL AND DECONTAMINATED ROCKS

5.1 TREATED COMPOST SOIL

Once laboratory analytical data verified that treatment goals were met for a windrow of treated compost soil, a loader transferred the treated material directly from the Biofacility building to semi-tractor live-bottom trailers. The trailers were free of contaminated soil prior to loading the treated material. Following loading, each truck was, covered with a tarp, decontaminated, and then weighed to determine the weight of compost exiting the Biofacility. The weighing requirement was subsequently eliminated (see FCR -FS-021 Rev.1 in Appendix A). The treated soil was transported back to MFA. Initially a temporary staging area was established, between Buildings 158 and 153, to receive and hold treated compost material (FCR-FS-008, Rev. 0 in Appendix A) prior to backfilling. Once backfilling operations began in June 1998, treated soil was transported back to MFA and backfilled into one of the excavations or staged in the temporary staging area for later use. In addition to backfilling and staging for later use, some compost material was field applied to promote vegetative growth. Due to the bulkier nature of the treated compost relative to the excavated soil, two permanent storage areas were also created to store compost. One permanent storage area is located north of Building 154 and a second is located east of Building 154. Table 4-2 identifies the location(s) where each windrow of material was transported following treatment. Backfilled material was placed in 12-inch lifts and compacted. Drawings showing the grid locations where windrows were backfilled are included in Appendix J. Final survey drawings of the work areas after completion of backfilling are included in Appendix F.

After backfilling, very little erosion occurred because a crust formed on the surface of the compost. If seeding did not take place shortly after placement of the windrow, a top dressing was spread prior to seeding. Compost was added to the front berm at Building 154 and to the area near Building 158 prior to seeding in the spring. Treated compost material had been placed in those areas earlier in the year and weather prevented seeding at that time. Hydroseeding was performed at Crane using a seed and cellulose binder mix. This mix was sprayed directly onto the compost mixture. The cellulose binder holds the seeds in place, prevents erosion, and should decrease the rate of water evaporation from the soil. However, h~~H~~ydroseeding at the first permanent storage areas, north of Building 154 and around Building 157, was unsuccessful. The hydroseeding was attempted in the summer when it was hot and dry, so insufficient watering may have caused poor germination. Also, there is a possibility that it may have been a bad batch of seed or not enough seed was applied. Both of these areas, in addition to a third area near Building 152, were subsequently seeded and watered. Grass is now growing at all of these locations. The second permanent storage area just east of Building 154 near the screener site is the only site which has not been seeded. Re-seeding of this area is pending further excavation and screening of material at MFA based on the completion of supplemental toxicity testing.

5.2 DECONTAMINATED ROCKS

Following decontamination, rocks that were screened out of the excavated soil were returned to the bottom of an open excavation within the same SWMU where they were excavated. Rocks were covered with no less than two feet of finished compost. Backfill drawings in Appendix J show where the rocks were placed.

6.0
QUALITY CONTROL

6.1 QUALITY CONTROL FIELD INSPECTIONS

QC inspections included excavation site operations, composting operations, sampling activities, field test kit analyses, and facility maintenance. QC checks were performed at required intervals using the field inspection checklists provided in Appendix F of the *FS-OP* [MK, 1998a]. Copies of all inspection records are maintained at the Biofacility office.

Occasional minor deficiencies were noted during inspections and subsequently corrected. Typical findings included items such as retention pond levels with less than two feet of freeboard remaining immediately after a major rain event. Two other deficiencies noted that were corrected by TolTest included hairline cracks in the process building floor and a water line leak below the asphalt in the process area.

6.2 DATA QUALITY CONTROL

Various data QC methods were utilized to verify the usability of samples collected and submitted for laboratory analysis (ICS, PES, and windrow contaminant monitoring samples (Day Zero and Day Last)). Samples were analyzed by Southwest Laboratory of Oklahoma, Inc. and Quanterra, Inc. of California. All data submitted for laboratory analysis were verified by reviewing chain-of-custody records, sample extraction records, analytical holding times, requested turnaround times, sample data in comparison to QC data and reporting requirements. Additionally, more than 10% of the data were validated. The data were compared with field and laboratory QC sample data to assess its usability. Sections 6.2.1 and 6.2.2 below summarize the field and laboratory QC methods employed, respectively. Sections 6.2.3 through 6.2.5 summarize the findings of the field and laboratory QC for the various types of project laboratory data.

6.2.1 Field Quality Control

Field QC included field duplicates, trip blanks, field blanks and equipment rinseates. Analytical results for these samples were evaluated to identify potential sources of error introduced during sampling, transportation and storage. Results for QC samples associated with the ICS are summarized in Table E-2 in Appendix E and QC samples associated with the PES are summarized on Table H-2 in Appendix H.

Field duplicates were collected at a frequency greater than the one in twenty samples specified in Section 3.1.2 in the *FS-QAPP* [MK, 1998b]. Field duplicates are samples collected at the same time and in the same location as the corresponding field sample, in order to qualitatively assess field precision. There are no quantitative precision criteria specified in the *FS-QAPP*.

Trip blanks were submitted with coolers containing samples to be analyzed for volatile organic compounds in order to evaluate the potential for cross-contamination during shipment to the laboratory. The trip blanks were received from the laboratory in a sealed container containing organic-free water, held intact at the site, and shipped back to the laboratory with the samples.

Field blank sample results were evaluated to identify any sources of contamination in the de-ionized rinse water and/or general atmospheric conditions in the field. Field blanks for water analysis were collected by pouring de-ionized water (from the same source used for sampling equipment decontamination) into appropriate sample containers and adding sample preservative, as required.

Equipment rinse blanks were collected by rinsing decontaminated sampling equipment with de-ionized water, collecting the rinse water in appropriate sample containers, adding any sample preservative required by the analytical method, and then submitting the rinse water for analysis. Results are used to

evaluate the effectiveness of decontamination procedures in preventing sample cross-contamination.

6.2.2 Laboratory Quality Control

The laboratory performed method blank, replicate, surrogate, laboratory control sample (LCS), laboratory control sample duplicate (LCSD), sample matrix spike (MS), and sample matrix spike duplicate (MSD) analyses to evaluate laboratory accuracy and precision according to the established EPA procedures.

Laboratory method blanks were prepared and analyzed with the samples in order to evaluate potential target compounds or interferences from laboratory glassware, reagents and/or solvents used in the preparation and analysis of samples.

Laboratory replicate samples are a second sample aliquot which the laboratory prepares and analyzes concurrently with the sample to evaluate analysis precision.

Surrogate spikes are known amounts of non-target organic compounds, which are spiked into all samples prior to sample preparation, in order to evaluate the efficiency of the organic sample preparation and analysis.

LCS and LCSD are samples prepared in the laboratory, consisting of clean soil or water spiked with known amounts of target analytes which are processed through the same preparation as field samples. Evaluation of the spike recoveries, and the variability between the LCS and LCSD, gives an indication of analysis accuracy and precision in a clean matrix.

MS and MSD are field samples that have been spiked with a known amount of target analytes and processed through the preparation and analysis with the field samples. Evaluation of the spike recoveries, and the variability between the MS and MSD, gives an indication of analysis accuracy and precision in the sample matrix. MS/MSD accuracy and precision can be affected by concentrations of both target and non-target compounds present in the original field sample, as well as the matrix of the sample itself.

6.2.3 Initial Characterization Samples (ICS)

All ICS were collected by MK. A total of 617 soil samples were collected from the grid sections to identify areas requiring excavation. Figures C-1 through C-6 in Appendix C show the locations of the grid sections. Various rinse, field, and trip blanks were collected along with these samples for QC purposes. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Most samples were received at a recorded temperature of 4°C +/- 2°C. A total of 231 samples were received at temperatures between -3°C and 1°C. Because no samples were frozen, these temperatures below 2°C did not impact the samples. Additionally, 36 samples were received at temperatures between 6.2°C and 10°C. Most of these samples were analyzed exclusively for explosives and metals, and the high temperatures did not impact the results for these analyses. The remaining samples were analyzed exclusively for VOCs and showed few detected analytes, and those detected were at levels at least three orders of magnitude below the cleanup objectives. The impact of these temperatures above the acceptable range is minor when comparing the reporting limits relative to the IM Industrial Cleanup Goal concentrations.

Field QC

Field QC samples collected with the ICS included duplicates, trip blanks, field blanks and equipment rinse blanks.

Volatile analysis showed no difference between field duplicate pairs. Total and TCLP metal analysis showed metals to have precision varying from 0 - 200% relative percent difference (RPD), but in all

cases, duplicate pairs showed analytes to either be both above or both below cleanup criteria. Explosive analysis showed analytes to have precision varying from 0 - 200% RPD. With two exceptions, duplicate pairs showed analytes to either both be above or both be below cleanup criteria. MFAICS519 had RDX present below the cleanup objective, at 9,120 µg/kg, while its field duplicate, MFAICS520, had RDX present above the cleanup objective, at 67,900 µg/kg. Similarly, MFAICS570 had RDX present below the cleanup objective, at 6,800 µg/kg, while its field duplicate, MFAICS574FD, had RDX present above the cleanup objective, at 18,900 µg/kg.

Trip blanks were submitted with most coolers containing samples to be analyzed for VOCs, in order to evaluate the potential for cross-contamination during shipping to the laboratory. The trip blanks were received from the laboratory in a sealed container containing organic-free water, held intact at the site, and shipped back to the laboratory with the samples. One cooler of samples was received on June 18, 1998 with a trip blank listed on the chain-of-custody, but the lab noted upon receipt that there was no trip blank present in the cooler. However, samples from this cooler all showed volatile results well below cleanup levels, so that if any cross-contamination did occur, it has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values. Methylene chloride, a common laboratory contaminant, was detected in several trip blanks at values that ranged from 5 µg/L to 28 µg/L. In each of these instances the laboratory blank had also shown the presence of methylene chloride, and all corresponding sample concentrations were flagged with "B". Sample concentrations ranged from estimated values of 2 µg/kg, below the reporting limit, to 21 µg/kg, all of which were significantly less than the cleanup objective of 18,000 µg/kg for methylene chloride. Acetone, another common laboratory contaminant, was detected in various trip blanks at values that ranged from 12 µg/L to 76 µg/L. Sample concentrations ranged from non-detect to 410 µg/kg, and are significantly less than the cleanup objective of 8,800,000 µg/kg for acetone. Other volatile compounds were not detected above the reporting limit in any of the trip blanks associated with these sampling events. Based upon these results it is concluded that no volatile organic cross-contamination has occurred during shipping or storage for the majority of the volatile compounds analyzed. The possible methylene chloride and/or acetone contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

Analysis of field blanks revealed low concentrations of various metals (Arsenic, Barium, Chromium, and Lead from 1.1 - 27.6 ug/L); acetone (7.0 - 8.0 ug/L); chloroform (1.0 ug/L); xylenes (2.0 ug/L); and/or methylene chloride (2.0 - 4.0 ug/L) present throughout the sampling event. Other field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the field blanks have not significantly impacted the sample results. Based upon these results, it is concluded that water used for decontamination and general atmospheric conditions did not impact the analytical results.

There were low concentrations of various metals (Arsenic [2.5 - 2.7 ug/L], Aluminum [35.2 - 65.5 ug/L] Barium [0.33 -3.3 ug/L, Cadmium [0.37 - 2.7 ug/L], Chromium [1.3 - 4.1 ug/L], Lead [0.95 - 2.1 ug/L], Mercury [0.18 - 0.25 ug/L]. Silver [1.0 - 1.6 ug/L]) acetone (7.0 ug/L), chloroform (1.0 - 4.0 ug/L), methylene chloride (2.0 ug/L) and/or RDX (29.3 ug/L)~~, and/or TNT~~ detected in many of the equipment rinse blanks. With one exception, the other field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the field blanks have not significantly impacted the sample results. RDX was present at 29.3 µg/l in the rinse blank collected on 11/24/97. RDX values in corresponding field samples range from non-detect to 1,760,000 µg/kg, and most of the field samples have concentrations which greatly exceeded the cleanup objective of 17,000 µg/kg. Based upon these results, it is concluded that the possible RDX contamination has not affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

Laboratory QC

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the ICS.

Laboratory method blanks showed the presence of acetone (1 - 14 ppb), chloroform (1 - 2 ppb), methylene chloride (1 - 420 ppb), MIBK (2 - 9 ppb), xylenes (1 - 4 ppb), aluminum (12.6 - 85.4 ppm), cadmium (0.45 - 0.66 ppm), TCLP barium (0.032 - 0.429 ppb), TCLP cadmium (14 ppb), TCLP chromium (15.7 ppb), and/or TCLP mercury (2.1 ppb) in various batches. For all of these analytes, field sample levels were significantly less than the cleanup objectives or for the applicable TCLP regulatory limit. All positive sample results for organic analytes which correspond to method blank detections have been flagged with a "B" flagcode to indicate possible elevated background levels. Based upon these results, it is concluded that method blank contamination has not adversely affected the interpretation of the data based upon field sample concentrations relative to the IM Industrial Cleanup Goal objectives and TCLP regulatory limits.

In 14% of batches where replicate samples were analyzed, the precision results were outside of laboratory criteria. Twenty-eight batches of metals had precision results for one or more metals outside of laboratory criteria. Metal RPD values outside of laboratory criteria included: Barium (22 - 47%); Cadmium (200%); Lead (21 - 83%); and Chromium (23 - 66%). The corresponding field sample results have been qualified with a "*" flag-code, to indicate that duplicate analysis was not within control limits and that more variability may be expected in the reproduction of these values. In these instances, the total metal results were below the Region III Risk-based levels and TCLP metals were below the regulatory levels. The concentration of these contaminants would likely remain below these objectives if re-sampling was performed consistent with the sampling protocol of this project.

Surrogate recoveries were generally acceptable for organic analyses. A total of 23 of the 621 samples collected showed surrogate recoveries outside of acceptable criteria. In 15 of these 23 samples, subsequent dilutions were required to bring the result within the linear range of the instrument, which caused the surrogate recoveries to be diluted outside of criteria. In the remaining eight samples, matrix interference is suspected to have caused poor surrogate recoveries for volatiles. Surrogate recoveries in these eight samples were as follows: 4-bromofluorobenzene: 63 - 185%, toluene-d8: 121 - 124%, and 1,2-dichloroethane-d4: 69%. In seven of these eight samples, only one of the four surrogates was outside of acceptable limits. Matrix interference was confirmed for many of these samples by a corresponding matrix spike with similar recoveries, or by re-analyzing with similar results. Most of these volatile samples do not show target analytes above reporting limits. The few analytes detected were between three and five orders of magnitude below cleanup objectives. For these reasons, surrogate results that are outside of laboratory limits have not adversely affected the interpretation of the data.

More than 98% of spiked target analytes showed laboratory control spike precision and accuracy results to be acceptable. Approximately 84% of the LCS/LCSD recoveries that were outside of acceptable QC limits had high recoveries. The following compounds exhibited high recoveries of LCS/LCSD in one or more analytical batches: Methylene chloride (220%); 4-Methyl-2-pentanone (158%); Xylene (150-160%); 2,4-Dinitrotoluene (190- 191%); 4-Amino-2,6-dinitrotoluene (138% - 187%); Nitrobenezene (144 - 147%); Tetryl (139%); Mercury (120 - 200%); Lead (670%); TCLP Silver (111 - 118%); TCLP Arsenic (111 - 113%); TCLP Barium (111 - 132%); TCLP Cadmium (113 - 118%); TCLP Chromium (112 - 117%); TCLP Mercury (112 - 115%); TCLP Lead (112 - 113%); and TCLP Selenium (119 - 126%). However, the field samples analyzed with these LCS/LCSD samples showed corresponding analytes to be undetectable or at levels considerably below cleanup objectives and/or TCLP regulatory limits. The remaining target analytes that showed low recoveries corresponded to field sample results which were significantly less than the cleanup objectives and/or TCLP regulatory limits. The following compounds exhibited low recoveries of LCS/LCSD in one or more analytical batches: Acetone (34%); Xylene (42 - 45%); Tetryl (0 - 14%); Barium (12 - 13%); Mercury (10 - 75%); and TCLP Mercury (8%). The bias seen in the low recoveries would not impact the data enough to consider that these values may actually be greater than the IM Industrial Cleanup Goal values if acceptable recovery was obtained. For these reasons, the relatively small percentage of LCS/LCSD results that are outside of laboratory limits have not adversely affected the interpretation of the data.

Recoveries for 90% of MS/MSD analyses were acceptable for the target analytes. Metal results have

been appropriately qualified with an "N" flag-code, whenever the corresponding spike sample recovery was not within control limits. The following metals exhibited MS/MSD percent recoveries outside of QC limits in one or more analytical batches: Silver (71 - 72%); Arsenic (119 - 466%); Barium (68- 294%); Cadmium (66 - 75%); Chromium (50 - 248%); Mercury (121 - 137%); Lead (0 - 673%); Selenium (72 - 189%) and Aluminum (greater than 500%). The following metals exhibitied MS/MSD percent recoveries outside of QC limits in one or more analytical batches of TCLP analysis: Silver (67 0 123%); Barium (48 - 140%); Carmium (64 - 186%); Chromium (37 0 182%); Mercury (19 - 133%); Lead (45 0 238%); and Selenium (73%). Approximately ⅓ of the poor MS/MSD recoveries were due to the high concentration of target analytes relative to spiking concentrations. Each analytical data set has been evaluated to determine the impact of the MS recovery on the useablity of the data. For the vast majority of samples, the results were either already above the cleanup objective levels or they were significantly less than the cleanup objective levels or TCLP regulatory limits, and the bias seen in the varying recoveries would not impact the data enough to consider that these values may either increase above, or decrease below, the cleanup levels if acceptable recoveries were obtained. MS/MSD percent recoveries were outside of QC limits in one or more analytical batches of the following explosive compounds: 1,3 TNB (236%); 2,4-DNT (181 0 193%); 2,6-DNT (138- 147%); 4A26DNT (140 - 191%); Tetryl (139 - 149%); HMX (23 analytical batches with recovery greater than 250%); RDX (one batch with 16% recovery, and 26 analytical batches with recovery greater than 500%); and TNT (one batch with 149% recovery, and 9 batches with recovery greater than 500%). These high percent recoveries were due to the high concentration of these target analytes relative to the spiking concentration. Results for two samples, MPSICS26 and MFAICS551, may have been impacted by high recoveries in MS/MSD samples; however, in both instances the reported results are above cleanup levels, and are likely conservative. These two samples also showed the presence of another target analyte, RDX, at levels above cleanup objectives. TNT recovered at 149% in one batch, and field sample MPSICS26, which had TNT present at 76,000 µg/kg, may actually have had an amount lower than the cleanup level of 64,000 µg/kg if acceptable TNT recovery could be obtained. Three sample results may have been impacted by a low RDX recovery of 16% in the corresponding MS sample, which was likely caused by matrix interference. This interference may bias the results from these three samples. RDX results for MFAICS503 (4,850 µg/kg), MFAICS509 (15,000 µg/kg), and MFAICS515 (8,990 µg/kg) are below the IM Industrial Cleanup Goal values but could potentially be greater than the cleanup objectives if acceptable RDX recovery could be obtained. MS/MSD percent recoveries of Volatile organic compounds were outside of QC limits in one or more analytical batches that were analyzed for the following compounds: 2-Butanone (152 - 161%); Methyl ethyl ketone (44 - 282%); and Acetone (29 - 261%). Results associated with all MS/MSD Volatiles which were outside of QC limits were significantly less than clean up objectives and the bias seen in the varying recoveries would not impact the data enough to consider that these values may either increase above, or decrease below the cleanup levels if acceptable recoveries were obtained. Of the more than 17,000 sample results obtained for Mine Fill A, these three sample results for RDX were the only samples where poor matrix spike recoveries could have changed the interpretation of the data based on the IM Industrial Cleanup Goals and/or TCLP regulatory limits.

Conclusion

The QC data demonstrate acceptable accuracy and precision when compared to the intended use of the data. The data meets the project objectives and are, therefore, considered usable for characterization analysis.

6.2.4 Post-Excavation Samples (PES)

PES were collected by both MK and TolTest following excavation and collection of in-process excavation samples to determine the levels of constituents of concern remaining in the soil at each grid section.

6.2.4.1 PES - MK Data QC Summary

A total of 209 PES samples were collected by MK. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Approximately

80% of samples were received at a recorded temperature of 4°C +/- 2°C. A total of 41 samples were received at temperatures between 6.2°C and 6.8°C. Approximately 50% of these samples were analyzed exclusively for explosives and metals, and the high temperatures did not impact results for these analyses. The remaining samples were analyzed exclusively for VOCs and showed few detected analytes. Those that were detected were present at levels at least four orders of magnitude below the cleanup objectives. The impact of these temperatures above the acceptable range is minor when comparing the reporting limits relative to the IM Industrial Cleanup Goal concentrations.

Field QC

Field QC samples collected with the MK PES included duplicates, trip blanks, field blanks and equipment rinse blanks.

Explosive and metal analysis of duplicate samples showed analytes to have precision varying from 0 - 200% RPD, but in all cases, duplicate pairs showed analytes to either be both above or both below cleanup criteria.

Analysis of trip blanks revealed acetone, a common laboratory contaminant, in various trip blanks at values that ranged from 10 µg/L to 72 µg/L. Sample concentrations ranged from non-detect to 200 µg/kg and are significantly less than the cleanup objective of 8,800,000 µg/kg for acetone. Other VOCs were not detected above the reporting limit in any of the trip blanks associated with these sampling events. Based upon these results, it is felt that no volatile organic cross-contamination has occurred during shipping or storage for the majority of the volatile compounds analyzed. The possible acetone contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

No target analytes were detected in the field blanks collected during this sampling event. Based upon this result, it is felt that water used for decontamination and general atmospheric conditions did not impact the analytical results.

Equipment rinse blank analysis showed low concentrations of aluminum (38.8 ug/L), barium (1.5 ug/L), chromium (0.85 - 1.6 ug/L), and/or mercury (0.19 ug/L) detected in the equipment rinse blanks. Field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the equipment rinse blanks have not significantly impacted the sample results.

Laboratory QC

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the PES collected by MK.

Laboratory method blanks showed the presence of acetone (2.0 - 9.0 ppb), methylene chloride (3.0 - 6.0 ppb), or mercury (0.21 ppb) in several batches. For all of these analytes, field sample levels were either non-detect or significantly less than the cleanup objectives. All positive sample results for organic analytes which correspond to method blank detections have been flagged with a "B" flagcode to indicate possible elevated background levels. Based upon these results, it is felt that method blank contamination has not adversely affected the interpretation of the data based upon field sample concentrations relative to the IM Industrial Cleanup Goal objectives.

In 14% of batches where replicate samples were analyzed, the precision results were outside of laboratory criteria. Ten batches of metals had precision results for one or more metals outside of laboratory criteria. Those metals included the following: Aluminum (8 - 24%); Barium (6-20%); Chromium (24%); and Mercury (81%). The corresponding field sample results have been qualified with a "*" flag-code, to indicate that duplicate analysis was not within control limits and that more variability may be expected in the reproduction of these values. In these instances, the total metal results were

below the Region V Risk-based levels and TCLP metals were below the regulatory levels. The concentration of these contaminants would likely remain below these objectives if re-sampling was performed consistent with the sampling protocol of this project.

Surrogate recoveries were generally acceptable for organic analyses. Ten of the 209 samples collected showed surrogate recoveries outside of acceptable criteria. In four of these ten samples, subsequent dilutions were required to bring the result within the linear range of the instrument, which caused the surrogate recoveries to be diluted outside of criteria. In the remaining six samples, matrix interference is suspected to have caused poor surrogate recoveries for volatiles. Surrogate recoveries in these six samples were as follows: 4-bromofluorobenzene: 68 - 73%, toluene-d8: 69-74%, and 1,2-dichloroethane-d4: 121%. In three of the six samples, two of the four surrogates were outside of acceptable limits, and in the remaining three samples, only one surrogate was outside of acceptable limits. Matrix interference was confirmed for one of these samples by a corresponding matrix spike with similar recoveries. Most of these volatile samples do not show target analytes to be present above reporting limits. The few analytes detected were approximately five orders of magnitude below cleanup objectives. For these reasons, surrogate results that are outside of laboratory limits have not adversely affected the interpretation of the data.

More than 98% of spiked target analytes showed laboratory control spike precision and accuracy results to be acceptable. Approximately 50% of the LCS recoveries that were outside of acceptable QC limits showed high recoveries. LCS percent recoveries outside of QC criteria included: Acetone (48-184%); Methyl ethyl ketone (20 - 152%); 2-Butanone (152%); Xylene (32 - 320%); 4A26DNT (145 - 170%); Tetryl (6 - 17%); Barium (12 - 13%); Mercury (65 - 200%); and Lead (greater than 500%). However, the field samples analyzed with these LCS/LCSD samples showed corresponding analytes to be undetectable or at levels considerably below cleanup objectives and/or TCLP regulatory limits. The remaining target analytes that showed low recoveries, corresponded to field sample results that were significantly less than the cleanup objectives and/or TCLP regulatory limits. The bias seen in the low recoveries would not impact the data enough to consider that these values may actually be greater than the IM Industrial Cleanup Goal values if acceptable recovery was obtained. For these reasons, the relatively small percentage of LCS/LCSD results that are outside of laboratory limits have not adversely affected the interpretation of the data.

Recoveries for 93% of MS/MSD analyses were acceptable for the target analytes. Metal results have been appropriately qualified with an "N" flag-code, whenever the corresponding spike sample recovery was not within control limits. Compounds that had poor MS/MSD percent recoveries included: Methyl ethyl ketone (23 - 27%); RDX (337 - 426%); Aluminum (greater than 500%); and Chromium (49 - 71%). Approximately 50% of the poor MS/MSD recoveries were due to the high concentration of target analytes relative to spiking concentrations, as seen in both RDX and Aluminum. Each analytical data set has been evaluated to determine the impact of the MS recovery on the useablity of the data. For the vast majority of samples, the results were either already above the cleanup objective levels or they were significantly less than the cleanup objective levels or TCLP regulatory limits, and the bias seen in the varying recoveries would not impact the data enough to consider that these values may either increase above, or decrease below, the cleanup levels if acceptable recoveries were obtained. Interpretation of the post-excavation sample data based on the IM Industrial Cleanup Goals and/or TCLP regulatory limits would not have changed due to the few poor matrix spike recoveries.

Conclusion

The QC data demonstrate acceptable accuracy and precision when compared to the intended use of the data. The data meets the project objectives and are, therefore, considered useable for post-excavation analysis.

6.2.4.2 PES - TolTest Data QC Summary

A total of 105 PES were collected by TolTest for laboratory analysis. The laboratory received 103 out of

105 samples collected for analysis. Sample MFAPES 238 for volatiles and the trip blank associated with MFAPES 265-268 did not make delivery to the laboratory and, therefore, results for these samples are not available. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Seventy-seven percent of the samples were received at temperatures of 4°C ± 2°C and 23% were received at 1°C to 2°C. Since none of these samples were frozen, the results were not affected by the 1°C below the desired temperature range.

Field QC

Field QC samples collected with the TolTest PES included duplicates, trip blanks, and equipment rinse blanks.

In analysis of duplicates, precision for volatile, metal, and explosive analyses varied from 0-200%. In all cases, duplicate pairs showed analytes to either be both above or both below cleanup standards.

Trip blanks were submitted with most coolers containing samples to be analyzed for VOCs in order to evaluate the potential for cross-contamination during shipment to the laboratory. Exceptions to this occurred with the trip blank associated with samples MFAPES 265-268 and with the trip blank associated with samples MFAPES 262-263. In the first case, the trip blank never made delivery to the laboratory. The trip blank was listed on the chain of custody, but the laboratory reported that it was not in the cooler. In the latter case, a trip blank was not taken by field personnel. In each of these cases, the corresponding sample analyses showed no evidence of the target compounds, thus indicating no cross-contamination. Acetone, a common laboratory contaminant, was detected in some of the trip blanks at concentrations ranging from non-detect to 26 µg/L. Sample concentrations of acetone ranged from non-detect to 40 µg/kg. These levels are significantly less than the cleanup targets for acetone at 8,800,000 µg/kg. Thus, the contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the industrial treatment standards. It also should be noted that acetone was detected in some of the method blanks analyzed by the laboratory indicating that the source of the contamination may lie within the laboratory. The laboratory is investigating possible contamination sources. Method blank values for acetone were well below treatment levels. Other volatile compounds for these trip blanks were not detected above the reporting limit. There were several occasions where the laboratory reported headspace (or bubbles) in the trip blank sample upon sample receipt. Since the trip blanks are prepared by the laboratory and shipped to field personnel, the laboratory was notified as to proper sampling protocol.

Only one rinsate blank was collected for these samples. All target compounds were found to be non-detect in this sample.

Laboratory QC

Method blanks, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the PES collected by TolTest.

Laboratory method blanks showed the presence of acetone (4 - 6 ppb), methylene chloride (3 - 10 ppb), aluminum (2.9 - 4.3 ppm), barium (0.064 ppm), arsenic (0.21 - 0.42 ppm), and 3-NT (238 ppb). For all of these analytes, the corresponding samples had levels significantly less than the targeted cleanup levels. Based on these findings, it is felt that the method blank contamination did not adversely affect the interpretation of the data based upon field sample concentrations relative to the industrial cleanup goals.

Surrogate recoveries were acceptable for all explosive analyses with the exception of the MSD to samples MFAPES 253-261 (141% recovery of 3,4-DNT surrogate). For the explosive analyses of MFAPES 237-252, surrogate recoveries for several of the samples and their corresponding LCS/LCSD were 0%. Re-extraction and re-analysis were performed for these samples and the surrogate recoveries were found to be acceptable. It was, therefore, concluded that the surrogate had been erroneously omitted during preparation of the first set. Surrogate recoveries for VOCs were generally acceptable.

The levels of target analytes were orders of magnitudes lower than the cleanup levels, therefore, any results outside laboratory QC limits did not adversely affect the interpretation of data.

Of the 15 sets of LCS/LCSD data for explosives with solid matrix samples, tetryl was outside the laboratory QC limits twice (MFAPES 282-287) with percent recoveries between 130 - 135%, 2-NT was out once (MFAPES 270-281) with percent recoveries between 73 and 76%, and 2,6-DNT was out once (MFAPES 237-252) with percent recoveries between 77 and 81%. However, the corresponding samples did not show evidence of these analytes. One water matrix explosive data LCS/LCSD set (MFAPES 270-281) showed tetryl outside the laboratory QC limits with percent recoveries between 52 and 60%. The corresponding sample did not show evidence of the tetryl analyte. Acetone was outside the laboratory QC recovery limits for MFAPES 282-287 (62 - 68%). The corresponding samples did not show any acetone present. The bias in the recoveries of any of these analytes for the LCS/LCSD results outside laboratory QC limits would not significantly affect the interpretation of the data since the detection levels of the analytes are significantly lower than cleanup objectives.

The tetryl analyte was outside QC limits for MFAPES 270-281 in the MS, MSD (52 - 59%) , and LCS (52 0 69%). However, no evidence of tetryl was found in the associated samples. In all of the other instances where the MS or MSD results did not meet laboratory QC limits, the corresponding LCS/LCSD results did meet QC limits, thus indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results outside laboratory QC limits do not adversely affect the interpretation of the sample data.

Conclusion

All QC data relating to PES samples collected by TolTest, except those noted above, are within laboratory control limits. The QC data satisfy the project objectives and the data are found usable for the confirmation of accuracy for the stated analyses.

6.2.5 Windrow Explosive Monitoring Samples

Windrow explosive monitoring sampling was performed by both MK and TolTest. As indicated in Section 4.5, explosives were the only constituents of concern that exceeded the industrial cleanup goals in the ICS, therefore, they were the only parameters analyzed during windrow treatment. Windrow samples collected and submitted for laboratory analysis included Day Zero samples, collected upon construction of the windrow and Day Last samples, collected after completion of treatment. Day Last samples were collected to confirm that the cleanup goals had been achieved. Day Last samples were collected after results from field screening test kits for explosives (RDX and TNT were used by MK and RDX by TolTest) were below detectable levels.

As stated in Section 4.5, samples were collected from 15 locations in each windrow. MK collected Day Zero samples for windrows 1 though 50 and Day Last samples for windrows 1 through 48. TolTest collected Day Zero samples for windrows 51 through 102 and Day Last samples for windrows 49 through 102.

6.2.5.1 Windrow Monitoring Samples - MK Data QC Summary

The analytical data for Windrow 13 reflected only nine monitoring locations due to the smaller windrow size. On Day Zero of monitoring, eight of the nine sampling locations did not detect the presence of 246TNT and the ninth location had a concentration of 1,620µg/kg. On Day Last of monitoring, eight of the nine sampling locations did not detect the presence of 246TNT. The ninth location has a value of 9,710 µg/kg of 246TNT reported. This single sampling location, which shows a significant difference between Day Zero and Day Last results, resulted in a (-223)% reduction in the concentration of 246TNT. Variability is expected between sampling locations due to the varied mixture of amendments in the windrow. For this reason various sample locations are selected and averaged to determine the average concentration of the windrow. The Industrial Cleanup Goal for this compound is 64,000 µg/kg

and the Residential Cleanup Goal is 15,000 µg/kg. The analytical results were well below these concentration levels.

A similar situation existed for the compound 4A26DT for Windrow 13. All nine results for the Day Zero monitoring were not detected and during Day Last, eight of the nine sample locations reported undetectable levels of 4A26DT while the last monitoring location had a value of 704 µg/kg. This variability between sampling locations is due to the varied mixture of amendments in each windrow. However, since the Industrial Cleanup Goal for this compound of 680,000 µg/kg and the Residential Cleanup Goal is 65,000 µg/kg, the impact of this increased variability is insignificant in the final use of these results.

Increases in reporting limits are often seen in Day Zero analytical results due to dilutions necessary for analysis. Concentrations of RDX, TNT, and HMX are at such high levels in Day Zero sampling that dilutions were performed. After the formation of Windrow 6, the lab made every effort to run all samples in an undiluted form initially which permitted consistent levels to be reported for undetectable compounds, and later performed the dilutions necessary for RDX, TNT, and HMX levels. Prior to the formation of Windrow S006, the lab performed dilutions initially to prevent over saturation of their instruments.

In the case of Windrow 5, there are changes between reporting values in several of the locations in a particular cross section. In each cross section three locations are sampled as described in the Full Scale Quality Assurance Project Plan, SOP 3.0 found in Appendix A. Windrow 5, Location 1 has a value of less than 25,000 µg/kg reported for 246TNT, while Location 2 has a value of less than 12,500 µg/kg, and Location 3 has a value of less than 250 µg/kg. These dilutions were necessary due to the high concentrations of RDX and HMX in these samples. A 100-time dilution was performed on Location 1, a 50-time dilution was performed on Location 2, and no dilution was required on Location 3. Ideally, it would be helpful to use the same dilution on all samples, however, based on varying concentrations of compounds which can be found within the windrow, this was not possible. As a result, inconsistent reporting limits are occasionally reported within a particular windrow.

Variances in reporting limits are also the result of the sample volume used in analysis. In Windrow 16, all Day Zero results were reported at values of less than 250 µg/kg for 2,4-DNT. Day Last results also show undetectable levels of this compound at reporting limits between 239 and 250 µg/Kg. Obviously, these are all less than the 250 reported for Day Zero results, but larger sample volumes (2.10 grams on Day Last rather than 2.00 grams on Day Zero) decreased the reporting limits.

Field Quality Control

Field QC samples collected and analyzed with the Day Zero and Day Last samples included field duplicates to evaluate the precision of the field sampling and laboratory analysis. Precision of the field duplicates varied based upon the concentration of the target analytes. Day Last duplicate data was acceptable based upon the concentrations found in the samples relative to the cleanup levels.

Laboratory Quality Control

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were prepared and analyzed for laboratory QC with the Day Zero and Day Last compost samples.

Laboratory QC was performed consistent with the requirements of the *FS-QAPP* [MK, 1998b]. Method blanks, LCS, LCSD and surrogates were acceptable in almost every analytical batch. MS and MSD data was generally acceptable. In some of the Day Zero data, consistent elevated MS and MSD recoveries of RDX and HMX are often seen in the analytical data because of the high levels of theses compounds initially present in the sample. In Day Zero samples, which often required dilutions after spiking of the sample, the concentration of the spiking solution is diluted to a low level which cannot often be

distinguished form the variability of the sample itself. Day Last data did not show similar interferences because initial concentrations were low in comparison to the concentration of spiking solution added to the sample. Other MS and MSD recoveries, which did not meet the established criteria in the *QAPP* [MK, 1998a], include recoveries for tetryl. Tetryl often suffers from degradation, which results in low recovery of the compound in the MS and MSD. However, based upon the undetectable levels of tetryl found in these samples, and the relation of the analytical reporting limits to the industrial and residential cleanup levels, the data is determined to be acceptable to show that cleanup goals have been successfully met.

Conclusion

Based on technical review of the field and laboratory QC data, analyses were performed within acceptable accuracy and precision requirements specified in the *QAPP* [MK, 1998a]. The confirmation data meets the project's data quality objectives and are, therefore, considered usable to support full-scale operations.

6.2.5.2 Windrow Monitoring Samples (Day Zero and Day Last) - TolTest QC Data Summary

A total of 705 Day Zero samples (for windrows 51 through 102) and 744 Day Last samples (for windrows 49 through 102) were collected by TolTest. All samples were received by the laboratory in acceptable condition, with custody seals and with containers intact.

Eighty-seven percent of the Day Zero samples and 85% of the Day Last samples were received at temperatures of 4°C ± 2°C. Ten percent of the Day Zero samples and 13% of the Day Last samples were received at 1°C to 2°C. Since none of these samples were frozen, the results were not affected by the 1°C below the desired temperature range. Three percent of the Day Zero samples were received at 11°C and 2% of the Day Last samples were received at 8°C. In these cases, there was a delay by the courier in transporting the samples to the laboratory. A potential effect of the increased temperature could be a low bias to the results and any result greater than the detection limit could be considered a minimum value. For these samples, the impact, if any, is minimal compared to the reported values and treatment standards.

TolTest sample results included seven samples that were reported with estimated values. Five of these samples exhibited analyte levels outside of the calibration range and, thus, warranted analyzing dilutions. However, due to laboratory workload, the holding times on these samples had expired before the dilutions could be analyzed. Thus, the estimated values were reported. Two of the seven samples required dilutions and dilutions were analyzed. In one case, a second dilution was required since RDX was still outside the calibration range. The hold time on this sample had expired prior to the analysis of the second dilution, therefore, an estimated value for RDX was reported. In the other case, a dilution was analyzed and the appropriate analytes were reported with diluted values with the exception of TNT. TNT did not meet the calibration criteria in this case and the estimated value from the initial run was reported.

Field Quality Control

Field duplicates were collected and analyzed as a method of field data QC. Precision for explosive analyses varied from 0-200%. This is not unexpected when considering the variable nature of the compost matrix.

Laboratory Quality Control

Method blanks, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the windrow monitoring samples collected by TolTest.

Laboratory method blanks showed no evidence of contamination.

The surrogate recoveries were generally acceptable for most samples, however in samples having high concentrations of TNT, the corresponding surrogate recoveries were often outside laboratory QC limits. This is attributed to an interference effect of a large TNT concentration on the surrogate peak.

In Day Zero samples, there were 13 batches or sets of LCS/LCSD where QC results did not meet laboratory control limits. There were two sets where tetryl was out of control in both the LCS and the LCSD, however tetryl was not detected in the samples corresponding to these LCS/LCSD sets. Values ranged from 1% to 15% outside the laboratory QC limit for tetryl. The tetryl compound often suffers from degradation, which makes this analyte difficult to analyze. Ten out of the 13 sets had one to two analytes outside of laboratory control limits (1-6%) for either the LCS or the LSCD. In each case, the corresponding QC sample was within control limits (i.e., if the LCS was out, the LCSD was acceptable), therefore, the impact on the sample data is minimal. One of the 13 sets had six analytes outside of laboratory control limits (1-10%) for the LCS sample. In this case, the corresponding LCSD sample was within control limits, therefore, the impact on the sample data is minimal and some of these analytes were not detected in the corresponding compost samples (Day Zero Windrow 81).

In Day Last samples, there were 15 sets of LCS/LCSD data where QC results for one to four analytes were outside of laboratory control limits (1-7%). In each case, the corresponding QC sample was within control limits (as described above), therefore, the impact on the sample data is minimal. There were eight sets where tetryl was out of control in both the LCS and the LCSD, however, tetryl was not detected in the samples corresponding to these analyses. There were two sets where RDX was above (1-6%) laboratory control limits for both the LCS and LCSD. The average RDX value for these samples was well below treatment standards, thus, the impact on the corresponding samples was minimal. One set of data showed 2-NT outside of the laboratory control limits (3-7%) for both LCS and LCSD. All other analytes were within control limits for this set and the corresponding samples showed no evidence of the 2-NT analyte. There were four analytes outside laboratory control limits for the LCS and 10 analytes out of control for the LCSD for one set of samples (BIO-S-084 Day 6). Of the analytes that were out of control in the LCS/LCSD, only 2-ADNT and 4-ADNT were detected in the associated compost samples. The 2-ADNT and 4-ADNT analytes were outside limits in both the LCS and LCSD, however, the sample results for these compounds were found at levels orders of magnitude lower than treatment goals, thus the QC was determined to be usable. The two other compounds detected in these compost samples, RDX and HMX, were also determined to be acceptable since the corresponding LCS/LCSD results for these analytes were within control limits.

In Day Zero samples, no MS/MSD sets exhibited all analyte recoveries in the laboratory QC limits. RDX, HMX, and TNT were often found to be outside the laboratory QC limits for MS/MSD. Day Zero samples often required dilutions to bring RDX, HMX, and TNT to quantifiable levels. The dilution occurs after sample spiking, thus, the concentration of the spiked compounds were diluted out and could not be determined. Tetryl, which often suffers degradation, was frequently outside laboratory QC recovery limits in the MS/MSD. In all of the instances where the MS or MSD results did not meet laboratory QC limits, the corresponding LCS/LCSD results did meet QC limits, thus indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results associated with Day Zero samples that were outside laboratory QC limits did not adversely affect the interpretation of the sample data.

For the MS/MSD associated with Day Last sample BIO-S-061 Day 8, the TNT recovery was negative. There was a large reported value of TNT in the sample, but the corresponding MS/MSD samples did not confirm this elevated TNT level. Possible contamination of the sample was presumed and a re-extraction of the sample was considered. However, it was determined that the final disposition of compost would not change and therefore re-extraction was not performed. Approximately 25% of the MS/MSD sets exhibited analytes slightly outside the limits in either the MS or MSD. As with the Day Zero samples, in all of the cases where the MS or MSD results did not meet laboratory QC limits, the

corresponding LCS/LCSD results did meet QC limits, indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results associated with Day Last samples that were outside laboratory QC limits do not adversely affect the interpretation of the sample data.

Conclusion

All QC data relating to Day Zero and Day Last samples collected by TolTest, except those noted above, are within the laboratory control limits. The QC data satisfy the project objectives and the data are found usable for the confirmation of accuracy for the stated analyses.

7.0
SAFETY AND INDUSTRIAL HYGIENE

7.1 GENERAL SAFETY

Over 160,000 labor hours were expended during the course of the work. One Occupational Safety and Health Administration (OSHA) recordable injury occurred. This injury was a hip contusion that resulted from an employee falling while repositioning a decontamination pad liner. There were no lost or restricted days associated with the injury. Three first aid cases (minor lacerations) also occurred.

A total of 71 formal safety inspections were performed. No significant findings of an imminent or serious nature were found. Immediate actions were taken to correct any minor findings observed. Daily informal walk around safety inspections reinforced and improved the worker safety performance.

7.2 INDUSTRIAL HYGIENE SAMPLING

During work activities, monitoring was performed for airborne bacteria/fungi (molds and yeast), ammonia, total dust, and airborne explosive compounds.

Two-time integrated air sampling campaigns (one in late spring and one in summer) were initially performed for bacteria/fungi using bioaerosol samples collected inside and outside of the compost buildings. No bacteria or fungi were detected above the occupational exposure limits or the threshold limit values (TLVs). The requirement for the two-time integrated air sampling was eliminated and replaced with visual monitoring in May 1999 (see FCR-FS-015 in Appendix A).

Ammonia samples were collected by colorimetric methods and passive dosimeters. Sampling indicated ammonia levels above the permissible exposure limit (PEL) of 50 ppm and the TLV of 25 ppm during windrow construction and the first three to five days of the windrow life cycle. The chicken manure amendment was the primary contributor to the ammonia concentrations. As a result, full face air purifying respirators with ammonia cartridges were worn during windrow formation and during the first five to seven days of the windrow life cycle.

Airborne explosive dust sampling included area and personal samples. Results of all samples were less than the lower limit of qualification (LOQ) for applicable explosives and far below any occupational exposure limits. Explosive wipe samples were also taken to identify any spread of explosive contamination out of work zones. No occupational exposure limit exists for explosives but a one ppm administrative control level was implemented. Some contamination was detected in the lab refrigerator, clothing change area and the shower area and some trackout of explosives occurred primarily at the personnel decontamination facility. A more aggressive housekeeping practice coupled with worker training was instituted to prevent recurrence.

Nuisance dust measurements, using a laser dust monitor, were taken during activities which had the greatest potential to generate dust. During these activities, water was used to prevent and suppress any dust that could be generated. All results were well below the 10 mg/m^3 non-respirable limit and the 3 mg/m^3 respirable limit.

8.0
CONCLUSIONS AND RECOMMENDATIONS

IM work at MFA including, identification, excavation, treatment, and backfilling/staging of explosives-contaminated soil around Buildings 152, 153/154, 157, and 158/159 has been completed in accordance with all relevant plans and plan modifications. Investigation in the areas of Buildings 151 and 160 did not identify any material that exceeded the cleanup criteria.

Excavation of impacted soil was completed to the extent possible in all areas identified by initial characterization sampling, with the exception of 17 grid sections (23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, and 173) near Buildings 153/154 which have not yet been excavated. These areas will be addressed following completion of supplemental toxicity testing of previously treated compost, as agreed to with the USEPA. An addendum to this IMR will be prepared to address work in those areas. In some of the grid sections that were excavated, impacted soil above the cleanup goals remains in areas where roads, railways, buildings, utilities or other permanent physical structures prevented complete removal of the material. All excavated soil was successfully treated at the Biofacility, by composting, to reduce the levels of contaminants of concern in the material to below either the industrial or residential cleanup goals. Treated soil was returned to the site and used for backfill or staged for future use. No future IM work is recommended for the subject areas at MFA after the material in the final 17 grid sections is excavated, treated and backfilled.

Results of ICS collected at MFA revealed levels of arsenic above cleanup goals. Arsenic was not a contaminant of concern at the MFA site so it is assumed that the detected levels represent a high background for this compound at the NSWC Crane facility. It is recommended that a background level for this compound be established for NSWC Crane to assist in future IM work.

9.0
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RESPONSES TO COMMENTS
DRAFT INTERIM MEASURES REPORT FOR REMOVAL AND BIOREMEDIATION OF MINE FILL A MATERIAL, NSWC CRANE, CRANE, INDIANA – DATED JANUARY 2000

Commentor: Bill Gates, Southern Division RPM

Item No.	Section/ Page	Comment	Response
1.	Page 3-1, Section 3.1.1	Figures C1 - C4 are referenced for grid locations. Figures C1 - C4 are labeled soil sampling results. These figures are referenced during a discussion of initial characterization samples. Clarify that Figures C1 - C4 reflect post-excavation sample results.	Figures C1 through C4 in the January 2000 draft IMR were Post-Excavation Characterization Sample Results. These figures have been moved to Appendix G, re-numbered as Figures G1 through G4, and renamed to clarify that they are post-excavation sample results. Appendix C now contains newly generated figures (C1 through C6) showing Initial Characterization Sample Results.
2.	Figures C1 - C4	Include reason per grid why soil exceeding all remedial goals was left in place. Footnote?	A new table (Table 3-2) has been generated to provide explanations for areas that exceeded remedial goals. A note has been added to Figures G1 through G4 to reference this table.
3.	Appendix G	One page, Summary of Windrow Sampling, was provided prior to Windrow 01. It included Windrow S-001 - M-050. Like information for Windrows 51 - 102 was not provided.	The information included in Appendix G in the January 2000 draft IMR has been moved to Appendix I. The Summary of Windrow Sampling table has been expanded to include all windrows.

Commentor: Christine Freeman, NAVSURFWARCENDIV Crane

Item No.	Section/ Page	Comment	Response
General	Various	Remove quotation marks from the "A" in Mine Fill A (and "B" in Mine Fill B) throughout the plan.	The quotation marks have been removed throughout the plan.
1.	p. iv	The correct acronym for Rockeye is RKI. Please make change throughout plan.	The Rockeye acronym has been revised on the Acronyms page and in the text.
2.	p. 1-1 §1 ¶3	Rewrite last sentence as, "MFA ~~(SWMU 12/14)~~ and the ..." (previously identified in ¶2).	The requested change has been made.
3.	p. 1-2 §1.1	a) ¶1 Delete the sentence, "Production was resumed in 1980, and MFA currently produces 2,000-pound aerial bombs." b) ¶2 In metals of concern add Mercury ¶3 Rewrite second sentence as, "Concentrations of ~~individual constituents~~ RDX in the soil range from non-detect to 15,300 mg/kg ~~(RDX)~~."	The requested changes have been made.

Item No.	Section/ Page	Comment	Response
4.	p. 1-4 §1.2	Last bullet should read, "Transportation and ~~disposal~~ backfill of the ..."	The requested change has been made.
5.	p. 1-4 §1.3	Rewrite first sentence as, "... is organized into ~~nine~~ eight sections..."	The revised report has nine sections, therefore, this change was not made.
6.	p. 1-5 Table 1-1	a) FCR-FS-002 In the description column, add a void notation for this FCR. b) FCR-FS-008 Add revisions 1 and 2. c) FCR-FS-009 Add no final approval given (could not find a signed approval copy). d) FCR-FS-011 Add that only approved portion of FCR was the removal of PETN requirement on all samples except initial characterization. e) FCR-FS-016 Mark the "no" box in the Regulator Approval/Notification Recommendation section. f) FCR-FS-018 Add revision 1 and include approved signature page (copy of the FCR is provided with these comments). g) FCR-FS-021 Add revision 1. h) Add FCR-FS-025 Rev 1 1/19/00 for Disposition of reject rocks from screener site (copy of the FCR is provided with these comments). i) Add FCR-FS-027 2/1/00 for Consolidate excavation completion report and compost completion report (copy of the FCR is provided with these comments). j) Table 1-1 Note should read, "FCRs 4, 5, 19, 20, 22, 24, and 26 did not affect ..."	a) The requested change has been made. b) The table has been revised to include revisions 1 and 2. c) A note was added to the "Description" column of the table to indicate that no final approval was given for this FCR. d) A note was added to the "Description" column of the table to indicate that only the removal of the PETN requirement was approved. e) The "no" box has been checked. f) The table has been revised to include revision 1 and the approved signature page has been included in Appendix A. g) The table has been revised to include revision 1. h) FCR-FS-025, Rev. 1, has been added to Table 1-1. i) FCR-FS-027 has been added to Table 1-1. j) Table 1-1 Note has been revised as requested. Additional text has been added to this note as described in the Response 22.
7.	p. 2-1 §2.1 ¶1	The first phrase is not a sentence.	Disagree – it is a sentence. "On-site bio-treatment" is the subject and "complied" is the verb.

Item No.	Section/ Page	Comment	Response
8.	p. 2-1 §2.1 ¶5	Rewrite paragraph as follows, "~~Based on the classification of the soils to be treated as non-hazardous waste, t~~The Biofacility and buildings were designed and built to meet hazardous waste applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility meeting the applicable codes, standards, and regulations.	The Biofacility was not built to meet all applicable hazardous waste codes, standards and regulations. It meets most of the requirements, however, due to the lack of secondary containment in some areas (buildings, asphalt, ponds), all hazardous waste requirements are not met. The referenced sections were re-written as follows: "The Biofacility and buildings were designed and built to meet, or exceed, all applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility."
9.	p. 3-1 §3.1.2	a) ¶1 In the next to the last sentence, should the word "some" by "same" in reference to where the locations of samples were to be collected? b) ¶2 These constituents of concern should be listed with section 1.1 so all parameters analyzed for are in one location. A table could be used if there is a concern over confusing reference from Halliburton and generator knowledge.	a) "Some" is the correct word in ¶1. It has been changed to "selected" to eliminate confusion. b) The constituents from ¶2 have been moved to section 1.1. The listing of compounds in section 1.1 have been split into "RFI" and "Generator Knowledge" for each class of compounds. Additionally, the compounds have been presented in columns for easier reading.
10.	p. 3-1 §3.1.3	In the second sentence replace "Initial characterization sampling" with "ICS" and the word "of" is in bold or a different font (or something, it looks different).	"Initial characterization sampling" has been changed to "ICS" as requested. The word "of" looked different due to a copier quality problem that affected the appearance of the text on the right side of the page. The problem has been corrected.
11.	p. 3-2 §3.2	a) ¶1 A description is made of how the trommel screener operated. Please add a description for the Powerscreen screener. b) ¶2 In the last sentence, Appendix H is mentioned before Appendices F and G. Is there anyway around this? Appendices should be in the same order they appear in the text.	a) The trommel screener and the Powerscreen unit that replaced it operated in a similar manner, with the primary difference being the increased production rate of the Powerscreen unit. Text has been added to Section 3.2 to clarify this. b) The appendices have been rearranged and additional appendices have been added. Appendices are now in the order that they are referenced in the text. Refer to the new Table of Contents for the revised listing and ordering of appendices.

Item No.	Section/ Page	Comment	Response
12.	p. 3.3 Table 3-1	a) Add a column for the cumulative amount of soil that was excavated and screened. b) When the quantity of material excavated/screened was added, it equaled 19,115 cubic yards, but the executive summary and §1.0 ¶5 states that there was approximately 20,000 cubic yards of soil that was excavated and screened. Please make these numbers consistent.	a) A column for cumulative volumes has been added to both excavated and screened tables. b) The amount of excavated material from both MK and Toltest has been converted to tons for consistency purposes. The amount of soil excavated is 20,209 tons and all references to excavated volumes are consistent with this value.
13.	p. 4-2 §4.2 ¶2	Rewrite first sentence as, "Each ~~C~~contract~~s~~ ~~were~~ was awarded…"	The requested change has been made.
14.	p. 4-2 §4.3 ¶1	a) Rewrite the third sentence as, "… homogenized each ~~mix~~ load by mixing…" b) Rewrite sentence eleven as, "…delivered to the compost windrow in covered trailers or by loader bucket." c) Delete sentence twelve, "… self powered hopper/conveyor…" or add that the use of the hopper/conveyor was stopped and the loader bucket used. d) Rewrite last sentence as, "… is summarized in Table 4-2 and Table 4-3 shows the quarterly cumulative amount of amendments used."	a) The requested change has been made. b) The requested change has been made. c) The sentence has been deleted. d) The requested change has been made.
15.	p. 4-2 §4.3 ¶2	Rewrite second sentence as, "…made at least two or three passes…"	The requested change has been made.
16.	p. 4-2 §4.3 ¶3 and ¶4 and all of §4.4	a) §4.3 ¶3 and ¶4 Add to these paragraphs the use of Building N half sized windrows. Reference and use FCR-FS013 for wording and descriptions as necessary. b) §4.4 The half sized windrow information should also be included throughout this section when sampling locations and number of samples are discussed.	a) The size and location descriptions for half-sized windrows have been added and a reference to FRC-013 has been made. b) Information regarding field sampling of half-sized windrows was added to section 4.4.

Item No.	Section/ Page	Comment	Response
17.	p. 4-3 Table 4-1	a) Add a column for the cumulative amount of soil that was processed. b) When the quantity of soil processed was added, it equaled 20,922, but §4.0 ¶2 states that there was approximately 20,000 cubic yards of soil that was processed. Please make these numbers consistent. c) In the Table 4-1 note section, state what was used as the cut off for each month (day last, day lab results were received, or when windrow was unloaded). I could not seem to find a pattern. d) Also when looking back at Quarterly Interim Progress Reports, windrows 49 and 50 are not recorded in a cumulative column in an MK or TolTest report. Were the windrows included in the cumulative for this report? e) How is it that more soil was processed (20,922) than was screened (19,115)?	a) Cumulative column has been added. b) The amount of processed material from both MK and TolTest has been converted to tons for consistency purposes. The amount of processed material is 21,174 tons and all references to the processed material are consistent with this value. c) A note has been added to Table 4-1 to explain the cut-off used. d) Values have been verified in order to ensure each windrow has been used in determining cumulative volumes. e) The quantities of soil processed and screened do not match exactly because one quantity (soil processed) is a field estimate and the other (soil screened) is an actual scale measurement. The quantities reported in the revised IMR are 21,174 tons processed and 20,209 tons screened. An explanation has been added to Table 4.1 to account for the disparity.
18.	p. 4-4 through 4-6 Table 4-2	a) Fill in missing disposal dates for Windrows 48, 49, 50, and 83. b) Fill in missing level attained and disposal locations for Windows 101 and 102. c) In the Total line, use some type of pattern fill or shading for the columns that remain empty (do not have totals).	a) The missing dates have been added to the table. b) The missing information has been added to the table. c) The empty cells at the bottom of columns have been colored black.
19.	p. 4-7 Table 4-3	a) Add columns/rows showing quantities of amendments that were used per quarter. b) Modify the title of Table 4-3 and text on page 4-2 §4.2 ¶1 to reflect a change in the contents of the table.	a) The table has been expanded to include the quantities of amendments used per reporting period. Quantities are included in tons and are taken from the recipe sheets for each windrow (included in Appendix I) with pounds converted to tons. Also, a note has been added to the table to indicate that quantities used are field estimates. Additional notes added to the table clarify which windrows are included in each reporting period. b) The title of Table 4-3 and the text in the referenced section have been revised to indicate that the table contains amendment quantities received and used.

Item No.	Section/ Page	Comment	Response
20.	p. 4-13 §4.6	a) This section, §4.6 Disposal of treated soil, should be renamed, §5.0 Disposition of treated compost soil. b) In the third sentence, it is discussed that the departing trucks are weighed to determine the weight of compost exiting the Biofacility. Please incorporate into text that FCR-FS021 deletes the requirement to weigh outgoing compost filled trucks. c) Discuss mulching and seeding operations by MK and TolTest, TolTest failed attempt at hydroseeding, and TolTest reseeding MK backfilled areas. d) Discuss staging area and permanent residential placement area.	a) The section has been re-numbered as requested and renamed "Disposition of Treated Compost Soil and Decontaminated Rocks." Subsequent sections have been re-numbered, as required. b) A sentence was added to indicate that the weighing requirement was removed with FCR-FS-021. c) Information regarding the mulching, seeding, and hydroseeding activities has been added to the newly named Section 5.0. d) Information regarding the staging area and the two permanent storage areas has been added to Section 5.0.
21.	p. 6-1 §6.2 ¶2	Reference FCR-FS015 deleting requirement for two time-integrated air sampling campaigns and replacing with visual monitoring.	The requested change has been made. Note that with re-numbering of the sections per Response 20, the referenced information is now in Section 7.1.
22.	Appendix A	a) FCR-FS-004 is included after FCR-FS-017 it should be after FCR-FS-018, but there should be some clarification as to why it is included since the Table 1-1 note states that it not included. b) Add the following FCRs to this appendix FCR-FS-018 Rev 1 signed approval page, FCR-FS-025 Rev 1, and FCR-FS-027 (copies of the FCR is provided with these comments).	a) FCR-FS-004 is included after FCR-FS-017 because it is an attachment to that FCR. Text has been added to the note in Table 1-1 to clarify that FCR-FS-004 did not affect MFA work but a comment to this FCR was the basis for the generation of FCR-FS-017. b) The referenced FCRs have been added to the appendix.
23.	Appendix B	a) p. B-1 Remove the reference, "(Awaiting files from field)". b) Include copies of the Contaminated Scrap Manifest that were submitted by TolTest.	a) The requested change has been made. b) Copies of the manifests have been included in Appendix B.

Item No.	Section/ Page	Comment	Response
24.	Appendix C	This appendix should be renamed "Initial Characterization Sampling Grid Location Drawings" and ICS marked on drawings. If ICS grid locations are not what are shown then they need to be shown here.	The appendix has been renamed as requested. Drawings showing the ICS results by grid have been generated and included in this appendix.
25.	Appendix D	This appendix needs a little explanation. For instance, Grid #1 of Appendix C shows grid #1 as 'meets industrial clean-up objectives' yet Appendix D shows that grid #1 was excavated. Which is right?	The drawing in Appendix C was correct. The drawings initially included in Appendix C were post-excavation sample results. These drawings have been moved to Appendix G and renamed to avoid being confused with ICS drawings. ICS drawings have been generated and are now located in Appendix C. Additionally, headings have been added to the table in Appendix D to clarify the types of samples.
26.	Appendix F	Where are the post excavation drawings showing areas that started as undetected or below residential, were excavated to residential or industrial, or contamination still remains above industrial? My point is that we need to see ICS grid before excavation started, then post excavation drawings showing what the result of the cleanup was, and then backfill maps showing where the soil was returned.	The drawings you requested are included as follows: • Appendix C: ICS grid before excavation • Appendix G: PES grid following excavation • Appendix J: Backfill maps showing where treated compost was placed.
27.	Appendix G p. G-1	Change the note in parenthesis from two binders to three binders.	The information in Appendix G has been moved to Appendix I. The information in this appendix is now on double-sided sheets and included in one binder. The note on the appendix cover sheet has been revised to reflect this.
28.	Appendix H	a) There were two permanent placement areas at MFA; additional information will have to be obtained from TolTest. b) TolTest also conducted additional backfilling in some MK areas at B-154 (used Windrow 97 to cover grids 1,2,3,13,14,39,&40) and B-158/159 (used windrows 99 & 100 to cover all grids) c) Where is the associated final survey information? d) Need to see locations where the rocks backfilled?	a) Additional backfill information has been obtained from TolTest. All TolTest backfill information has been transferred to the MK generated backfill drawings for consistency. Backfill drawings are now included in Appendix J. b) Additional backfill information has been obtained from TolTest and added to the appropriate drawings. c) Final survey drawings have been added in Appendix F. Reference to the final survey drawings has been added to Section 5.1. d) Figure J-4 in the revised report shows the location where the rocks were backfilled.

DRAFT

Interim Measures Report
Removal and Bioremediation of Mine Fill A Material

NSWC Crane
Crane, Indiana

Unit Identification Code: N00164
Contract No. N62467-93-D-1106

June 2000

Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina
29419-9010

DRAFT
INTERIM MEASURES REPORT
REMOVAL AND BIOREMEDIATION OF MINE FILL A MATERIAL

NSWC CRANE
CRANE, INDIANA

June 26, 2000

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EXECUTIVE SUMMARY

This interim measures report has been prepared by Morrison Knudsen Corporation (MK) for Southern Division, Naval Facilities Engineering Command. This report documents the actions completed for the identification, removal, and treatment through bioremediation of explosives-contaminated soil near Buildings 152, 153/154, 157, and 158/159 at Mine Fill A (MFA) at Naval Surface Warfare Center (NSWC) Crane in Crane, Indiana, and the subsequent on-site backfill of the treated material. This report also covers investigation sampling at MFA Buildings 151 and 160, where no impacted soil exceeding cleanup criteria was identified. The report summarizes the work actions performed pursuant to the requirements of the approved *Full-Scale Operational Plan* [MK, 1998a] and the *Quality Assurance Project Plan* [MK, 1998b]. The field work was performed by MK from April 1998 to March 1999 and by TolTest, Inc. from April 1999 to September 1999.

The scope of work included the following:

- Collection and analysis of 617 initial site characterization samples from 203 grids of potentially-impacted soil at MFA.
- Excavation and screening of 20,209 tons of explosives-contaminated soil identified in the site characterization with limitations at some locations based on physical constraints such as buildings, railways, roads, etc.
- Collection and analysis of 299 confirmation samples at MFA that included sampling of excavations to verify that all soil exceeding the cleanup goals was removed (to the extent possible).
- Transportation of excavated, screened material to the on-site Bioremediation Facility for treatment.
- Treatment of the contaminated material at the Bioremediation Facility through composting to reduce the levels of the contaminants of concern to below the target cleanup goals.
- Confirmatory sampling of treated material to ensure cleanup goals were achieved. All treated material met either the industrial or residential cleanup levels for the constituents of concern.
- Transportation of the treated material back to MFA and backfilling the material or staging it for future use. A total of approximately 37,024 tons of compost was returned to MFA.

All interim measures work actions have been completed in accordance with the approved plans and approved field changes with the exception of work at 17 grid sections (23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, and 173) near Buildings 153/154 which have not yet been excavated. These areas will be addressed following completion of supplemental toxicity testing of previously treated compost, as agreed to with the United States Environmental Protection Agency. An addendum to this report will be prepared to address work in those areas. No further action is recommended for all other areas surrounding Buildings 153/154 and all designated areas around Buildings 151, 152, 157, and 158/159 at MFA.

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ACRONYMS

°C	degrees Centigrade
2A46DT	2-amino-4,6-dintrotoluene
24DNT	2,4-dinitrotoluene
26DNT	2,6-dintrotoluene
2NT	2-nitrotoluene
3NT	3-nitrotoluene
4NT	4-nitrotoluene
4A26DT	4-amino-2,6-dintrotoluene
ABG	Ammunition Burning Ground
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CAAA	Crane Army Ammunition Activity
CFR	Code of Federal Regulations
DOD	Department of Defense
DNB	1,3-dinitrobenzene
EPD	Environmental Protection Division
FCR	Field Change Request
FS-OP	Full-Scale Operational Plan
FS-QAPP	Quality Assurance Project Plan for Full-Scale Operations at the Bioremediation Facility
HMX	cycloteremethylenetetranitramine
IAC	Indiana Administrative Code
ICS	Initial characterization sampling
IM	Interim Measure
IMR	Interim Measures Report
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOQ	limit of quantitation
MFA	Mine Fill A
MFB	Mine Fill B
MK	Morrison Knudsen Corporation
MS	matrix spike
MSD	matrix spike duplicate
MSDS	material safety data sheets
NB	nitrobenzene
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
NSWC	Naval Surface Warfare Center
OSHA	Occupational Safety and Health Administration

ACRONYMS (continued)

PETN	Pentaerylthritol tetranitrate
PEL	permissible exposure limit
PES	post excavation samples
PID	photoionization detector
ppm	parts per million
PPE	personnel protective equipment
QAPP	Quality Assurance Project Plan
QC	quality control
RAC	Navy Remedial Action Contractor
RDX	cyclotrimethylene trinitramine
RKI	Rockeye Munitions Facility
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOP	standard operating procedure
SWMU	solid waste management unit
SZ	Support Zone
TLV	Threshold Limit Value
TNT	2,4,6-trinitrotoluene
TNB	trinitrobenzene
Tetryl	methyl-2,4,6-trinitro phenylnitramine
TCLP	toxicity characteristic leaching procedure
U.S.EPA	United States Environmental Protection Agency
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
VOC	volatile organic compound
WHC	water holding capacity

1.0
INTRODUCTION

This interim measures report (IMR) has been prepared by Morrison Knudsen Corporation (MK) for Southern Division, Naval Facilities Engineering Command. This report documents the actions completed for the identification, excavation, on-site treatment through bioremediation (composting) of explosives-contaminated soil, and on-site backfill/staging of compost at Mine Fill A (MFA) at Naval Surface Warfare Center (NSWC) Crane in Crane, Indiana. This IMR summarizes the work actions performed pursuant to the requirements of the approved *Full-Scale Operational Plan* (FS-OP) [MK, 1998a] and the *Quality Assurance Project Plan for Full-Scale Operations, Soils Bioremediation Facility* (FS-QAPP) [MK, 1998b]. The field work was performed by MK from April 1998 to March 1999 and by TolTest, Inc. from April 1999 to September 1999. Five progress reports were generated by MK and TolTest during this period to document the work completed during prescribed periods. Information provided in the progress reports and various field documentation were used in developing this IMR.

NSWC Crane, located in southwestern Indiana, provides support for equipment shipboard weapons systems and ordnance. This site also supports Crane Army Ammunition Activity (CAAA), which includes production and renovation, storage, shipment, and demilitarization and disposal of conventional ammunition. Explosive-compounds contaminated soil resulting from the above operations have been identified at MFA (also known as solid waste management unit (SWMU) 12/14), and three other SWMUs: (Ammunition Burning Ground (ABG) (SWMU-03/10), Rockeye Munitions Facility (RKI) (SWMU-10/15), and Mine Fill B (MFB) (SWMU-13/14)).

To reduce or eliminate the potential for contaminant migration, NSWC Crane evaluated its 31 SWMUs to determine which ones would be amenable to accelerated cleanup actions, otherwise known as Interim Measures (IM). NSWC Crane submitted a proposal to the United States Environmental Protection Agency (U.S. EPA) to conduct IM cleanup actions at selected SWMUs. MFA and the other three SWMUs mentioned above were identified for IM cleanup due to explosive contaminants in the soil.

Based on past success at other Department of Defense (DOD) facilities, as well as other factors (including cost and contaminated soil transportation requirements), excavation and on-site ex-situ bioremediation of the contaminated soils was selected as the preferred treatment alternative for the IM at MFA, ABG, RKI, and MFB. Bioremediation has proven to be successful at other sites having explosive contaminated materials [Weston, 1993]. SWMU 33/00 was identified as the treatment location of the affected soil (Bioremediation Facility). The Bioremediation Facility (Biofacility) was constructed by MK from March 1996 to June 1997. The Biofacility area is a 5½-acre complex located in the southwest quadrant of NSWC Crane near the Crane Landfill as shown on Figure 1-1. It is comprised of three compost buildings each measuring 300 feet long by 70 feet wide by 18 feet tall, a vehicle decontamination facility, two lined storm-water collection ponds, a diesel storage tank, amendment storage area, and a field laboratory and administration facility. A description of the facility is provided in Section 3.0 of the *FS-OP* [MK, 1998a] and the details of the facility are included in the *Construction As-Built Report* [MK, 1998c].

The first phase of the IM process consisted of a pilot-scale bioremediation operation that evaluated several mix recipes and provided lessons learned, a final recipe for full-scale operation, and cleanup goals for treated soil. Results and discussions of the pilot-scale operations are provided in the *Pilot-Scale Treatability Test Report* [MK, 1998d]. The second phase of the IM process consisted of excavating impacted soils and full-scale operation of the Biofacility for treatment of the soils. This IMR documents the identification, excavation, and treatment of 20,209 tons of impacted soil from MFA and the backfilling of the approximately 37,024 tons of generated compost.

1.1 SITE BACKGROUND

MFA is located in the west-central portion of NSWC Crane situated along Highway H-17, as shown on Figure 1-1. MFA consists of 29 buildings, which have been used to assemble mines, depth charges, rocket heads, aerial bombs, and projectiles. MFA began operation in 1942 with the loading of depth charge bombs. The area was also used during the Korean and Vietnam wars. Production rates are not available for other periods, but over six million bombs were manufactured at MFA and MFB during the Vietnam War [Halliburton, 1992]. MFA continued to produce ordnance until 1975, when production was suspended. Demilitarization activities that include ordnance disassembly and decommissioning are also performed in this area. Prior to 1980, a variety of liquid wastes were disposed of on-site without treatment. Explosive-contaminated wastewater was discharged into unlined ponds or into storm drains and ditches. Wastewater generated from cleaning operations was discharged into an unlined pond. Oily waters, battery acids, paint thinner, acetone, boiler blowdown, and solvents were dumped behind buildings or into ravines. Waste hydraulic oil was spread on dirt roads. Since the early 1980s, treatment plants have been built, wastewater streams have been connected to the sanitary sewer, and oils and solvents have been collected, segregated, and either recycled, sold, or disposed of properly [Halliburton, 1992]. As a result, the major sources of contamination were from wash-down operations prior to 1980 and the exhaust ventilation system.

The areas at MFA where soil was impacted by the waste discharges were around Buildings 152, 153/154, 157, and 158/159. Buildings 151 and 160 were investigated but no exceedances of cleanup objectives were identified. The constituents of concern for MFA include compounds that were identified in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Phase I Environmental Monitoring Report for MFA [Halliburton, 1992]. Additional compounds were added to those identified in the RFI based on generator knowledge and process operations at MFA to ensure that solvent-contaminated soil, or characteristic wastes, were not transported to the Biofacility for composting. Compounds identified from both sources include the following:

Explosives:

RFI

- Pentaerylthritol tetranitrate (PETN)
- 2,4,6-trinitrotoluene (TNT);
- cyclotrimethylene trinitramine (RDX)
- cycloteremethylenetetranitramine (HMX)
- tetryl; trinitrobenzene (TNB)
- 1,3-dinitrobenzene (DNB)
- nitrobenzene (NB)
- 4-amino-2,6-dintrotoluene (4A26DT)
- 2-amino-4,6-dintrotoluene (2A46DT)
- 2,4-dinitrotoluene (24DNT)
- 2,6-dintrotoluene (26DNT)
- 2-nitrotoluene (2NT)
- 3-nitrotoluene (3NT)
- 4-nitrotoluene (4NT)

Generator Knowledge - no additional compounds

Metals:

RFI

- aluminum
- barium
- cadmium
- chromium
- lead
- mercury

Generator Knowledge

- arsenic
- selenium
- silver

Volatile Organic Compounds (VOCs):

RFI

- Dichloromethane (methylene chloride)
- acetone
- methyl ethyl ketone (2-butanone)
- methyl isobutyl ketone
- toluene
- xylene (total)

Generator Knowledge

- Chloroform
- 1,2-dichloroethane
- 1,1-dichloroethane

Soil from MFA was used for the start-up of full-scale operation of the Biofacility due to its high concentrations of RDX, TNT, HMX and other explosive contaminant compounds. Concentrations of RDX in the soil ranged from non-detect to 15,300 mg/kg. TNT and HMX were reported as high as 3,790 mg/kg and 1,340 mg/kg, respectively. Soil samples were collected in 1985 around Buildings 153 and 158 with the highest concentrations of contaminants detected near Building 153 [Halliburton, 1992].

1.2 SCOPE OF WORK

The scope of work for the IM completed at MFA included:

- Initial site characterization by sampling and analysis of potentially contaminated in-situ soil to determine areas where contamination existed and to delineate the extent of the impacted areas
- Excavation of explosives-contaminated soil identified in the site characterization, screening of the material, and transportation of the screened soil to the Biofacility for treatment
- Field screening during excavation to assist in determining the extent of contamination
- Confirmatory sampling after excavation was completed to document site conditions
- Treatment of the contaminated soil at the Biofacility through composting, including process monitoring of the material during treatment
- Confirmation sampling of the treated material to ensure that it had met the cleanup objectives
- Transportation and backfill of the treated compost at MFA

Field clarification requests (FCRs) were generated to modify, clarify, and/or revise elements associated with the work. Copies of the FCRs are included in Appendix A. Table 1-1 summarizes the scope of each of the FCRs associated with the MFA operations.

1.3 REPORT ORGANIZATION

This report is organized into nine sections and includes ten appendices. Section 1.0 provides a brief introduction of the site and identifies the scope of work covered by this report. Section 2.0 identifies and discusses the applicable site and regulatory compliance issues associated with the work. Section 3.0 provides a summary of the work performed at MFA including the initial site characterization sampling, excavation activities, and confirmation sampling. A summary of the Biofacility composting operations is provided in Section 4.0. Information on disposition of treated compost soil is provided in Section 5.0. Details of the quality control (QC) checks performed during full-scale operations, including data QC, are included in Section 6.0. A summary of safety and industrial hygiene sampling and monitoring is provided in Section 7.0. Conclusions and recommendations of full-scale operations at MFA are summarized in Section 8.0. A list of reference documents is provided in Section 9.0.

Pertinent information is provided in the following appendices:

Appendix A -	Field Clarification Requests
Appendix B -	Waste Disposal Documentation
Appendix C -	Initial Characterization Sample Grid Location Drawings
Appendix D -	Grid Excavation Sampling Summary
Appendix E -	Initial Characterization Sample Results
Appendix F -	Surveyed Drawings
Appendix G -	Post-Excavation Sample Grid Location Drawings
Appendix H -	Post-Excavation Sample Results
Appendix I -	Windrow Recipes, Field Monitoring Results, and Day Zero/Day Last Sample Results Summary
Appendix J -	Backfill Grid Location Drawings

TABLE 1-1 SUMMARY OF MFA FIELD CLARIFICATION REQUESTS NSWC CRANE BIOREMEDIATION FACILITY		
FCR-FS-#	**Date Issued**	**Description**
001	1/12/98	Clarification on short term toxicity screening of compost
002	2/16/98	Revision of screener and procedure due to wet conditions and positioning requirements. Note: ***FCR VOIDED***
003	4/16/98	Revision of Section 5.4 of *FS-OP* to include use of front end loader to place soil in windrows during formation.
006	4/29/98	Clarification on remedial goal for TNT (Denied)
007	5/1/98	Clarification of remedial goal for TNT
008	5/7/98	Identification of temporary staging areas for treated compost in Bioremediation Compost Buildings or at Mine Fill A.
008 Rev. 1	5/27/98	Per direction from EPA in approval letter, additional details on transporting treated compost soil back to the site, with storage and maintenance requirements for the piles, and restoration of the storage area used.
008 Rev. 2	6/3/98	Additional details were added to 008 Rev. 1.
009	7/9/98	Modification to the covering of excavation areas causing moisture to be retained. Note: No final approval received for this FCR.
010	8/25/98	Clarifications to support process operational activities
011	8/25/98	Discontinue Day Zero sampling of windrows, and remove PETN requirement on all samples except initial characterization. Note: Only removal of PETN requirement was approved. Day Zero sampling continued.
012	3/29/99	Addition of Health & Safety Plan from TolTest to the Operational Plan
013	4/12/99	Clarification of building space to utilize small area in front of stockpile where a smaller windrow can be formed.
014	4/27/99	Modification of rock washing procedure
015	5/6/99	Modification to Health & Safety Plan to exclude requirement for two integrated air sampling events
016	6/15/99	Modification to Health & Safety Plan to include new officer
017	6/23/99	Ability to mix MFA and MFB soils into a single stockpile

TABLE 1-1 (continued) SUMMARY OF MFA FIELD CLARIFICATION REQUESTS NSWC CRANE BIOREMEDIATION FACILITY		
FCR-FS-#	**Date Issued**	**Description**
018 Rev. 1	6/28/99	Modification of decontamination requirements between MFA and MFB. Rev. 1 added details per EPA request.
021 Rev. 1	7/9/99	Clarification of treated compost weighing requirements
023	8/3/99	Clarification of reject pile from soil screening at MFA
025 Rev. 1	1/19/00	Revised handling procedure for rocks screened out of excavated soil.
027	2/1/00	Combines requirements for Excavation Completion Report and Compost Completion Report into one Interim Measures Report.

Note: FCRs 004, 005, 019, 020, 022, 024 and 026 did not affect MFA operations and are, therefore, not included in this table. FCR 004 did not directly affect MFA operations, but a comment by U.S. EPA on this FCR was the basis for FCR 017 and FCR 004 is an attachment to FCR 017.

2.0
REGULATORY COMPLIANCE

Various regulatory and site compliance issues were involved in the operations at MFA and the Biofacility. The following sections discuss the site and regulatory requirements associated with soil and treated compost media classification, waste management operations, storm water discharge, and excavation permitting.

2.1 CONTAMINATED MEDIA CLASSIFICATION

On-site bio-treatment of contaminated media complied with all relevant permitting and reporting requirements of RCRA (1976 *et seq.*). No hazardous waste was allowed to be treated in the Biofacility. Sampling and analysis of the soil to be treated was performed for the constituents of concern, and additional VOCs and heavy metals, that may have been present based on generator knowledge, to verify that material was non-hazardous.

Data obtained from in-situ soil samples from all excavation areas indicated that the contaminated soil did not contain Title 40 Code of Federal Regulations (CFR) 261 Appendix VIII hazardous constituents above the characteristic reactivity threshold as determined in 40 CFR 261.23. Contaminated soil containing reactive nitrated aromatics has been evaluated and it was determined that reactivity is not observable if the reactive constituents are present below concentrations of 10% (100,000 mg/kg) [Kristoff et al, 1987]. The site soil concentrations of nitrated aromatic compounds were below this concentration.

Wash-out water from ammunition processing had previously been released to soil in various areas at NSWC Crane, including MFA. This wastewater was classified as KO47 (pink/red water from TNT operations). Per the regulations, KO47 waste becomes de-listed upon deactivation. The reactive level for TNT has been determined to be less than 10% as discussed above. The subject soils did not contain TNT concentrations greater than 10%, therefore the soil was acceptable for treatment at the Biofacility.

Review of in-situ soil analyses indicated that all soil at MFA were non-reactive and non-characteristic and therefore, were classified as non-hazardous waste.

The Biofacility and buildings were designed and built to meet, or exceed, all applicable codes, standards, and regulations. Based on the classification of the soils to be treated as non-hazardous waste, the Biofacility was approved as a solid waste and contaminated media treatment facility.

2.2 WASTE MANAGEMENT

The NSWC Crane Environmental Protection Division (EPD) representative coordinated all waste management and disposal. The contractors complied with all NSWC Crane EPD requirements for management of all generated wastes.

Decontamination water generated from the cleaning of equipment and tools was collected and subsequently used as moisture additive for windrows. Stormwater was collected in retention ponds. When the ponds were nearly full, the water was sampled and analyzed as required by the *FS-OP* [MK, 1998a] and the FS-QAPP [MK, 1998b]. Based on sample results, the water was pumped either to the site drainage ditch or the site sanitary sewer. No generated water was taken off-site for disposal.

Specific waste containers (for acetone, field screening kits, PPE, etc.) were generated in response to operational needs. These materials were characterized by generator knowledge and Material Safety Data Sheets (MSDS). All filled waste storage containers were stored, labeled, and disposed of in accordance with the appropriate regulations listed in Section 2.6 below and NSWC Crane directives. Specifically, waste, such as acetone from the field test kits and some of the waste which was explosive-

contaminated combustible material, was transported for treatment at the ABG. A *Contaminated Scrap Manifest - NSWCC 6280/4, Rev. 6-84* was filled out and submitted for approval by the NSWC Crane EPD. Upon approval, these specific wastes were transported to the ABG for treatment. PPE was disposed at the on-site landfill. Copies of waste disposal documentation are included in Appendix B.

2.3 STORM-WATER DISCHARGE

NSWC Crane obtained a Storm-water Discharge Permit [NSWC Crane, 1997] under Title 327 Indiana Administrative Code (IAC) 15, National Pollution Discharge Elimination System (NPDES) General Permit Rule Program. Operations were in compliance with the specifications in the *FS-OP* [MK, 1998a] that is consistent with the permit. The storm-water diversion and retention controls for the Biofacility are described in Sections 3.6 and 7.2.4 of the *FS-OP* [MK, 1998a]. Additional details on sampling procedures and analytical methodologies for storm-water discharge are provided in the *FS-QAPP* Section 4.3 [MK, 1998b].

2.4 LANDFILL PERMITTING

Soil excavated from MFA was treated and returned to MFA (SWMU 12/14). It was used as fill and cover in the existing excavations, therefore, no landfill permit was required.

2.5 EXCAVATION PERMITTING

A Digging Permit was obtained from the Public Works Officer for soil excavation at MFA.

2.6 SPECIFICATIONS, CODES, AND STANDARDS

Compliance in the material, examination, testing, inspection, and documentation included the applicable portions of the specifications, codes, and standards listed below.

- U.S. Navy and NSWC Crane guidance
- U.S. Occupational Safety and Health Administration
  - 29 CFR 1910, Occupational Safety and Health Standards
  - 29 CFR 1926, Safety and Health Regulations for Construction
- U.S. Army Corps of Engineers
  - EM-385-1-1, Safety and Health Manual
- U.S. Environmental Protection Agency
  - 40 CFR 257, Criteria for Classification of Solid Waste Disposal Facilities and Practices
  - 40 CFR 261, Identification and Listing of Hazardous Waste
  - 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
  - 40 CFR 264, Subpart S Corrective Action
  - 40 CFR 300, National Oil and Hazardous Substance Contingency Plan
- U. S. Department of Transportation
  - 49 CFR 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements. This part describes requirements for completing shipping papers; marking, labeling, and placarding; training; and emergency response.
  - 49 CFR 173, General Requirements for Shipments and Packaging. This part describes classification and packaging of hazardous materials.

- Indiana Department of Environmental Management
  - 327 IAC 15, NPDES General Permit Rule Program
  - 329 IAC 2, Solid Waste Management
  - 329 IAC 3.1, Hazardous Waste Management Permit Program And
  - Related Hazardous Waste Management
  - Department of Defense Explosives Safety Board explosive safety standard for construction equipment.

- National Codes and Standards
  - ASTM, American Society for Testing and Materials
  - ANSI, American National Standards Institute
  - NEMA, National Electrical Manufactures Association
  - NEC, National Electric Code
  - NFPA, National Fire Protection Association

2.7 ENVIRONMENTAL PROTECTION

All work was conducted in a way that minimized pollution of the air, water, and land. Noise and the disposal of solid waste materials were controlled to protect human health and the environment.

All excavations, stockpiles, access roads, and other work areas were maintained free from excess dust to avoid causing a hazard. Dust at the excavation sites and Biofacility was controlled with a wetting spray from a potable water source.

Temporary erosion control was used in excavation areas until permanent surface drainage was re-established. The amount of bare soil exposed at any time did not exceed three acres. Excavations were protected when work was not in progress.

All erosion control structures in excavation areas were built to conform to SWMU specific conditions. Generally, erosion control structures consisted of berms, ditches, sumps or straw bale dikes. These structures were maintained as often as required to minimize the migration of sediment into, or out of, exclusion zones. Potentially-contaminated stormwater contained and collected within the exclusion zones, was pumped to on-site storage tanks and handled as described in Section 2.3.

3.0
MFA SITE OPERATIONS

3.1 INITIAL CHARACTERIZATION SOIL SAMPLING

3.1.1 Sample Locations

Pre-excavation sampling was performed by MK at MFA around Buildings 151, 152, 153/154, 157, 158/159 and 160 to provide initial site characterization for the purpose of delineating the extent of contaminated soil requiring excavation in impacted areas and to establish that cleanup goals were met in areas where no excavation was required. The locations of potentially contaminated areas were based on previous sampling results as discussed in Appendix E1 (Soil Excavation Plan for MFA) in the *FS-OP* [MK, 1998a]. The subject areas were marked off with grids. The grid layout and boundaries were affected by the presence of buildings, railways, roadways, utilities, etc. Initially 121 grid sections were established as specified in Appendix E1 of the *FS-OP* [MK, 1998a]. Grid borders were flagged in the field.

Initial Characterization Samples (ICS) were collected from each of the 121 grid sections as described in Section 3.1.2 below. Sample results from these sections revealed exceedances of the cleanup goals in some of the outer grid sections. An additional 82 grid sections were added to the outer limits of the areas being characterized to delineate the horizontal extent of contamination. The locations of the 203 grid sections (original 121 plus additional 82) and the results of the ICS samples are shown on Figures C1 (Buildings 153/154), C2 (Buildings 158/159), C3 (Building 152) C4 (Building 157), C5 (Building 160) and C6 (Building 151) in Appendix C. Areas with exceedances of the cleanup criteria were identified at all Buildings except 151 and 160.

3.1.2 Sample Collection and Analysis

Samples were collected from each grid section for site characterization. Generally, sampling at each grid location consisted of three samples, including two composite samples that were analyzed for explosives and metals, and one grab sample that was analyzed for VOCs. The composites were collected at depths of zero to 12 inches and 24 to 36 inches and the grab sample was collected from a depth of 12 inches. Additional samples were obtained for VOCs analysis, as deemed necessary in the field, based on photoionization detector (PID) screening. Field duplicates and other appropriate field QC samples were also collected from selected locations as described in Section 3.1.2 of the *FS-QAPP* [MK, 1998b]. Table D-1 in Appendix D identifies all ICS collected at MFA by grid section.

Samples were analyzed by U.S. EPA SW-846 methods 8330 (explosives), 8260 (VOCs) and 6010/7470 (metals) for the constituents of concern identified in the RFI and additional compounds identified through generator knowledge and process operations at MFA. The analytes are identified in Section 1.1.

The analysis of the compounds identified from generator knowledge and process operations at MFA was performed to ensure that solvent-contaminated soil, or other characteristic wastes, were not transported to the Biofacility for composting. Analysis of these compounds was on a total basis with the correction factor of 20 used to check if the values were below the toxicity characteristic leaching procedure (TCLP) regulatory limits. If the total metals and total VOC results, with the correction factor, indicated that values were higher than the regulatory limits, then TCLP analysis would have been requested. However, all totals results were significantly less than 20 times the TCLP limit, so no TCLP analyses were performed.

3.1.3 Sampling Data Summary

ICS results are summarized on Table E-1 in Appendix E. ICS QC sample results are on Table E-2, in Appendix E. ICS from the 203 grid locations revealed 123 grid sections that exceeded industrial cleanup objectives and required excavation. Table D-1 in Appendix D summarizes the samples collected from

each grid section and identifies which sections exceeded the cleanup goals and required excavation. After the ICS results were received, the horizontal boundaries of explosives contamination had been delineated by grids with no detectable levels of contamination, levels that were below cleanup objectives, or buildings, roads, railroad tracks or other physical limitations. No metals or VOCs were detected above cleanup action levels for SWMU-specific contaminants of concern in any of the samples. Arsenic, for which samples were tested specifically to ensure that material treated in the Biofacility was not a characteristic hazardous waste, was present in samples at various levels which exceeded industrial cleanup goals. However, because arsenic was not a contaminant of concern for MFA, and none of the arsenic results exceeded 20 times the TCLP limit, no action was taken. The arsenic data has been included in this report to demonstrate that background levels of arsenic are present throughout the Crane area and will need to be considered in future sites of excavation where arsenic is a contaminant of concern.

3.2 SOIL EXCAVATION, SCREENING, AND TRANSPORTATION

Soil excavation was performed at Buildings 152, 153/154, 157, and 158/159. Surveyed drawings of these areas prior to excavation are included in Appendix F. Soil excavation and screening began in November 1997 at Buildings 153/154 prior to the actual start of full-scale operations of the Biofacility. The operation moved to Buildings 158/159 in search of drier soils, before Buildings 153/154 were completed. Contaminated soil was initially excavated from depths of zero to three feet using a backhoe/loader and a Bobcat skid-steer loader. Field screening was performed at this depth, as described in Section 3.3, to determine if additional soil was to be excavated. All excavated soil was screened to remove oversized material (1½-inch or larger) prior to transport to the Biofacility. This was to ensure that the soil to be treated was homogenous so that the composting operation would be effective. Excavated soil was loaded into the soil screening equipment using a backhoe or loader. Screening was initially performed using a trommel screener with a 50-ton/hour capacity. The screen was a standard portable design with a feed hopper and grizzly bars, fines stacking conveyor, and a reject (oversized material) discharge conveyor. In August 1998, a new soil screening unit, the Powerscreen, was purchased and put into operation to increase the quantity of soil screened. It was a larger unit that followed the same general procedure as the trommel screener and nearly doubled production. As a result, a substantial stockpile of screened soil was prepared prior to winter to allow for continued uninterrupted compost operation all year. After screening, the fines were dropped from the fines stacking conveyor into a loader and placed into a live-bottom truck bed for transport to the Biofacility. A step-by-step procedure for soil screening is provided in Field Standard Operating Procedure (SOP) 1.0 in Appendix D of the *FS-OP* [MK, 1998a].

Oversized material was separated into soil clods, vegetation, and rock. Soil clods were spread out, allowed to sufficiently dry, and then pulverized and re-screened. Vegetation was stockpiled on site and then relocated to the Biofacility where it was incorporated into windrows. The rocks were washed, as described in Section 3.6, and backfilled.

Table 3-1 shows the quantity of soil that was excavated and screened at MFA through August 1999. Excavation ceased at that point because of concerns raised by U.S. EPA regarding backfilling of the treated soil from the Biofacility due to the toxicity of the compost. The additional areas remaining to be excavated are near Buildings 153 and 154 and include grid sections 23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, 173. Per an agreement with the U.S. EPA in January 2000, the Navy will perform supplemental toxicity testing of treated compost soil to address U.S. EPA's concern. The toxicity testing procedure for the compost was submitted to U.S. EPA in April 2000 as a revision to Appendix G of the *FS-QAPP* [MK, 1998b]. Additional details were added to the procedure in June 2000 and currently the Navy is awaiting approval by U.S. EPA. Upon completion of the supplemental testing, the remaining grid sections will be excavated. An addendum to this IMR will be generated and submitted to U.S. EPA to detail the excavation, treatment, sampling, and backfilling of the material from the remaining grids.

TABLE 3-1 SOIL EXCAVATION AND SCREENING QUANTITIES NSWC CRANE MFA		
Month	**Quantity of Material Excavated and Screened[1] Through August 1999 (Tons)**	**Cumulative Quantity (Tons)**
March 1998	1,530	1,530
April 1998	183	1,713
May 1998	914	2,627
June 1998	126	2,753
July 1998	958	3,711
August 1998	1,520	5,231
September 1998	1,996	7,227
October 1998	1,671	8,898
November 1998	1,187	10,085
December 1998	586	10,671
January 1999	0	10,671
February 1999	1,047	11,718
March 1999	329	12,047
April 1999	841	12,888
May 1999	2,216	15,104
June 1999	2,617	17,721
July 1999	2,230	19,951
August 1999	258	20,209

Notes:

1- Quantities are taken from Quarterly Interim Progress Reports based on actual scale weights of soil trucked to the biofacility.

3.3 IN-PROCESS EXCAVATION SOIL SAMPLING

Soil samples were collected during excavation activities at MFA to assist the field crew in determining the extent of excavation required at each grid section. Field screening test kits were used to test TNT and RDX levels in the in-process soil samples to provide quick field screening results. Soil sampling during excavation was performed as specified in the Soil Excavation Plan, Appendix E of the *FS-OP* [MK, 1998a]. Two composite samples were collected from each grid section for field screening with the test kits. One sample was collected from the base of the excavation and one from the sidewalls. If the field screening indicated that concentrations of TNT and RDX were greater than industrial cleanup levels, subsequent layers of contaminated soil were removed until field screening indicated acceptable concentrations of explosives (below the industrial cleanup objectives) or physical impediments (buildings, railways, roadways, utilities, etc.) were encountered. Table 3-2 identifies the grid sections that were not excavated to the cleanup goals and the reason why there was no additional excavation.

3.4 POST-EXCAVATION CONFIRMATION SOIL SAMPLING

Post-excavation confirmation soil samples (PES) were collected, following excavation and field screening, to determine the levels of SWMU-specific contaminants remaining in the soil. PES were collected by both MK and TolTest. PES included one composite sample from the base of each grid section and one composite sample from the sidewalls of each grid excavation. Samples were analyzed for contaminants that were detected above the industrial cleanup objectives in the ICS. The samples were analyzed as specified in the Soil Excavation Plan, Appendix E of the *FS-OP* [MK, 1998a]. Analysis was performed by an off-site laboratory. Table D-1 in Appendix D identifies the PES collected from each grid. Appendix G includes grid location drawings that show the results of the post-excavation samples with respect to the cleanup goals. PES results are included in Appendix H.

3.5 EQUIPMENT DECONTAMINATION

After equipment was no longer required at MFA, it was decontaminated prior to being transported to another site (with the exception of equipment going to MFB from MFA since contaminants were the same - see FCR 18). All decontamination fluids were collected and used for moisture conditioning of windrows at the Biofacility.

3.6 ROCK WASHING

Initially, the *FS-OP* [MK, 1998a] specified washing and triple rinsing oversized material rejected from the soil screening process. The wash and rinse water were to be collected and analyzed as described in Figure 1.4 of the *FS-OP*. This procedure was labor intensive, generated excessive amounts of contaminated rinse water, and proved to be futile in attaining the cleanup standards established in the *FS-OP* for acceptable decontamination of the rocks [drinking water standards on the rinse water]. FCR 14 was generated to replace the original rock washing procedure. The revised procedure required that the rocks be washed with a high-pressure-low-volume sprayer to remove all visible soil contamination. The rocks were then returned to the bottom of an open excavation within the same SWMU and covered with no less than two feet of finished compost. This technique permitted more timely backfilling of the rocks back to the point of origin. Additionally, the rinse water was used for moisture conditioning of the windrows, thereby minimizing the quantity of generated waste requiring disposal.

TABLE 3-2 SUMMARY OF GRIDS NOT EXCAVATED TO CLEANUP GOALS NSWC CRANE MFA		
Grid Section	**Building Location**	**Reason Soil Not Excavated to Cleanup Goals**
2	153/154	Encountered blast wall footer
3	153/154	Encountered blast wall footer
4	153/154	Encountered utility lines
5	153/154	Encountered bedrock
10	158/159	Encountered blast wall footer
11	158/159	Encountered blast wall footer
12	158/159	Encountered utility lines
17	153/154	Railroad track prevented further soil removal
23	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
24	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
26	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
27	153/154	Soil left in place was structural support for a steam line
28	153/154	Soil left in place was structural support for a steam line
29	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
33	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
34	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
35	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
36	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
37	153/154	Encountered blast wall footer
38	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
40	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
56	158/159	Soil left in place was structural support for a steam line
58	158/159	Soil left in place was structural support for a steam line
59	158/159	Encountered utility lines
62	158/159	Encountered blast wall footer
63	158/159	Encountered utility lines
64	158/159	Encountered blast wall footer

TABLE 3-2 (continued) SUMMARY OF GRIDS NOT EXCAVATED TO CLEANUP GOALS NSWC CRANE MFA		
Grid Section	**Building Location**	**Reason Soil Not Excavated to Cleanup Goals**
65	158/159	Encountered blast wall footer
72	152	Encountered footer
103	157	Soil was excavated to a depth of 10 feet. Excavation ceased per direction from NSWC Crane ECOTR
106	157	Encountered overhead conveyor footers
126	153/154	Encountered lightning mast footers
127	153/154	Encountered blast wall footer
128	153/154	Encountered lightning mast footers
131	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
132	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
133	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
134	153/154	Encountered utility lines
135	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
149	158/159	Encountered utility lines
150	158/159	Encountered utility lines
171	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
172	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
173	153/154	Area not yet excavated pending soil toxicity discussions with U.S. EPA
200	153/154	Encountered bedrock
202	153/154	Encountered bedrock
203	153/154	Encountered bedrock

4.0
BIOFACILITY COMPOSTING OPERATIONS

Impacted soil excavated from MFA was treated in the Biofacility by composting to microbially degrade the explosive compounds in the soil. Organic amendments (chicken manure and straw) were mixed with the contaminated soil in windrows to form the compost. Section 4.1 describes maintenance and repairs of the Biofacility. Section 4.2 describes the supply and storage of the amendments. Section 4.3 describes the windrow construction process. The amendments in the compost served as a carbon source for the microorganisms in the material that were capable of degrading the explosives. The availability of organic material and inorganic nutrients (such as nitrogen and phosphorus), temperature, moisture content, pH, and oxygen availability in the compost were optimized in order to enhance the process. Section 4.4 describes the monitoring of various constituents/properties in the soil to ensure optimum conditions were maintained and to track the progress of the treatment. Section 4.5 describes the monitoring of explosives in the treated soil. Microbial activity in the soil was stimulated by heat that was generated and contained in the compost matrix. A full description of the composting operation process is provided in Section 5.0 of the approved *FS-OP* [MK, 1998a].

A total of 102 windrows of material excavated from MFA were treated in the Biofacility. All windrows successfully achieved either the residential or industrial cleanup goals for the constituents of concern. Table 4-1 shows the quantity of soil processed each month. Approximately 21,174 tons of soil were processed. The quantities of soil processed are field estimates based on number of loads of soil used to create each windrow, while quantities of soil excavated (Table 3-1) are actual scale weights. This accounts for the apparent treatment of more soil than was excavated.

The actual performance schedule for the treatment of the MFA soils was significantly ahead of the planned dates. This was primarily due to the relatively short biodegradation period. The average treatment period for MFA soils between Day Zero and Day Last was 9.2 days. The schedule planned this period to be thirty days. MK and TolTest closely monitored the bioremediation of the windrows with the use of available data, including field test kits, to determine when windrows reached cleanup goals and Day Last confirmation samples could be collected. This minimized the lengths of the biodegradation periods. Table 4-2 provides a summary of all windrows, including soil and amendment quantities, process duration, and treatment level attained (industrial or residential).

4.1 BIOFACILITY MAINTENANCE AND REPAIRS

Routine maintenance and housekeeping activities were performed at the Biofacilty. General building cleanliness was maintained during full-scale operations by using a front end loader and/or a skid steer loader to collect stray compost materials and reform the piles, as necessary. Brooms and shovels were used in inaccessible areas. Any ponded liquid inside the buildings was manually moved to the sump within 24 hours. Throughout operations, windrows were kept segregated, well-formed, and identified with signs containing the windrow number and date formed. Any ponded liquid on external asphalt surfaces was manually moved to the retention ponds within 24 hours.

Inspections of Biofacility buildings and associated structures were performed on a quarterly basis. Items found to be deficient were repaired or scheduled for repair at the earliest available period. Special attention was paid to specific items such as checking for settlement cracks in the Biofacility building floors and leaks in either storm-water retention pond liners or compost buildings. The Biofacility building floors and sumps were inspected for new cracks between building compost cycles in addition to the quarterly inspection. Any new cracks were scheduled for repair. Repair was performed by saw-cutting the crack as necessary to allow installation of Silkaflex 1a Polyurethane sealant, or equivalent sealant. A water line leak was identified under the asphalt in the process area. This was repaired by TolTest. All facility repairs were in accordance with the facility construction specifications [MK, 1997 and MK, 1998c].

TABLE 4-1 MFA PROCESSED SOIL QUANTITIES NSWC CRANE BIOFACILITY		
Month	**Quantity of Soil Processed[1] (tons)**	**Cumulative Soil Processed (tons)**
April 1998	0	0
May 1998	926	926
June 1998	253	1,180
July 1998	1,386	2,566
August 1998	866	3,432
September 1998	1,155	4,587
October 1998	1,155	5,742
November 1998	1,172	6,914
December 1998	1,165	8,079
January 1999	1,162	9,241
February 1999	682	9,923
March 1999	928	10,851
April 1999	1,856	12,707
May 1999	1,575	14,283
June 1999	2,135	16,417
July 1999	2,547	18,964
August 1999	2,117	21,081
September 1999	92.8	21,174

Note:

1 - Weights determined from Windrow Recipe Forms for each windrow that obtained Day Last status during the month specified. Quantities of soil processed are field estimates, while quantities of soil excavated (Table 3-1) are actual scale weights. This accounts for the apparent treatment of more soil than excavated soil.

TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
1	232.1	133	69.6	434.7	4/15/98	5/11/98	26	Residential	6/24/98	West Berm Bldg.159
2	232.1	115	58.9	406.0	4/17/98	5/8/98	21	Residential	6/25/98	West Berm Bldg. 159
3	236.5	122	58.0	416.5	4/22/98	5/7/98	15	Residential	6/26/98	SW Bldg. 157
4	220.0	109	62.9	391.9	4/24/98	5/8/98	14	Residential	6/30/98	West Berm Bldg. 159
30%	22.0	11	4.7	37.7	4/27/98	6/26/98	60	Residential	9/1/98	Reprocessed as soil
Control	5.5	3	1.4	9.9	4/25/98	5/20/98	26	NA	6/24/98	West Berm Bldg.159
5	231.0	128	51.2	410.2	6/3/98	6/18/98	15	Residential	7/2/98	SE Bldg. 157
6	231.0	120	60.1	411.1	6/17/98	7/1/98	14	Residential	7/14/98	Back Berm Bldg. 159
7	231.0	120	60.6	411.6	6/24/98	7/7/98	13	Residential	7/16/98	West Berm Bldg. 159
8	231.0	120	56.2	407.2	7/1/98	7/9/98	8	Residential	7/24/98	West Berm 153/154
9	231.0	113	60.4	404.4	7/8/98	7/16/98	8	Residential	7/28/98	NW Swale 153/154
10	231.0	116	61.7	408.7	7/17/98	7/27/98	10	Residential	8/7/98	West Berm Bldg. 159
11	231.0	122	58.7	411.7	7/22/98	7/31/98	9	Residential	3/21/99	Field Applied
12	57.2	29	14.9	101.1	7/28/98	8/4/98	7	Residential	8/17/98	South of Bldg. 157
13	132.0	70	34.3	236.3	8/4/98	8/11/98	7	Residential	3/21/99	Field Applied
14	231.0	119	68.8	418.8	8/6/98	8/14/98	8	Residential	3/21/99	Field Applied
15	220.0	116	78.7	414.7	8/12/98	8/19/98	7	Residential	9/4/98	Steam Line Bldg. 2793
16	225.5	116	72.0	413.5	8/15/98	8/21/98	6	Residential	9/8/98	Steamline Bldg. 2793
17	225.5	115	54.9	395.4	8/26/98	9/2/98	7	Residential	9/17/98	Steamline Bldg. 2793
18	231.0	112	70.5	413.5	8/28/98	9/3/98	6	Residential	9/18/98	NW Bldg. 153/154
19	236.5	116	60.9	413.4	9/9/98	9/16/98	7	Residential	9/15/98	NW Bldg. 153/154
20	231.0	114	65.0	410.0	9/11/98	9/18/98	7	Residential	9/28/98	Steam Line Bldg. 2793
21	231.0	111	59.9	401.9	9/18/98	9/25/98	7	Residential	10/6/98	NW Bldg. 153/154
22	231.0	114	64.7	409.7	9/23/98	10/14/98	21	Residential	10/27/98	RR Ditch Bldg. 153/154
23	231.0	115	63.1	409.1	9/30/98	10/22/99	22	Residential	10/23/98	Bldg. 158/159 Backside
24	231.0	117	65.2	413.2	10/2/98	10/12/98	10	Residential	3/21/99	Field Applied
25	231.0	118	62.8	411.8	10/9/98	10/16/98	7	Residential	10/29/98	Steam Line Bldg. 2793
26	231.0	117	73.1	421.1	10/24/98	10/30/98	6	Residential	11/14/98	NW Bldg. 153/154
27	242.0	122	67.4	431.4	10/28/98	11/4/98	7	Residential	3/17/99	West Berm Bldg. 153/154
28	231.0	117	65.8	413.8	10/30/98	11/20/99	21	Industrial	11/23/98	Back Berm Bldg. 159
29	231.0	116	66.5	413.5	11/5/99	11/12/98	7	Residential	11/24/98	NW Bldg. 153
30	236.5	120	70.9	427.4	11/18/98	12/8/99	12	Industrial	12/9/98	West Berm Bldg. 159
31	231.0	118	65.5	414.5	11/20/98	11/30/98	10	Residential	12/10/98	North Berm 152
32	232.1	119	61.6	412.7	11/25/98	12/2/98	7	Residential	12/11/98	NW Bldg. 153
33	232.1	119	68.1	419.2	12/2/98	12/8/98	6	Residential	12/22/98	North/East Bldg. 157
34	236.5	126	63.0	425.5	12/11/98	12/18/98	7	Residential	1/13/99	Back berm Bldg. 159
35	232.1	119	59.0	410.1	12/13/98	12/22/98	9	Industrial	1/7/99	Back berm Bldg. 159
36	232.1	118	68.6	418.7	12/15/98	12/28/98	13	Industrial	1/1/4/99	NW swale Bldg. 153
37	232.1	117	73.9	423.0	12/30/99	1/11/99	12	Industrial	1/21/99	West Berm Bldg. 153/154
38	235.4	120	57.5	412.9	1/12/99	1/19/99	7	Industrial	1/21/99	NW Berm Bldg. 153/154

TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
39	231.0	122	64.6	417.6	1/15/99	1/21/99	6	Industrial	1/31/99	West Berm Bldg. 153/154
40	231.0	119	62.6	412.6	1/17/99	1/24/99	7	Industrial	2/8/99	West Berm Bldg. 153/154
41	232.1	123	55.5	410.6	1/24/99	1/31/99	7	Industrial	2/12/99	West Berm Bldg. 153/154
42	221.1	113	61.9	396.0	2/1/99	2/8/99	7	Industrial	2/19/99	SE Berm Bldg. 158/159
43	229.9	117	59.8	406.7	2/6/99	2/12/99	6	Industrial	2/25/99	North Berm Bldg. 152
44	231.0	116	62.7	409.7	2/11/99	2/18/99	7	Industrial	2/26/99	North Berm Bldg. 152
45	232.1	119	62.3	413.4	2/18/99	3/8/99	18	Industrial	3/20/99	North Berm Bldg. 152
46	232.1	116	57.6	405.7	2/22/99	3/10/99	16	Residential	3/20/99	1/3 North Berm Bldg. 152; 2/3 Field Applied
47	232.1	118	59.9	410.0	3/4/99	3/17/99	13	Industrial	3/20/99	N/NE Bldg. 157
48	232.1	118	62.6	412.7	3/6/99	3/23/99	17	Industrial	3/30/99	NE, NW and SW Bldg. 157
49	231.0	116	57.1	404.1	3/22/99	4/1/99	10	Industrial	4/8/99	S. side Bldg. 152; NE and SW Bldg. 157
50	232.1	122	59.2	413.3	3/24/99	4/2/99	9	Industrial	4/11/99	SE and S. Bldg. 152; NE Bldg. 157
51	232.1	117	54.7	403.8	3/29/99	4/12/99	14	Residential	4/17/99	SE side Bldg. 152
52	232.1	105	51.4	388.5	4/2/99	4/13/99	11	Residential	4/19/99	Storage Area
53	232.1	118	57.3	407.4	4/10/99	4/21/99	11	Industrial	4/26/99	SE side Bldg. 157
54	232.1	119	53.9	405.0	4/14/99	4/26/99	12	Residential	4/30/99	Storage Area
55	232.1	117	55.2	404.3	4/21/99	4/30/99	9	Residential	5/7/99	Storage Area
56	232.1	117	57.7	406.8	4/23/99	4/30/99	7	Residential	5/8/99	Storage Area
57	110.0	59	25.5	194.5	4/24/99	5/3/99	9	Residential	5/10/99	Storage Area
58	93.5	49	21.4	163.9	4/28/99	5/7/99	9	Residential	5/14/99	Storage Area
59	232.1	120	54.2	406.3	5/3/99	5/12/99	9	Residential	5/17/99	E. Bldg. 154
60	232.1	118	55.9	406.0	5/6/99	5/13/99	7	Industrial	5/20/99	SW Bldg. 157
61	232.1	117	54.0	403.1	5/11/99	5/19/99	8	Residential	5/26/99	E. Bldg. 154
62	232.1	116	53.3	401.4	5/14/99	5/20/99	6	Industrial	5/27/99	NW Bldg. 157
63	88.0	44	21.9	153.9	5/17/99	5/25/99	8	Residential	6/1/99	SE and SW Bldg. 157
64	232.1	109	54.1	395.2	5/19/99	5/27/99	8	Industrial	6/3/99	SE Bldg. 152
65	123.2	64	28.8	216.0	5/20/99	5/28/99	8	Industrial	6/4/99	NW Bldg. 157
66	232.1	91	42.5	365.6	5/21/99	6/2/99	12	Residential	6/8/99	E. Bldg. 154
67	232.1	109	47.6	388.7	5/27/99	6/3/99	7	Industrial	6/10/99	NW Bldg. 157
68	232.1	119	54.3	405.4	5/28/99	6/7/99	10	Residential	6/14/99	E. Bldg. 154
69	98.6	50	22.6	171.2	6/2/99	6/9/99	7	Industrial	6/16/99	NE Bldg. 157
70	232.1	123	53.6	408.7	6/4/99	6/11/99	7	Residential	6/21/99	E. Bldg. 154
71	98.6	49	22.8	170.5	6/5/99	6/14/99	9	Industrial	6/21/99	NE Bldg. 157
72	232.1	116	51.8	399.9	6/9/99	6/16/99	7	Residential	6/23/99	E. Bldg. 154
73	232.1	114	49.8	395.9	6/12/99	6/18/99	6	Residential	6/25/99	E. Bldg. 154
74	232.1	115	50.5	397.6	6/15/99	6/23/99	8	Residential	6/30/99	E. Bldg. 154
75	81.2	40	17.6	138.8	6/17/99	6/25/99	8	Residential	7/3/99	E. Bldg. 154
76	232.1	112	47.0	391.1	6/22/99	6/29/99	7	Industrial	7/6/99	N. Bldg. 152
77	232.1	107	44.8	383.9	6/24/99	7/2/99	8	Industrial	7/10/99	S. Bldg. 152
78	81.2	40	17.2	138.4	6/25/99	7/1/99	6	Industrial	7/9/99	S. Bldg. 152

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TABLE 4-2
MINE FILL A SOIL WINDROW TREATMENT/BACKFILLSUMMARY
NSWC CRANE

Windrow[1]	Soil Qty.[2] (tons)	Chicken Manure Qty.[2] (tons)	Straw Qty.[2] (tons)	Total Windrow Qty.[2] (tons)	Day Zero	Day Last	Process Duration (days)	Level Attained[3]	Date Backfilled/ Placed	Disposal Location
79	232.1	113	48.2	393.3	6/26/99	7/6/99	10	Residential	7/13/99	E. Bldg. 154
80	232.1	120	51.5	403.6	7/1/99	7/8/99	7	Residential	7/15/99	E. Bldg. 154
81	98.6	50	21.6	170.2	7/3/99	7/9/99	6	Residential	7/16/99	E. Bldg. 154
82	232.1	108	47.7	387.8	7/8/99	7/14/99	6	Residential	7/20/99	E. Bldg. 154
83	98.6	49	21.3	169.0	7/9/99	7/15/99	6	Residential	7/21/99	E. Bldg. 154
84	232.1	115	48.1	395.2	7/10/99	7/16/99	6	Residential	7/24/99	E. Bldg. 154
85	232.1	108	48.8	388.9	7/13/99	7/20/99	7	Residential	7/27/99	E. Bldg. 154
86	232.1	108	47.6	387.7	7/15/99	7/21/99	6	Residential	7/27/99	E. Bldg. 154
87	81.2	41	17.5	139.7	7/16/99	7/22/99	6	Residential	7/28/99	E. Bldg. 154
88	232.1	112	50.5	394.6	7/21/99	7/27/99	6	Residential	8/2/99	E. Bldg. 154
89	98.6	49	21.2	168.8	7/22/99	7/28/99	6	Residential	8/2/99	E. Bldg. 154
90	232.1	104	45.5	381.6	7/24/99	7/29/99	5	Residential	8/4/99	E. Bldg. 154
91	232.1	113	50.3	395.4	7/27/99	8/2/99	6	Residential	8/9/99	E. Bldg. 154
92	232.1	109	49.2	390.3	7/28/99	8/3/99	6	Industrial	8/9/99	Staging Area
93	81.2	40	17.6	138.9	7/29/99	8/4/99	6	Industrial	8/11/99	Staging Area
94	232.1	110	47.2	389.3	8/3/99	8/9/99	6	Residential	8/16/99	E. Bldg. 154
95	81.2	40	17.8	139.0	8/4/99	8/12/99	8	Residential	8/18/99	E. Bldg. 154
96	232.1	138	47.7	417.8	8/5/99	8/11/99	6	Residential	8/17/99	E. Bldg. 154
97	232.1	112	50.0	394.1	8/9/99	8/16/99	7	Residential	8/23/99	E. Bldg. 154
98	232.1	113	50.0	395.1	8/10/99	8/17/99	7	Industrial	8/25/99	Staging Area
99	98.6	49	21.9	169.6	8/11/99	8/20/99	9	Residential	8/27/99	E. Bldg. 154
100	232.1	103	43.0	378.1	8/16/99	8/23/99	7	Residential	8/29/99	E. Bldg. 154
101	232.1	107	46.4	385.5	8/18/99	8/27/99	9	Industrial	9/3/99	Staging Area
102	92.8	46	19.9	158.7	8/19/99	9/2/99	14	Industrial	9/8/99	Staging Area
TOTAL	**21,174**	**10,612**	**5,238**	**37,024**			**Avg. 9.2[4]**			

Notes:
1) Windrows 1-48 constructed and processed by MK; 49-50 constructed by MK and processed by TolTest; 51-102 constructed and processed by TolTest.
2) Quantities are taken from the Record of Recipe Worksheets included in Appendix G with pounds converted to tons, rounded to the nearest ton.
3) Level Attained is for most commonly detected explosive contaminants (HMX, RDX, TNT)
4) Average does not include 30% loading windrow or Contol windrow.

NA - Not Applicable

The only damage to the Biofacility during treatment of the MFA soils was to seven panels on the south side of the north building. The damage occurred when the panels were hit by the discharge chute of a tub grinder. The panels were subsequently replaced.

4.2 AMENDMENTS SUPPLY AND STORAGE

The compost mix used in full-scale operations included chicken manure and straw amendments that were added to the soil. Amendments were brought to the site and stored in the asphalt-paved amendment storage bins at the Biofacility. Table 4-3 summarizes the quantities of amendments received and used.

Each contract was awarded to supply amendments for approximately one year of compost operations. All trucks were weighed off-site, and 20% of the trucks were verified prior to offloading of amendments on the truck scale at the entrance of the Biofacility. All amendments were stored in the asphalt-paved amendment storage area. Straw from the local area was trucked to the Biofacility for immediate use or stockpiled for later use. Straw was delivered in bales bound with plastic mesh which was removed prior to mixing.

Chicken manure was obtained from Wabash Valley Produce in Dubois, IN. It was trucked to the Biofacility on an as-needed bases. The manure was from hens and contained approximately 1% feathers, eggs, or other natural impurities and was free of bedding material. All manure was delivered in bulk to the amendment storage area within one week prior to loading the windrows to ensure quality of freshness of the amendment and to avoid potential odor and leaching problems.

4.3 WINDROW CONSTRUCTION AND MAINTENANCE

The compost mix used in the Biofacility full-scale operations consisted of 25% soil, 15% chicken manure, and 60% straw by volume. Amendments were loaded on a volume basis using a center-pivot loader into a tractor-powered grinder/mixer unit as described in SOP 3.0 of Appendix D of the *FS-OP* [MK, 1998a]. The mixer then homogenized each load by mixing for 10 to 15 minutes. Water was added for dust control. The amendment blend was unloaded from the grinder/mixer unit through a side-mounted discharge conveyer forming a windrow approximately six feet high and 12 foot wide. The grinder/mixer then returned to the amendment storage area for reloading. This process continued until a windrow approximately 250 to 270 feet long was formed. A second windrow, adjacent to and partially overlapping the first windrow was then loaded into the building. This formed a single, larger windrow approximately 20 feet wide with two peaks 6 feet high. A full description of the windrow formation procedure is provided in SOP 4.0 of Appendix D of the *FS-OP* [MK, 1998a]. After the amendment blend was loaded in the building and shaped, stockpiled screened soil was delivered to the compost windrow in covered trailers or by loader bucket. The soil was loaded on a volume basis. A full description of the transport and loading of soil into the windrow is provided in SOP 5.0 of Appendix D of the *FS-OP* [MK, 1998a]. Records of recipes for the formation of each windrow formulated with explosive compound contaminated soil are provided in Appendix I of this IMR. The quantity of amendments used in each windrow is summarized in Table 4-2 and Table 4-3 shows the quarterly cumulative amount of amendments used.

After the soil was loaded into the windrows, the windrow/compost turning machine (SCARAB®) mixed and reformed the windrow to a pile approximately 20 feet wide and four feet tall. The SCARAB® generally made at least two or three passes during initial windrow construction to assure thorough mixing. Following formation, windrows were turned on a daily basis as described in SOP 6.0 of the *FS-OP* [MK, 1998a]. Water was added, as needed, to maintain optimum moisture levels (see Section 4.4.3).

Full-scale windrows generally extended the length of the Biofacility building and were 250 to 270 feet in length. Occasionally lengths and total volumes of soil and amendments were modified for operational reasons. In the case of Windrow 13, a smaller windrow was formed after Windrow 12 because

TABLE 4-3 AMENDMENT QUANTITIES RECEIVED AND USED NSWC CRANE BIOFACILITY						
Quantities[1]	**First Quarter[2] April - June 1998**	**Second Quarter[3] July - Sep. 1998**	**Third Quarter[4] Sep. - Dec 1998**	**Fourth Quarter[5] Jan. - Mar. 1999**	**TolTest Operation[6] April - Aug. 1999**	**Cumulative**
Chicken Manure Received	1,034 tons	1,602 tons	1,492 tons	1,199 tons	4,691 tons	10,018 tons
Chicken Manure Used	981 tons	1,598 tons	1,663 tons	1,301 tons	5,069 tons	10,612 tons
Straw Received	636 tons	2,340 tons	0 tons	445 tons	2,612 tons	6,033 tons
Straw Used	484 tons	890 tons	932 tons	667 tons	2,253 tons	5,226 tons

Notes:
1 - Quantities of amendments received are actual scale weights while quantities of amendments used are field estimates. This accounts for the apparent use of more chicken manure than was received.
2 - Includes windrows 1 through 8, the 30% loading windrow, and the control windrow.
3 - Includes windrows 9 through 23
4 - Includes windrows 24 through 37
5 - Includes windrows 38 through 48
6 - Includes windrows 49 through 102

mechanical problems with the tub grinder hindered the completion of a full windrow for M012. As a result, two separate smaller windrows (12 and 13) containing the same amendment ratio were formed in the location of one full-scale windrow. Shortened windrows approximately 125 feet in length were used during full scale operations to utilize the unused east-end of the "N" building, opposite the contaminated stockpile of screened soil at the west-end. FCR-013 (Appendix A) discusses the details of these shortened windrows. Windrow 57, 58, 63, 65, 69, 71, 75, 78, 81, 83, 87, 89, 93, 95, 99, and 102 were formed in N building using half-sized windrow recipes.

The full scale windrows were monitored in 15 locations, as described in Section 4.4, in order to assess oxygen, temperature, pH and explosive concentrations. The 15 locations included five cross-sections through the windrow with three depths at each cross-section. Half-sized windrows were monitored in six locations to assess oxygen, temperature, pH, and explosive concentrations. The six locations included two cross-sections through the windrow with three depths at each cross-section as described in FCR-013 (Appendix A).

During full scale operations of MFA material at the Biofacility, 102 windrows achieved Day Last status. In addition, several special windrows were formulated for other studies. A windrow containing a 30% mixture of contaminated soil was formed and the results of this windrow are discussed in the *30% Soil Loading Batch Report, Full-Scale Bioremediation, NSWC Crane* [MK, 1998f]. A pilot scale size windrow containing uncontaminated soil was created and treated for the purposes of a control windrow for toxicity testing. The results of this windrow are discussed in *Toxicity Report, Full-Scale Bioremediation, NSWC Crane* [MK, 1998e].

4.4 WINDROW TREATMENT FIELD PROCESS MONITORING

Process monitoring of each windrow included the daily monitoring of oxygen and temperature both prior to and after windrow turning with the SCARAB®. In addition, moisture levels and pH were monitored periodically with field instruments to demonstrate acceptable conditions for biological degradation. Field test kits were used to monitor the levels of explosive contaminants in the compost. Monitoring locations and frequencies for each of these parameters are described in Section 6.0 of the *FS-OP* [MK, 1998a]. Monitoring locations were modified as described in FCR-013 (Appendix A) for half-sized windrows. All field instrumentation was calibrated daily prior to use. A summary of the monitoring data is provided, by windrow, in Appendix I.

4.4.1 Temperature

Temperature was monitored during soil treatment, as it is the primary indicator of successful thermophilic composting. The process goal was to maintain average windrow temperatures near 55°C during treatment. Temperature decreasing over time to below 50°C is viewed as an indicator that a windrow is nearing the end of its operation [Weston, 1993].

During full-scale operations, windrow temperature was monitored twice daily, before and after windrow turning. Temperature readings were taken using a hand-held temperature probe at six monitoring locations at each of the cross sections (3, 5, 7, 9, and 11) as described in Section 4.0 of the *FS-QAPP* [MK, 1998b]. Temperatures readings for half-sized windrows occurred at six monitoring locations at two cross sections (3 and 5). These locations were selected to provide representative temperature profiles for the inner core and outer near-surface conditions. Ambient air temperature and humidity inside the buildings were monitored daily using an alcohol thermometer and a hygrometer.

4.4.2 Oxygen

Oxygen levels approaching ambient atmospheric conditions, or about 20%, are preferred in a compost windrow, and 5% is considered the minimum for rapid compost degradation. Oxygen levels below 1% indicate anaerobic conditions. If sufficient oxygen levels are not maintained, proper microbial degradation may not occur, thermophilic temperatures may not be maintained, and putrefaction of

organic matter may occur. During pilot scale operations, it was found that anaerobic conditions commonly exist in a compost windrow throughout most of each day depending on the density of the compost and the moisture content. As the compost degrades, the porosity is reduced which reduces the available oxygen. The windrows were turned daily to help increase the oxygen levels in the compost. Like temperature, oxygen levels were also monitored twice daily during full-scale operations both before and after windrow turning was performed. A hand-held probe was used to measure oxygen at the same locations used for the temperature measurements.

4.4.3 Moisture

As discussed in the *FS-OP* [MK, 1998a], the operating goal for composting moisture content was 40 to 60% maximum water holding capacity (WHC). Moisture level monitoring was performed three times per week, prior to windrow turning, to determine if moisture addition was required to maintain the operating goals. One composite sample per cross-section, composed of three discrete samples, was collected for moisture level determination. These samples were analyzed to determine the maximum water holding capacity (WHC). The WHC is the ratio of the mass of water retained in the sample compared to the mass of water retained in the sample at saturation.

Based on the results of the moisture monitoring, water was added during the windrow mixing stage, as necessary, to maintain moisture conditions in the operating goals. Moisture was added to the windrows by either a spray manifold on the windrow turning machine or manually, using a hose. At no time during operations was leachate observed from any of the windrows.

4.4.4 pH

Samples for pH monitoring were collected weekly prior to turning. Samples were composites of three locations at each of the five cross sections. After the formation of Windrow 50, sufficient data had been collected to ensure that the proper pH (5.5 to 9.0 s.u) of the soil and amendment mixture from MFA existed and no pH adjustments were needed. Weekly monitoring of the pH was discontinued at this point.

4.4.5 Explosives

Field screening was performed at least weekly to monitor the RDX and TNT levels of each windrow being processed. Each sample represented a composite of the three sampling locations from each cross-section.

4.5 EXPLOSIVE CONTAMINANT LABORATORY SAMPLES

Explosives were the only contaminants that exceeded the industrial cleanup goals in the ICS, therefore, explosive compounds were the only parameters that required laboratory analysis during windrow treatment. Samples were collected for laboratory analysis when the windrow was constructed (Day Zero) and following treatment (Day Last). Day Last samples were collected to confirm that the cleanup goals had been achieved when field screening for explosives indicated RDX and TNT readings were below detectable levels. MK performed field screening for both RDX and TNT. TolTest's field screening included only RDX since they felt it provided the best indication of contaminant degradation. However, both MK and TolTest used field screening analysis only as an indication to collect Day Last samples for analysis at an approved off-site laboratory.

For each windrow, samples were collected from three locations in each of five cross-section areas across the windrow for a total of 15 locations. Samples were collected in glass jars, placed in a cooler or refrigerator and shipped to an off-site laboratory for analysis of explosives for confirmation purposes. Either Southwest Laboratories of Oklahoma or Quanterra of West Sacramento performed analysis by Method 8330 according to SOP provided in Appendix C of the *FS-QAPP* [MK, 1998b]. Shipping and handling procedures are detailed in Section 4.3.4 of the *FS-QAPP*.

Analytical results of all explosives analyzed on Day Zero and Day Last are included, by windrow, in Appendix I. Average results for HMX, RDX and TNT are summarized on Table 4-4, by windrow. Cleanup levels for these compounds are shown on Table 4-5. Residential or industrial cleanup levels for explosive compounds were achieved for all windrows. Table 4-2 identifies which windrows met industrial cleanup goals and which met residential standards.

TABLE 4-4
AVERAGE RESULTS FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #1		Windrow #2		Windrow #3		Windrow #4	
	Day 0	Day 26	Day 0	Day 21	Day 0	Day 15	Day 0	Day 26
HMX	151.1	2.1	82.3	2.3	41.4	2.2	151.1	2.1
RDX	1177.2	1.0	626.6	1.4	315.4	1.1	1177.2	1.0
TNT	116.7	0.4	39.5	0.3	11.9	0.3	116.7	0.4

	Windrow #5		Windrow #6		Windrow #7		Windrow #8	
	Day 0	Day 15	Day 0	Day 14	Day 0	Day 13	Day 0	Day 8
HMX	249.1	2.2	13.5	2.2	18.5	2.2	20.9	2.2
RDX	102.5	1.1	96.5	1.0	134.2	1.0	129.1	1.1
TNT	25.5	0.3	6.6	0.3	2.6	0.3	7.3	0.3

	Windrow #9		Windrow #10		Windrow #11		Windrow #12	
	Day 0	Day 8	Day 0	Day 10	Day 0	Day 9	Day 0	Day 7
HMX	4.6	2.2	14.3	2.2	14.9	2.1	30.5	4.9
RDX	24.3	1.8	86.6	1.0	85.6	1.0	83.7	1.6
TNT	0.7	0.5	0.8	0.3	12.9	0.3	0.4	0.4

	Windrow #13		Windrow #14		Windrow #15		Windrow #16	
	Day 0	Day 7	Day 0	Day 8	Day 0	Day 7	Day 0	Day 6
HMX	32.1	2.8	19.2	2.2	28.6	1.9	22.7	2.0
RDX	124.6	1.4	76.7	1.0	103.0	1.1	128.2	1.2
TNT	0.4	1.3	0.3	0.3	0.3	0.3	5.6	0.2

	Windrow #17		Windrow #18		Windrow #19		Windrow #20	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7	Day 0	Day 7
HMX	8.1	1.9	9.4	2.3	18.9	2.4	16.1	3.3
RDX	19.8	1.1	29.4	1.1	110.1	1.7	71.7	1.6
TNT	0.3	0.3	0.3	0.3	0.4	0.2	0.3	0.3

	Windrow #21		Windrow #22		Windrow #23		Windrow #24	
	Day 0	Day 7	Day 0	Day 21	Day 0	Day 23	Day 0	Day 10
HMX	26.7	2.6	31.3	2.1	59.2	4.5	36.5	2.6
RDX	143.1	2.5	181.8	2.3	511.0	3.3	237.7	2.0
TNT	1.4	0.5	2.5	0.3	6.7	0.3	4.0	0.4

	Windrow #25		Windrow #26		Windrow #27		Windrow #28	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7	Day 0	Day 21
HMX	17.8	2.5	15.4	2.4	15.3	1.9	24.1	2.8
RDX	117.0	3.0	73.5	2.3	46.0	1.7	195.4	5.9
TNT	2.0	0.2	0.5	1.0	27.9	0.4	24.5	1.5

	Windrow #29		Windrow #30		Windrow #31		Windrow #32	
	Day 0	Day 7	Day 0	Day 20	Day 0	Day 10	Day 0	Day 7
HMX	18.6	2.7	23.8	2.1	12.9	2.2	13.0	1.7
RDX	59.9	2.0	189.4	4.9	64.7	3.7	92.9	3.0
TNT	0.9	1.5	14.7	0.3	12.2	0.3	34.1	0.2

	Windrow #33		Windrow #34		Windrow #35		Windrow #36	
	Day 0	Day 6	Day 0	Day 7	Day 0	Day 9	Day 0	Day 13
HMX	10.5	2.0	18.1	3.1	19.2	3.7	26.0	2.8
RDX	57.7	2.8	106.8	3.2	167.0	6.2	231.8	4.2
TNT	13.9	0.7	49.8	1.5	12.4	0.5	29.0	0.3

TABLE 4-4
AVERAGE RESULTS[1] FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #37		Windrow #38		Windrow #39		Windrow #40	
	Day 0	Day 12	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7
HMX	13.5	2.8	10.1	3.9	16.4	5.2	29.0	5.8
RDX	89.0	6.8	69.0	7.2	120.4	13.1	208.6	5.2
TNT	16.6	0.5	53.4	11.0	18.5	1.2	6.8	1.1

	Windrow #41		Windrow #42		Windrow #43		Windrow #44	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 6	Day 0	Day 7
HMX	33.9	5.5	42.4	7.1	32.1	2.9	27.8	4.7
RDX	238.3	8.9	299.0	13.9	247.9	8.3	182.5	7.2
TNT	5.4	0.3	4.4	0.4	5.5	0.3	9.7	0.3

	Windrow #45		Windrow #46		Windrow #47		Windrow #48	
	Day 0	Day 18	Day 0	Day 16	Day 0	Day 13	Day 0	Day 6
HMX	18.8	3.4	11.6	2.8	8.3	2.1	14.1	2.4
RDX	121.3	4.4	59.8	2.9	49.6	1.5	88.2	2.1
TNT	17.0	0.3	4.0	0.3	2.7	0.3	6.3	0.3

	Windrow #49		Windrow #50		Windrow #51		Windrow #52	
	Day 0	Day 10	Day 0	Day 9	Day 0	Day 14	Day 0	Day 11
HMX	9.5	2.0	15.7	2.6	19.3	2.1	20.4	2.9
RDX	50.9	1.4	97.7	2.8	131.3	1.2	124.0	2.0
TNT	3.7	0.3	6.5	0.3	7.7	0.2	1.4	0.3

	Windrow #53		Windrow #54		Windrow #55		Windrow #56	
	Day 0	Day 11	Day 0	Day 12	Day 0	Day 9	Day 0	Day 7
HMX	8.0	3.0	22.4	2.1	12.1	2.1	6.6	1.9
RDX	57.0	6.7	140.8	1.1	74.5	1.4	44.5	2.2
TNT	21.0	5.8	6.6	0.2	8.8	0.3	5.7	0.2

	Windrow #57		Windrow #58		Windrow #59		Windrow #60	
	Day 0	Day 9	Day 0	Day 9	Day 0	Day 8	Day 0	Day 8
HMX	13.1	2.2	9.7	2.1	5.0	2.0	4.1	2.0
RDX	54.1	2.1	57.5	1.0	50.4	2.8	45.3	4.9
TNT	14.9	4.6	9.4	0.3	21.1	0.4	31.1	0.4

	Windrow #61		Windrow #62		Windrow #63		Windrow #64	
	Day 0	Day 8	Day 0	Day 6	Day 0	Day 8	Day 0	Day 8
HMX	6.0	2.1	5	2.2	2.7	2.2	4.1	2.6
RDX	54.6	3.6	40.0	6.3	21.9	3.5	38.6	12.4
TNT	17.9	4.5	15.4	0.7	62.3	0.4	14.0	1.8

	Windrow #65		Windrow #66		Windrow #67		Windrow #68	
	Day 0	Day 8	Day 0	Day 11	Day 0	Day 7	Day 0	Day 10
HMX	4.2	2.0	3.5	2.1	3.8	2.1	4.9	2.2
RDX	31.8	5.3	26.7	1.9	29.9	4.2	44.2	3.0
TNT	8.3	1.3	10.6	0.3	7.3	0.8	5.9	3.6

	Windrow #69		Windrow #70		Windrow #71		Windrow #72	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 9	Day 0	Day 8
HMX	3.7	2.2	4.1	2.1	17.2	2.2	8.4	2.1
RDX	22.3	6.8	28.5	3.0	94.0	1.0	30.2	1.7
TNT	1.8	2.2	6.0	0.4	45.7	22.7	14.3	0.2

TABLE 4-4
AVERAGE RESULTS[1] FROM EXPLOSIVE CONTAMINANT MONITORING
BIOREMEDIATED SOIL FROM MFA - NSWC CRANE

	Windrow #73		Windrow #74		Windrow #75		Windrow #76	
	Day 0	Day 6	Day 0	Day 8	Day 0	Day 6	Day 0	Day 7
HMX	6.7	2.0	3.5	1.9	2.3	2.0	8.3	1.8
RDX	58.0	2.4	12.8	1.5	17.3	3.5	41.5	4.3
TNT	16.9	5.9	2.2	0.4	2.4	0.2	14.3	0.3

	Windrow #77		Windrow #78		Windrow #79		Windrow #80	
	Day 0	Day 8	Day 0	Day 6	Day 0	Day 10	Day 0	Day 7
HMX	6.7	3.7	4.9	3.9	3.5	2.5	5.6	2.2
RDX	38.0	7.9	29.9	8.0	18.0	4.0	29.4	3.3
TNT	17.1	0.4	6.1	0.5	5.3	0.2	1.7	0.5

	Windrow #81		Windrow #82		Windrow #83		Windrow #84	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	3.8	2.1	12.7	2.6	7.5	1.7	6.2	2.5
RDX	17.8	1.8	37.3	1.8	34.7	2.4	2.7	1.8
TNT	5.3	0.2	2.2	0.2	1.9	0.5	1.3	0.2

	Windrow #85		Windrow #86		Windrow #87		Windrow #88	
	Day 0	Day 7	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	2.4	2.3	5.5	1.9	5.0	2.3	4.4	2.6
RDX	10.1	2.3	19.2	1.4	21.1	2.1	21.0	2.3
TNT	0.2	0.4	0.5	0.2	2.2	0.2	0.3	0.2

	Windrow #89		Windrow #90		Windrow #91		Windrow #92	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6	Day 0	Day 6
HMX	17.7	2.2	5.5	2.4	4.4	2.4	6.8	2.4
RDX	77.8	1.7	28.0	3.5	21.6	1.1	16.8	4.4
TNT	2.0	0.7	0.8	0.2	4.2	0.3	1.3	0.3

	Windrow #93		Windrow #94		Windrow #95		Windrow #96	
	Day 0	Day 6	Day 0	Day 6	Day 0	Day 8	Day 0	Day 6
HMX	3.9	3.3	7.9	2.8	2.5	2.1	5.8	2.8
RDX	15.8	5.5	32.4	1.9	2.7	1.3	24.9	1.3
TNT	0.4	0.5	0.4	0.2	0.2	0.2	0.4	0.2

	Windrow #97		Windrow #98		Windrow #99		Windrow #100	
	Day 0	Day 7	Day 0	Day 7	Day 0	Day 9	Day 0	Day 7
HMX	8.0	0.9	7.2	2.2	9.0	1.1	9.2	1.6
RDX	32.2	2.8	30.1	5.3	26.8	0.5	27.0	1.9
TNT	2.8	1.9	33.6	0.2	1.4	0.3	11.0	0.2

	Windrow #101		Windrow #102	
	Day 0	Day 9	Day 0	Day 14
HMX	8.9	2.4	26.6	2.9
RDX	48.8	6.5	258.1	16.3
TNT	2.6	1.1	19.7	0.9

Note:
1 - Results provided are in mg/kg (ppm)

TABLE 4-5 CLEANUP GOALS FOR SELECT EXPLOSIVE COMPOUNDS NSWC CRANE MFA		
Compound	**Residential Cleanup Goal (mg/kg)**	**Industrial Cleanup Goal (mg/kg)**
HMX	3,300	34,000
RDX	4	17
TNT	15	64

5.0
DISPOSITION OF TREATED COMPOST SOIL AND DECONTAMINATED ROCKS

5.1 TREATED COMPOST SOIL

Once laboratory analytical data verified that treatment goals were met for a windrow of treated compost soil, a loader transferred the treated material directly from the Biofacility building to semi-tractor live-bottom trailers. The trailers were free of contaminated soil prior to loading the treated material. Following loading, each truck was, covered with a tarp, decontaminated, and then weighed to determine the weight of compost exiting the Biofacility. The weighing requirement was subsequently eliminated (see FCR -FS-021 Rev.1 in Appendix A). The treated soil was transported back to MFA. Initially a temporary staging area was established, between Buildings 158 and 153, to receive and hold treated compost material (FCR-FS-008, Rev. 0 in Appendix A) prior to backfilling. Once backfilling operations began in June 1998, treated soil was transported back to MFA and backfilled into one of the excavations or staged in the temporary staging area for later use. In addition to backfilling and staging for later use, some compost material was field applied to promote vegetative growth. Due to the bulkier nature of the treated compost relative to the excavated soil, two permanent storage areas were also created to store compost. One permanent storage area is located north of Building 154 and a second is located east of Building 154. Table 4-2 identifies the location(s) where each windrow of material was transported following treatment. Backfilled material was placed in 12-inch lifts and compacted. Drawings showing the grid locations where windrows were backfilled are included in Appendix J. Final survey drawings of the work areas after completion of backfilling are included in Appendix F.

After backfilling, very little erosion occurred because a crust formed on the surface of the compost. If seeding did not take place shortly after placement of the windrow, a top dressing was spread prior to seeding. Compost was added to the front berm at Building 154 and to the area near Building 158 prior to seeding in the spring. Treated compost material had been placed in those areas earlier in the year and weather prevented seeding at that time. Hydroseeding at the first permanent storage areas, north of Building 154 and around Building 157, was unsuccessful. Both of these areas, in addition to a third area near Building 152, were subsequently seeded and watered. Grass is now growing at all of these locations. The second permanent storage area just east of Building 154 near the screener site is the only site which has not been seeded. Re-seeding of this area is pending further excavation and screening of material at MFA based on the completion of supplemental toxicity testing.

5.2 DECONTAMINATED ROCKS

Following decontamination, rocks that were screened out of the excavated soil were returned to the bottom of an open excavation within the same SWMU where they were excavated. Rocks were covered with no less than two feet of finished compost. Backfill drawings in Appendix J show where the rocks were placed.

6.0
QUALITY CONTROL

6.1 QUALITY CONTROL FIELD INSPECTIONS

QC inspections included excavation site operations, composting operations, sampling activities, field test kit analyses, and facility maintenance. QC checks were performed at required intervals using the field inspection checklists provided in Appendix F of the *FS-OP* [MK, 1998a]. Copies of all inspection records are maintained at the Biofacility office.

Occasional minor deficiencies were noted during inspections and subsequently corrected. Typical findings included items such as retention pond levels with less than two feet of freeboard remaining immediately after a major rain event. Two other deficiencies noted that were corrected by TolTest included hairline cracks in the process building floor and a water line leak below the asphalt in the process area.

6.2 DATA QUALITY CONTROL

Various data QC methods were utilized to verify the usability of samples collected and submitted for laboratory analysis (ICS, PES, and windrow contaminant monitoring samples (Day Zero and Day Last)). Samples were analyzed by Southwest Laboratory of Oklahoma, Inc. and Quanterra, Inc. of California. All data submitted for laboratory analysis were verified by reviewing chain-of-custody records, sample extraction records, analytical holding times, requested turnaround times, sample data in comparison to QC data and reporting requirements. Additionally, more than 10% of the data were validated. The data were compared with field and laboratory QC sample data to assess its usability. Sections 6.2.1 and 6.2.2 below summarize the field and laboratory QC methods employed, respectively. Sections 6.2.3 through 6.2.5 summarize the findings of the field and laboratory QC for the various types of project laboratory data.

6.2.1 Field Quality Control

Field QC included field duplicates, trip blanks, field blanks and equipment rinseates. Analytical results for these samples were evaluated to identify potential sources of error introduced during sampling, transportation and storage. Results for QC samples associated with the ICS are summarized in Table E-2 in Appendix E and QC samples associated with the PES are summarized on Table H-2 in Appendix H.

Field duplicates were collected at a frequency greater than the one in twenty samples specified in Section 3.1.2 in the *FS-QAPP* [MK, 1998b]. Field duplicates are samples collected at the same time and in the same location as the corresponding field sample, in order to qualitatively assess field precision. There are no quantitative precision criteria specified in the *FS-QAPP*.

Trip blanks were submitted with coolers containing samples to be analyzed for volatile organic compounds in order to evaluate the potential for cross-contamination during shipment to the laboratory. The trip blanks were received from the laboratory in a sealed container containing organic-free water, held intact at the site, and shipped back to the laboratory with the samples.

Field blank sample results were evaluated to identify any sources of contamination in the de-ionized rinse water and/or general atmospheric conditions in the field. Field blanks for water analysis were collected by pouring de-ionized water (from the same source used for sampling equipment decontamination) into appropriate sample containers and adding sample preservative, as required.

Equipment rinse blanks were collected by rinsing decontaminated sampling equipment with de-ionized water, collecting the rinse water in appropriate sample containers, adding any sample preservative required by the analytical method, and then submitting the rinse water for analysis. Results are used to

evaluate the effectiveness of decontamination procedures in preventing sample cross-contamination.

6.2.2 Laboratory Quality Control

The laboratory performed method blank, replicate, surrogate, laboratory control sample (LCS), laboratory control sample duplicate (LCSD), sample matrix spike (MS), and sample matrix spike duplicate (MSD) analyses to evaluate laboratory accuracy and precision according to the established EPA procedures.

Laboratory method blanks were prepared and analyzed with the samples in order to evaluate potential target compounds or interferences from laboratory glassware, reagents and/or solvents used in the preparation and analysis of samples.

Laboratory replicate samples are a second sample aliquot which the laboratory prepares and analyzes concurrently with the sample to evaluate analysis precision.

Surrogate spikes are known amounts of non-target organic compounds, which are spiked into all samples prior to sample preparation, in order to evaluate the efficiency of the organic sample preparation and analysis.

LCS and LCSD are samples prepared in the laboratory, consisting of clean soil or water spiked with known amounts of target analytes which are processed through the same preparation as field samples. Evaluation of the spike recoveries, and the variability between the LCS and LCSD, gives an indication of analysis accuracy and precision in a clean matrix.

MS and MSD are field samples that have been spiked with a known amount of target analytes and processed through the preparation and analysis with the field samples. Evaluation of the spike recoveries, and the variability between the MS and MSD, gives an indication of analysis accuracy and precision in the sample matrix. MS/MSD accuracy and precision can be affected by concentrations of both target and non-target compounds present in the original field sample, as well as the matrix of the sample itself.

6.2.3 Initial Characterization Samples (ICS)

All ICS were collected by MK. A total of 617 soil samples were collected from the grid sections to identify areas requiring excavation. Figures C-1 through C-6 in Appendix C show the locations of the grid sections. Various rinse, field, and trip blanks were collected along with these samples for QC purposes. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Most samples were received at a recorded temperature of 4°C +/- 2°C. A total of 231 samples were received at temperatures between -3°C and 1°C. Because no samples were frozen, these temperatures below 2°C did not impact the samples. Additionally, 36 samples were received at temperatures between 6.2°C and 10°C. Most of these samples were analyzed exclusively for explosives and metals, and the high temperatures did not impact the results for these analyses. The remaining samples were analyzed exclusively for VOCs and showed few detected analytes, and those detected were at levels at least three orders of magnitude below the cleanup objectives. The impact of these temperatures above the acceptable range is minor when comparing the reporting limits relative to the IM Industrial Cleanup Goal concentrations.

Field QC

Field QC samples collected with the ICS included duplicates, trip blanks, field blanks and equipment rinse blanks.

Volatile analysis showed no difference between field duplicate pairs. Total and TCLP metal analysis showed metals to have precision varying from 0 - 200% relative percent difference (RPD), but in all

cases, duplicate pairs showed analytes to either be both above or both below cleanup criteria. Explosive analysis showed analytes to have precision varying from 0 - 200% RPD. With two exceptions, duplicate pairs showed analytes to either both be above or both be below cleanup criteria. MFAICS519 had RDX present below the cleanup objective, at 9,120 µg/kg, while its field duplicate, MFAICS520, had RDX present above the cleanup objective, at 67,900 µg/kg. Similarly, MFAICS570 had RDX present below the cleanup objective, at 6,800 µg/kg, while its field duplicate, MFAICS574FD, had RDX present above the cleanup objective, at 18,900 µg/kg.

Trip blanks were submitted with most coolers containing samples to be analyzed for VOCs, in order to evaluate the potential for cross-contamination during shipping to the laboratory. The trip blanks were received from the laboratory in a sealed container containing organic-free water, held intact at the site, and shipped back to the laboratory with the samples. One cooler of samples was received on June 18, 1998 with a trip blank listed on the chain-of-custody, but the lab noted upon receipt that there was no trip blank present in the cooler. However, samples from this cooler all showed volatile results well below cleanup levels, so that if any cross-contamination did occur, it has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values. Methylene chloride, a common laboratory contaminant, was detected in several trip blanks at values that ranged from 5 µg/L to 28 µg/L. In each of these instances the laboratory blank had also shown the presence of methylene chloride, and all corresponding sample concentrations were flagged with "B". Sample concentrations ranged from estimated values of 2 µg/kg, below the reporting limit, to 21 µg/kg, all of which were significantly less than the cleanup objective of 18,000 µg/kg for methylene chloride. Acetone, another common laboratory contaminant, was detected in various trip blanks at values that ranged from 12 µg/L to 76 µg/L. Sample concentrations ranged from non-detect to 410 µg/kg, and are significantly less than the cleanup objective of 8,800,000 µg/kg for acetone. Other volatile compounds were not detected above the reporting limit in any of the trip blanks associated with these sampling events. Based upon these results it is concluded that no volatile organic cross-contamination has occurred during shipping or storage for the majority of the volatile compounds analyzed. The possible methylene chloride and/or acetone contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

Analysis of field blanks revealed low concentrations of various metals, acetone, chloroform, xylenes, and/or methylene chloride present throughout the sampling event. Other field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the field blanks have not significantly impacted the sample results. Based upon these results, it is concluded that water used for decontamination and general atmospheric conditions did not impact the analytical results.

There were low concentrations of various metals, acetone, chloroform, methylene chloride, RDX, and/or TNT detected in many of the equipment rinse blanks. With one exception, the other field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the field blanks have not significantly impacted the sample results. RDX was present at 29.3 µg/l in the rinse blank collected on 11/24/97. RDX values in corresponding field samples range from non-detect to 1,760,000 µg/kg, and most of the field samples have concentrations which greatly exceeded the cleanup objective of 17,000 µg/kg. Based upon these results, it is concluded that the possible RDX contamination has not affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

Laboratory QC

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the ICS.

Laboratory method blanks showed the presence of acetone, chloroform, methylene chloride, MIBK, xylenes, aluminum, cadmium, TCLP barium, TCLP cadmium, TCLP chromium, and/or TCLP mercury in various batches. For all of these analytes, field sample levels were significantly less than the cleanup

objectives or for the applicable TCLP regulatory limit. All positive sample results for organic analytes which correspond to method blank detections have been flagged with a "B" flagcode to indicate possible elevated background levels. Based upon these results, it is concluded that method blank contamination has not adversely affected the interpretation of the data based upon field sample concentrations relative to the IM Industrial Cleanup Goal objectives and TCLP regulatory limits.

In 14% of batches where replicate samples were analyzed, the precision results were outside of laboratory criteria. Twenty-eight batches of metals had precision results for one or more metals outside of laboratory criteria. The corresponding field sample results have been qualified with a "*" flag-code, to indicate that duplicate analysis was not within control limits and that more variability may be expected in the reproduction of these values. In these instances, the total metal results were below the Region III Risk-based levels and TCLP metals were below the regulatory levels. The concentration of these contaminants would likely remain below these objectives if re-sampling was performed consistent with the sampling protocol of this project.

Surrogate recoveries were generally acceptable for organic analyses. A total of 23 of the 621 samples collected showed surrogate recoveries outside of acceptable criteria. In 15 of these 23 samples, subsequent dilutions were required to bring the result within the linear range of the instrument, which caused the surrogate recoveries to be diluted outside of criteria. In the remaining eight samples, matrix interference is suspected to have caused poor surrogate recoveries for volatiles. Matrix interference was confirmed for many of these samples by a corresponding matrix spike with similar recoveries, or by re-analyzing with similar results. Most of these volatile samples do not show target analytes above reporting limits. The few analytes detected were between three and five orders of magnitude below cleanup objectives. For these reasons, surrogate results that are outside of laboratory limits have not adversely affected the interpretation of the data.

More than 98% of spiked target analytes showed laboratory control spike precision and accuracy results to be acceptable. Approximately 84% of the LCS/LCSD recoveries that were outside of acceptable QC limits had high recoveries. However, the field samples analyzed with these LCS/LCSD samples showed corresponding analytes to be undetectable or at levels considerably below cleanup objectives and/or TCLP regulatory limits. The remaining target analytes that showed low recoveries corresponded to field sample results which were significantly less than the cleanup objectives and/or TCLP regulatory limits. The bias seen in the low recoveries would not impact the data enough to consider that these values may actually be greater than the IM Industrial Cleanup Goal values if acceptable recovery was obtained. For these reasons, the relatively small percentage of LCS/LCSD results that are outside of laboratory limits have not adversely affected the interpretation of the data.

Recoveries for 90% of MS/MSD analyses were acceptable for the target analytes. Metal results have been appropriately qualified with an "N" flag-code, whenever the corresponding spike sample recovery was not within control limits. Approximately ⅓ of the poor MS/MSD recoveries were due to the high concentration of target analytes relative to spiking concentrations. Each analytical data set has been evaluated to determine the impact of the MS recovery on the useablity of the data. For the vast majority of samples, the results were either already above the cleanup objective levels or they were significantly less than the cleanup objective levels or TCLP regulatory limits, and the bias seen in the varying recoveries would not impact the data enough to consider that these values may either increase above, or decrease below, the cleanup levels if acceptable recoveries were obtained. Results for two samples, MPSICS26 and MFAICS551, may have been impacted by high recoveries in MS/MSD samples; however, in both instances the reported results are above cleanup levels, and are likely conservative. These two samples also showed the presence of another target analyte, RDX, at levels above cleanup objectives. TNT recovered at 149% in one batch, and field sample MPSICS26, which had TNT present at 76,000 µg/kg, may actually have had an amount lower than the cleanup level of 64,000 µg/kg if acceptable TNT recovery could be obtained. Three sample results may have been impacted by a low RDX recovery of 16% in the corresponding MS sample, which was likely caused by matrix interference. This interference may bias the results from these three samples. RDX results for MFAICS503 (4,850 µg/kg), MFAICS509 (15,000 µg/kg), and MFAICS515 (8,990 µg/kg) are below the IM Industrial Cleanup

Goal values but could potentially be greater than the cleanup objectives if acceptable RDX recovery could be obtained. Of the more than 17,000 sample results obtained for Mine Fill A, these three sample results for RDX were the only samples where poor matrix spike recoveries could have changed the interpretation of the data based on the IM Industrial Cleanup Goals and/or TCLP regulatory limits.

Conclusion

The QC data demonstrate acceptable accuracy and precision when compared to the intended use of the data. The data meets the project objectives and are, therefore, considered usable for characterization analysis.

6.2.4 Post-Excavation Samples (PES)

PES were collected by both MK and TolTest following excavation and collection of in-process excavation samples to determine the levels of constituents of concern remaining in the soil at each grid section.

6.2.4.1 PES - MK Data QC Summary

A total of 209 PES samples were collected by MK. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Approximately 80% of samples were received at a recorded temperature of 4°C +/- 2°C. A total of 41 samples were received at temperatures between 6.2°C and 6.8°C. Approximately 50% of these samples were analyzed exclusively for explosives and metals, and the high temperatures did not impact results for these analyses. The remaining samples were analyzed exclusively for VOCs and showed few detected analytes. Those that were detected were present at levels at least four orders of magnitude below the cleanup objectives. The impact of these temperatures above the acceptable range is minor when comparing the reporting limits relative to the IM Industrial Cleanup Goal concentrations.

Field QC

Field QC samples collected with the MK PES included duplicates, trip blanks, field blanks and equipment rinse blanks.

Explosive and metal analysis of duplicate samples showed analytes to have precision varying from 0 - 200% RPD, but in all cases, duplicate pairs showed analytes to either be both above or both below cleanup criteria.

Analysis of trip blanks revealed acetone, a common laboratory contaminant, in various trip blanks at values that ranged from 10 µg/L to 72 µg/L. Sample concentrations ranged from non-detect to 200 µg/kg and are significantly less than the cleanup objective of 8,800,000 µg/kg for acetone. Other VOCs were not detected above the reporting limit in any of the trip blanks associated with these sampling events. Based upon these results, it is felt that no volatile organic cross-contamination has occurred during shipping or storage for the majority of the volatile compounds analyzed. The possible acetone contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the IM Industrial Cleanup Goal values.

No target analytes were detected in the field blanks collected during this sampling event. Based upon this result, it is felt that water used for decontamination and general atmospheric conditions did not impact the analytical results.

Equipment rinse blank analysis showed low concentrations of aluminum, barium, chromium, and/or mercury detected in the equipment rinse blanks. Field samples collected on corresponding days did not show concentrations of these compounds above the cleanup levels, therefore, low concentrations found in the equipment rinse blanks have not significantly impacted the sample results.

Laboratory QC

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the PES collected by MK.

Laboratory method blanks showed the presence of acetone, methylene chloride, or mercury in several batches. For all of these analytes, field sample levels were either non-detect or significantly less than the cleanup objectives. All positive sample results for organic analytes which correspond to method blank detections have been flagged with a "B" flagcode to indicate possible elevated background levels. Based upon these results, it is felt that method blank contamination has not adversely affected the interpretation of the data based upon field sample concentrations relative to the IM Industrial Cleanup Goal objectives.

In 14% of batches where replicate samples were analyzed, the precision results were outside of laboratory criteria. Ten batches of metals had precision results for one or more metals outside of laboratory criteria. The corresponding field sample results have been qualified with a "*" flag-code, to indicate that duplicate analysis was not within control limits and that more variability may be expected in the reproduction of these values. In these instances, the total metal results were below the Region V Risk-based levels and TCLP metals were below the regulatory levels. The concentration of these contaminants would likely remain below these objectives if re-sampling was performed consistent with the sampling protocol of this project.

Surrogate recoveries were generally acceptable for organic analyses. Ten of the 209 samples collected showed surrogate recoveries outside of acceptable criteria. In four of these ten samples, subsequent dilutions were required to bring the result within the linear range of the instrument, which caused the surrogate recoveries to be diluted outside of criteria. In the remaining six samples, matrix interference is suspected to have caused poor surrogate recoveries for volatiles. Matrix interference was confirmed for one of these samples by a corresponding matrix spike with similar recoveries. Most of these volatile samples do not show target analytes to be present above reporting limits. The few analytes detected were approximately five orders of magnitude below cleanup objectives. For these reasons, surrogate results that are outside of laboratory limits have not adversely affected the interpretation of the data.

More than 98% of spiked target analytes showed laboratory control spike precision and accuracy results to be acceptable. Approximately 50% of the LCS recoveries that were outside of acceptable QC limits showed high recoveries. However, the field samples analyzed with these LCS/LCSD samples showed corresponding analytes to be undetectable or at levels considerably below cleanup objectives and/or TCLP regulatory limits. The remaining target analytes that showed low recoveries, corresponded to field sample results that were significantly less than the cleanup objectives and/or TCLP regulatory limits. The bias seen in the low recoveries would not impact the data enough to consider that these values may actually be greater than the IM Industrial Cleanup Goal values if acceptable recovery was obtained. For these reasons, the relatively small percentage of LCS/LCSD results that are outside of laboratory limits have not adversely affected the interpretation of the data.

Recoveries for 93% of MS/MSD analyses were acceptable for the target analytes. Metal results have been appropriately qualified with an "N" flag-code, whenever the corresponding spike sample recovery was not within control limits. Approximately 50% of the poor MS/MSD recoveries were due to the high concentration of target analytes relative to spiking concentrations. Each analytical data set has been evaluated to determine the impact of the MS recovery on the useablity of the data. For the vast majority of samples, the results were either already above the cleanup objective levels or they were significantly less than the cleanup objective levels or TCLP regulatory limits, and the bias seen in the varying recoveries would not impact the data enough to consider that these values may either increase above, or decrease below, the cleanup levels if acceptable recoveries were obtained. Interpretation of the post-excavation sample data based on the IM Industrial Cleanup Goals and/or TCLP regulatory limits would not have changed due to the few poor matrix spike recoveries.

Conclusion

The QC data demonstrate acceptable accuracy and precision when compared to the intended use of the data. The data meets the project objectives and are, therefore, considered useable for post-excavation analysis.

6.2.4.2 PES - TolTest Data QC Summary

A total of 105 PES were collected by TolTest for laboratory analysis. The laboratory received 103 out of 105 samples collected for analysis. Sample MFAPES 238 for volatiles and the trip blank associated with MFAPES 265-268 did not make delivery to the laboratory and, therefore, results for these samples are not available. All samples were received by the laboratory in acceptable condition, with custody seals, correctly preserved, and with containers intact. Seventy-seven percent of the samples were received at temperatures of 4°C ± 2°C and 23% were received at 1°C to 2°C. Since none of these samples were frozen, the results were not affected by the 1°C below the desired temperature range.

Field QC

Field QC samples collected with the TolTest PES included duplicates, trip blanks, and equipment rinse blanks.

In analysis of duplicates, precision for volatile, metal, and explosive analyses varied from 0-200%. In all cases, duplicate pairs showed analytes to either be both above or both below cleanup standards.

Trip blanks were submitted with most coolers containing samples to be analyzed for VOCs in order to evaluate the potential for cross-contamination during shipment to the laboratory. Exceptions to this occurred with the trip blank associated with samples MFAPES 265-268 and with the trip blank associated with samples MFAPES 262-263. In the first case, the trip blank never made delivery to the laboratory. The trip blank was listed on the chain of custody, but the laboratory reported that it was not in the cooler. In the latter case, a trip blank was not taken by field personnel. In each of these cases, the corresponding sample analyses showed no evidence of the target compounds, thus indicating no cross-contamination. Acetone, a common laboratory contaminant, was detected in some of the trip blanks at concentrations ranging from non-detect to 26 µg/L. Sample concentrations of acetone ranged from non-detect to 40 µg/kg. These levels are significantly less than the cleanup targets for acetone at 8,800,000 µg/kg. Thus, the contamination has not adversely affected the interpretation of the data based upon sample concentrations relative to the industrial treatment standards. It also should be noted that acetone was detected in some of the method blanks analyzed by the laboratory indicating that the source of the contamination may lie within the laboratory. The laboratory is investigating possible contamination sources. Method blank values for acetone were well below treatment levels. Other volatile compounds for these trip blanks were not detected above the reporting limit. There were several occasions where the laboratory reported headspace (or bubbles) in the trip blank sample upon sample receipt. Since the trip blanks are prepared by the laboratory and shipped to field personnel, the laboratory was notified as to proper sampling protocol.

Only one rinsate blank was collected for these samples. All target compounds were found to be non-detect in this sample.

Laboratory QC

Method blanks, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the PES collected by TolTest.

Laboratory method blanks showed the presence of acetone, methylene chloride, aluminum, barium, arsenic, and 3-NT. For all of these analytes, the corresponding samples had levels significantly less than the targeted cleanup levels. Based on these findings, it is felt that the method blank contamination

did not adversely affect the interpretation of the data based upon field sample concentrations relative to the industrial cleanup goals.

Surrogate recoveries were acceptable for all explosive analyses with the exception of the MSD to samples MFAPES 253-261. For the explosive analyses of MFAPES 237-252, surrogate recoveries for several of the samples and their corresponding LCS/LCSD were 0%. Re-extraction and re-analysis were performed for these samples and the surrogate recoveries were found to be acceptable. It was, therefore, concluded that the surrogate had been erroneously omitted during preparation of the first set. Surrogate recoveries for VOCs were generally acceptable. The levels of target analytes were orders of magnitudes lower than the cleanup levels, therefore, any results outside laboratory QC limits did not adversely affect the interpretation of data.

Of the 15 sets of LCS/LCSD data for explosives with solid matrix samples, tetryl was outside the laboratory QC limits twice (MFAPES 282-287), 2-NT was out once (MFAPES 270-281), and 2,6-DNT was out once (MFAPES 237-252). However, the corresponding samples did not show evidence of these analytes. One water matrix explosive data LCS/LCSD set (MFAPES 270-281) showed tetryl outside the laboratory QC limits. The corresponding sample did not show evidence of the tetryl analyte. Acetone was outside the laboratory QC recovery limits for MFAPES 282-287. The corresponding samples did not show any acetone present. The bias in the recoveries of any of these analytes for the LCS/LCSD results outside laboratory QC limits would not significantly affect the interpretation of the data since the detection levels of the analytes are significantly lower than cleanup objectives.

The tetryl analyte was outside QC limits for MFAPES 270-281 in the MS, MSD, and LCS. However, no evidence of tetryl was found in the associated samples. In all of the other instances where the MS or MSD results did not meet laboratory QC limits, the corresponding LCS/LCSD results did meet QC limits, thus indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results outside laboratory QC limits do not adversely affect the interpretation of the sample data.

Conclusion

All QC data relating to PES samples collected by TolTest, except those noted above, are within laboratory control limits. The QC data satisfy the project objectives and the data are found usable for the confirmation of accuracy for the stated analyses.

6.2.5 Windrow Explosive Monitoring Samples

Windrow explosive monitoring sampling was performed by both MK and TolTest. As indicated in Section 4.5, explosives were the only constituents of concern that exceeded the industrial cleanup goals in the ICS, therefore, they were the only parameters analyzed during windrow treatment. Windrow samples collected and submitted for laboratory analysis included Day Zero samples, collected upon construction of the windrow and Day Last samples, collected after completion of treatment. Day Last samples were collected to confirm that the cleanup goals had been achieved. Day Last samples were collected after results from field screening test kits for explosives (RDX and TNT were used by MK and RDX by TolTest) were below detectable levels.

As stated in Section 4.5, samples were collected from 15 locations in each windrow. MK collected Day Zero samples for windrows 1 though 50 and Day Last samples for windrows 1 through 48. TolTest collected Day Zero samples for windrows 51 through 102 and Day Last samples for windrows 49 through 102.

6.2.5.1 Windrow Monitoring Samples - MK Data QC Summary

The analytical data for Windrow 13 reflected only nine monitoring locations due to the smaller windrow size. On Day Zero of monitoring, eight of the nine sampling locations did not detect the presence of

246TNT and the ninth location had a concentration of 1,620µg/kg. On Day Last of monitoring, eight of the nine sampling locations did not detect the presence of 246TNT. The ninth location has a value of 9,710 µg/kg of 246TNT reported. This single sampling location, which shows a significant difference between Day Zero and Day Last results, resulted in a (-223)% reduction in the concentration of 246TNT. Variability is expected between sampling locations due to the varied mixture of amendments in the windrow. For this reason various sample locations are selected and averaged to determine the average concentration of the windrow. The Industrial Cleanup Goal for this compound is 64,000 µg/kg and the Residential Cleanup Goal is 15,000 µg/kg. The analytical results were well below these concentration levels.

A similar situation existed for the compound 4A26DT for Windrow 13. All nine results for the Day Zero monitoring were not detected and during Day Last, eight of the nine sample locations reported undetectable levels of 4A26DT while the last monitoring location had a value of 704 µg/kg. This variability between sampling locations is due to the varied mixture of amendments in each windrow. However, since the Industrial Cleanup Goal for this compound of 680,000 µg/kg and the Residential Cleanup Goal is 65,000 µg/kg, the impact of this increased variability is insignificant in the final use of these results.

Increases in reporting limits are often seen in Day Zero analytical results due to dilutions necessary for analysis. Concentrations of RDX, TNT, and HMX are at such high levels in Day Zero sampling that dilutions were performed. After the formation of Windrow 6, the lab made every effort to run all samples in an undiluted form initially which permitted consistent levels to be reported for undetectable compounds, and later performed the dilutions necessary for RDX, TNT, and HMX levels. Prior to the formation of Windrow S006, the lab performed dilutions initially to prevent over saturation of their instruments.

In the case of Windrow 5, there are changes between reporting values in several of the locations in a particular cross section. In each cross section three locations are sampled as described in the Full Scale Quality Assurance Project Plan, SOP 3.0 found in Appendix A. Windrow 5, Location 1 has a value of less than 25,000 µg/kg reported for 246TNT, while Location 2 has a value of less than 12,500 µg/kg, and Location 3 has a value of less than 250 µg/kg. These dilutions were necessary due to the high concentrations of RDX and HMX in these samples. A 100-time dilution was performed on Location 1, a 50-time dilution was performed on Location 2, and no dilution was required on Location 3. Ideally, it would be helpful to use the same dilution on all samples, however, based on varying concentrations of compounds which can be found within the windrow, this was not possible. As a result, inconsistent reporting limits are occasionally reported within a particular windrow.

Variances in reporting limits are also the result of the sample volume used in analysis. In Windrow 16, all Day Zero results were reported at values of less than 250 µg/kg for 2,4-DNT. Day Last results also show undetectable levels of this compound at reporting limits between 239 and 250 µg/Kg. Obviously, these are all less than the 250 reported for Day Zero results, but larger sample volumes (2.10 grams on Day Last rather than 2.00 grams on Day Zero) decreased the reporting limits.

Field Quality Control

Field QC samples collected and analyzed with the Day Zero and Day Last samples included field duplicates to evaluate the precision of the field sampling and laboratory analysis. Precision of the field duplicates varied based upon the concentration of the target analytes. Day Last duplicate data was acceptable based upon the concentrations found in the samples relative to the cleanup levels.

Laboratory Quality Control

Method blanks, replicates, surrogates, LCS/LCSD and MS/MSD samples were prepared and analyzed for laboratory QC with the Day Zero and Day Last compost samples.

Laboratory QC was performed consistent with the requirements of the *FS-QAPP* [MK, 1998b]. Method blanks, LCS, LCSD and surrogates were acceptable in almost every analytical batch. MS and MSD data was generally acceptable. In some of the Day Zero data, consistent elevated MS and MSD recoveries of RDX and HMX are often seen in the analytical data because of the high levels of theses compounds initially present in the sample. In Day Zero samples, which often required dilutions after spiking of the sample, the concentration of the spiking solution is diluted to a low level which cannot often be distinguished form the variability of the sample itself. Day Last data did not show similar interferences because initial concentrations were low in comparison to the concentration of spiking solution added to the sample. Other MS and MSD recoveries, which did not meet the established criteria in the *QAPP* [MK, 1998a], include recoveries for tetryl. Tetryl often suffers from degradation, which results in low recovery of the compound in the MS and MSD. However, based upon the undetectable levels of tetryl found in these samples, and the relation of the analytical reporting limits to the industrial and residential cleanup levels, the data is determined to be acceptable to show that cleanup goals have been successfully met.

Conclusion

Based on technical review of the field and laboratory QC data, analyses were performed within acceptable accuracy and precision requirements specified in the *QAPP* [MK, 1998a]. The confirmation data meets the project's data quality objectives and are, therefore, considered usable to support full-scale operations.

6.2.5.2 Windrow Monitoring Samples (Day Zero and Day Last) - TolTest QC Data Summary

A total of 705 Day Zero samples (for windrows 51 through 102) and 744 Day Last samples (for windrows 49 through 102) were collected by TolTest. All samples were received by the laboratory in acceptable condition, with custody seals and with containers intact.

Eighty-seven percent of the Day Zero samples and 85% of the Day Last samples were received at temperatures of 4°C ± 2°C. Ten percent of the Day Zero samples and 13% of the Day Last samples were received at 1°C to 2°C. Since none of these samples were frozen, the results were not affected by the 1°C below the desired temperature range. Three percent of the Day Zero samples were received at 11°C and 2% of the Day Last samples were received at 8°C. In these cases, there was a delay by the courier in transporting the samples to the laboratory. A potential effect of the increased temperature could be a low bias to the results and any result greater than the detection limit could be considered a minimum value. For these samples, the impact, if any, is minimal compared to the reported values and treatment standards.

TolTest sample results included seven samples that were reported with estimated values. Five of these samples exhibited analyte levels outside of the calibration range and, thus, warranted analyzing dilutions. However, due to laboratory workload, the holding times on these samples had expired before the dilutions could be analyzed. Thus, the estimated values were reported. Two of the seven samples required dilutions and dilutions were analyzed. In one case, a second dilution was required since RDX was still outside the calibration range. The hold time on this sample had expired prior to the analysis of the second dilution, therefore, an estimated value for RDX was reported. In the other case, a dilution was analyzed and the appropriate analytes were reported with diluted values with the exception of TNT. TNT did not meet the calibration criteria in this case and the estimated value from the initial run was reported.

Field Quality Control

Field duplicates were collected and analyzed as a method of field data QC. Precision for explosive analyses varied from 0-200%. This is not unexpected when considering the variable nature of the compost matrix.

Laboratory Quality Control

Method blanks, surrogates, LCS/LCSD and MS/MSD samples were used for laboratory quality control for the windrow monitoring samples collected by TolTest.

Laboratory method blanks showed no evidence of contamination.

The surrogate recoveries were generally acceptable for most samples, however in samples having high concentrations of TNT, the corresponding surrogate recoveries were often outside laboratory QC limits. This is attributed to an interference effect of a large TNT concentration on the surrogate peak.

In Day Zero samples, there were 13 batches or sets of LCS/LCSD where QC results did not meet laboratory control limits. There were two sets where tetryl was out of control in both the LCS and the LCSD, however tetryl was not detected in the samples corresponding to these LCS/LCSD sets. Values ranged from 1% to 15% outside the laboratory QC limit for tetryl. The tetryl compound often suffers from degradation, which makes this analyte difficult to analyze. Ten out of the 13 sets had one to two analytes outside of laboratory control limits (1-6%) for either the LCS or the LSCD. In each case, the corresponding QC sample was within control limits (i.e., if the LCS was out, the LCSD was acceptable), therefore, the impact on the sample data is minimal. One of the 13 sets had six analytes outside of laboratory control limits (1-10%) for the LCS sample. In this case, the corresponding LCSD sample was within control limits, therefore, the impact on the sample data is minimal and some of these analytes were not detected in the corresponding compost samples (Day Zero Windrow 81).

In Day Last samples, there were 15 sets of LCS/LCSD data where QC results for one to four analytes were outside of laboratory control limits (1-7%). In each case, the corresponding QC sample was within control limits (as described above), therefore, the impact on the sample data is minimal. There were eight sets where tetryl was out of control in both the LCS and the LCSD, however, tetryl was not detected in the samples corresponding to these analyses. There were two sets where RDX was above (1-6%) laboratory control limits for both the LCS and LCSD. The average RDX value for these samples was well below treatment standards, thus, the impact on the corresponding samples was minimal. One set of data showed 2-NT outside of the laboratory control limits (3-7%) for both LCS and LCSD. All other analytes were within control limits for this set and the corresponding samples showed no evidence of the 2-NT analyte. There were four analytes outside laboratory control limits for the LCS and 10 analytes out of control for the LCSD for one set of samples (BIO-S-084 Day 6). Of the analytes that were out of control in the LCS/LCSD, only 2-ADNT and 4-ADNT were detected in the associated compost samples. The 2-ADNT and 4-ADNT analytes were outside limits in both the LCS and LCSD, however, the sample results for these compounds were found at levels orders of magnitude lower than treatment goals, thus the QC was determined to be usable. The two other compounds detected in these compost samples, RDX and HMX, were also determined to be acceptable since the corresponding LCS/LCSD results for these analytes were within control limits.

In Day Zero samples, no MS/MSD sets exhibited all analyte recoveries in the laboratory QC limits. RDX, HMX, and TNT were often found to be outside the laboratory QC limits for MS/MSD. Day Zero samples often required dilutions to bring RDX, HMX, and TNT to quantifiable levels. The dilution occurs after sample spiking, thus, the concentration of the spiked compounds were diluted out and could not be determined. Tetryl, which often suffers degradation, was frequently outside laboratory QC recovery limits in the MS/MSD. In all of the instances where the MS or MSD results did not meet laboratory QC limits, the corresponding LCS/LCSD results did meet QC limits, thus indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results associated with Day Zero samples that were outside laboratory QC limits did not adversely affect the interpretation of the sample data.

For the MS/MSD associated with Day Last sample BIO-S-061 Day 8, the TNT recovery was negative. There was a large reported value of TNT in the sample, but the corresponding MS/MSD samples did not confirm this elevated TNT level. Possible contamination of the sample was presumed and a re-extraction of the sample was considered. However, it was determined that the final disposition of compost would not change and therefore re-extraction was not performed. Approximately 25% of the MS/MSD sets exhibited analytes slightly outside the limits in either the MS or MSD. As with the Day Zero samples, in all of the cases where the MS or MSD results did not meet laboratory QC limits, the corresponding LCS/LCSD results did meet QC limits, indicating a matrix effect and not a problem with instrumentation or analytical technique. Therefore, any MS/MSD results associated with Day Last samples that were outside laboratory QC limits do not adversely affect the interpretation of the sample data.

Conclusion

All QC data relating to Day Zero and Day Last samples collected by TolTest, except those noted above, are within the laboratory control limits. The QC data satisfy the project objectives and the data are found usable for the confirmation of accuracy for the stated analyses.

7.0
SAFETY AND INDUSTRIAL HYGIENE

7.1 GENERAL SAFETY

Over 160,000 labor hours were expended during the course of the work. One Occupational Safety and Health Administration (OSHA) recordable injury occurred. This injury was a hip contusion that resulted from an employee falling while repositioning a decontamination pad liner. There were no lost or restricted days associated with the injury. Three first aid cases (minor lacerations) also occurred.

A total of 71 formal safety inspections were performed. No significant findings of an imminent or serious nature were found. Immediate actions were taken to correct any minor findings observed. Daily informal walk around safety inspections reinforced and improved the worker safety performance.

7.2 INDUSTRIAL HYGIENE SAMPLING

During work activities, monitoring was performed for airborne bacteria/fungi (molds and yeast), ammonia, total dust, and airborne explosive compounds.

Two-time integrated air sampling campaigns (one in late spring and one in summer) were initially performed for bacteria/fungi using bioaerosol samples collected inside and outside of the compost buildings. No bacteria or fungi were detected above the occupational exposure limits or the threshold limit values (TLVs). The requirement for the two-time integrated air sampling was eliminated and replaced with visual monitoring in May 1999 (see FCR-FS-015 in Appendix A).

Ammonia samples were collected by colorimetric methods and passive dosimeters. Sampling indicated ammonia levels above the permissible exposure limit (PEL) of 50 ppm and the TLV of 25 ppm during windrow construction and the first three to five days of the windrow life cycle. The chicken manure amendment was the primary contributor to the ammonia concentrations. As a result, full face air purifying respirators with ammonia cartridges were worn during windrow formation and during the first five to seven days of the windrow life cycle.

Airborne explosive dust sampling included area and personal samples. Results of all samples were less than the lower limit of qualification (LOQ) for applicable explosives and far below any occupational exposure limits. Explosive wipe samples were also taken to identify any spread of explosive contamination out of work zones. No occupational exposure limit exists for explosives but a one ppm administrative control level was implemented. Some contamination was detected in the lab refrigerator, clothing change area and the shower area and some trackout of explosives occurred primarily at the personnel decontamination facility. A more aggressive housekeeping practice coupled with worker training was instituted to prevent recurrence.

Nuisance dust measurements, using a laser dust monitor, were taken during activities which had the greatest potential to generate dust. During these activities, water was used to prevent and suppress any dust that could be generated. All results were well below the 10 mg/m^3 non-respirable limit and the 3 mg/m^3 respirable limit.

8.0
CONCLUSIONS AND RECOMMENDATIONS

IM work at MFA including, identification, excavation, treatment, and backfilling/staging of explosives-contaminated soil around Buildings 152, 153/154, 157, and 158/159 has been completed in accordance with all relevant plans and plan modifications. Investigation in the areas of Buildings 151 and 160 did not identify any material that exceeded the cleanup criteria.

Excavation of impacted soil was completed to the extent possible in all areas identified by initial characterization sampling, with the exception of 17 grid sections (23, 24, 26, 29, 33, 34, 35, 36, 38, 40, 131, 132, 133, 135, 171, 172, and 173) near Buildings 153/154 which have not yet been excavated. These areas will be addressed following completion of supplemental toxicity testing of previously treated compost, as agreed to with the USEPA. An addendum to this IMR will be prepared to address work in those areas. In some of the grid sections that were excavated, impacted soil above the cleanup goals remains in areas where roads, railways, buildings, utilities or other permanent physical structures prevented complete removal of the material. All excavated soil was successfully treated at the Biofacility, by composting, to reduce the levels of contaminants of concern in the material to below either the industrial or residential cleanup goals. Treated soil was returned to the site and used for backfill or staged for future use. No future IM work is recommended for the subject areas at MFA after the material in the final 17 grid sections is excavated, treated and backfilled.

Results of ICS collected at MFA revealed levels of arsenic above cleanup goals. Arsenic was not a contaminant of concern at the MFA site so it is assumed that the detected levels represent a high background for this compound at the NSWC Crane facility. It is recommended that a background level for this compound be established for NSWC Crane to assist in future IM work.

9.0
REFERENCES AND BIBLIOGRAPHY

REFERENCES

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[Weston, 1993] *Windrow Composting for Explosives-Contaminated Soils at the Umatilla Depot Activity, Hermiston, Oregon.* Prepared by Roy F. Weston, Inc., West Chester, Pennsylvania, 1993.

[MK, 1997] *Work Plan for the Soils Bioremediation Facility at NSWC Crane, Crane, Indiana,* Delivery Order No. 0009, Contract N62467-93-D-1106. Prepared by Morrison Knudsen Corporation, June 30, 1997.

[NSWC Crane, 1997] Naval Surface Warfare Center, Storm-water Permit for Industrial Activities General Permit #INR00C083, 11/9/94, amended 1997.

[MK, 1998a] *Full-Scale Operational Plan for Soils Bioremediation Facility, NSWC Crane, Crane, Indiana.* Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation. Revision 2, March 12, 1998.

[MK, 1998b] *Quality Assurance Project Plan for Full-Scale Operations, Soils Bioremediation Facility, NSWC Crane, Crane, Indiana.* Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation. Revision 2, March 12, 1998.

[MK, 1998c] *Construction As-Built Report for the Soils Bioremediation Facility at NSWC Crane, Crane, Indiana,* Delivery Order No. 0009, Contract No. N62467-93-D-1106. Prepared by Morrison Knudsen Corporation. February 1998.

[MK, 1998d] *Pilot-Scale Treatability Test Report for Soils Bioremediation Facility, NSWC Crane, Crane, Indiana,* Delivery Order No. 0009, Contract N62467-93-D-1106. Revision 1, September 02, 1998.

[MK, 1998e] 30% Soil Loading Batch Report, Full-Scale Bioremediation, NSWC Crane. Prepared by Morrison Knudsen Corporation. August 1998.

[MK, 1998f] Draft Toxicity Report, Full-Scale Bioremediation, NSWC Crane. Prepared by Morrison Knudsen Corporation. August 1998.

BIBLIOGRAPHY

Quarterly Interim Progress Report, April - June 1998, Full-Scale Operations, Bioremediation of Explosives Contaminated Soil, NSWC Crane, Crane, Indiana. Prepared by Morrison Knudsen Corporation. July 1998.

Quarterly Interim Progress Report, July - September 1998, Full-Scale Operations, Bioremediation of Explosives Contaminated Soil, NSWC Crane, Crane, Indiana. Prepared by Morrison Knudsen Corporation. December 1998.

BIBLIOGRAPHY (continued)

Quarterly Interim Progress Report, October - December 1998, Full-Scale Operations, Bioremediation of Explosives Contaminated Soil, NSWC Crane, Crane, Indiana. Prepared by Morrison Knudsen Corporation. April 1999.

Quarterly Interim Progress Report, January - March 1999, Full-Scale Operations, Bioremediation of Explosives Contaminated Soil, NSWC Crane, Crane, Indiana. Prepared by Morrison Knudsen Corporation. June 1999.

Quarterly Interim Progress Report, March 27 - August 31, 1999, Full-Scale Operations, Bioremediation of Explosives Contaminated Soil, NSWC Crane, Crane, Indiana. Prepared by TolTest. December 1999.

U.S. Environmental Protection Agency, *Seminar on Technologies for Remediation Sites Contaminated with Explosive and Radioactive Wastes*, EPA/625/K-93/001. June 1993.

U.S. Environmental Protection Agency, *Approaches for the Remediation of Federal Facility Sites Contaminated with Explosive or Radioactive Wastes,* EPA/625/R-93/013. September 1993.

APPENDIX A

FIELD CLARIFICATION REQUESTS

(61 double-sided sheets)

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS001
Full Scale Operational Plan		Page 1 of 1

Reference Documents: Protocol for Short Term Toxicity Screening of Hazardous Waste Sites (EPA 1600/3-88/029 July 1988)

Problem / Change Description:

The Navy has not specifically provided directions concerning short term toxicity screening of the selected compost mix.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 1/9/98

Resolution:

MK to contract with a laboratory experienced in environmental toxicity testing to perform earthworm survival study as described in Section A.8.5. of the above document. MK will provide approximately 1200 grams of finished compost from Pilot Scale Mix 7B to the laboratory as specified in protocol. The lab is to perform toxicity test on a 100% undiluted compost sample. If test results on this sample are acceptable, as defined in the protocol, the test is considered complete. If test results from the undiluted sample are not acceptable, continue test using the five dilution factors recommended in the protocol.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature:	Date: 1/12/98	Approval by ROICC/NTR or RPM	Signature:	Date 1/20/98
Approval by MK PjM	Signature: D Beall	Date: 1/12/98	Additional Reviews: By/Date Christine D. Freeman 1/15/98 Incorporate into the QAPP		
Approval by MK QC	Signature: R. J. Spurgeon	Date: 1/12/98			
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☒

A:FCRPAPER.DOC

3.0
SEDIMENT AND EROSION CONTROL

Storm-water and erosion control measures will be implemented as necessary to control storm-water run-on/ run-off and to prevent erosion. Straw bales will be placed along the edges of exclusion zones in sloped areas so that potential run-on and run-off are diverted in a manner that prevents surface water entry or exit from the excavation. During ***the months of October through May*** ~~daily operations~~, open excavations will be covered during periods of ***heavy*** precipitation to prevent contact waters from forming. Potentially contaminated storm-water that may collect in the excavation will be either sent directly to the Mine Fill A contaminated water pretreatment system or containerized and sampled to determine its disposition**, according to NSWC Crane EPD procedures.**

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	COPY

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS009
COVERING EXCAVATION AREAS JUNE-SEPTEMBER		Page 1 of 5

Reference Documents:
Full-Scale Operational Plan , Appendix E, March 1998 Rev. 2

Problem / Change Description:

Covering of Excavation area's during the month's of June through September causes moisture to be retained in the soil rather than allowing it to dry for screening.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 7/8/98

Solution:

Revise the excavation plan as shown on attached pages to allow relief from covering excavation sites during the months of June through September and during minor precipitation the balance of the year. The excavation sites will be protected to prevent water and sediment runoff.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature: For V. VENKATESH	Date: 7/9/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Ball	Date: 7/9/98	Additional Reviews: By/Date awaiting approval		
Approval by MK QC	Signature: C. L. Spencer	Date: 7/9/98			
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☐ awaiting approval

Minor additions are directly written onto the Original FCR (enclosed). If you have any questions regarding this matter, please contact me at (312) 886-6146.

Sincerely,

Carol Witt-Smith
Corrective Action Expert
WMB, IL/IN/MI Section

cc: Bill Gates, SOUTHDIV
Dave Beall, MK Crane
Tom Linson, IDEM
Stephanie Riddle, IDEM BRAC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

May 18, 1998

DRP-8J
REPLY TO THE ATTENTION OF:

Ms. Chris Freeman
Environmental Protection Department
BLDG.. 3260
Naval Surface Warfare Center
Crane, Indiana 47522

RE: FCR-FS-008
Bioremediation Facility
Naval Surface Warfare Center
Crane, IN

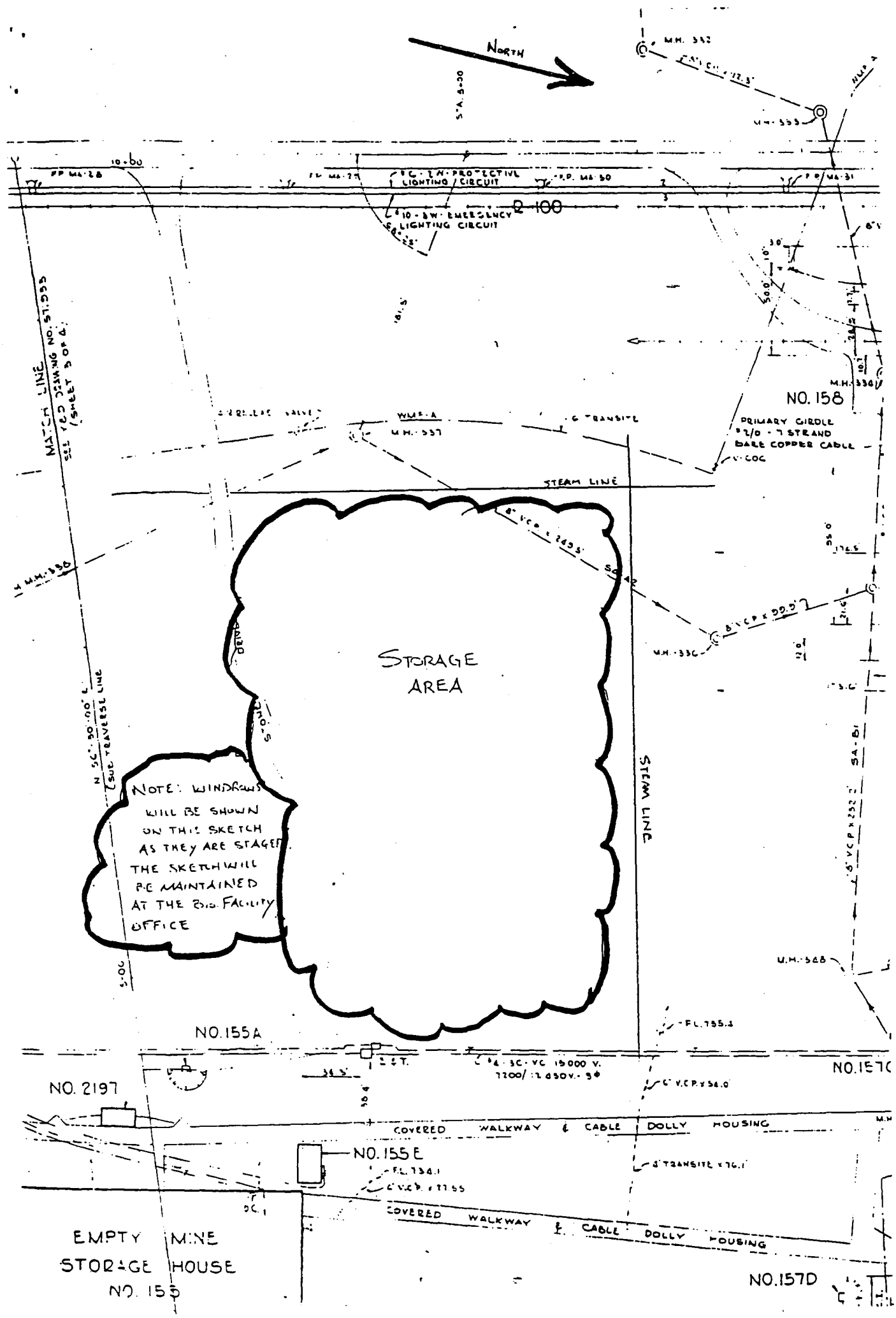
Dear Ms. Freeman:

I have reviewed FCR-FS-008, Temporary Staging of Treated Compost, dated May 8, 1998, for modification of the approved Full-scale Work Plan. I am approving the temporary storage of treated compost soil in the Bioremediation Facility buildings. All piles must be maintained in a segregated storage position in order to allow for the tracking of piles to their final disposal area.

Temporary storage at Mine Fill A will be allowed once the Agency has received and approved the description of how treated compost soil will be transported back to the site, with storage and maintenance and inspection requirements for the piles, and restoration of the storage area used. Piles should not be stored more than 6 months. Any piles stored during major rain events and winter months must have sufficient erosion and weather protection. All piles must remain segregated and tracked (i.e., logging pile numbers and locations) until final disposition. Movable blocks may be used to contain the piles. Industrial level soils can not be stored on clean soil areas without liners under the piles. Residential level soils can be stored on clean soil areas. Industrial level piles must remain covered to prevent wind dispersion. All piles should be placed in an area, or covers
used, to prevent wind dispersion into any facility worker areas. Pile storage should not interfere with facility operations or safety.

If at any point in time similar temporary storage is necessary, the Bioremediation Facility buildings may be used for any of the cleanup site treated soils. At locations other than Mine Fill A, a plan must be submitted for approval as to where the piles will be stored, and must be incorporated into the excavation and restoration plan for that site.

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 50% Recycled Paper (20% Postconsumer)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P.P. MA-30
P.P. MA-31
P.C. 2N PROTECTIVE LIGHTING CIRCUIT
10-2W EMERGENCY LIGHTING CIRCUIT
R-100
MATCH LINE
SEE F.C.D. DRAWING NO. S.T.1355 (SHEET 2 OF 4)
M.H. 336
NO. 158
PRIMARY GIRDLE
2/0 - 7 STRAND
BARE COPPER CABLE
WMR-A
M.H. 337
TRANSITE
STEAM LINE
M.H. 330
STORAGE AREA
NOTE: WINDROWS WILL BE SHOWN ON THIS SKETCH AS THEY ARE STAGED. THE SKETCH WILL BE MAINTAINED AT THE BIO. FACILITY OFFICE
STEAM LINE
M.H. 330
M.H. 568
N 56°-30'-00" E (SUB TRAVERSE LINE)
NO. 155A
NO. 157C
NO. 2197
COVERED WALKWAY & CABLE DOLLY HOUSING
NO. 155E
COVERED WALKWAY & CABLE DOLLY HOUSING
EMPTY MINE STORAGE HOUSE NO. 155
NO. 157D

RESOLUTION: (continued)

The staging area will be inspected weekly **and after major rain events** for any deterioration of the facility or possible loss of treated compost due to wind or precipitation. Any required corrective action will be taken with the concurrence of EPD.

The staging area will not be piled higher than eight feet. Should odor become a nuisance, the pile will be spread out to adequately aerate the curing compost. A marked up map will be used to identify the location of individual windrows within the staging area. The map will be maintained at the biofacility office. Treated compost will be transported back to the SWMU that was the original source of the contaminated soil. The treated compost will be unloaded at staging areas designated within the SWMU. Mine Fill "A" will have the first staging areas established. One staging area will be established for treated compost meeting the residential clean up level and one staging area will be established for treated compost meeting the industrial clean up level. A proposed staging area is being shown between buildings #158 and #153. The approximate location is shown on the attached sketch. If the work at building #165 in Mine Fill "B" becomes a priority, similar staging areas will be established at Mine Fill "B". A staging area will be established with EPD's concurrence in Mine Fill "B". **Staging areas will be made a part of the excavation plan in the Operations Plan.**

Once backfill activities begin, treated compost from the staging areas will be utilized as fill material. Oldest compost will be used first while newer treated compost cures in the staging area. Log book entries **and** maps will document the source of fill material and location of backfill. **Log books, maps, and survey data will be made part of the permanent biofacility record in accordance with the operations plan.** At the completion of the backfill or other usage, the staging area will be sampled for explosives to assure that the area was not contaminated. The erosion control barriers and plastic will be removed, **decontaminated for reuse, or disposed of per operations plan**. Seeding and mulching will **be placed and maintained until vegetation is established**.

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS008 Rev. 2
Temporary Staging of Treated Compost		Page 1 of 2

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
The EPA approval with comment of FCR-FS008 requests additional detail. **FCR-FS008 Rev. 1 is being revised to incorporate EPA comments.**

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 6/2/98

Resolution:
Treated compost, that has met clean up goals as verified by laboratory results, will be loaded with biofacility equipment. The loading equipment will place treated compost into trucks for transportation to Mine Fill "A", the originating SWMU. Trucks will be decontaminated, when necessary, at the decon facility after loading. Trucks will be weighed in accordance with the Operation Plan. Trucks will observe the 36 ton bridge load limit. Loads will be covered during transportation.

The staging areas will be prepared prior to accepting treated compost. Soil samples in the area will be taken and laboratory testing performed for the presence of explosives in the underlying soil, **to document to the Navy the existence of clean soil**. Erosion control barriers will be erected to contain any run on/run off. Staging areas will accept treated compost in such a manner that the oldest compost will be used first for backfill or **for use according to the approved work plan**. This essentially means that the staging area will be accessible from both ends. One end will receive new treated compost, while the other end remains accessible for the removal of treated compost for use.

Staged compost that meet the industrial standard, but not the residential standard, will be placed on protective plastic sheeting and covered. Treated compost meeting residential levels will be placed directly on the ground and not covered. Piles should not be stored more than six (6) months. (Continued page 2)

Approval by MK PE	Signature: For Venky Venkatesh	Date: 6/3/98	Approval by ROICC/NTR or RPM	Signature:	Date ~~6/18/98~~
Approval by MK PjM	Signature: D Beall	Date: 6/3/98	Additional Reviews: By/Date Christine D. Freeman 6/22/98		
Approval by MK QC	Signature: R. L. Nguyen	Date: 6/3/98			
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☐

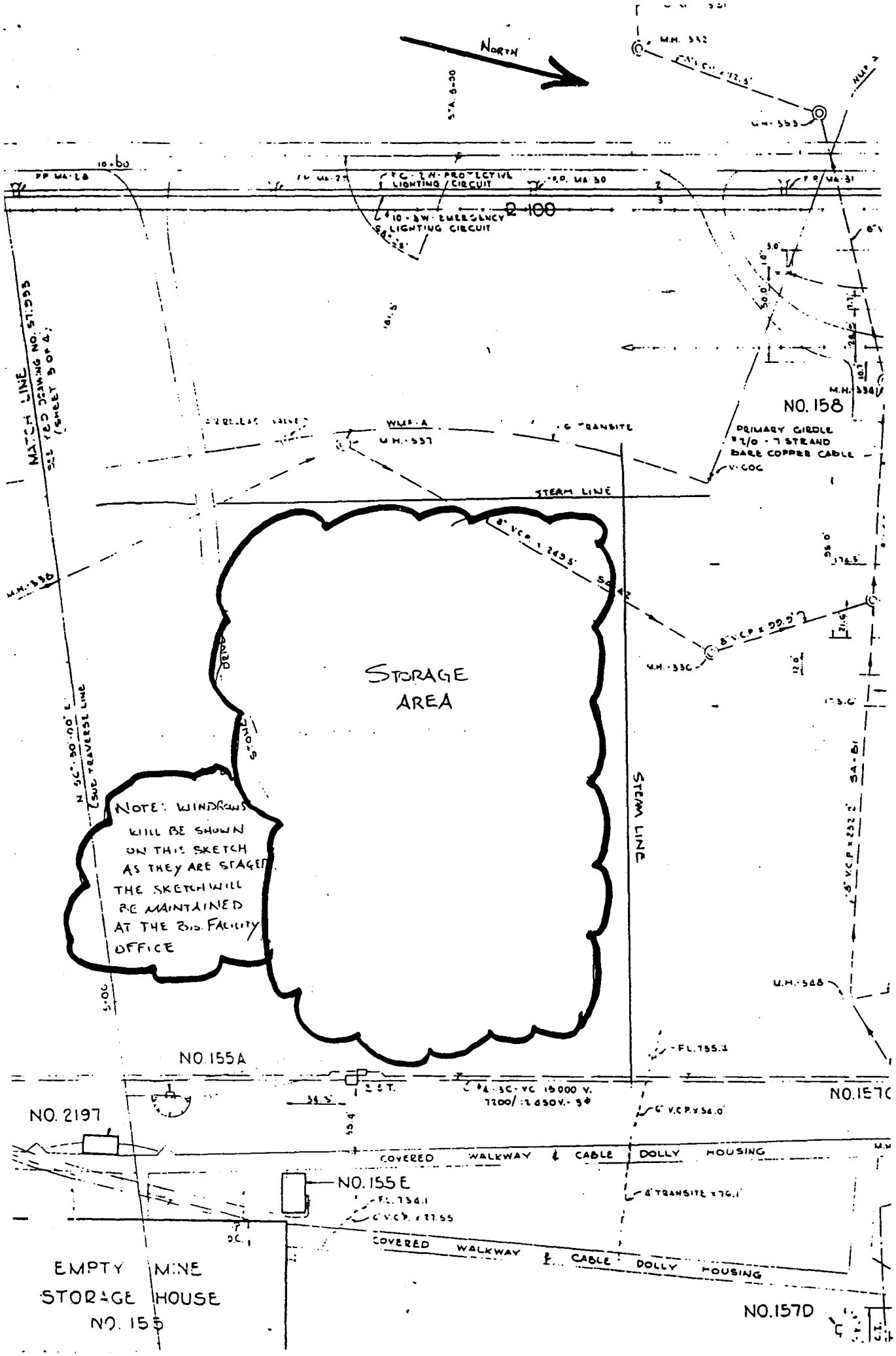
6/18/98

Minor additions are directly written onto the Original FCR (enclosed). If you have any questions regarding this matter, please contact me at (312) 886-6146.

Sincerely,

Carol Witt-Smith
Corrective Action Expert
WMB, IL/IN/MI Section

cc: Bill Gates, SOUTHDIV
Dave Beall, MK Crane
Tom Linson, IDEM
Stephanie Riddle, IDEM BRAC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M.H. 333
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P.P. MA-29
P.P. MA-30
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P.C. 2W-PROTECTIVE LIGHTING CIRCUIT
10-2W-EMERGENCY LIGHTING CIRCUIT
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SEE F.C.D. DRAWING NO. 51.955 (SHEET 3 OF 4)
WLR-A
M.H. 337
TRANSITE
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V-COC
STEAM LINE
8" VCP x 249.5'
8" VCP x 22.5'
M.H. 336
M.H. 335
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STORAGE AREA
STEAM LINE
N 56°-30'-00" E
SEE TRAVERSE LINE
NOTE: WINDROWS WILL BE SHOWN ON THIS SKETCH AS THEY ARE STAGED. THE SKETCH WILL BE MAINTAINED AT THE BIO. FACILITY OFFICE
SA-81
8" VCP x 232.2'
M.H. 348
F.L. 755.1
NO. 155A
NO. 157C
NO. 2197
COVERED WALKWAY & CABLE DOLLY HOUSING
NO. 155E
F.L. 734.1
6" VCP x 27.55
6" TRANSITE x 76.1'
COVERED WALKWAY & CABLE DOLLY HOUSING
EMPTY MINE STORAGE HOUSE NO. 155
NO. 157D

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

May 18, 1998

DRP-8J
REPLY TO THE ATTENTION OF:

Ms. Chris Freeman
Environmental Protection Department
BLDG.. 3260
Naval Surface Warfare Center
Crane, Indiana 47522

RE: FCR-FS-008
Bioremediation Facility
Naval Surface Warfare Center
Crane, IN

Dear Ms. Freeman:

I have reviewed FCR-FS-008, Temporary Staging of Treated Compost, dated May 8, 1998, for modification of the approved Full-scale Work Plan. I am approving the temporary storage of treated compost soil in the Bioremediation Facility buildings. All piles must be maintained in a segregated storage position in order to allow for the tracking of piles to their final disposal area.

Temporary storage at Mine Fill A will be allowed once the Agency has received and approved the description of how treated compost soil will be transported back to the site, with storage and maintenance and inspection requirements for the piles, and restoration of the storage area used. Piles should not be stored more than 6 months. Any piles stored during major rain events and winter months must have sufficient erosion and weather protection. All piles must remain segregated and tracked (i.e., logging pile numbers and locations) until final disposition. Movable blocks may be used to contain the piles. Industrial level soils can not be stored on clean soil areas without liners under the piles. Residential level soils can be stored on clean soil areas. Industrial level piles must remain covered to prevent wind dispersion. All piles should be placed in an area, or covers
used, to prevent wind dispersion into any facility worker areas. Pile storage should not interfere with facility operations or safety.

If at any point in time similar temporary storage is necessary, the Bioremediation Facility buildings may be used for any of the cleanup site treated soils. At locations other than Mine Fill A, a plan must be submitted for approval as to where the piles will be stored, and must be incorporated into the excavation and restoration plan for that site.

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ESOLUTION: (continued)

The staging area will be inspected weekly for any deterioration of the facility or possible loss of treated compost due to wind or precipitation. Any required corrective action will be taken with the concurrence of EPD.

The staging area will not be piled higher than eight feet. Should odor become a nuisance, the pile will be spread out to adequately aerate the curing compost. A marked up map will be used to identify the location of individual windrows within the staging area. The map will be maintained at the biofacility office. Treated compost will be transported back to the SWMU that was the original source of the contaminated soil. The treated compost will be unloaded at staging areas designated within the SWMU. Mine Fill "A" will have the first staging areas established. One staging area will be established for treated compost meeting the residential clean up level and one staging area will be established for treated compost meeting the industrial clean up level. A proposed staging area is being shown between buildings #158 and #153. The approximate location is shown on the attached sketch. If the work at building #165 in Mine Fill "B" becomes a priority, similar staging areas will be established at Mine Fill "B". A staging area will be established with EPD's concurrence in Mine Fill "B".

Once backfill activities begin, treated compost from the staging areas will be utilized as fill material. Oldest compost will be used first while newer treated compost cures in the staging area. Log book entries or maps will document the source of fill material and location of backfill. At the completion of the backfill or other usage, the staging area will be sampled for explosives to assure that the area was not contaminated. The erosion ›ntrol barriers and plastic will be removed. Seeding and mulching will return the area to it's original ‹ondition.

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC COPY - FOR INFO

FIELD CLARIFICATION REQUEST (FCR)

VOID

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS008 Rev. 1
Temporary Staging of Treated Compost		Page 1 of 2

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
The EPA approval with comment of FCR-FS008 requests additional detail.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 5/27/98 27 TDO

Resolution:

Treated compost, that has met clean up goals as verified by laboratory results, will be loaded with biofacility equipment. The loading equipment will place treated compost into trucks for transportation to Mine Fill "A", the originating SWMU. Trucks will be decontaminated, when necessary, at the decon facility after loading. Trucks will be weighed in accordance with the Operation Plan. Trucks will observe the 36 ton bridge load limit. Loads will be covered during transportation.

The staging areas will be prepared prior to accepting treated compost. Soil samples in the area will be taken and laboratory testing performed for the presence of explosives in the underlying soil. Erosion control barriers will be erected to contain any run on/run off. Staging areas will accept treated compost in such a manner that the oldest compost will be used first for backfill or other purposes. This essentially means that the staging area will be accessible from both ends. One end will receive new treated compost, while the other end remains accessible for the removal of treated compost for use.

Staged compost that meet the industrial standard, but not the residential standard, will be placed on protective plastic sheeting and covered. Treated compost meeting residential levels will be placed directly on the ground and not covered. Piles should not be stored more than six (6) months. (Continued page 2)

Approval by MK PE	Signature: FOR V. VENKATESH	Date: 5/27/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 5/27/98	Additional Reviews: By/Date		
Approval by MK QC	Signature: R L. Dupuy	Date: 5/27/98			
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☐

Minor additions are directly written onto the Original FCR (enclosed). If you have any questions regarding this matter, please contact me at (312) 886-6146.

Sincerely,

Carol Witt-Smith
Corrective Action Expert
WMB, IL/IN/MI Section

cc: Bill Gates, SOUTHDIV
Dave Beall, MK Crane
Tom Linson, IDEM
Stephanie Riddle, IDEM BRAC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

May 18, 1998

DRP-8J
REPLY TO THE ATTENTION OF:

Ms. Chris Freeman
Environmental Protection Department
BLDG.. 3260
Naval Surface Warfare Center
Crane, Indiana 47522

RE: FCR-FS-008
Bioremediation Facility
Naval Surface Warfare Center
Crane, IN

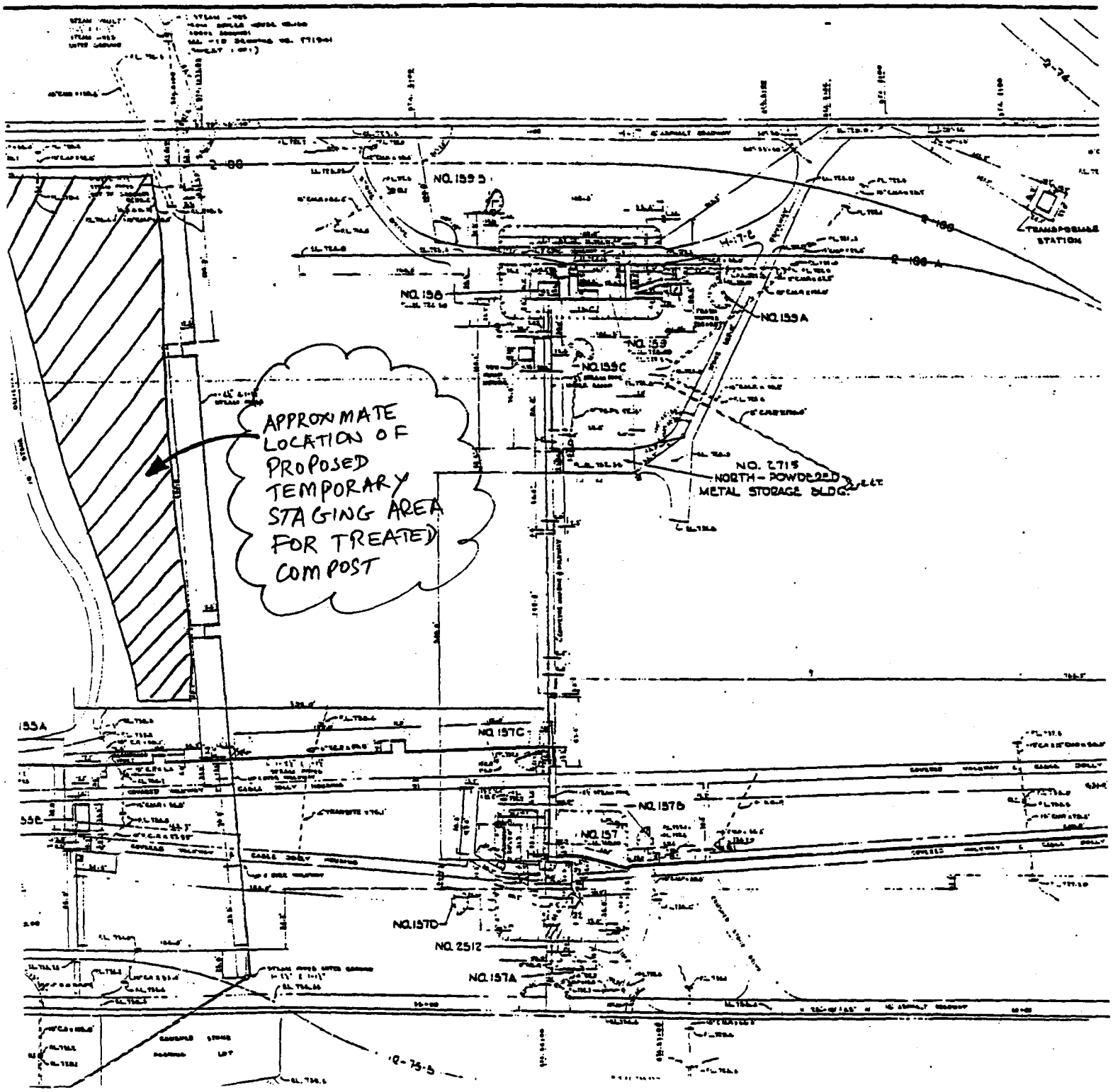
Dear Ms. Freeman:

I have reviewed FCR-FS-008, Temporary Staging of Treated Compost, dated May 8, 1998, for modification of the approved Full-scale Work Plan. I am approving the temporary storage of treated compost soil in the Bioremediation Facility buildings. All piles must be maintained in a segregated storage position in order to allow for the tracking of piles to their final disposal area.

Temporary storage at Mine Fill A will be allowed once the Agency has received and approved the description of how treated compost soil will be transported back to the site, with storage and maintenance and inspection requirements for the piles, and restoration of the storage area used. Piles should not be stored more than 6 months. Any piles stored during major rain events and winter months must have sufficient erosion and weather protection. All piles must remain segregated and tracked (i.e., logging pile numbers and locations) until final disposition. Movable blocks may be used to contain the piles. Industrial level soils can not be stored on clean soil areas without liners under the piles. Residential level soils can be stored on clean soil areas. Industrial level piles must remain covered to prevent wind dispersion. All piles should be placed in an area, or covers
used, to prevent wind dispersion into any facility worker areas. Pile storage should not interfere with facility operations or safety.

If at any point in time similar temporary storage is necessary, the Bioremediation Facility buildings may be used for any of the cleanup site treated soils. At locations other than Mine Fill A, a plan must be submitted for approval as to where the piles will be stored, and must be incorporated into the excavation and restoration plan for that site.

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 50% Recycled Paper (20% Postconsumer)


NO. 159 B
NO. 158
NO. 159 A
NO. 159
NO. 159C
TRANSFORMER STATION
APPROXIMATE LOCATION OF PROPOSED TEMPORARY STAGING AREA FOR TREATED COMPOST
NO. 2715
NORTH-POWDERED METAL STORAGE BLDG.
NO. 157C
NO. 157B
NO. 157
NO. 157D
NO. 2512
NO. 157A

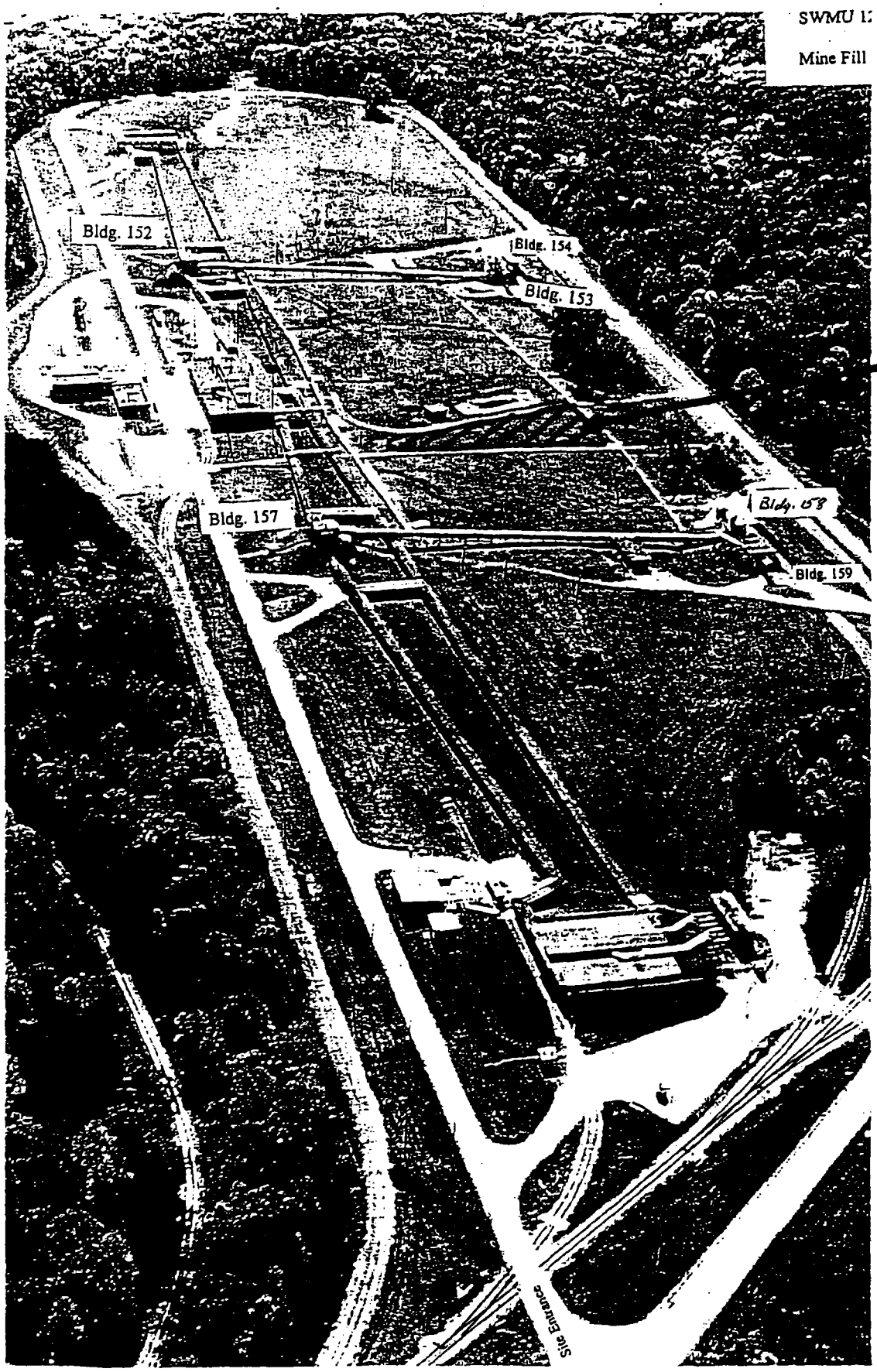


PHOTO 32
SWMU 12/14, MINE FILL A AERIAL VIEW (AS OF NOVEMBER 1993)

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS008
Temporary Staging of Treated Compost		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Currently the excavation of soil is in progress around Buildings 152 and 153/154 in Mine Fill A. Excavation is mostly done on the berms around the buildings. None of the excavation grids have been completely excavated and confirmation samples not yet collected. Therefore, there is no excavated area where the treated compost can be used as fill. Additionally, the required toxicity tests are not completed.

Similarly, land use agreement has not been established and approved by U. S. EPA Region 5. Therefore, treated compost material needs to managed until such date. This would allow for continued processing of soil in the compost buildings.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 5/7/98

Resolution:

Temporarily stage treated compost materials (from multiple windrows) in one of the Bioremediation Compost buildings or at Mine Fill A. See attached drawing for approximate location of the temporary staging area in Mine Fill A. Also, marked-up aerial photograph of Mine Fill A is attached. Required storm-water and erosion control measures at the staging area in Mine Fill A will be implemented to control run-on/run-off by installing perimeter silt fences. Separate staging areas will be established, one for compost meeting industrial clean up levels, and one for compost meeting residential levels.

Once toxicity tests results are received and the excavation site confirmation results indicate that the excavation meets the industrial cleanup goals, then the compost material will be used as fill material or as topsoil in Mine Fill A only per Section 8.0 of Appendix E1 of the referenced document.

at least — treated — (if industrial or residential level) — (if residential level)

NOTE: Continue to temporarily stage the treated compost until land use agreement has been approved. Also, implement this FCR if similar situation (i.e., no area to place the treated compost) arises in the future for Mine Fill A. The temporary staging area will be located and approved by NSWC Crane EPD.

Approval by MK PE	Signature:	Date: 5/7/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 5/8/98	Additional Reviews: By/Date Christine D. Freeman 5/11/98 NSWC Crane - Env. Prot. Dept.		
Approval by MK QC	Signature: R. L. Spencer	Date: 5/8/98			
Approval by MK REG SPT.	Signature:	Date:	Approval w/ comments attached & letter		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ Carol Wittenbach 5/15/98

A:FCRFS008.DOC

1.3.2 Remedial Goals

The primary objective of full-scale operation at the Bioremediation Facility is to reduce, through composting, the explosive contaminant levels of affected soils to meet the National Contingency Plan (NCP) **[U.S. EPA, 1990]** criteria of 90% to 99% reduction of toxicity and mobility (leachability); and to achieve human health (residential or industrial) and/or ecological risk-based remedial goals based on disposition of soil.

The NCP Preamble indicates 90% to 99% reduction of toxicity and mobility (leachability) as a guide for effective treatment. Previous studies have indicated that reductions in parent compounds and first series intermediate compounds were providing parallel reductions in toxicity and leachability based on combined chemical, toxicology and leachability data [U.S. EPA, 1996b]. Therefore, a 90% to 99% reduction in concentrations of contaminant compounds corresponds to a 90% to 99% reduction in toxicity and leachability and meets the NCP treatment performance guideline for composting of TNT, RDX, HMX, and other explosives.

A performance goal of 30 mg/kg for TNT and RDX was used during the pilot-scale as opposed to the industrial soil **Preliminary Remedial Goals** (PRGs) (64 mg/kg and 17 mg/kg, respectively) and the residential soil PRGs (15 mg/kg and 4 mg/kg, respectively). The U.S. EPA has applied the 30 mg/kg performance goal at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites to minimize the phytotoxicity effects of munitions compounds on plant species [U.S. EPA, 1996b]. This criteria is especially applicable to areas which may be backfilled with treated soil and revegetated. In particular, the PRG established for soil cleanup at the Bangor facility was set at 30 mg/kg for TNT, as this level corresponded to "lifetime excess cancer risks between 10^{-5} and 10^{-6} under CERCLA and is protective for non-carcinogenic effects" [U.S. EPA, 1993c]. Other constituents' performance goals have been reduced from the PRG level such as 2,4 and 2,6 DNT based on previous studies [U.S. EPA, 1996c].

Human health (residential and industrial) and ecological risk-based remedial goals have been established using preliminary remedial goals and data quality **limits** ~~levels~~ by U.S. EPA Region 5 [U.S. EPA, 1998]. ~~If compost material is used at a disposal site other than the on-site solid waste landfill, and an industrial scenario is used, the limits above, used for the pilot-scale, still apply, since revegetation will be necessary even in an industrial setting.~~ Cumulative risk, other risk scenarios, and toxicity testing results are not considered in the U.S. EPA evaluation. These remedial goals are presented in Tables 1-1 through 1-3. The analytical methods and analytical reporting limits are also shown in these Tables. Method reporting limits for each of the target constituents are provided by Southwest Laboratory of Oklahoma and have been evaluated by Morrison Knudsen Corporation (MK) for acceptability for data quality.

The Navy may amend this Plan for approval by the U.S. EPA, to establish

ORIGINAL

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS007
CLARIFICATION FOR TNT REMEDIAL GOAL IN TABLE 1-2		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2
Quality Assurance Project Plan for Full-Scale Operations at the Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Section 1.3.2 (fourth paragraph) of the Full-Scale Operational Plan specifies a remedial goal of 30 mg/kg for TNT for industrial use scenerio for disposal at areas other than the on-site solid waste landfill. However, Table 1-2 in the Full-Scale Operational Plan and QAPP lists a remedial goal of 64 mg/kg for TNT. (See attached page)

The value of 64 mg/kg for TNT (industrial use scenario) was derived by U.S. EPA Region 5 using human health risks. Therefore, recommend using this value.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 5/01/98

Resolution:

Use the value of 64 mk/kg as the Industrial remedial goal for TNT as listed in the Table 1-2 (Industrial Use).
Delete sentence two from Section 1.3.2 (fourth paragraph).

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature:	Date: 5/1/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 5/1/98	Additional Reviews: By/Date		
Approval by MK QC	Signature: R. J. Dupuyer	Date: 5/1/98	Christine D. Freeman May 4, 1998 Env. Prot. Dept. - NSWC Crane Approved w/comments		
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended: Yes ☒ No ☐ w/comments 10/26/98 Carol A. Smith

Yes only because industrial disposal scenario requires soil cover prior to revegetation. That is why 30 was still recommended for industrial disposal without soil cover.

A:FCRFS007.DOC
7

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TABLE 1 - 2
INDUSTRIAL USE SOIL REMEDIAL GOALS, SWMU-SPECIFIC CHEMICALS OF CONCERN, AND ACCEPTABLE REPORTING LIMITS NAVAL SURFACE WARFARE CENTER - CRANE

Parameter	SWMU Parameter Applicable To				IM Industrial Cleanup Goal (Human Health Only) (mg/kg)	Method of Analysis[1]	Analytical Reporting Limit (mg/kg)
	MA	MB	ABG	RE			
2,4 DNT	X	X	X	X	1,400	8330	0.24
2,6-DNT	X	X	X	X	680	8330	0.39
2-nitrotoluene (2 NT)	X	X	X	X	6,800	8330	0.72
3 NT	X	X	X	X	6,800	8330	0.50
4 NT	X	X	X	X	6,800	8330	0.48

NOTES: MA = Mine Fill A, MB = Mine Fill B, ABG = Ammunition Burning Ground, and RE = Rockeye.
X = Parameter is a Chemical of Concern at the SWMU.
1. Analytical methods listed above are SW-846 methods, unless otherwise indicated.
* = Region 9 Preliminary Remedial Goal (PRG) value.
* * = Using 2,6 DNT as the surrogate for toxicity potential.
*** = Using 2,4 DNT as the surrogate for toxicity potential.
+ = Use this as remedial goal for treated compost material to be used for disposal at the on-site solid waste landfill.
++ = Use this as remedial goal for excavation site confirmation samples and for treated compost material to be used in areas other than the on-site solid waste landfill.

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Pg. 4 of 5

TABLE 1 - 2
INDUSTRIAL USE SOIL REMEDIAL GOALS, SWMU-SPECIFIC CHEMICALS OF CONCERN, AND ACCEPTABLE REPORTING LIMITS NAVAL SURFACE WARFARE CENTER - CRANE

Parameter	SWMU Parameter Applicable To				IM Industrial Cleanup Goal (Human Health Only) (mg/kg)	Method of Analysis[1]	Analytical Reporting Limit (mg/kg)
	MA	MB	ABG	RE			
EXPLOSIVES							
Pentaerythritrol tetranitrate (PETN)	X	X	X	X	To be determined by U.S. EPA 1998	8330	0.25
2,4,6-trinitrotoluene (TNT)	X	X	X	X	64+ /30++	8330	0.50
Cyclotrimethylene trinitramine (RDX) (Hexahydro 1,3,5 trinitro 1,3,5 triazine)	X	X	X	X	17	8330	0.625
Cyclotetremethylene tetranitramine (HMX) (Octahydro 1,3,5,7 tetranitro 1,3,5,7 tetrazocine)	X	X	X	X	34,000	8330	1.60
Tetryl (Methyl 2,4,6 trinitro phenylnitroamine)	X	X	X	X	6,800	8330	0.38
Trinitrobenzene (TNB)	X	X	X	X	34	8330	0.575
1,3-Dinitrobenzene (DNB)	X	X	X	X	68	8330	0.49
~~1,2 DNB~~	~~X~~	~~X~~	~~X~~	~~X~~	~~270~~	~~8330~~	
~~1,4 DNB~~	~~X~~	~~X~~	~~X~~	~~X~~	~~270~~	~~8330~~	
Nitrobenzene (NB)#	X	X	X	X	94	8330	0.26
~~Dinitrotoluene (DNT) (total)~~	~~X~~	~~X~~	~~X~~	~~X~~	~~2.8~~	~~8330~~	
4-Amino 2,6 Dinitrotoluene (4-Am DNT)	X	X	X	X	680 **	8330	0.45
2-Amino 4,6 Dinitrotoluene (2-Am DNT)	X	X	X	X	1,400 ***	8330	0.40

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Pg. 3 of 15

TABLE 1 - 2
INDUSTRIAL USE SOIL REMEDIAL GOALS, SWMU-SPECIFIC CHEMICALS OF CONCERN, AND ACCEPTABLE REPORTING LIMITS NAVAL SURFACE WARFARE CENTER - CRANE

Parameter	SWMU Parameter Applicable To				IM Industrial Cleanup Goal (Human Health Only) (mg/kg)	Method of Analysis[1]	Analytical Reporting Limit (mg/kg)
	MA	MB	ABG	RE			
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2,6-DNT	X	X	X	X	680	8330	0.39
2-nitrotoluene (2 NT)	X	X	X	X	6,800	8330	0.72
3 NT	X	X	X	X	6,800	8330	0.50
4 NT	X	X	X	X	6,800	8330	0.48

NOTES: MA = Mine Fill A, MB = Mine Fill B, ABG = Ammunition Burning Ground, and RE = Rockeye.
X = Parameter is a Chemical of Concern at the SWMU.
1. Analytical methods listed above are SW-846 methods, unless otherwise indicated.
* = Region 9 Preliminary Remedial Goal (PRG) value.
* * = Using 2,6 DNT as the surrogate for toxicity potential.
*** = Using 2,4 DNT as the surrogate for toxicity potential.
+ = Use this as remedial goal for treated compost material to be used for disposal at the on-site solid waste landfill.
++ = Use this as remedial goal for excavation site confirmation samples and for treated compost material to be used in areas other than the on-site solid waste landfill.

TABLE 1 - 2
INDUSTRIAL USE SOIL REMEDIAL GOALS, SWMU-SPECIFIC CHEMICALS OF CONCERN, AND ACCEPTABLE REPORTING LIMITS NAVAL SURFACE WARFARE CENTER - CRANE

Parameter	SWMU Parameter Applicable To				IM Industrial Cleanup Goal (Human Health Only) (mg/kg)	Method of Analysis[1]	Analytical Reporting Limit (mg/kg)
	MA	MB	ABG	RE			
EXPLOSIVES							
Pentaerythritol tetranitrate (PETN)	X	X	X	X	To be determined by U.S. EPA 1998	8330	0.25
2,4,6-trinitrotoluene (TNT)	X	X	X	X	64+ /30++	8330	0.50
Cyclotrimethylene trinitramine (RDX) (Hexahydro 1,3,5 trinitro 1,3,5 triazine)	X	X	X	X	17	8330	0.625
Cyclotetremethylene tetranitramine (HMX) (Octahydro 1,3,5,7 tetranitro 1,3,5,7 tetrazocine)	X	X	X	X	34,000	8330	1.60
Tetryl (Methyl 2,4,6 trinitro phenylnitroamine)	X	X	X	X	6,800	8330	0.38
Trinitrobenzene (TNB)	X	X	X	X	34	8330	0.575
1,3-Dinitrobenzene (DNB)	X	X	X	X	68	8330	0.49
~~1,2 DNB~~	~~X~~	~~X~~	~~X~~	~~X~~	~~270~~	~~8330~~	
~~1,4 DNB~~	~~X~~	~~X~~	~~X~~	~~X~~	~~270~~	~~8330~~	
Nitrobenzene (NB)#	X	X	X	X	94	8330	0.26
~~Dinitrotoluene (DNT) (total)~~	~~X~~	~~X~~	~~X~~	~~X~~	~~2.8~~	~~8330~~	
4-Amino 2,6 Dinitrotoluene (4-Am DNT)	X	X	X	X	680 **	8330	0.45
2-Amino 4,6 Dinitrotoluene (2-Am DNT)	X	X	X	X	1,400 ***	8330	0.40

1.3.2 Remedial Goals

The primary objective of full-scale operation at the Bioremediation Facility is to reduce, through composting, the explosive contaminant levels of affected soils to meet the National Contingency Plan (NCP) [U.S. EPA, 1990] criteria of 90% to 99% reduction of toxicity and mobility (leachability); and to achieve human health (residential or industrial) and/or ecological risk-based remedial goals based on disposition of soil.

The NCP Preamble indicates 90% to 99% reduction of toxicity and mobility (leachability) as a guide for effective treatment. Previous studies have indicated that reductions in parent compounds and first series intermediate compounds were providing parallel reductions in toxicity and leachability based on combined chemical, toxicology and leachability data [U.S. EPA, 1996b]. Therefore, a 90% to 99% reduction in concentrations of contaminant compounds corresponds to a 90% to 99% reduction in toxicity and leachability and meets the NCP treatment performance guideline for composting of TNT, RDX, HMX, and other explosives.

A performance goal of 30 mg/kg for TNT and RDX was used during the pilot-scale as opposed to the industrial soil Preliminary Remedial Goals (PRGs) (64 mg/kg and 17 mg/kg, respectively) and the residential soil PRGs (15 mg/kg and 4 mg/kg, respectively). The U.S. EPA has applied the 30 mg/kg performance goal at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites to minimize the phytotoxicity effects of munitions compounds on plant species [U.S. EPA, 1996b]. This criteria is especially applicable to areas which may be backfilled with treated soil and revegetated. In particular, the PRG established for soil cleanup at the Bangor facility was set at 30 mg/kg for TNT, as this level corresponded to "lifetime excess cancer risks between 10^{-5} and 10^{-6} under CERCLA and is protective for non-carcinogenic effects" [U.S. EPA, 1993c]. Other constituents' performance goals have been reduced from the PRG level such as 2,4 and 2,6 DNT based on previous studies [U.S. EPA, 1996c].

Human health (residential and industrial) and ecological risk-based remedial goals have been established using preliminary remedial goals and data quality limits ~~levels~~ by U.S. EPA Region 5 [U.S. EPA, 1998]. **If compost material is used at a disposal site other than the on-site solid waste landfill, and an industrial scenario is used, the limits above, used for the pilot-scale, still apply, since revegetation will be necessary even in an industrial setting.** Cumulative risk, other risk scenarios, and toxicity testing results are not considered in the U.S. EPA evaluation. These remedial goals are presented in Tables 1-1 through 1-3. The analytical methods and analytical reporting limits are also shown in these Tables. Method reporting limits for each of the target constituents are provided by Southwest Laboratory of Oklahoma and have been evaluated by Morrison Knudsen Corporation (MK) for acceptability for data quality.

The Navy may amend this Plan for approval by the U.S. EPA, to establish

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS006
CLARIFICATION FOR TNT REMEDIAL GOAL IN TABLE 1-2		Page 1 of 5

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2
Quality Assurance Project Plan for Full-Scale Operations at the Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Section 1.3.2 (fourth paragraph) of the Full-Scale Operational Plan specifies a remedial goal of 30 mg/kg for TNT for industrial use scenerio for disposal at areas other than the on-site solid waste landfill. However, Table 1-2 in the Full-Scale Operational Plan and QAPP lists a remedial goal of 64 mg/kg for TNT.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 4/29/98

Resolution:

Use the revised pages 1-13a and 1-13b -- Table 1-2 (Industrial Use Soil Remedial Goals) of the Full-Scale Operational Plan.

Use the revised Section 1, pages 6a of 44 and 6b of 44 -- Table 1-2 (Industrial Use Soil Remedial Goals) of the QAPP.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature:	Date: 4/29/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 4/29/98	Additional Reviews: By/Date Christine D. Freeman 5/1/98 NSWC Crane Env. Prot. Dept. Denied (will be resubmitted if FCR-FS007 is denied by EPA)		
Approval by MK QC	Signature: R. J. [illegible]	Date: 4/29/98			
Approval by MK REG SPT.	Signature: D Beall	Date: 4/29/98			

Regulator Approval/Notification Recommended:
Yes ☐ No ☐

used to remove the soil from the floor and place the soil evenly on the pile at a 2 foot height. Refer to Figure 1 of Field SOP 4.0 for windrow formation dimensions. Care will be taken as to not compact the soil while loading.

6. **Continue this process until the entire length of windrow has ~~been brought to~~ achieved the proper height ~~with soil~~ and quantity of soil.**

7. **Once the truck trailer is emptied it will proceed to the vehicle decontamination facility, if leaving the Bioremediation facility.**

8. **The exterior of the truck and trailer will be decontaminated prior to exiting the facility.**

Drawings P-102 and P-103 in Appendix C of this Full-Scale Operational Plan provide the travel path for loading soil into the windrows.

Repeat this at the end of §5.2 for clarification.

9. The wheels and bucket of the front end loader should have any excess soil brushed off prior to exiting the building. Any soil removed from the front end loader should be added to the pile that was being constructed

formation dimensions.

8. If the trailer is emptied prior to reaching the end of the windrow, another trailer of soil will begin discharging where the previous trailer emptied. This process will continue until the entire length of windrow has been brought to the proper height with soil.

9. Once the trailer is emptied, the conveyor will be disconnected and the tractor-trailer will proceed to the vehicle decontamination facility if leaving the Bioremediation Facility.

10. The exterior of the tractor-trailer will be decontaminated prior to exiting the facility.

11. The tractor-trailer will return for another load of soil.

12. This process will be repeated until all windrows have been loaded with soil.

5.3 Loading Soil Into Windrows Using A Front End Loader

The general sequence of activities for loading soil into the windrows using a front end loader.

1. **The semi-tractor trailer rig loaded with soil arrives at the windrow and the volume and weight of soil is recorded on the *Record of Recipe* form (See Field SOP 3.0). At this time, the *Record of Recipe* form has already been partially completed during the amendment proportioning and mixing procedure, Field SOP 3.0.**

2. **The semi-tractor trailer enters the compost building and is positioned to the left of the amendment pile.**

3. **Next the bottom flap at the rear of the trailer will be opened to a minimum of six inches.**

4. **Then the live bottom trailer is activated and soil will be placed evenly along the pile on the floor.**

5. **Once the soil has been placed on the floor, a front end loader will be**

trailer rig will be decontaminated at the equipment decontamination facility located at the composting facility exit as discussed in Field SOP 7.0.

Screened soil may be transported and stockpiled in one of the buildings at the Bioremediation Facility, if necessary with approval of NSWC Crane EPD. Stockpiled soil will be covered to prevent dust from emminating.

5.2 Loading Soil into Windrows Using the Hopper Conveyor

The general sequence of activities for loading soil into the windrows **using the hopper conveyor** is as follows: **(See Sect 5.3 for Loading Soil into Windrows using a front end loader.)**

1. The semi-tractor trailer rig loaded with soil arrives at the windrow and the volume and weight of soil is recorded on the *Record of Recipe* form (See Field SOP 3.0). At this time, the *Record of Recipe* form has already been partially completed during the amendment proportioning and mixing procedure, Field SOP 3.0.

2. The semi-tractor trailer enters the compost building.

3. The Hopper/Conveyor is connected to the rear of the semi-tractor trailer via two swivel hooks and latches.

4. Once positioned to the left of the first amendment pile, the engine of the Hopper/Conveyor will be started.

5. Next the bottom flap at the rear of the trailer will be opened to a minimum of six inches.

6. Then the trailer and Hopper/Conveyor will be activated. Soil will begin discharging into the Hopper/Conveyor and onto the amendment windrow. Care should be taken not to transfer excess soil onto the Hopper/Conveyor and causing a Hopper/Conveyor overload. The speed of the Hopper/Conveyor should always be slightly faster than the trailer discharge conveyor.

7. As the soil begins to pile up about two feet above the top of the amendments, the tractor-trailer will be driven forward at a slow rate of speed such that a uniform two feet high pile of soil is maintained until the trailer is emptied. Refer to Figure 1 of Field SOP 4.0 for windrow

load excavated soil on to the blended amendment windrow. The tractor would only be used when not in use for amendment mixing.

3.5 Backhoe

The backhoe is a Catepillar 416B that may be used to load excavated soil on to the blended amendment windrow. The backhoe would only be used when not in use at the excavation site.

4.0 SAFETY AND HEALTH PRECAUTIONS AND CONTROLS

1. Follow explosives handling procedures as required by NSWC Crane Safety Department.

2. Use modified Level D PPE (per the SSHP, Appendix A) when off-loading contaminated soils into windrows and Modified Level D for set-up and preparation tasks associated with off-loading. Hearing protection may be required based on results of sound level surveys.

3. Maintain clear distance of approximately 15 feet and wear high visibility vest when working around moving machinery. Stay in equipment operators line-of-sight.

4. Ensure all rotating equipment guards are in place and functional prior to equipment operation.

5.0 PROCEDURE

Soil will be excavated from the excavation areas and screened as specified in the Soil Excavation Plan, Appendix E.

5.1 Transporting Soil

Screened soil will be transported from the excavation areas or from stockpile at the Bioremediation Facility building using the semi-tractor and live-bottom trailer. Soil at NSWC Crane averages 1.1 tons per cubic yard. The empty weight of each tractor-trailer rig is approximately 16.3 tons. Loaded with 15 cubic yards of soil (16.5 tons), the total load of 32.8 tons will not exceed the 36 ton capacity limit of two bridges on the NSWC Crane base. Transportation route from the excavation sites to the composting facility is shown in the Soil Excavation Plan, Appendix E. Prior to leaving the composting facility, the exterior of the tractor-

FIELD SOP: 5.0
TITLE: TRANSPORT AND LOADING SOIL INTO WINDROWS

1.0 PURPOSE

This procedure describes the methods which will be used to transport soil to the composting facility and load the soil into windrows for full-scale operations.

2.0 SCOPE

This procedure applies to the Naval Surface Warfare Center, Crane, Indiana site for Bioremediation Facility full-scale operations.

3.0 EQUIPMENT

The following equipment will be used to transport soil to the composting buildings and convey the soil to windrows for full-scale operations:

3.1 Semi-Tractor and Live-Bottom Trailer

The semi-tractor is a Mack model 169CH613. The live-bottom trailer is a Red River model HS 236 102. The trailer is 43 feet long and has a minimum capacity of 48 cubic yards. It has a conveyor floor which is capable of discharging material out the rear of the trailer. The tractor-trailer rig will be used to transport soil to the composting facility.

3.2 Hopper/Conveyor

The Hopper/Conveyor is a specially designed piece of equipment that will be used to convey soil from the live-bottom trailer to the windrows. The unit attaches to the rear of the trailer via two swivel hooks and latches. The conveyor is self powered by a diesel engine mounted on the unit. Soil from the live-bottom trailer is discharged into a hopper on the Hopper/Conveyor and is then conveyed to the center of the windrow off the right side of the unit.

3.3 Center Pivot Loader

The rubber tired loader is a caterpillar 966F. The loader may be used to load excavated soil on the blended amendment windrow when the hopper/ conveyor is not used.

3.4 Farm Tractor

The farm tractor is a John Deere Model 7710. The tractor may be used to

the trailer empties its load. **The empty truck will disconnect from the conveyor unit. When a front end loader is used, the truck will unload the soil on the floor next to the windrow in even distribution. A front end loader will then place the soil on top of the windrow to the proper height with even distribution.** Care will be taken as to not compact the soil while loading.
The empty truck will ~~**disconnect from the conveyor unit,**~~ leave the building, and may proceed to get another load of soil. A truck of soil will enter the building ~~**where the hopper/conveyor unit will be reconnected**~~ to continue soil unloading. This process will continue until amendment blend windrow is covered with soil to the proper height and length as shown on drawing P-102 in Appendix C. Field SOP 5.0 in Appendix D provides a step-by-step procedure for transporting and loading soil into the windrows.

If an empty truck is to return to the excavation site for a load of soil, it must proceed to the vehicle decontamination facility (as illustrated on drawing P-102 in Appendix C) where the wheels and exterior will be washed with a high-pressure, low-volume spray prior to exiting the facility per Field SOP 7.0 in Appendix D. Incidental sediments and soils removed from the water collection sumps or ponds may be added to the windrows during initial pile formation.

5.5 TURN/MIX WINDROW

Once the soil has been loaded into the windrow to the specified level, the windrow/compost turning machine will commence mixing and forming the windrow. The travel speed of the windrow turner is adjusted automatically based on the density of the material being turned to maintain a constant load on the drum. The windrow turner may make multiple passes during initial windrow construction to assure thorough mixing which are recorded on the daily report. The final shape and size of the homogeneous windrow is shown on Figure 1 of Field SOP 5.0 in Appendix D.

Upon completion of turning a windrow, the equipment will be locked out and brushed or scraped to remove loose or caked material. Material which has fallen off the sides or been thrown beyond the ends of the windrow will be cleaned up and placed back onto the windrow maintaining the original configuration. Flyout material will be minimized by the rubber flap at the rear of the windrow turner. The windrow turning frequency and monitoring is expected to be daily, but will be adjusted as necessary to maintain proper aeration, temperature, and moisture as described in Section 6.0. A detailed procedure for windrow turning and moisture addition is provided in Field SOP 6.0 in Appendix D.

5.3 LOAD AMENDMENT BLEND INTO WINDROW

Windrow formation will begin by unloading the amendment blend as shown on drawing P-100, in Appendix C. The amendments will be unloaded from the grinder/mixer unit through a side-mounted discharge conveyor, forming a windrow approximately 6-foot high and 12-foot wide. The windrow will begin to be formed at approximately column line 2, i.e., the column numbers along the length of the building. The grinder/mixer will return to the amendments storage for reloading once the blending hopper is emptied. This process will continue until a windrow is formed approximately 250 to 270 feet long (approximately column line 2 through column line 12).

A second windrow, adjacent to and partially overlapping the first windrow, will then be loaded into the building. This will form a single, larger windrow approximately 20-foot wide with two peaks six feet high. Figure 1 of Field SOP 4.0 in Appendix D shows the amendment and soil loading windrow dimensions. As the amendment windrow is completed, the amendment grinder/mixer will be loaded with materials in the proper proportions to repeat the process for loading another amendment windrow. This process will continue until the amendment windrows have been formed as shown on drawing P-101 in Appendix C.

Once the amendment blends have been loaded into a windrow, the windrow turner will turn and shape each of the piles into approximately 20-foot wide and 4-foot, 6-inch tall windrow. Field SOP 4.0 in Appendix D provides a step-by-step procedure for loading the amendment blends into windrows.

5.4 LOAD SOIL INTO WINDROW

Once the amendment blend has been loaded and shaped into a windrow, screened soil will be transported to the windrow being created. The trucks will be inspected in the facility work area, and the quantity of soil recorded, prior to the delivery truck entering the building.

(i.e. center pivot loader, farm tractor, and backho

The soil will be loaded onto the amendment windrow using a self-powered, tow-behind hopper/conveyor unit **or a front end loader** as shown on drawings P-102 and P-103 in Appendix C. Once the truck has entered into the building, the hopper/conveyor unit **if used,** will be attached to the rear of the trailer. As the trailer begins to unload the soil into the tow-behind hopper, the discharge conveyor will place the soil on top of the existing amendment blend windrow. The truck unloading conveyor and the tow-behind conveyor are both equipped with a variable-speed drive for optimum discharge control based on varying soil conditions. As the soil reaches the proper height, the truck will slowly move forward continuing to place soil over the amendment blend windrow until

ORIGINAL

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS003
WINDROW LOADING AND TRANSPORTATION OF SOIL		Page 1 of 8

Reference Documents: Full-Scale Operational Plan for Soils Bioremediation Facility, February 1998 Rev. 2

Problem / Change Description:

Revise Section 5.4 of the FS Ops Plan and SOP 5.0 "Transport and Loading Soil into Windrows" to add the option of using a front end loader to place soil on top of windrows.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 4/16/98

Resolution:

Proceed as indicated on revised attachments.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature:	Date: 4/16/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 4/16/98	Additional Reviews: By/Date EPD Christine D. Freeman 4/21/98 (Approved w/comments)		
Approval by MK QC	Signature: R. L.	Date: 4/16/98			
Approval by MK REG SPT.	Signature:	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☒ Per phone con. w/Gale Hruska (concerns: compaction + tracked material)

A:FCRPAPER.DOC

2. With the fines conveyor speed adjustment at 0, start the fines conveyor and increase to desired speed. Check the belt tracking and alignment and adjust if necessary.

3. With the drum speed adjustment at 0, start the drum and increase to desired speed.

4. With the feed conveyor adjustment at 0, start the feed conveyor and increase to desired speed. Check the belt tracking and alignment and adjust as necessary.

5.3 Loading Screener

Excavated soil will be loaded directly into the screener hopper with the backhoe for processing.

1. Begin feeding carefully to be sure that the screen speeds are suitable.

2. The loader operator must use good judgement when loading the screen. Any objects which could severely damage the screen must be separated before loading into the hopper.

3. Generally, load material into the front end of the hopper.

4. Operate the prescreen whenever necessary to remove large material from the top. Make sure no one is standing in the dump area before operating the prescreen.

5.4 Flail Hammer/Shredder Operation

Detailed instructions will be added for flail hammer (shredder after successful procurement of an alternate screener.

5.5 Product Handling to Truck

Screened material will be conveyed from the screener unit into the tractor trailer bed via the stacking conveyor and/or via the center pivot loader.

5.6 Rejected Material

Rejected material from the screening process will be discharged into a lined pile or an a planned excavation area. The material will be segregated into separate lined piles based on material type, i.e., wood waste, rocks, and other.

5.2.1 Starting Engine

1. Check all fluid levels before starting engine.

2. Turn all switches to off and make sure emergency stop switches are deactivated (out position).

3. Pull out the throttle enough for 1000 RPM **or to be determined for alternate screener**.

4. Push and hold override button. If the red light turns on, an automatic shutdown or emergency stop switch is engaged and will not allow the engine to start. Check all gauges and switches and correct the shutdown condition. Turn the ignition switch until the engine starts. Immediately release the key, but hold the override button for approximately 5 seconds or until oil pressure is maintained.

5. Check all engine gauges and allow engine to warm up before increasing throttle to operating speed.

5.2.2 Positioning The Conveyor - **Knight Trommel Screener**

NOTE: Detailed instructions will be added for alternate screener after successful procurement.

After the engine has warmed up, the fines conveyor can be moved into position.

1. Remove the transport lock.

2. Make sure the area under the conveyor is clear of obstructions or bystanders.

3. Lower and extend the conveyor using the fine conveyor cylinder switch on the control panel.

4. Insert locking pins in side frame.

5.2.3 Starting The Components

See Note in Sect. 5.2.2

1. Increase engine speed to 1800-2000 RPM.

Add 3.6 Dump Truck

Type to be determined. The dump trucks are used to transport unscreened soil form the excavation site to the screener location.

Add 3.7 Trackhoe

Type to be determined. The trackhoe may be used to load excavated soil into dump trucks prior to screening.

4.0 SAFETY AND HEALTH PRECAUTIONS AND CONTROLS

1. Follow explosives Handling Procedures as required by NSWC Crane Safety Department.

2. Use modified Level D PPE per the Site Safety and Health Plan (SSHP), Appendix A. Personnel shall avoid direct contact with contaminated soil as much as possible. Hearing protection is required within 15 feet of operating equipment.

3. Maintain clear distance of approximately 15 feet and wear high visibility vest when working within moving machinery path. Stay in equipment operators line-of-sight. Ensure back-up alarms are operational on equipment.

4. Ensure all rotating and conveyer equipment guards are in place and functional prior to equipment operation.

5. Ensure Screener is operated on level ground and is properly locked and stabilized in position.

6. Know location of emergency stop switch on Screener control panel.

7. Shut-down Screener and remove key prior to refueling and servicing.

8. Ensure trailer brakes are locked on Semi-Tractor and Live-Bottom Trailer prior to loading.

5.0 PROCEDURE

5.1 Placement

Placement of the screener unit will be per the Soil Excavation Plan, Appendix E.

5.2 Screener Start-up

FIELD SOP: 1.0
TITLE: SOIL SCREENING OPERATION

1.0 PURPOSE

This procedure describes the operations related to using the soil screener at the excavation sites.

2.0 SCOPE

This procedure applies to the Naval Surface Warfare Center, Crane, Indiana site for Bioremediation Facility full-scale operations.

3.0 EQUIPMENT

The following equipment will be used to screen the excavated soil for removal of large particles not suitable for composting at the Bioremediation Facility:

3.1 Soil Screener

The soil screener is a Knight Manufacturing Corporation model 005580 ProScreen Trommel Screen **or alternate screener to be determined**. The screener is used to filter out the large particles over 1.5 inches in diameter that are not suitable for composting. It is equipped with a conveyor **or chute** for fines stacking or loading.

3.2 Backhoe

The backhoe is a CAT 416 B that is used to load excavated soil into the screener and for reject material handling.

3.3 Semi-Tractor and Live-Bottom Trailer

The semi-tractor is a Mack model 169CH613. The live-bottom trailer is a Red River model HS 236 102. The trailer is 43 feet long and has a minimum capacity of 48 cubic yards. It has a conveyor floor which is capable of discharging material out the rear of the trailer. The tractor-trailer rig is used to transport screened soil from the excavation sites to the composting facility.

3.4 Stacking Conveyor

The stacking conveyor is a trough belt conveyor which is used to convey the screened material from the discharge of the screener to the live-bottom trailer.

3.5 Center Pivot Loader

The rubber tired loader is a Catepillar 966F and is used for moving larger quantities of material, particularly when loading trucks.

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR) VOID

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS002
Soil Screening Equipment		Page 1 of 5

Reference Documents: Full-Scale Operational Plan for Soils Bioremediation Facility, February 1998; Appendix E Excavation Plan and SOP 1.0 Soil Screening Operation

Problem / Change Description:

1. The current screener is rejecting more material than originally expected. Wet conditions are causing the material to "ball up" in the screener, thereby increasing rejects production into unacceptable limits.

2. The current equipment positioning of the screener is restrictive. We are experiencing excessive down time to handle the large volume of rejects and the repositioning of the equipment.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 2/13/98

Resolution:

Procure a higher production screener and revise operations as follows:

1. Permit a central screening location at each of the 4 sites. This will allow for a larger production area which will provide the area necessary to properly handle the rejects without experiencing downtime. This will also minimize the repositioning time required as the excavations move around the facilities. The material will be transported to the central location via dump truck. Revise Appx E figures E1-1 thru E1-4 to show an alternative central location for screening in addition to screener set ups in the immediate excavation area. The screener would be set up in the flat grassy area at the backside (south) of Mine Fill "A". A containment pad constructed layers of 10 mil polyethylene sheeting, geo-clay liner (left over from original DBG cap), and 6" of #53 stone, would be installed in the central screening area. The polyethylene and GCL would go up and over a berm constructed of large diameter PVC pipe, straw bales, or earth. A sump will be located at the low point for water collection. The containment pad and screener would be relocated to the next area (Mine Fill "B") at the completion of Mine Fill "A" activities.

2. Replace the current screener with screening equipment that includes a flailing device that will pulverize the material, further reducing rejects. Revise SOP 1.0 Soil Screening Operation per the attached.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature:	Date: 2/16/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Ball	Date: 2/16/98	Additional Reviews: By/Date VOID – 2/23/98		
Approval by MK QC	Signature: R. L. Dreyer	Date: 2/16/98	VOID		
Approval by MK REG SPT.	Signature: NA –	Date:			

Regulator Approval/Notification Recommended:
Yes ☐ No ☐

4.0
EXCAVATION AND SCREENING OF CONTAMINATED SOIL

4.1 PERMITS

Prior to initiating any excavating, a Digging Permit will be required. In addition, a statement of clearance for safe access based on the removal or absence of unexploded ordnance in the work zone has been obtained and is included in Attachment E1-A of this Plan.

4.2 SOIL EXCAVATION

An estimated 11,000 cubic yards of explosive contaminated soil will be excavated at Mine Fill A by a backhoe/loader and/or a skid steer loader. Particular attention will be paid to the areas near and about the Mine Fill buildings. Excavation will proceed cautiously due to the potential of unknown buried utilities and piping. NSWC Crane utility and building foundation drawings are provided in Attachment E1-B of this Plan.

Soil excavation will begin in areas with pre-determined grids near Buildings 153 and 158 as shown on Figures E1-1 and E1-2. Each grid will be excavated until confirmation sample results indicate that cleanup goals have **been** met, however the maximum depth of excavation will not exceed two feet. If cleanup goals have not **been** met and the area requires excavation in excess of two feet, NSWC Crane EPD will provide further direction. In areas of shallow bedrock, excavation will cease upon bedrock contact. Areas under construction will be identified and barricaded for personnel protection as described in the SSHP, Appendix A. The area will be sampled and ***surveyed*** ~~covered to avoid leaving open excavations during periods of predicted precipitation~~. During ***the months of October through May*** ~~daily operations~~, open excavations will be covered during periods of ***heavy*** ~~predicted~~ precipitation to prevent contact waters from forming.

4.3 SOIL SCREENING

Contaminated soil will be screened at the excavation site to remove oversize material (1½" or larger) from the soil prior to transport to the Bioremediation Facility for Full-Scale composting. The excavated soil will be loaded into the soil screening equipment using a backhoe/loader, excavator, or trackhoe. The screening will be performed in

~~minimum of one sample for volatile organics analysis will be collected from the center of each grid block at the 12 to 18-inch depth and will not be composited.~~

5.3 MARKING GRID BLOCKS FOR EXCAVATION

Analytical results will be used to mark grid blocks or sampling areas as requiring excavation. If a grid block or sampling area shows contamination (off-site laboratory results TNT or RDX shows greater than cleanup goals in Table 1-2 of the Full-Scale Operations Plan) to a depth of three feet, the grid block or area will be marked for three feet of excavation. If a grid block or area shows contamination at the one-foot depth, the block or area will be marked for one foot of excavation. If a grid block shows no contamination at the one-foot and the three-foot depth, the grid block shall not be marked for excavation. Additional grid blocks will be sampled as necessary to allow excavation of the required volume of soil.

5.4 IN-PROCESS EXCAVATION SOIL SAMPLING

Field test kits for explosives will be used to delineate the horizontal and vertical extent of contamination during excavation activities, followed by confirmation sampling and laboratory analysis. After the initial and in-process excavation activities are complete in each grid, the horizontal and vertical extent of remaining contaminants will be determined by using colorometric field test kits for TNT and RDX as described in Section 4.0 of the approved Full-Scale QAPP [MK, 1998a]. A sampling grid will be laid out along the base of the excavation(s), using a nodal spacing provided in Figures E1-1 through E1-4 of this Plan. Each grid block will be sampled using procedures described in the approved Full-Scale QAPP [MK, 1998a] for in-process excavation sampling. Discrete samples will be collected from the four corners and center of the grid block, from surface to six inches below ground surface within the excavation, using a drive sampler, composited and analyzed for TNT and RDX (field test kits).

Pin flags will be placed every 20 feet along sidewalls greater than one foot in depth. Samples will be collected at each pin flag location, using a drive sampler. One sample will be collected from 0-6 inches into the sidewall surface at the midpoint between the surface and bottom of excavation. The sample will be analyzed for TNT and RDX (field test kits).

After the soil is excavated to a depth where field screening indicate acceptable concentrations of explosives, post-excavation soil samples will be collected for analysis by a laboratory. Post-excavation soil samples will be taken as described in Section 5.5 of this Plan.

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	Subcontract No.: N/A	FCR No.: FCO3-FCR-FS027 Rev. 0
Consolidate Excavation Completion Report and Compost Completion Report		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Section 12 and Section 14 Table 14-1 of the Full Scale Bioremediation Facility Operations Plan requires that within 180 days of completion two separate Interim Measures reports for each SWMU, Excavation Completion Report and Compost Completion Report, should be submitted. For simplification and ease of managing reports and correspondence, it is requested that one Interim Measures report be submitted for each SWMU containing all the information required by the separate Excavation Completion Report and Compost Completion Report.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 2/1/2000

Resolution:
Amend Section 12 Paragraph 4 Bullet 3 of the Full Scale Bioremediation Facility Operations Plan as follows: Interim Measures Reports - These reports will include a summary of operations and analytical results, cubic yards of soil processed, process adjustments, disposal of wastes and treated soil, photographs, confirmatory s[illegible]ling and backfilling actions, acceptance of work etc.. These reports will be submitted within 180 days u[illegible] completion of interim measures and restoration activities at each SWMU.

Amend Section 14 Table 14-1 of the Full Scale Bioremediation Facility Operations Plan as follows: see attachment.

Approval by TolTest, PM	Signature: Lance Parsons	Date:	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date:	Approval by EPD ECOTR:	Signature Christine Freeman	Date

Regulator Approval/Notification Recommended:
Yes No ■

2/3/2000

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS027 Rev. 0
Consolidate Excavation Completion Report and Compost Completion Report		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Section 12 and Section 14 Table 14-1 of the Full Scale Bioremediation Facility Operations Plan requires that within 180 days of completion two separate Interim Measures reports for each SWMU, Excavation Completion Report and Compost Completion Report, should be submitted. For simplification and ease of managing reports and correspondence, it is requested that one Interim Measures report be submitted for each SWMU containing all the information required by the separate Excavation Completion Report and Compost Completion Report.

Initiated by	Signature: Lance M Po	Organization: TolTest, Inc.	Date: 2/1/2000

Resolution:
Amend Section 12 Paragraph 4 Bullet 3 of the Full Scale Bioremediation Facility Operations Plan as follows: Interim Measures Reports - These reports will include a summary of operations and analytical results, cubic yards of soil processed, process adjustments, disposal of wastes and treated soil, photographs, confirmatory sampling and backfilling actions, acceptance of work etc.. These reports will be submitted within 180 days upon completion of interim measures and restoration activities at each SWMU.

Amend Section 14 Table 14-1 of the Full Scale Bioremediation Facility Operations Plan as follows: see attachment.

Approval by TolTest PM	Signature: Lance Parsons	Date: 2/1/00	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date: 2/1/00	**Approval by EPD ECOTR:**	Signature Christine D Freeman Christine Freeman	Date 2/2/00

Regulator Approval/Notification Recommended:
Yes ☒ No ☐

see faxed approval

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS025 Rev. 1
Disposition of Reject Rocks from Screener Site		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Current handling requirements for rocks rejected from the screener operation are labor intensive and time consuming. Reject rocks (not gravel) must be transported to the Biofacility, washed to remove visible contamination, and transported back to the SWMU of origination. The rocks are then put into an open excavation and covered with no less than two feet of finished compost. This procedure was outlined in FCR FS014.

Initiated by	Signature: Lance M Parsons	Organization: TolTest, Inc.	Date: 1/19/2000

Resolution:
Amend the FSOP Section 7.1.1 as follows:

Insert the following after the second sentence of the first paragraph: "Separated rocks determined to be non-hazardous debris (40 CFR 268.2(h)) will be placed in the bottom of an open excavation at the SWMU of origination and covered with no less that 2 feet of finished compost. The grids where the rocks are to be placed will be shown, by post-excavation sampling, to contain levels of explosives above industrial cleanup levels. If an open excavation is not available at the time of screening, the rocks will be contained either in a metal collection bin and covered with 6 mil plastic, or a bermed containment pad will be constructed of 60 mil plastic (or multiple layers of thinner plastic equivalent to 60 mil) with a 6 mil plastic covering. In the event that no contaminated grids above industrial cleanup levels as shown by post-excavation sampling are available for placement of the rocks, the following procedures apply."

Approval by TolTest, PM	Signature: Lance M Parsons Lance Parsons	Date: 01/19/00	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty Debbie Leighty	Date: 1/19/00	Approval by EPD ECOTR:	Signature Christine D Freeman Christine Freeman	Date 1/20/00

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ Approval by fax

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS025 Rev. 1
Disposition of Reject Rocks from Screener Site		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Current handling requirements for rocks rejected from the screener operation are labor intensive and time consuming. Reject rocks (not gravel) must be transported to the Biofacility, washed to remove visible contamination, and transported back to the SWMU of origination. The rocks are then put into an open excavation and covered with no less than two feet of finished compost. This procedure was outlined in FCR FS014.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 1/19/2000

Resolution:
Amend the FSOP Section 7.1.1 as follows:

Insert the following after the second sentence of the first paragraph: "Separated rocks determined to be non-hazardous debris (40 CFR 268.2(h)) will be placed in the bottom of an open excavation at the SWMU of origination and covered with no less that 2 feet of f ed compost. The grids where the rocks are to be placed will be shown, by post-excavation sampling, to contain levels of explosives above industrial cleanup levels. If an open excavation is not available at the time of screening, the rocks will be contained either in a metal collection bin and covered with 6 mil plastic, or a bermed containment pad will be constructed of 60 mil plastic (or multiple layers of thinner plastic equivalent to 60 mil) with a 6 mil plastic covering. In the event that no contaminated grids above industrial cleanup levels as shown by post-excavation sampling are available for placement of the rocks, the following procedures apply."

Approval by TolTest, PM	Signature: Lance Parsons	Date:	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date:	Approval by EPD ECOTR:	Signature Christine O Freeman Christine Freeman	Date 1/20/00

Regulator Approval/Notification Recommended:
Yes No ■

1/20/2000

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FC03-FCR-FS023 Rev. 0
Composting of Dirt & Rock Rejects from MFA Screening Operation		Page 1 of 1

Reference Documents:

Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Quality Assurance Project Plan for Full-Scale Operations Soils Bioremediation Facility March 1998 Rev. 2

Problem / Change Description:

The reject pile from the soil screening operation at Mine Fill A is a mixture of large gravel and contaminated soil clods. This mixture has been screened a minimum of five times and has failed to pass through the screener. This mixture should not be composted in the normal manner since: 1) the mixture has not passed through the screener (a requirement of Sec. 4.0 of the FSOP) and; 2) the high concentration of gravel in the mix would cause excessive wear and tear on the SCARAB. This gravel/soil mixture should be composted using the front-end loader to turn and mix the windrow. The use of the front-end loader (provided for in Section 9.1 of the FSOP) will prevent undue wear on the SCARAB from the high concentration of gravel. This procedure should be implemented when a similar reject pile is generated during Mine Fill B screening operations.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 7/21/99

Resolution:

Insert the following paragraph to the end of Appendix E-1 Section 4.3 and to the end of Appendix E-2 Section 4.3 of the FSOP;

The reject pile consisting of large gravel and soil clods which has been rejected by the screener numerous times shall be transported to the North building of the Biofacility and segregated from existing stockpiled soil. The reject pile will be pulverized by heavy equipment in order to further reduce soil/gravel particle size. Amendments for this windrow will be mixed, loaded, and shaped as outlined in Field SOP 3.0 and 4.0 of the FSOP. The contaminated soil/gravel mixture will then be loaded onto the windrow with the front-end loader and will be processed to residential cleanup levels as verified by laboratory testing. From that time until the end of the windrow life cycle, the front-end loader will be utilized to turn and mix the windrow. All other windrow process monitoring, moisture addition, and sampling procedures will remain unchanged as outlined in Field SOP: QAPP 4.4 of the QAPP. At the end of the windrow life cycle, the treated reject pile compost will be returned to the bottom of the excavation and the final location tracked and logged.

Approval by TolTest, PM	Signature: Lance Parsons	Date:	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date:	Approval by EPD ECOTR:	Signature Christine Freeman	Date

Regulator Approval/Notification Recommended:

Yes No ■

8/3/99

Crane Naval Surface Warfare Center

EJOC Contract N622467-96-D-0052

TolTest, Inc.

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS021 Rev. 1
Weighing of Treated Compost Exiting the Biofacility		Page 1 of 1

Reference Documents:

Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Treated compost that has met clean-up goals is currently loaded onto dump trucks and weighed before being transported to the SWMU of origination. The process of weighing treated compost is both unnecessary and unsafe. It is unnecessary because all amendments and contaminated soil coming into the facility are weighed, and the Navy is billed on the amount of contaminated soil that is treated not the amount of finished compost that is produced. The weight of each windrow cannot be compared to one another due to varying moisture levels and product degradation. Therefore weighing finished compost serves no purpose and has no benefit to Biofacility operations. The process is unsafe because the truck scale at the Biofacility was designed for trucks to enter from the north (the direction trucks with amendments and soil enter from) which allows the driver easy access to the scale transmitter booth upon exiting the truck cab. Trucks with finished compost must enter from the south which requires the driver upon exiting the cab to walk on top of the guardrail (an obvious safety concern) and around the truck to access the scale transmitter booth.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 7/8/99

Resolution:

Replace paragraph two in Section 5.6 of the FSOP with the following:

ce the treatment goals have been met as determined by sampling results, the building will be emptied by loading treated compost ectly into decontaminated dump trucks. The treated compost will then be transported to the SWMU of origination, the on-site solid waste landfill for use as daily cover pending IDEM approval, or disposed of as approved by NSWC Crane EPD according to the flowchart provided in Figure 1-3.

Remove the third sentence of Section 2.0, Field SOP 2.0 in Appendix D of the FSOP: Trucks carrying treated soil shall be weighed prior to disposal at the on-site landfill or excavation areas or other areas as directed by NSWC Crane EPD.

Approval by TolTest, PM	Signature: Lance Parsons	Date:	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date:	Approval by EPD ECOTR	Signature: Christine Freeman	Date:
			Additional Reviews: By/Date	7/26/99	

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS021 Rev. 1
Weighing of Treated Compost Exiting the Biofacility		Page 1 of 1

Reference Documents:

Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Treated compost that has met clean-up goals is currently loaded onto dump trucks and weighed before being transported to the SWMU of origination. The process of weighing treated compost is both unnecessary and unsafe. It is unnecessary because all amendments and contaminated soil coming into the facility are weighed, and the Navy is billed on the amount of contaminated soil that is treated not the amount of finished compost that is produced. The weight of each windrow cannot be compared to one another due to varying moisture levels and product degradation. Therefore weighing finished compost serves no purpose and has no benefit to Biofacility operations. The process is unsafe because the truck scale at the Biofacility was designed for trucks to enter from the north (the direction trucks with amendments and soil enter from) which allows the driver easy access to the scale transmitter booth upon exiting the truck cab. Trucks with finished compost must enter from the south which requires the driver upon exiting the cab to walk on top of the guardrail (an obvious safety concern) and around the truck to access the scale transmitter booth.

Initiated by	Signature: Lance Parsons	Organization: TolTest, Inc.	Date: 7/8/99

Resolution:

Replace paragraph two in Section 5.6 of the FSOP with the following:

Once the treatment goals have been met as determined by sampling results, the building will be emptied by loading treated compost directly into decontaminated dump trucks. The treated compost will then be transported to the SWMU of origination or disposed of as approved by NSWC Crane EPD according to the flowchart provided in Figure 1-3.

Remove the third sentence of Section 2.0, Field SOP 2.0 in Appendix D of the FSOP: Trucks carrying treated soil shall be weighed prior to disposal at the on-site landfill or excavation areas or other areas as directed by NSWC Crane EPD.

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 7/9/99	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty Debbie Leighty	Date: 7/12/99	Approval by EPD ECOTR	Signature: Christine D. Freeman Christine Freeman	Date: 7/27/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ see attached fax

Lance Parsons

From: Freeman Christine D CNIN <FreemanCD@cninexchsrv08.crane.navy.mil>
To: 'PETER RAMANAUSKAS' <RAMANAUSKAS.PETER@epamail.epa.gov>
Cc: Lance Parsons (E-mail) <toltest@kiva.net>
Sent: Wednesday, July 07, 1999 3:51 PM
Subject: RE: FCR-FS018 Rev 1 -Reply

Thanks for the speedy reply!

The Navy will consider the below message a verbal approval and begin moving the equipment from MFA to MFB using the procedures set in FCR-FS018 Rev. 1 and the Biofacility Operations Plan. I assume a faxed copy of FCR-FS018 Rev. 1 w/your signature will follow.

Thanks again.

-----Original Message-----
From: PETER RAMANAUSKAS [SMTP:RAMANAUSKAS.PETER@epamail.epa.gov]
Sent: Wednesday, July 07, 1999 2:30 PM
To: FreemanCD@cninexchsrv08.crane.navy.mil
Subject: FCR-FS018 Rev 1 -Reply

No further comments. You should be good to go!

Pete

>>> Freeman Christine D CNIN
<FreemanCD@cninexchsrv08.crane.navy.mil> 07/07/99 01:44pm >>>
Just checking to see if you have any other comments on FCR-FS018
Rev. 1 (Rev
1 incorporates your first set of comments). Please let me know
because
TolTest would like to start moving equipment ASAP.

Thanks

Lance Parsons

From: Freeman Christine D CNIN <freeman_cd@crane.navy.mil>
To: Lance Parsons (E-mail) <toltest@kiva.net>
Sent: Monday, June 28, 1999 8:52 AM
Subject: FW: FCRs

Please make the modification mentioned below and e-mail the revised FCR so I can review & send to EPA for approval.
Thanks

-----Original Message-----
From: PETER RAMANAUSKAS [SMTP:RAMANAUSKAS.PETER@epamail.epa.gov] <mailto:[SMTP:RAMANAUSKAS.PETER@epamail.epa.gov]>
Sent: Friday, June 25, 1999 2:27 PM
To: freeman_cd@crane.navy.mil <mailto:freeman_cd@crane.navy.mil>
Subject: FCRs

Hi Chris,

Regarding the FCRs that you gave me on Thursday:

For the FCR pertaining to Transportation of Excavation Equipment from Mine Fill A to Mine Fill B: The only thing I think needs to be done is to modify the "When moving equipment to Rockeye or ABG..." sentence to explain that these decontamination procedures will be followed at the conclusion of excavation activities (i.e. when the excavating equipment will be prepared for transportation off-site). Otherwise it seems fine.
You can FAX or Email me the modified FCR so I can approve it quickly as I remember Lance mentioning he was going to be moving the equipment within a few days. I will be out on Monday (I won't be at home either) and Tuesday through Friday I have a training class, but I will try to stop in the office during breaks to check for this modification and sign-off on it.
I'm afraid I won't get to the remaining two FCRs before the end of today, but I will turn my attention to them next week. I'll keep you posted.
Thanks much & hope you had a good weekend!
Pete

Crane Naval Surface Warfare Center

EJOC Contract N622467-96-D-0052

TolTest, Inc.

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS018 Rev. 1
Transportation of Excavation Equipment from Mine Fill A to Mine Fill B		Page 1 of 1

Reference Documents:

Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Field SOP 7.0, Section 3.2.1 in Appendix D of the FSOP requires that excavation equipment be fully decontaminated prior to exiting the exclusion zone. This procedure would apply when moving equipment from Mine Fill A to Mine Fill B. However the soil profile at Mine Fill B is similar to that of Mine Fill A and the constituents of concern are exactly the same at both sites (explosives, metals, and volatiles). Modification of the decontamination procedure when moving equipment from Mine Fill A to Mine Fill B as outlined below would prevent the generation and subsequent disposal of contaminated waste water.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 6/28/99

Resolution:

Amend Field SOP 7.0, Section 3.2.1 in Appendix D of the FSOP as follows:

Insert the following sentence at the end of the first paragraph: "When moving equipment to Rockeye, Ammunition Burning Grounds, or when preparing equipment for off-site transportation, the following decontamination procedures apply:"

Insert the following after number 5 of this section:

When moving excavation equipment to Mine Fill B from Mine Fill A, decontamination will proceed as follows:

1. Sweep or brush all loose dirt off the exterior and interior of the equipment.
2. Remove excess soil from wheels, tracks, buckets, and other exposed equipment parts with shovels.
3. Place 6 mil plastic sheeting on bed of transport truck to include a sufficient amount to wrap around equipment.
4. After loading equipment onto transport truck, wrap all wheel, tracks, buckets, and other exposed contaminated parts with plastic sheeting.
5. Visually inspect the equipment to ensure all contamination is covered prior to leaving the site.

Approval by TolTest, PM	Signature: Lance Parsons	Date:	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty	Date:	Approval by EPD ECOTR	Signature: Christine Freeman	Date:
			Additional Reviews: By/Date	7/7/99	

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS018 **Rev. 1**
Transportation of Excavation Equipment from Mine Fill A to Mine Fill B		Page 1 of 1

Reference Documents:

Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

Field SOP 7.0, Section 3.2.1 in Appendix D of the FSOP requires that excavation equipment be fully decontaminated prior to exiting the exclusion zone. This procedure would apply when moving equipment from Mine Fill A to Mine Fill B. However the soil profile at Mine Fill B is similar to that of Mine Fill A and the constituents of concern are exactly the same at both sites (explosives, metals, and volatiles). Modification of the decontamination procedure when moving equipment from Mine Fill A to Mine Fill B as outlined below would prevent the generation and subsequent disposal of contaminated waste water.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 6/28/99

Resolution:

Amend Field SOP 7.0, Section 3.2.1 in Appendix D of the FSOP as follows:

Insert the following sentence at the end of the first paragraph: "When moving equipment to Rockeye, Ammunition Burning Grounds, or when preparing equipment for off-site transportation, the following decontamination procedures apply:"

Insert the following after number 5 of this section:

en moving excavation equipment to Mine Fill B from Mine Fill A, decontamination will proceed as follows:

1. Sweep or brush all loose dirt off the exterior and interior of the equipment.
2. Remove excess soil from wheels; tracks, buckets, and other exposed equipment parts with shovels.
3. Place 6 mil plastic sheeting on bed of transport truck to include a sufficient amount to wrap around equipment.
4. After loading equipment onto transport truck, wrap all wheel, tracks, buckets, and other exposed contaminated parts with plastic sheeting.
5. Visually inspect the equipment to ensure all contamination is covered prior to leaving the site.

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 6/28/99	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson Brent Robertson	Date 6/29/99
Approval by TolTest QC/SHSO	Signature: Debbie Leighty Debbie Leighty	Date: 6/28/99	**Approval by EPD ECOTR**	Signature: Christine D. Freeman Christine Freeman	Date: 6/28/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS004
EXCAVATION OF SOIL AT BUILDING 165 (MINE FILL B)		Page 1 of 11

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2
Quality Assurance Project Plan for Full-Scale Operations at the Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:

The CAAA will be installing three new utility lines (electrical service and water) and one tunnel at Building 165 -- Mine Fill B (as shown in the attached drawing). The work is expected to start during the first week of June 1998.

Therefore, there is a need to establish a plan for excavating soil to facilitate the installation of the new utility lines and tunnel at Building 165 -- Mine Fill B.

NOTE: A complete Soil Excavation Plan for Mine Fill B (Buildings 165, 166, 167, 171, 172, and 173) will be developed and issued for approval at a later date.

Initiated by	Signature: [signature]	Organization: Morrison Knudsen Corporation	Date: 5/5/98

Resolution:

Proceed with soil grid layout, sampling, excavation, screening, and transportation per the attached procedure.

Proceed with treatment of soil per the referenced documents.

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature: [signature]	Date: 5/5/98	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 5/7/98	Additional Reviews: By/Date		
Approval by MK QC	Signature: [signature]	Date: 5/7/98	Christine D. Greenman Env. Prot. Dept. - NSWC		5/11/98
Approval by MK SPT.	Signature:	Date:	Approved w/ comments attached		

Regulator Approval/Notification Recommended: Yes ☒ No ☐ [signature] Letter 5/15/98

A:FCRFS004.DOC

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.:	Subcontract No.:	FCR No.:
FC03	N/A	FCO3-FCR-FS017 Rev. 0
Formation of windrow with Mine Fill A and Mine Fill B soils		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
The contaminated soil excavated from Bldg. 165 at Mine Fill B (approx. 20 tons) is stored in the North compost building at the Biofacility separate from the Mine Fill A soils. This stockpile has impacted operations at the Biofacility in two ways: 1) it has been moved several times to accommodate equipment maneuvering and placement of the shortened windrows; and 2) of primary importance, it prevents full utilization of the building for stockpiling of Mine Fill A soils because it requires an inordinate amount of floor space given its small size.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 6/23/99

Resolution:
Comments to FCR-FS004 dated 5/5/98 (attached) by Carol Witt-Smith of EPA Region V imply that Mine Fill B and Mine Fill A soils can be mixed in one windrow (see the end of the first paragraph of Section 8 of the Soil Excavation for New Utility and Tunnel Installation at Building 165). Furthermore, the soil profile at Mine Fill B is similar to that of Mine Fill A and the constituents of concern are exactly the same at both sites (explosives, metals, and volatiles). There are PCBs present at Mine Fill B however they were not a constituent of concern at Building 165. Therefore to alleviate the problems associated with the Mine B stockpile, this soil will be blended with soil from Mine Fill A to form one windrow. The disposition of this windrow, as with all other windrows, be tracked, logged, and reported to the NSWC Crane EPD.

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 6/23/99	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Debbie Leighty Debbie Leighty	Date: 6/23/99	Approval by EPD ECOTR	Signature: Christine D. Freeman Christine Freeman	Date: 6/23/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ 6/24/99

PM shall follow the reporting requirements described in PHSP 04.1. The PS shall conduct a critique of the incident with selected TolTest and Subcontractor personnel as soon as possible after critical management of the incident is complete. The PS and SSHO will develop lessons learned and communicate them to all affected personnel.

3.3 TolTest Site Safety and Health Officer

The TolTest SSHO, Ms. Debbie Leighty, is responsible for the day-to-day implementation of the SSHP, and verification of compliance with the SSHP and all applicable occupational safety and health rules and regulations. In the event that Ms. Leighty is unavailable, the Project Manager or Mr. Travis Nowak will fill in. The Project Manager also has the option to appoint another TolTest employee to fill in temporarily. The SSHO has the authority to suspend work at any time if there is an imminent threat to the health and safety of project workers or the general public. The SSHO shall assure the Navy's designated authority at the site is notified immediately of any accident including spills. The SSHO shall assist in the accident investigation effort and shall have final approval authority for accident reports. The TolTest Work Plan document describes in detail the role and responsibilities of the SSHO on this project. The SSHO, in conjunction with the Corporate Health and Safety Manager, are responsible for making modifications to the plans and recommending changes to the work tasks if they affect safety and health. The SSHO is responsible for ensuring that all required sampling/monitoring is performed and that all required safety and health documentation is maintained.

3.4 Nearest Emergency Medical Facility

Directions to the On-Site NSWC Medical Department:

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of road H-2, just north of H-5. See Figure A-1.

Directions to Bedford Medical Center:

From the Bloomington Gate, head east on Highway 58 to the city of Bedford, turn left onto 16th. This Gate is open 24 hours. The approximate distance to hospital is 22 miles.

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS016 **Rev. 0**
TolTest Site Safety and Health Officer		Page 1 of 1

Reference Documents:
Site-Specific Safety and Health Plan, March 1999 Rev. 0

Problem / Change Description:

Revise the entire Site-Specific Safety and Health Plan to include the name of our new Site Safety and Health Officer, Debbie Leighty. Also revise it to include the appointing of substitute Site Safety and Health Officers by the Project Manager, if needed.

Initiated by	Signature: Lance Parsons	Organization: TolTest, Inc.	Date: 6/15/99

Resolution:
Amend the SSHP Section 3.3 as follows:

3.3 TolTest Site Safety and Health Officer

The TolTest SSHO, Ms. Debbie Leighty, is responsible for the day-to-day implementation of the SSHP, and verification of compliance with the SSHP and all applicable occupational safety and health rules and regulations. In the event that Ms. Leighty is unavailable, the Project Manager or Mr. Travis Nowak will fill in. The Project Manager also has the option to appoint another TolTest Associate to fill in temporarily. The SSHO has the authority to suspend work at any time if there is an imminent threat to the health and safety of project workers or the general public. The SSHO shall assure the Navy's designated authority at the site is notified immediately of any accident including spills. The SSHO shall assist in the accident investigation effort and shall have final approval authority for accident reports. The TolTest Work Plan document describes in detail the role and responsibilities of the SSHO on this project. The SSHO, in conjunction with the Corporate Health and Safety Manager, are responsible for making modifications to the plans and recommending changes to the work tasks if they affect safety and health. The SSHO is responsible for ensuring that all required sampling/monitoring is performed and that all required safety and health documentation is maintained.

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 6/15/99	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson Brent Robertson	Date 6/15/99
Approval by TolTest QC/SHSO	Signature: Debbie Leighty Debbie Leighty	Date: 6/15/99	**Approval by EPD ECOTR**	Signature: Christine D. Freeman Christine Freeman	Date: 6/15/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☐ No ☒

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS015 **Rev. 0**
Exposure Monitoring/Air Sampling Program, Biological Hazards Air Sampling Campaigns		Page 1 of 1

Reference Documents:
Site-Specific Safety and Health Plan, March 1999 Rev. 0

Problem / Change Description:

Revise Section 7.3.2 of the Site-Specific Safety and Health Plan, "Biological Hazards" to exclude the requirements for two time-integrated air sampling campaigns and replace with visible monitoring.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 5/6/99

Resolution:
Amend the SSHP Section 7.3.2 as follows:

7.3.2 **Biological Hazards** Quarterly inspections will be performed by the SSHO inside the Bioremediation Facility for the visible signs of bioaerosols. These inspections will include monitoring of all personnel who have access the facility, for the signs and symptoms of potential over-exposure of bacteria and fungi (yeasts and molds). If evidence shows a potentially high level of bioaerosols, then air sampling campaigns will be initiated.

2.1 Air Sampling Campaigns will be discussed with an Industrial Hygienist familiar with microbiology and related sampling methods. If sampling proves to be necessary, only approved methods will be used.

Approval by TolTest, PM	Signature: Lance Parsons	Date: 5/6/99	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson	Date 5/25/99
Approval by TolTest QC/SHSO	Signature: Travis Nowak	Date: 05/07/99	**Approval by EPD ECOTR**	Signature: Christine D. Freeman Christine Freeman	Date: 5/7/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ Approved change Carol 5/12/99

TOLTEST, INC.

FIGURE 1-4
ROCK DECONTAMINATION WATER AND DISPOSAL DECISION-MAKING FLOWCHART

THIS FLOWCHART APPLIES TO THE EXCAVATION SITE ROCKS

EXCAVATION ROCKS
SCREENED FROM SOIL

↓

WASH ROCKS ← *B*
(Use Section 7.0 and SOP 7.0
Appendix D and QAPP
Procedures)

↓

Rocks to be returned to SWMU of origination? → Yes → Place in excavation and cover with minimum two feet of finished compost

NO

↓

SAMPLE FINAL RINSE WATER
(Use QAPP procedures for lab analysis,
Section 1.3 parameters)

↓

ARE THE RESULTS ALL NON-DETECT? → Yes → Rocks may be disposed of without use restrictions

NO

↓

WHAT REMEDIAL GOALS ARE MET?
(See Tables 1-4a and 1-4b, Section 1.3)

GO TO *A*

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS014 **Rev. 0**
Disposition of Rocks Excavated with Contaminated Soils		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Require final clarification / disposition of rocks excavated with contaminated soil at the excavation sites. Current rock decontamination procedures are labor intensive (multiple washes and rinses are required for every rock) and generates an excessive amount of contaminated rinse water. Special approval is then required for disposal of this potentially contaminated rinse water. Analysis of the rinse water for disposal characterization must meet drinking water standards, which are restrictive since cleanup goals at the excavation sites are to industrial use standards. Realistically these drinking water standards are difficult to meet with this decontamination procedure ensuring that special procedures and approvals will be required for final disposition of the rocks.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 4/23/99

Resolution:
Amend the FSOP Section 7.1.1 as follows:

Change the third and fourth sentence of the first paragraph to "The separated rocks will be containerized and transported to the Biofacility Truck Wash decontamination bay. The rocks will be thoroughly rinsed with a high pressure, low volume sprayer to remove all visible soil contamination as described in Field SOP 7.0 in Appendix D of this plan."

Change the second paragraph to "Rinse water will be collected in the wash bay sump for use on the windrows as described in Field SOP 6.0 in Appendix D of this plan. If the rocks are to be placed in other than the SWMU of origination, final rinse samples will be collected and analyzed to determine the cleanliness of the washed rocks as described in SOP QAPP 2.0 of the approved QAPP for full Sc[illegible] Operations. Figure 1-4 provides the decision-making flowchart for the rock decontamination.

[illegible]e Figure 1-4 of the FSOP and replace with the revised Figure 1-4 (attached).

Amend the FSOP Field SOP 7.0, Section 3.2.2 as follows:

A) Delete number 1 through 8.
B) Insert the following:
   1) Containerize the rocks and transport to the Biofacility Truck Wash decontamination bay;
   2) Place the rocks on a metal screen or grate to protect the concrete base of the wash bay;
   3) Utilize a high-pressure low-volume sprayer to remove all visible soil contamination. Allow rinse water to drain into the wash bay sump.
   4) Utilize the rinse water from the wash bay sump on the windrows as described in Field SOP 6.0 in Appendix D of this plan.
   5) Return the rocks to the SWMU of origination and place in the bottom of an open excavation. Cover with no less than ~~three~~ TWO feet of finished compost. Log and map the area and grid where the rocks were placed.
   6) If the rocks are to be placed in an area other than the SWMU of origination, then collect final rinse samples for off-site laboratory analysis per SOP QAPP 2.0 in the approved QAPP for Full-Scale Operations. The same volume of water shall be used per volume of rock for each final rinsing.

Approval by TolTest, PM	Signature: Lance Parsons	Date:	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Travis Nowak	Date:	**Approval by EPD ECOTR**	Signature: Christine Freeman	Date:
			Additional Reviews: By/Date		

[illegible] Approval/Notification Recommended:
Yes ☒ No ☐ Modification 2 feet cover okay instead of 3.
Send final pages after this approval. [illegible] 4/25/99

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS014 **Rev. 0**
Disposition of Rocks Excavated with Contaminated Soils		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
Require final clarification / disposition of rocks excavated with contaminated soil at the excavation sites. Current rock decontamination procedures are labor intensive (multiple washes and rinses are required for every rock) and generates an excessive amount of contaminated rinse water. Special approval is then required for disposal of this potentially contaminated rinse water. Analysis of the rinse water for disposal characterization must meet drinking water standards, which are restrictive since cleanup goals at the excavation sites are to industrial use standards. Realistically these drinking water standards are difficult to meet with this decontamination procedure ensuring that special procedures and approvals will be required for final disposition of the rocks.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 4/23/99

Resolution:
Amend the FSOP Section 7.1.1 as follows:

Change the third and fourth sentence of the first paragraph to "The separated rocks will be containerized and transported to the Biofacility Truck Wash decontamination bay. The rocks will be thoroughly rinsed with a high pressure, low volume sprayer to remove all visible soil contamination as described in Field SOP 7.0 in Appendix D of this plan."

Change the second paragraph to "Rinse water will be collected in the wash bay sump for use on the windrows as described in Field SOP 6.0 in Appendix D of this plan. If the rocks are to be placed in other than the SWMU of origination, final rinse samples will be collected and analyzed to determine the cleanliness of the washed rocks as described in SOP QAPP 2.0 of the approved QAPP for full `cale Operations. Figure 1-4 provides the decision-making flowchart for the rock decontamination.

emove Figure 1-4 of the FSOP and replace with the revised Figure 1-4 (attached).

Amend the FSOP Field SOP 7.0, Section 3.2.2 as follows:

A) Delete number 1 through 8.
B) Insert the following:
   1) Containerize the rocks and transport to the Biofacility Truck Wash decontamination bay;
   2) Place the rocks on a metal screen or grate to protect the concrete base of the wash bay;
   3) Utilize a high-pressure low-volume sprayer to remove all visible soil contamination. Allow rinse water to drain into the wash bay sump.
   4) Utilize the rinse water from the wash bay sump on the windrows as described in Field SOP 6.0 in Appendix D of this plan.
   5) Return the rocks to the SWMU of origination and place in the bottom of an open excavation. Cover with no less than two feet of finished compost. Log and map the area and grid where the rocks were placed.
   6) If the rocks are to be placed in an area other than the SWMU of origination, then collect final rinse samples for off-site laboratory analysis per SOP QAPP 2.0 in the approved QAPP for Full-Scale Operations. The same volume of water shall be used per volume of rock for each final rinsing.

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 4/27/99	**Approval by ROICC/NTR or RPM**	Signature: Brent Robertson Brent Robertson	Date 5/13/99
Approval by TolTest QC/SHSO	Signature: Travis Nowak Travis Nowak	Date: 4/27/99	**Approval by EPD ECOTR**	Signature: Christine D. Freeman Christine Freeman	Date: 4/28/99
			Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ See attached approval signature ~~(faxed copy)~~

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	Subcontract No.: N/A	FCR No.: FCO3-FCR-FS013 Rev. 0
5th Windrow on East side of Building N		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2
Full-Scale QAPP 2/ 98 Rev. O

Problem / Change Description:
Utilize the east-end of the North building for construction of shortened windrows.

Initiated by	Signature:	Organization: TolTest, Inc.	Date: 4/12/99

Resolution:
Each windrow (one on the north and/or south side of building) will be unto itself (not one windrow consisting of two short segments), eliminating the need to amend Section 5.1.2 "Sample identification of the FS QAPP 3 / 98 Rev. 2". Each windrow will be constructed in the same manner as a full length windrow, only shorter. The length will be approximately 125 feet between columns 1 and 7 (see attached drawing). Sample locations will be located at columns (cross sections) 3 and 5, all other sampling procedures will remain the same. The SCARAB turn area will be in the uncontaminated zone between columns 7 and 9. Contaminated soil will be contained between columns 9 and 13, down-gradient of the windrows.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 2

To Chris Freeman	From Carol Witt-Smith
Dept./Agency NSWC	Phone # 312 886 6146
Fax # 812 854 4177	Fax # 312 353 4788

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Approval by TolTest, PM	Signature: Lance Parsons Lance Parsons	Date: 4/12/99	Approval by ROICC/NTR or RPM	Signature: Brent Robertson	Date
Approval by TolTest QC/SHSO	Signature: Travis Nowak	Date: 04-12-99	Approval by EPD ANTR	Signature: Christine D. Freeman Chris Freeman	Date: 4/14/99
	Signature:	Date:	Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
Yes ☒ No ☐ okay Carol Witt-Smith 4/22/99

Chris Fax (812) 854 4177

DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

IN REPLY REFER TO:
5090
Ser 095/9080
05 APR 1996

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
Attn: Ms. Carol Witt-Smith (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Ms. Witt-Smith:

Crane Division, Naval Surface Warfare Center (NAVSURFWARCENDIV Crane) submits, as enclosure (1), three copies of the TolTest Mine Fill A (SWMU 12/14) and Mine Fill B (SWMU 13/14) Site Specific Safety and Health Plan (SSHP) - Appendix A2 for incorporation into the Final Full Scale (FS) Operational Plan (OP) for the Bioremediation Project. TolTest Inc. will forward to your office an electronic copy of the SSHP. A replacement page for page v of the FS OP Table of Contents is included as enclosure (2). Enclosure (3) is the required certification statement.

NAVSURFWARCENDIV Crane point of contact is
Ms. Christine D. Freeman, Code 09511, telephone 812-854-4423.

Sincerely,

James M. Hunsicker

JAMES M. HUNSICKER
Director, Environmental Protection Department
By direction of
the Commander

Encl:
(1) Appendix A2 - SWMUs 12/14 & 13/14 SSHP
(2) Replacement page for FS OP Table of Contents page v
(3) Certification Statement

Copy to:
ADMINISTRATIVE RECORD (2 copies)
COMNAVSEASYSCOM (SEA OOT) (w/o encls)
IDEM (w/o encls)
NAVSURFWARCENDIV ROICC (w/o encls)
SOUTHNAVFACENGCOM (Code 1864) (w/o encls)
TOLTEST Crane (w/o encls)

Crane Naval Surface Warfare Center TolTest, Inc.	EJOC Contract N622467-96-D-0052

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: FC03	**Subcontract No.:** N/A	**FCR No.:** FCO3-FCR-FS012 **Rev. 0**
TolTest Site Health and Safety Plan		Page 1 of 1

Reference Documents:
Full-Scale Operational Plan for Soils Bioremediation Facility, March 1998 Rev. 2

Problem / Change Description:
TolTest, Inc. has transitioned into assuming responsibilities of onsite activities at the Bioremediation Facility, Mine Fill A and Mine Fill B excavations. TolTest Site Specific Health and Safety Plan will need to be inserted into the Full Scale Operational Plan. The Table of Contents in the Full Scale Operational Plan for "v" will need a replacement page.

Initiated by	Signature: Jane M Parsons	Organization: TolTest, Inc.	Date: 3/26/99

Resolution:

Attached to this Field Change Request are a Site Specific Health and Safety Plan that will be inserted as section "Appendix A2" and also a replacement page for Table of Contents "v".

Approval by TolTest, PM	Signature: Jane M Parsons	Date: 3/29/99	**Approval by ROICC/NTR or RPM**	Signature: [illegible]	Date 3/30/99
Approval by TolTest QC/SHSO	Signature: [illegible]	Date: 03/29/99	**Approval by EPD ANTR**	Signature: Christine D. Freeman	Date: 4/1/99
Approval by TolTest Proj SPT.	Signature: [illegible]	Date: 3/29/99	Additional Reviews: By/Date		

Regulator Approval/Notification Recommended:
☐ No ☒

NSV RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-012

SL	10-1			10-2			10-3			12-1			12-2			12-3			Windrow Averages		
Day	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red
HMX	44.7	2.2	95.08	28.5	8.13	71.47	27.4	12.1	55.84	26.1	2.45	90.61	32.3	2.2	93.19	15.1	2.65	82.45	29.02	4.96	82.92
RDX	136	1	99.26	80.5	2.61	96.76	88.6	1.96	97.79	101	1	99.01	111	2.74	97.53	59.5	1.01	98.30	96.10	1.72	98.21
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	0.65	0.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
TNT	.825	.25	69.70	.25	.25	0.00	.25	.509	-103.60	.822	.25	69.59	.966	.882	8.70	.651	.25	61.60	0.63	0.40	36.48
4ADNT	.25	.25	0.00	1.07	.25	76.64	1.92	.25	86.98	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.67	0.25	62.41
2ADNT	.831	.25	69.92	1.27	.25	80.31	2.5	.25	90.00	.25	.25	0.00	1.38	.25	81.88	.25	.25	0.00	1.08	0.25	76.86
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.25	.25	0.00	.42	.25	40.48	.25	.25	0.00	.25	.542	-116.80	.25	.25	0.00	.657	.328	50.08	0.35	0.31	9.97

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

M-012 was not full length because the windrow mixing equipment broke down after forming the windrow at these two cross sections

Detection limits

Day	00	07
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	.25
PETN	.25	.25

Day	00	07
Dilution factor	2	2

SL = sample location

NSWC CRANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-013

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red	00	07	%red
HMX	39.8	2.2	94.47	31.5	7.04	77.65	41.2	2.2	94.66	26.4	2.2	91.67	20.5	2.2	89.27	23.7	2.2	90.72	21.8	2.2	89.91	32.6	4.61	85.86	29.1	2.2	92.44
RDX	213	1	99.53	144	5.37	96.27	199	1	99.50	159	1.71	98.92	120	1	99.17	153	1	99.35	85.4	1	98.83	146	1.25	99.14	136	1	99.26
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	6.43	.65	89.89	3.55	.65	81.69	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	.735	.25	65.99	1.23	.25	79.67	.821	.267	67.48	.786	9.71	-1135.37	.25	.25	0.00	.709	.25	64.74	.436	.25	42.66	.792	.25	68.43	.53	.25	52.83
[illegible]DNT	.25	.25	0.00	.25	.525	-110.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.704	-181.60	.25	.25	0.00
[illegible]ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
[illegible]DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
[illegible]DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
[illegible]	1.1	.25	77.27	.732	.25	65.85	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.372	.25	32.80	.25	.25	0.00	.28	.25	10.71	.25	.25	0.00

[illegible]013 was placed in front of M-012 and thus was not a full length windrow

SL	Windrow Averages		
Day	00	07	%red
HMX	29.62	3.01	89.85
RDX	150.60	1.59	98.94
TNB	0.25	0.25	0.00
DNB	0.25	0.25	0.00
TETRYL	1.61	0.65	59.74
NB	0.26	0.26	0.00
TNT	0.70	1.30	-86.47
4ADNT	0.25	0.33	-32.40
2ADNT	0.25	0.25	0.00
26DNT	0.26	0.26	0.00
24DNT	0.25	0.25	0.00
2NT	0.25	0.25	0.00
4NT	0.25	0.25	0.00
3NT	0.25	0.25	0.00
PETN	0.41	0.25	39.74

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	07
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	[illegible]
PETN	.25	[illegible]

Day	00	07
Dilution factor	2	2

SL = sample location

NSW RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow S-010

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red
HMX	14.9	2.2	85.23	11.2	2.2	80.36	11.3	2.2	80.53	17	2.2	87.06	18.3	2.2	87.98	18.2	2.2	87.91	8.41	2.2	73.84	20.9	2.2	89.47	19.5	2.2	88.72
RDX	62.1	1	98.39	62.7	1	98.41	57.6	1	98.26	113	1	99.12	102	1	99.02	139	1	99.28	50	1	98.00	140	1	99.29	139	1	99.28
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	.425	.25	41.18	.742	.25	66.31	.955	.25	73.82	.753	.25	66.80	.779	.25	67.91	2.75	.25	90.91	.25	.25	0.00	1.01	.25	75.25	.608	.25	58.88
4ADNT	.483	.25	48.24	.553	.25	54.79	.645	.25	61.24	1.14	.25	78.07	1.37	.25	81.75	1.37	.25	81.75	.645	.25	61.24	1.42	.25	82.39	1.25	.25	80.00
2ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.418	.25	40.19	.986	.25	74.65	.575	.25	56.52	.927	.25	73.03	.848	.25	70.52	.683	.25	63.40
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.336	.25	25.60	.286	.25	12.59	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red	00	10	%red
HMX	13.2	2.2	83.33	6.42	2.2	65.73	17.5	2.2	87.43	17.2	2.2	87.21	13.4	2.2	83.58	6.94	2.2	68.30	14.29	2.20	84.61
RDX	68.5	1	98.54	37.4	1	97.33	97	1	98.97	49.9	1	98.00	69.8	1	98.57	54.6	1	98.17	82.84	1.00	98.79
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	0.65	0.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
TNT	.58	.25	56.90	.659	.25	62.06	1.38	.25	81.88	.778	.25	67.87	.355	.25	29.58	1.19	.25	78.99	0.88	0.25	71.62
4ADNT	.934	.25	73.23	1.27	.25	80.31	.551	.25	54.63	.25	.25	0.00	.667	.25	62.52	.618	.25	59.55	0.88	0.25	71.52
2ADNT	.668	.25	62.57	.678	.25	63.13	.25	.25	0.00	.25	.25	0.00	.264	.25	5.30	.25	.25	0.00	0.50	0.25	50.31
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.26	0.25	3.15

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	10
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	.25
PETN	.25	.25

Day	00	10
Dilution factor	2	2

SL = sample location

NSWC CRANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow S-011

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red
HMX	8.35	2.2	73.65	12.3	2.2	82.11	7.09	2.2	68.97	10.6	2.2	79.25	18.3	2.2	87.98	18.5	2.2	88.11	9.01	2.2	75.58	22.9	2.2	90.39	23.4	2.2	90.60
RDX	76.7	1	98.70	114	1	99.12	43.6	1	97.71	94.9	1	98.95	113	1	99.12	142	1	99.30	58.9	1	98.30	113	1	99.12	106	1	99.06
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	3.21	.25	92.21	3.87	.25	93.54	1.2	.25	79.17	1.21	.25	79.34	7.19	.25	96.52	3.73	.25	93.30	.887	.25	71.82	.703	.25	64.44	.498	.25	49.80
4ADNT	.61	.25	59.02	2.91	.25	91.41	.556	.25	55.04	1.39	.25	82.01	1.72	.25	85.47	1.67	.25	85.03	.827	.25	69.77	.484	.25	48.35	.912	.25	72.59
2ADNT	.854	.25	70.73	1.99	.25	87.44	.25	.25	0.00	1.25	.25	80.00	1.51	.25	83.44	1.33	.25	81.20	.25	.25	0.00	.291	.25	14.09	.608	.25	58.88
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red	00	09	%red
HMX	12.2	2.2	81.97	21.1	2.2	89.57	19.6	2.2	88.78	18.8	2.2	88.30	9.83	2.2	77.62	11.3	2.2	80.53	14.89	2.20	85.22
RDX	68.8	1	98.55	101	1	99.01	123	1	99.19	96.5	1	98.96	72.8	1	98.63	75.2	2.2	97.07	93.29	1.08	98.84
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	0.62	0.62	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.29	0.29	0.00
TNT	.793	.285	64.06	173	.25	99.86	1.97	.25	87.31	.992	.25	74.80	1.56	.25	83.97	.25	.25	0.00	13.40	0.25	98.11
4ADNT	.25	.25	0.00	.25	.25	0.00	.382	.25	34.55	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.85	0.25	70.50
2ADNT	3.01	.25	91.69	.25	.25	0.00	.867	.25	71.16	.818	.25	69.44	.25	.25	0.00	.25	.25	0.00	0.92	0.25	72.78
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.465	.25	46.24	.25	.25	0.00	.315	.25	20.63	.25	.25	0.00	.293	.25	14.68	.25	.25	0.00	0.27	0.25	7.93

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	09
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	[illegible]
PETN	.25	[illegible]

Day	00	09
Dilution factor	2	2

SL = sample location

NSV RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-008

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red
HMX	25.6	2.2	91.41	27	2.2	91.85	15.5	2.2	85.81	23.3	2.2	90.56	18.4	2.2	88.04	23.3	2.2	90.56	12	2.2	81.67	23.9	2.2	90.79	20	2.2	89.00
RDX	110	2.2	98.00	115	1	99.13	92.9	1	98.92	135	1.58	98.83	132	1	99.24	132	1	99.24	86.8	1	98.85	217	1	99.54	137	1	99.27
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	3.61	.25	93.07	4.57	.25	94.53	.537	.25	53.45	8.76	.25	97.15	19	.817	95.70	16.3	.25	98.47	3.64	.25	93.13	33.6	.264	99.21	.631	.25	60.38
4ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.397	.25	37.03	.367	.25	31.88	.972	.25	74.28	.25	.25	0.00	.25	.25	0.00	.25	.316	-26.40
2ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red
HMX	22.6	2.2	90.27	16.6	2.2	86.75	11.4	2.2	80.70	22	2.2	90.00	14.6	2.2	84.93	18	2.2	87.78	19.61	2.20	88.78
RDX	99.4	1	98.99	94.5	1	98.94	75	1	98.67	99.1	1	98.99	79.2	1	98.74	116	1	99.14	114.73	1.12	99.02
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	0.65	0.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
TNT	.926	.25	73.00	4.54	.25	94.49	4.54	.288	93.66	.956	.275	71.23	.79	2.48	-213.92	.546	.25	54.21	6.86	0.44	93.57
4ADNT	.25	.25	0.00	.692	.25	63.87	1.25	.25	80.00	.398	.25	37.19	.25	.25	0.00	.34	.25	26.47	0.43	0.25	40.52
2ADNT	.25	.25	0.00	.25	.25	0.00	.399	.25	37.34	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.26	0.25	3.82
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	08
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	.25
PETN	.25	.25

Day	00	08
Dilution factor	2	2

SL = sample location

NSWC CRANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-009

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red
HMX	6.04	2.2	63.58	5.03	2.2	56.26	2.2	3.76	-70.91	10.5	2.2	79.05	7.6	2.2	71.05	8.94	2.2	75.39	4.07	2.2	45.95	3.72	2.2	40.86	2.2	2.2	0.00
RDX	42	4.12	90.19	17.9	1	94.41	29.5	8.92	69.76	40	1	97.50	36	1	97.22	45.5	1.54	96.62	26.9	1	96.28	25.3	1	96.05	17.2	1	94.19
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	3.35	.65	80.60	3.33	.65	80.48	.65	.897	-38.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	.367	.25	31.88	.25	.25	0.00	.25	.25	0.00	.311	.25	19.61	.402	.25	37.81	.25	3.45	-1260.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4ADNT	.362	.25	30.94	.25	.25	0.00	.25	.25	0.00	.385	.25	35.06	.25	.25	0.00	.498	.25	49.80	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.566	.25	55.83	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red	00	08	%red
HMX	2.2	2.2	0.00	2.2	2.2	0.00	2.2	2.2	0.00	2.27	2.2	3.08	2.2	2.2	0.00	2.2	2.2	0.00	4.24	2.30	45.63
RDX	6.01	1	83.36	3.43	1	70.85	5.68	1	82.39	4.47	1	77.63	5.73	1	82.55	3.71	1.42	61.73	20.62	1.80	91.27
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	7.8	.65	91.67	.65	.65	0.00	1.49	0.67	55.13
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
TNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.27	0.46	-70.34
4ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.28	0.25	11.66
2ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.447	.25	44.07	0.28	0.25	12.03

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	08
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	.25
PETN	.25	.25

Day	00	08
Dilution factor	2	2

SL = sample location

NSW RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

'indrov S-006

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red
HMX	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	41.4	2.2	94.69	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	23.2	2.2	90.52
RDX	58.4	1	98.29	25.1	1	96.02	90.9	1	98.90	335	1	99.70	84.6	1	98.82	111	1	99.10	209	1	99.52	77.1	1	98.70	161	1	99.38
TNB	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64
DNB	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
TRYL	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00
NB	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00
NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	26.3	.6	97.72	9	.25	97.22	6.14	.25	95.93	19.7	.25	98.73	2.5	.25	90.00	12.1	.25	97.93
ADNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	4.83	.25	94.82	4.4	.25	94.32	4.14	.25	93.96	8.08	.25	96.91	5.57	.25	95.51	3.38	.25	92.60
ADNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
26DNT	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00
24DNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
2NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
4NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
3NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00
PETN	1.32	.25	81.06	1.8	.25	86.11	.471	.25	46.92	.25	.25	0.00	1.28	.25	80.47	.894	.25	72.04	.585	.25	57.26	1.7	.25	85.29	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red
HMX	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	22	2.2	90.00	23.37	2.20	90.59
RDX	116	1	99.14	43.1	1	97.68	82.8	1	98.79	21	1	95.24	12.5	1	92.00	30	1	96.67	97.17	1.00	98.97
TNB	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.2	.25	88.64	2.20	0.25	88.64
DNB	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
TETRYL	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.5	.65	90.00	6.50	0.65	90.00
NB	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.60	0.26	90.00
TNT	4.04	.25	93.81	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	6.65	0.27	95.89
4ADNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	3.53	0.25	92.91
2ADNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
26DNT	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.6	.26	90.00	2.60	0.26	90.00
24DNT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
2NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
4NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
3NT	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.5	.25	90.00	2.50	0.25	90.00
PETN	.72	.25	65.28	2.26	.25	88.94	.25	.25	0.00	.25	.25	0.00	.4	.25	37.50	.57	.25	56.14	0.87	0.25	71.15

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	14
HMX	22	2.2
RDX	10	1
TNB	2.2	.25
DNB	2.5	.25
TETRYL	6.5	.65
NB	2.6	.26
TNT	2.5	.25
4ADNT	2.5	.25
2ADNT	2.5	.25
26DNT	2.6	.26
24DNT	2.5	.25
2NT	2.5	.25
4NT	2.5	.25
3NT	2.5	.25
PETN	.25	.25

Day	00	14
Dilution factor	20	2

SL = sample location

NSWC CRANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow S-007

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red
HMX	10.3	2.2	78.64	28.2	2.2	92.20	28.2	2.2	92.20	23	2.2	90.43	23.3	2.2	90.56	18.3	2.2	87.98	28.6	2.2	92.31	27	2.2	91.85	20.6	2.2	89.32
RDX	72.9	1	98.63	194	1	99.48	205	1	99.51	166	1	99.40	148	1	99.32	118	1	99.15	164	1	99.39	146	1	99.32	127	1	99.21
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00	.691	.65	5.93	.715	.65	9.09	.65	.65	0.00	.65	.65	0.00	.65	.65	0.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
TNT	1.9	.25	86.84	10	.25	97.50	4.01	.25	93.77	.61	.25	59.02	.323	.25	22.60	.25	.25	0.00	1.14	.25	78.07	1.92	.25	86.98	.311	.25	19.61
4ADNT	.25	.25	0.00	1.93	.25	87.05	.933	.25	73.20	.647	.25	61.36	.344	.25	27.33	.25	.25	0.00	.414	.25	39.61	.474	.25	47.26	.522	.25	52.11
2ADNT	1.13	.25	77.88	.908	.25	72.47	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	1.23	.25	79.67	.25	.25	0.00	.25	.25	0.00	.73	.25	65.75	.25	.25	0.00
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.441	.25	43.31	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red	00	13	%red
HMX	12	2.2	81.67	13.1	2.2	83.21	13.7	2.2	83.94	18.5	2.2	88.11	7.81	2.2	71.83	4.35	2.2	49.43	18.46	2.20	88.08
RDX	78	1	98.72	84.2	1	98.81	84.8	1	98.82	120	1	99.17	66.4	1	98.49	45.6	1	97.81	121.33	1.00	99.18
TNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
DNB	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
TETRYL	.65	.65	0.00	.65	.65	0.00	1.31	1.01	22.90	.686	.65	5.25	.65	.65	0.00	3.76	.65	82.71	0.91	0.67	26.00
NB	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
TNT	12.6	.25	98.02	1.08	.25	76.85	1.73	.25	85.55	1.12	.25	77.68	.618	.25	59.55	.46	.25	45.65	2.54	0.25	90.15
4ADNT	.536	.25	53.36	.57	.25	56.14	.6	.25	58.33	.782	.25	68.03	.455	.25	45.05	.25	.25	0.00	0.60	0.25	58.13
2ADNT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.35	0.25	29.08
26DNT	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	.26	.26	0.00	0.26	0.26	0.00
24DNT	.25	.25	0.00	.25	.25	0.00	1.18	.25	78.81	.25	.25	0.00	1.6	.25	84.38	3.56	.25	92.98	0.72	0.25	65.28
2NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
4NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
3NT	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.26	0.25	4.85

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	13
HMX	2.2	2.2
RDX	1	1
TNB	.25	.25
DNB	.25	.25
TETRYL	.65	.65
NB	.26	.26
TNT	.25	.25
4ADNT	.25	.25
2ADNT	.25	.25
26DNT	.26	.26
24DNT	.25	.25
2NT	.25	.25
4NT	.25	.25
3NT	.25	.25
PETN	.25	[illegible]

Day	00	13
Dilution factor	2	2

SL = sample location

NSW RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-004

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red
HMX	32.8	2.2	93.29	35	2.2	93.71	13.4	2.2	83.58	83.9	2.2	97.38	42.2	2.2	94.79	41.4	2.2	94.69	81.6	2.2	97.30	30.1	2.2	92.69	79.6	3.28	95.88
RDX	319	1	99.69	232	1	99.57	95.1	7.13	92.50	660	1	99.85	258	.294	99.89	301	2.07	99.31	564	2.34	99.59	193	1	99.48	539	9.77	98.19
TNB	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
DNB	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
TETRYL	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99
NB	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00
TNT	36.4	.916	97.48	4.38	.319	92.72	6.98	2.26	67.62	14.9	.277	98.14	6.75	.25	96.30	5.37	.229	95.74	29.1	3.68	87.35	7.32	.25	96.58	19.5	1.11	94.31
4ADNT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	4.9	.25	94.90	6.25	.25	96.00	4	.25	93.75	5.19	.25	95.18	6.25	.25	96.00	7.79	.25	96.79
2ADNT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
26DNT	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00
24DNT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
2NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
4NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
3NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00
PETN	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red	00	14	%red
HMX	23	2.2	90.43	38.8	2.2	94.33	5.96	2.2	63.09	14.7	2.2	85.03	20.3	2.2	89.16	13.1	2.2	83.21	37.06	2.27	93.87
RDX	100	1	99.00	265	1	99.62	30.3	1.9	93.73	92.6	1	98.92	131	1.01	99.23	72.7	1	98.62	256.85	2.17	99.16
TNB	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
DNB	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
TETRYL	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.2	.65	95.99	16.20	0.65	95.99
NB	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.50	0.26	96.00
TNT	6.25	.25	96.00	12.8	.25	98.05	6.25	.25	96.00	1.99	.25	87.44	4.44	.25	94.37	7.99	.25	96.87	11.36	0.72	93.67
4ADNT	6.25	.25	96.00	3.99	.25	93.73	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	5.89	0.25	95.76
2ADNT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
26DNT	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.5	.26	96.00	6.50	0.26	96.00
24DNT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
2NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
4NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
3NT	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00
PETN	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	.25	96.00	6.25	0.25	96.00

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	14
HMX	55	2.2
RDX	25	1
TNB	6.25	.25
DNB	6.25	.25
TETRYL	32.5	.65
NB	13	.26
TNT	12.5	.25
4ADNT	12.5	.25
2ADNT	12.5	.25
26DNT	13	.26
24DNT	12.5	.25
2NT	12.5	.25
4NT	12.5	.25
3NT	12.5	.25
PETN	6.25	.25

Day	00	14
Dilution factor	50	2

SL = sample location

All results in ppm

NSWC CRANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

S-005

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red
HMX	110	2.2	98.00	30.2	2.2	92.72	2.2	2.2	0.00	110	2.2	98.00	275	2.2	99.20	11	2.2	80.00	275	2.2	99.20	275	2.2	99.20	11	2.2	80.00
RDX	87.2	1	98.85	144	1	99.31	4.79	1	79.12	99.6	2.96	97.03	138	1	99.28	20.6	1	95.15	146	1	99.32	149	1	99.33	22.2	1	95.50
TNB	12.5	.758	93.94	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
DNB	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
TETRYL	32.5	.65	98.00	16.2	.65	95.99	.65	.65	0.00	32.5	.65	98.00	81.2	.65	99.20	3.25	.65	80.00	81.2	.65	99.20	81.2	.65	99.20	3.25	.65	80.00
NB	13	.26	98.00	6.5	.26	96.00	.26	.26	0.00	13	.26	98.00	32.5	.26	99.20	1.3	.26	80.00	32.5	.26	99.20	32.5	.26	99.20	1.3	.26	80.00
TNT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	2.27	.25	88.99	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
4ADNT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
2ADNT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
26DNT	13	.26	98.00	6.5	.26	96.00	.26	.26	0.00	13	.26	98.00	32.5	.26	99.20	1.3	.26	80.00	32.5	.26	99.20	32.5	.26	99.20	1.3	.26	80.00
24DNT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
2NT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
4NT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
3NT	12.5	.25	98.00	6.25	.25	96.00	.25	.25	0.00	12.5	.25	98.00	31.2	.25	99.20	1.25	.25	80.00	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red
HMX	275	2.2	99.20	275	2.2	99.20	11	2.2	80.00	55	2.2	96.00	275	2.2	99.20	11	2.2	80.00	133.43	2.20	98.35
RDX	241	1	99.59	235	1	99.57	8.23	1	87.85	59.2	1	98.31	176	1	99.43	8.03	1	87.55	102.69	1.13	98.90
TNB	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.28	98.15
DNB	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
TETRYL	81.2	.65	99.20	81.2	.65	99.20	3.25	.65	80.00	16.2	.72	95.56	81.2	.65	99.20	3.25	.652	79.94	39.88	0.65	98.36
NB	32.5	.26	99.20	32.5	.26	99.20	1.3	.26	80.00	6.5	.26	96.00	32.5	.26	99.20	1.3	.26	80.00	15.96	0.26	98.37
TNT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	14.65	0.25	98.29
4ADNT	31.2	.279	99.11	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.36
2ADNT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
26DNT	32.5	.26	99.20	32.5	.26	99.20	1.3	.26	80.00	6.5	.26	96.00	32.5	.26	99.20	1.3	.26	80.00	15.96	0.26	98.37
24DNT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
2NT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
4NT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
3NT	31.2	.25	99.20	31.2	.25	99.20	1.25	.25	80.00	6.25	.25	96.00	31.2	.25	99.20	1.25	.25	80.00	15.33	0.25	98.37
PETN	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	.25	.25	0.00	0.25	0.25	0.00

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	15
HMX		2.2
RDX		1
TNB		.25
DNB		.25
TETRYL		.65
NB		.26
TNT		.25
4ADNT		.25
2ADNT		.25
26DNT		.26
24DNT		.25
2NT		.25
4NT		.25
3NT		.2[illegible]
PETN		[illegible]

Day	00	15
Dilution factor	50	2

various detection limits used on Day 00 analysis

SL = sample location

NSW RANE
BIOFACILITY
WINDROW PERCENT REDUCTIONS

Windrow M-002

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red
HMX	52.7	2.2	95.83	141	4.08	97.11	62.8	2.2	96.50	91.9	2.2	97.61	172	2.2	98.72	95.9	2.2	97.71	98.7	2.2	97.77	51	2.2	95.69	89.2	2.2	97.53
RDX	394	1	99.75	1120	1.16	99.90	564	1	99.82	734	1	99.86	1290	1.54	99.88	793	1	99.87	746	1	99.87	409	1	99.76	800	1	99.88
TNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
DNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
TETRYL	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00
NB	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00
TNT	9.43	.2	97.88	48.8	.25	99.49	30.8	.25	99.19	27.9	.25	99.10	73.9	.25	99.66	40.1	.25	99.38	87.8	.201	99.77	13.9	.198	98.58	30.4	.216	99.29
4ADNT	5.34	.25	95.32	5.34	.25	95.32	9.39	.25	97.34	7.23	.25	96.54	18.5	.25	98.65	13.5	.25	98.15	4.17	.25	94.00	5.43	.25	95.40	12	.25	97.92
2ADNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
26DNT	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00
24DNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
2NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
4NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
3NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
PETN	11.6	.25	97.84	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red	00	21	%red
HMX	79.2	2.2	97.22	41.8	2.2	94.74	83.2	2.2	97.36	67.4	2.2	96.74	27.9	2.2	92.11	60.5	2.2	96.36	81.01	2.33	97.13
RDX	563	1	99.82	356	1	99.72	553	1	99.82	494	1	99.80	226	3.06	98.65	501	3.91	99.22	636.20	1.38	99.78
TNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
DNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
TETRYL	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.50	0.65	98.00
NB	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13.00	0.26	98.00
TNT	45.4	.173	99.62	19.7	.201	98.98	33	.204	99.38	59.8	.239	99.60	15	1.54	89.73	36.9	.25	99.32	38.19	0.31	99.18
4ADNT	12.5	.25	98.00	5.31	.25	95.29	12.5	.25	98.00	5.81	.25	95.70	2.98	.25	91.61	6.89	.25	96.37	8.46	0.25	97.04
2ADNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
26DNT	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13.00	0.26	98.00
24DNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
2NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
4NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
3NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
PETN	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.44	0.25	97.99

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	21
HMX	110	2.2
RDX	50	1
TNB	12.5	.25
DNB	12.5	.25
TETRYL	32.5	.65
NB	13	.26
TNT	12.5	.25
4ADNT	12.5	.25
2ADNT	12.5	.25
26DNT	13	.26
24DNT	12.5	.25
2NT	12.5	.25
4NT	12.5	.25
3NT	12.5	.25
PETN	12.5	.25

Day	00	21
Dilution factor	100	2

SL = sample location

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ndrow S-003

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red
HMX	56.2	2.2	96.09	26.6	1.4	94.74	9.3	7.71	17.10	70.9	2.2	96.90	71.8	.68	99.05	29	.707	97.56	85.8	2.33	97.28	69	2.39	96.54	36.8	2.2	94.02
RDX	598	1	99.83	159	.64	99.60	49.3	5.22	89.41	354	1	99.72	471	.908	99.81	172	.787	99.54	694	.58	99.92	544	.506	99.91	336	1	99.70
TNB	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
DNB	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
TRYL	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00
NB	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00
TNT	31.2	.25	99.20	4.41	.25	94.33	1.38	.25	81.88	8.14	.25	96.93	4.46	.25	94.39	3.42	.25	92.69	19.6	.198	98.99	2.51	.25	90.04	3	.296	90.13
DNT	4.42	.25	94.34	1.25	.25	80.00	1.25	.25	80.00	2.67	.25	90.64	1.25	.565	54.80	1.25	.25	80.00	3.59	.117	96.74	1.25	.184	85.28	4.25	.25	94.12
ADNT	1.6	.25	84.38	1.25	.25	80.00	1.25	.25	80.00	1.15	.25	78.26	1.25	1.15	8.00	1.25	.25	80.00	2.42	.25	89.67	1.25	.25	80.00	1.18	.25	78.81
6DNT	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00
24DNT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
2NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
4NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
3NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00
PETN	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red	00	15	%red
HMX	23	2.2	90.43	42.7	2.2	94.85	8.93	.269	96.99	58.1	2.2	96.21	36.4	2.2	93.96	6.74	2.2	67.36	42.08	2.21	94.76
RDX	170	1	99.41	366	1	99.73	87.8	.589	99.33	538	1	99.81	394	1	99.75	75.8	1	98.68	333.93	1.15	99.66
TNB	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	2.64	.25	90.53	1.25	.25	80.00	1.25	.25	80.00	1.34	0.25	81.38
DNB	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	0.25	80.00
TETRYL	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	.65	80.00	3.25	0.65	80.00
NB	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.30	0.26	80.00
TNT	3.18	.25	92.14	3.39	.25	92.63	1.25	.25	80.00	50	.25	99.50	41.5	.25	99.40	1.25	.25	80.00	11.91	0.25	97.90
4ADNT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	3.42	.25	92.69	3.91	.25	93.61	1.25	.25	80.00	2.23	0.26	88.46
2ADNT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	.696	.25	64.08	1.25	.25	80.00	1.30	0.31	76.21
26DNT	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.3	.26	80.00	1.30	0.26	80.00
24DNT	1.25	.25	80.00	1.25	.25	80.00	5.14	.25	95.14	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.51	0.25	83.44
2NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	0.25	80.00
4NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	0.25	80.00
3NT	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	0.25	80.00
PETN	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	.25	80.00	1.25	0.25	80.00

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	15
HMX	11	2.2
RDX	5	1
TNB	1.25	.25
DNB	1.25	.25
TETRYL	3.25	.65
NB	1.3	.26
TNT	1.25	.25
4ADNT	1.25	.25
2ADNT	1.25	.25
26DNT	1.3	.26
24DNT	1.25	.25
2NT	1.25	.25
4NT	1.25	.25
3NT	1.25	[illegible]
PETN	1.25	[illegible]

Day	00	15
Dilution factor	10	2

SL = sample location

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The following tables represent percent reductions of explosives based on Day 00 and Day Last analytical results.
To date, complete Day 00 and Day Last analytical data have been received on the first 13 full scale windrows, which are included here.
Percent reductions were computed on a per sample basis and on an average of the entire windrow.
The latter is provided because whether or not a windrow meets clean-up goals is determined by comparing the average of the entire windrow (for a given constituent) to the clean-up goals and not by comparing individual data points.

In many instances it appears that the 90 to 99% reduction goal has not been met. Closer inspection of the data indicate that the levels at which individual constituents were detected render many of the percent reductions meaningless. For instance, many contituents were neither detected on Day 00 nor Day Last, such as PETN on windrow S-001. However, since the detection limit dropped by a factor of 50 from Day 00 to Day Last, it appears that a 98 percent reduction was accomplished. This is obviously misleading since the actual concentration of PETN in these two samples is not known, if PETN exists at all. **NOTE - if a constituent was not detected, it was listed in the tables at the detection limit **
In fact, a majority of the reductions listed are below 90%. In most cases, this is simply because the detected values are at or very near the detection limits. There are individual instances however, such as M-009 at sample location 03-3, where neither the clean-up goal nor the 90% reduction have been met.

Despite these misleading values, in **all cases** where the detected levels are valid (i.e. above detection limits) and significant (i.e. above clean-up goals), the 90 to 99% reduction goal has been met on an average windrow basis. In fact the highest level of reduction achieved, both on an average windrow basis and on an individual sample basis, was achieved on windrow S-001, the most contaminated of the 13 windrows represented.
Here, the average RDX reduction was 99.91% and the single highest reduction was at sample location 07-1 at 99.96%.

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Windrow S-001

SL	03-1			03-2			03-3			05-1			05-2			05-3			07-1			07-2			07-3		
Day	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red
HMX	75.3	2.2	97.08	178	2.2	98.76	154	2.2	98.57	175	2.2	98.74	28.3	2.2	92.23	95.5	2.2	97.70	285	2.2	99.23	154	2.2	98.57	220	.571	99.74
RDX	625	1	99.84	1510	1	99.93	1160	1	99.91	1490	1	99.93	166	1	99.40	702	1	99.86	2440	1	99.96	1390	1	99.93	1780	1	99.94
TNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
DNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
TETRYL	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00
NB	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00
TNT	24.1	.523	97.83	83.3	.744	99.11	77	.375	99.51	208	.592	99.72	2.94	.274	90.68	74.3	.457	99.38	271	.25	99.91	100	.434	99.57	286	.434	99.85
4ADNT	5.32	.25	95.30	10.3	.25	97.57	18.9	.25	98.68	20	.25	98.75	2.48	.25	89.92	6.35	.25	96.06	22.6	.25	98.89	27.6	.25	99.09	9.59	.25	97.39
2ADNT	12.5	.25	98.00	12.5	.25	98.00	3.44	.25	92.73	5.75	.25	95.65	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	6.16	.25	95.94	12.5	.25	98.00
26DNT	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00
24DNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
2NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
4NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
3NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00
PETN	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00

SL	09-1			09-2			09-3			11-1			11-2			11-3			Windrow Averages		
Day	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red	00	26	%red
HMX	243	2.2	99.09	232	2.2	99.05	174	2.2	98.74	101	2.2	97.82	27.4	2.2	91.97	84.7	2.2	97.40	148.48	2.09	98.59
RDX	1870	1	99.95	1830	1	99.95	1470	1	99.93	198	1	99.49	159	1	99.37	544	1	99.82	1155.60	1.00	99.91
TNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
DNB	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
TETRYL	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.5	.65	98.00	32.50	0.65	98.00
NB	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13.00	0.26	98.00
TNT	172	.241	99.86	146	.31	99.79	152	.25	99.84	40.9	.25	99.39	14.8	.25	98.31	36.5	.259	99.29	112.59	0.38	99.67
4ADNT	27	.25	99.07	28.5	.25	99.12	9.88	.25	97.47	6.66	.25	96.25	12.5	.25	98.00	12.5	.25	98.00	14.68	0.25	98.30
2ADNT	8.48	.25	97.05	6.54	.25	96.18	2.59	.25	90.35	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	9.70	0.25	97.42
26DNT	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13	.26	98.00	13.00	0.26	98.00
24DNT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
2NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
4NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
3NT	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00
PETN	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.5	.25	98.00	12.50	0.25	98.00

	Goals	
	Res.	Ind.
HMX	3300	34000
RDX	4	17
TNB	3.3	34
DNB	6.5	68
TETRYL	650	6800
NB	18	94
TNT	15	64
4ADNT	65	680
2ADNT	130	1400
26DNT	65	680
24DNT	130	1400
2NT	650	6800
4NT	650	6800
3NT	650	6800
PETN	to be determined	

Detection limits

Day	00	26
HMX	110	2.2
RDX	50	1
TNB	12.5	.25
DNB	12.5	.25
TETRYL	32.5	.65
NB	13	.26
TNT	12.5	.25
4ADNT	12.5	.25
2ADNT	12.5	.25
26DNT	13	.26
24DNT	12.5	.25
2NT	12.5	.25
4NT	12.5	.25
3NT	12.5	.25
PETN	12.5	.25

Day	00	26
Lab Dilution factor	100	2

SL = sample location

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	**ORIGINAL**

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	**Subcontract No.:** N/A	**FCR No.:** 4324-0009-FCR-FS011
CLARIFICATION OF ITEMS		Page 1 of 1

Reference Documents: Full-Scale Biofacility Operations QAPP para. 1.1.2

Problem / Change Description:

Data resulting from the initial few months of Biofacility operations indicates that percent reduction goals are readily being met. There also have been no greater than detectable limit "hits" for PETN in any sample originating from MFA or MFB, from either windrow or initial characterization sampling.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 8/25/98

Resolution:

1. Attached is day zero, day last, and percent reduction data for all windrows to date. The data demonstrates that [redacted] the 90-99% reduction goal is being attained for all chemicals of concern. Discontinue all day zero laboratory testing and rely on initial soil characterization and day last laboratory testing to prove clean up and percent reduction goals have been met.

2. Discontinue all windrow PETN laboratory testing based upon test results to date. Continue to test for PETN in the initial characterization sampling at the excavation sites. Any "hit" above the detection limit would require direction by the Navy EPD.

ok for Mine Fields A & B only

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature: U. Venkatesh signature on file	Date:	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Beall	Date: 8/25/98	Additional Reviews: By/Date		
Approval by MK QC	Signature: [illegible]	Date: 8/26/98	Christine D. Freeman NSWC Crane Env. Prot. Dept Approved w/comments		9/3/98
Approval by MK REG SPT.	Signature: S. Cory signature on file	Date:	Approved w/ comments		

Regulator Approval/Notification Recommended: Yes ☒ No ☐

[illegible] 10/26/98 PETN for Mine Fields A & B to stop

A:FCRFS011.DOC

Field measurement locations

Six field measurement locations will be established at each of the windrow cross-sections. The correct depth for each measurement will be indicated by marked intervals on the shaft of the oxygen/temperature probe for oxygen and temperature measurements. The following procedure will be used to locate the field measurement locations:

1. Sample location 1A is located on the longitudinal centerline of the pile at a depth of 1 foot below the top surface. Insert the marked probe shaft to the 1-foot mark.

2. Sample location 1 is located on the longitudinal centerline of the pile at a depth of 3 feet below the top surface. Insert the marked probe shaft to the 3-foot mark.

3. Sample location 2A is located on the south side of the pile at a depth of 1 foot below the surface. ~~Lay the 4 ft. 7 in. measuring stick~~ **Determine the mid point** on the side of the pile ~~from~~ **between** the ground surface ~~up~~ **and top of windrow**, hold the marked probe shaft perpendicular to the side surface of the pile, and insert to the 1-foot mark.

4. Sample location 2 is located on the south side of the pile at a depth of 2.5 feet below the surface. ~~Lay the 4 ft. 7 in. measuring stick~~ **Determine the mid point** on the side of the pile ~~from~~ **between** the ground surface ~~up~~ **and top of windrow**, hold the marked probe shaft perpendicular to the side surface of the pile, and insert to the 2.5-foot mark.

5. Sample location 3A is located on the north side of the pile at a depth of 1 foot below the surface. ~~Lay the 4 ft. 7 in. measuring stick~~ **Determine the mid point** on the side of the pile ~~from~~ **between** the ground surface ~~up~~ **and top of windrow**, hold the marked probe shaft perpendicular to the side surface of the pile, and insert to the 1-foot mark.

6. Sample location 3 is located on the north side of the pile at a depth of 2.5 feet below the surface. ~~Lay the 4 ft. 7 in. measuring stick~~ **Determine the mid point** on the side of the pile ~~from~~ **between** the ground surface ~~up~~ **and top of windrow**, hold the marked probe shaft perpendicular to the side surface of the pile, and insert to the 2.5-foot mark.

3.0 OXYGEN AND TEMPERATURE MONITORING

This section describes the procedure to be followed for collecting oxygen and temperature measurements within the compost windrows. Procedures for decontamination of monitoring and sampling equipment are described in Field SOP 7.0 in the Full-Scale Operational Plan, Appendix D.

3.1 Tools and Materials

The following tools and materials are required to collect oxygen and temperature measurements:

primary instrument - Demista Instruments Model OT-21 oxygen-temperature monitor
backup instrument (temperature only) - K-type thermocouple with hand-held temperature meter
~~4 ft 7 in. long measuring stick~~ Marked probe shaft
Windrow Process Data - Daily Log form
indelible pen

3.2 Calibration

Demista Oxygen-Temperature Monitor

The Demista oxygen-temperature monitor can be calibrated only for percent oxygen. Temperature calibration shall be performed at the instrument manufacturer's facility. The recommended calibration frequency is minimum once every 12 months based on daily use, however, temperature checks of the probe reading to the ambient temperature will be performed prior to beginning monitoring of each pile.

Oxygen calibration is performed by activating the 'oxygen' mode, aspirating (squeezing and releasing the rubber bulb) several times, and noting the display reading. If the reading is other than 21%, the monitor is adjusted to '21' by turning the oxygen calibration screw with a small screwdriver. Oxygen calibration of the probe will be performed prior to beginning monitoring of each pile. Calibration shall be documented on the Windrow Process Data - Daily Process Log Form (Figure 2 of this SOP).

K-type Thermocouple

Calibration shall be performed at the instrument manufacturer's facility. The recommended calibration frequency is minimum once every 6 months based on daily use.

3.3 Measurement Procedure

The monitoring and sample collection will be performed in the following order:

1. In-situ reading of Oxygen.

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5.2 Loading Amendments

The bulking agents should be loaded first (e.g., straw, alfalfa, and wood chips). The manures should be loaded next to provide improved mixing. After zero balancing the scales, as described above, the amendments shall be loaded into the grinder/mixer as follows:

1. Activate the mixer drive to begin mixing.

2. Load the first amendment via the center pivot loader from the amendment storage bin and gradually dump into the grinder/mixer until the desired volume is added. Record the volume and actual weight on the appropriate *Record of Recipe* form (Figures 2a, 2b, and 2c) for that batch.

3. Press the [TARE] key on the scale display to establish a temporary zero point.

4. Press the [NET/GROSS] key to select NET mode.

5. Load the desired volume of the second amendment in a similar fashion. Record the actual volume and weight on the appropriate *Record of Recipe* form (Figures 2a, 2b, and 2c) for that batch.

6. Repeat steps 2, 3 and 4 for each additional amendment to be added.

5.3 Blending of Amendments

Once all amendments for that batch have been loaded into the grinder/mixer, the mixer continues to chop and blend the amendment mixture as the grinder/mixer is pulled to the composting building by the farm tractor. Each load shall be blended for ~~a minimum of~~ **approximately** ten minutes. The blended amendment batch will be unloaded as described in Field SOP 4.0.

bottle containing tap water. If necessary, use a plastic awl to poke out any material clogging the air inlet holes.

3. Allow the probe shaft to drain, dry the teflon tip with a clean disposable paper towel, replace the probe tip after making sure it has been cleaned, and secure in place with the screw.

4. Remove the probe suction tube from the monitor and connect to the outlet of the aspirator bulb. Using the aspirator bulb, blow air through the probe tip to expel any remaining water. Reconnect the probe suction tube to the monitor.

5. After the last use for the day and the equipment has been decontaminated, store the equipment in the sample equipment transfer vehicle.

Windrow Measuring Equipment

All measuring sticks will be dedicated to each individual windrow. The sticks will have any solids brushed off **if used** at the end of measurements for that windrow. Any solid residues shall be placed onto that windrow. The measuring sticks shall be stored adjacent to the windrows, next to the containment wall of the building.

3.1.2.2 **On-site Laboratory Equipment**
~~Sampling Equipment Used for On-site Laboratory Samples~~

~~*Non-compost Sampling Equipment*~~

Cleaning of on-site laboratory non-disposable equipment (except for compost sampling and windrow sampling equipment) will be performed as described in Section 3.1.2.1 above except emersion in the decontamination fluids may not be permissible. Spray bottles of cleaning and rinse fluids will be used.

All field laboratory equipment shall be cleaned and maintained so that cross-contamination does not occur. This includes the Wiley mill and the riffle splitter for creating split samples.

3.2 Decontamination related to Excavation Sites
~~**Excavation Equipment And Rock Decontamination**~~

3.2.1 Excavation Equipment ~~and Decontamination Pad~~

Equipment such as conveyors, backhoe, soil screener, and smaller equipment

complete with the concurrence of NSWC Crane EPD.

5.1.2 Windrow Turning Procedure

During the turning process, the operator will try to keep the soil within the building containment. The following steps will be followed during the turning process:

1. Position the windrow machine at the windrow to be turned.

2. Engage the drum on the windrow machine and begin turning the windrow. NOTE: More than one pass may be required to complete turning.

3. Upon completion of turning the end of the windrow, stop the windrow machine and disengage the drum. **Inspect the equipment for loose or caked material.**

4. **If loose or caked material is evident, then** lockout the windrow machine; the driver will exit the cab, lock the door and wait on the windrow machine platform until given clearance by the person cleaning the underside of the machine.

5. Clean caked material from the drum and flaps of the windrow machine.

6. Cleanup material which has been thrown beyond the ends of the windrow and place in back onto the windrow using a skid steer loader or similar piece of equipment.

7. Repeat steps 1 through 6 for the remaining windrows to be turned.

5.2 Moisture Addition

Water will be added to the windrows to adjust moisture content. The operating goal for compost moisture content is 40 to 60% of the maximum Water Holding Capacity (WHC) of the compost. A 50% WHC is the ideal moisture content for the composting process. Refer to the approved QAPP for Full-Scale Operations for determination of actual moisture and WHC.

Water will be added using; the spray nozzles on the windrow machine during the turning process; a hose with a flow meter and spray nozzle connected to the buildings potable water source; or a hose and spray nozzle connected to the trailer mounted calibrated tank and pump.

5.2.1 Water Sources and Their Usage

During the Bioremediation Facility operations, fluids will be generated which may be used for windrow moisture addition. At no time shall fluid be used for

ensure quality and freshness of the amendment.

5.1.2 Alfalfa and Straw

The alfalfa hay and straw will be provided in bales bound with hemp or a plastic mesh baling material which will be removed prior to amendment blending. The supplier will deliver the alfalfa and straw within two weeks of windrow construction.

5.1.3 Wood Chips

Wood chips will be delivered in bulk to the amendment storage area, within two weeks of windrow formation. Wood chips will be ground to 1.5 inch minus size.

5.1.4 Amendment Storage

The amendments will be stockpiled in bins separated by movable concrete dividers. The amendments will be stored within the amendment storage bins and will not flow outside the diked areas. Bales of alfalfa and straw may be stored along the northern edge of the amendment storage area as shown in Figure P-100 in Appendix C. Available amendment storage capacity has been allocated for more than 1,200 cubic yards, thus allowing more than sufficient storage capacity of amendments for one building of full-scale operation. ~~Any ponding of water on the asphalt pavement will be manually removed within 24 hours, except during periods of precipitation.~~

All stockpiles are to be covered when not in use for protection from precipitation and wind. The covers are to be placed in a manner that directs clean storm-water away from the storage area. The covers are to be made of plastic of sufficient strength to withstand typical weather conditions and frequent handling. The covers are to be held in position with a sufficient number of weighted items to keep them in place during a strong wind. Efforts will be made to avoid puncturing the covers when placing the weighted items. If amendments are showing signs of excess fluid, straw bales will be placed along the edges of the dividers to minimize nutrient water run-off from one section to another. When not in use the cover will remain inside the amendment storage area.

5.2 LOAD AMENDMENTS INTO GRINDER/MIXER

Amendments will be loaded in the proper proportions into the farm tractor-powered grinder/mixer unit using a center-pivot loader located in the Amendment Storage Area. Once mixed, the amendments will be unloaded in the Compost Buildings as illustrated on drawing P-100, in Appendix C. The nearly 26 cubic yard capacity unit will be loaded with amendments based on the selected recipe per the volume ratios given in Figure 1 provided in Field SOP 3.0 in Appendix D. Field SOP 3.0 in Appendix D also provides a step-by-step procedure for loading and blending of amendments.

Sampling frequencies, procedures, and analytical methodologies are contained in Table 6-1 and the approved QAPP for Full-Scale Operations [MK, 1998b].

Water not meeting off-site discharge requirements will either be recycled in the Bioremediation Facility for windrow compost moisture control or transported to one of the water treatment facilities. Sampling frequencies, procedures, and analytical methodologies are contained in Table 6-1 and the approved QAPP for Full-Scale Operations [MK, 1998b]. Storm-water collected in the retention ponds may be used for windrow moisture addition at anytime during the composting process if the retention pond level is in excess of 18-inches. Retention pond fluid less than 18-inches deep may only be used during the first seven days of windrow formation. This will prevent potentially high levels of explosives contaminated sediment from being added to the windrows once the explosives degradation has significantly progressed.

Sediments from the retention ponds, collected during any maintenance operations, will be added to the windrows only at the beginning of a compost cycle during initial windrow formation, or disposed of as approved by NSWC Crane EPD. Sampling frequencies, procedures, and analytical methodologies are contained in Table 6-1 and the approved QAPP for Full-Scale Operations [MK, 1998b].

hopper/conveyor unit will be reconnected to continue soil unloading. This process will continue until amendment blend windrow is covered with soil to the proper height and length as shown on drawing P-102 in Appendix C. Field SOP 5.0 in Appendix D provides a step-by-step procedure for transporting and loading soil into the windrows.

If an empty truck is to return to the excavation site for a load of soil, it must proceed to the vehicle decontamination facility (as illustrated on drawing P-102 in Appendix C) where the wheels and exterior will be washed with a high-pressure, low-volume spray prior to exiting the facility per Field SOP 7.0 in Appendix D. Incidental sediments and soils removed from the water collection sumps or ponds may be added to the windrows during initial pile formation.

5.5 TURN/MIX WINDROW

Once the soil has been loaded into the windrow to the specified level, the windrow/compost turning machine will commence mixing and forming the windrow. The travel speed of the windrow turner is adjusted automatically based on the density of the material being turned to maintain a constant load on the drum. The windrow turner may make multiple passes during initial windrow construction to assure thorough mixing which are recorded on the daily report. The final shape and size of the homogeneous windrow is shown on Figure 1 of Field SOP 5.0 in Appendix D.

Upon completion of turning a windrow, the equipment will be **inspected to determine if loose or caked material is evident. If evident, the equipment will be** locked out and brushed or scraped to remove loose or caked material. Material which has fallen off the sides or been thrown beyond the ends of the windrow will be cleaned up and placed back onto the windrow maintaining the original configuration. Flyout material will be minimized by the rubber flap at the rear of the windrow turner. The windrow turning frequency and monitoring is expected to be daily, but will be adjusted as necessary to maintain proper aeration, temperature, and moisture as described in Section 6.0. A detailed procedure for windrow turning and moisture addition is provided in Field SOP 6.0 in Appendix D.

5.6 UNLOAD WINDROW AND TRANSPORT SOIL FOR DISPOSAL

If the cleanup goals have not been achieved based **on the** evaluation of **the** sample results, the following options are available to ensure that the pile meets the cleanup goals:
(1) extend **the** life cycle of composting (i.e., another 15, 30, 60 days or as needed); (2) use the pile as new windrow and re-start the composting process; or (3) blend the pile with excavated soil into a new windrow. The NSWC Crane EPD will provide direction **and approval** for selecting the option.

Once the treatment goals have been met, as determined by sampling results, the building will be emptied. The loader will transfer successfully treated material, directly

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TABLE 6-1
PROCESS MONITORING AND SAMPLING SCHEDULE

Matrix	Parameter	Frequency	Method
1. Pre-excavation in-situ soil (characterization)	SWMU-specific parameters per Section 1.3 **and QAPP**	Two composites per grid block[1] and one grab sample (VOCs)	Laboratory (various per QAPP and Tables **1-1 through 1-3** ~~1-2~~)
2. In-process excavation in-situ soil (during excavation)	Explosives RDX and TNT	**Base:** One composite ~~and one grab (VOCs)~~ per grid block[1] ~~**Sidewalls:** One composite and one grab (VOCs) per 20'~~	Field screening kits per SOP QAPP-5.0 (SW846-8510 & 8515)
3. Post-excavation in-situ soil (confirmation)	SWMU-specific parameters per Section 1.3 **and QAPP**	**Base:** One composite and one grab (VOCs) per grid block[1] **Sidewalls:** One ~~composite and one grab (VOCs)~~ **grab** per 20'	Laboratory (various per QAPP and Tables **1-1 through 1-3** ~~1-2~~)
4. Windrow compost	Explosives RDX and TNT	One composite sample per cross-section from location 1, 2, & 3 on Day 7, 14, and 21	Field screening kits per SOP QAPP-5.0 (SW846- 8510, & 8515)
5. Windrow compost	Explosives Per Table 6-2	One sample per location 1, 2, & 3 per cross-section on Day 0 and at end of cycle	Laboratory (SW846-8330)
6. Windrow compost	SWMU-specific parameters per Section 1.3 **and QAPP** [Required only if present in the characterization samples.]	One sample per location per cross-section on Day 0 and at end of cycle	Laboratory (various per QAPP and Tables 1-1 through 1-3)
7. Windrow compost	Temperature	Daily: before & after turning	Field SOP QAPP- 4.0
8. Windrow compost	Moisture	Three times per week and directly after moisture addition	Field SOP QAPP-3.0 and 4.0
9. Windrow compost	pH	One time per week	Field SOP QAPP-3.0 and 4.0
10. Windrow compost	Oxygen	Daily: before & after turning	Field SOP QAPP-4.0
11. Storm-water	Per NPDES	After heavy rainfall or per the NPDES Permit **or per Navy EPD direction**	Laboratory (various per QAPP)
12a. Decon/wash water from Bioremediation Facility and Excavation Sites	Per Table 1-5	If required for disposal to on-site sewer treatment system. [No testing is required if disposal to one of the on-site waste treatment facilities or used for **initial** composting moisture addition.]	

methodologies are contained in Table 6-1 of this Plan and the approved QAPP for Full-Scale Operations [MK, 1998b]. Sump sediments will be collected and added to the windrows at the beginning of a compost cycle during initial windrow formation only.

7.2.2 Personnel Decontamination

A personnel decontamination trailer is located next to the equipment decontamination facility and consists of a change room area, lockers, lavatory, toilets and showers. The trailer sanitary sewer line is routed to the pump/lift station in the office/laboratory area.

Any personnel exiting the work area must first pass through the contamination reduction zone which includes a boot wash station, cleaning and wipe station, etc. Personnel will avoid over spraying at the boot wash area. Follow decontamination procedures specified in the SSHP in Appendix A.

7.2.3 Compost Building Sumps

Each of the three structures is equipped with an epoxy-coated sump for collection of any excess water in the building. The building sump water will be collected, stored in poly storage tanks, if necessary, and recycled in the treatment process for compost moisture control in the same building. Drawings 4324-0009-02-A and 02-C in Appendix C provide a schematic of the process flow. Any sediments collected in the building sumps will be removed and added to the windrows at the beginning of the compost cycle. If excess building sump water is present, it will be disposed of at the on-site water treatment facilities at Mine Fill A or Rockeye; on-site sewer treatment system; or as approved by NSWC Crane EPD. Disposal of water at the on-site water treatment facilities (i.e., Mine Fill A or Rockeye) will not require sampling. However, sampling and analysis of water will be required for disposal at the on-site sewer treatment system. Sampling frequencies, procedures, and analytical methodologies are contained in Table 6-1 of this Plan and the approved QAPP for Full-Scale Operations [MK, 1998b].

7.2.4 Storm-Water Diversion and Retention Ponds

The facility will utilize both the existing topography and site drainage controls to control storm-water run-off and run-on.

Two lined storm-water retention basins sized to store rainfall from a 10-year, 24-hour storm are constructed inside the Bioremediation Facility boundary. These retention basins will retain and store storm-water from the area paved with asphalt inside the facility. Pond #1 will retain a maximum of 428,000 gallons of storm-water and Pond #2 will retain a maximum of 407,000 gallons. A peak discharge flow to the local drainage swales will vary from 315 gallons per minute (gpm) at full level to 160 gpm at low level, allowing for controlled off-site storm-water discharge. Water collected in the retention basin will be sampled within 24 hours following a major storm event to **or as otherwise directed by the Navy EPD** determine whether the water meets off-site discharge requirements. The discharge pipes from the ponds will remain closed and locked until discharge is approved. The operators of the facility will maintain the level of the ponds with a minimum of two-foot freeboard. If the water level approaches the freeboard limit and a storm event is anticipated, the NSWC Crane EPD Representative will be immediately notified. NSWC Crane EPD will provide disposition which may include sampling and discharging pond water to the waste water treatment sewer system.

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The slope of the pile shall be limited to contact at one foot below the top of the concrete wall.

Portions of the stockpile not in use will be tarped or covered with plastic and weights **during windy conditions** to prevent dust from being transported out of the building ~~during windy conditions~~. The coverings shall also limit the potential of leachate generation during heavy rainfall with high winds blowing into the building. Should covering of the contaminated soil prove to be insufficient during periods of high winds or heavy rainfall, a contingency plan to possibly enclose the southwest end or both ends of the building will be created and approved by the NSWC Crane EPD prior to implementation. The contingency plan includes providing retractable mesh or solid fabric curtains covering the entire width of the building openings. The eves of the building ends may remain open to aid in air circulation through the building.

4.5 SOIL TRANSPORTATION

The transport route may vary pending NSWC Crane operations during the periods of soil transport. However, the following transportation route to the Bioremediation Facility and Figure E1-6 should be utilized for the Mine Fill A excavation activities.

> The vehicles will exit the Mine Fill A facility by turning left onto Highway 45 (H-45). Travel south on H-45 for approximately 4½ miles and turn left on Highway 161 (H-161). Continue on H-161 past the golf course, and turn right onto the NSWC landfill entrance road. The Bioremediation Facility is immediately on the left.

Each truck load of screened soil will be weighed to determine and record the quantity and weight of soil entering the Bioremediation Facility. The trucks will be weighed at the truck scale at the entrance to the Bioremediation Facility access road as described in Field SOP 2.0 in Appendix D of this Plan.

routed to the pump/lift station in the office/laboratory area.

3.5 OFFICE AND LABORATORY TRAILER AREA

The Office and On-Site Laboratory Trailers are located north of the Compost Building Area as shown on drawing G-100 in Appendix C. They are provided with a compacted limestone, 24-vehicle capacity, parking area. Sanitary sewer service is provided by way of a grinder pump/lift station as specified in the technical specifications and drawings. The existing roadside drainage swales are sloped to obtain proper drainage.

The On-Site Laboratory Trailer contains the necessary equipment and supplies to support the process monitoring requirements as described in Section 6.0.

3.6 STORM-WATER DIVERSION AND RETENTION CONTROLS

The facility utilizes both the existing topography and site drainage controls to control storm-water run-off and run-on as shown on drawing G-100 in Appendix C. Two lined storm-water retention ponds sized to store rainfall from a 10-year, 24-hour storm are constructed inside the Bioremediation Facility. Each pond has a 10-foot high chain link perimeter fence with access gates for protection against wildlife intrusion. The **area under the** access gates will also be fenced to provide protection against wildlife intrusion. The discharge pipes for both ponds are controlled with a locking device which allows for controlled on-site storm-water storage/retention and off-site storm-water discharge.

Water collected in the retention basin will be sampled following a storm **or as otherwise directed by the Navy EPD** to determine whether the water meets off-site discharge or sanitary sewer influent requirements. Water not meeting off-site discharge requirements will either be recycled in the soil treatment area for compost moisture adjustment, pumped into the sanitary sewer system, or transported to one of the water treatment facilities located at Mine Fill A and Rockeye. Evaporation will be the preferred method of decreasing retention pond volumes, but analyses of retained water will be kept current so that water may be discharged when needed.

NSWC Crane EPD will implement the NPDES discharge permit [NSWC Crane, 1997b] and obtain another modification for discharge of the pond water to the local drainage swales.

NAVFAC Southern Division/ Morrison Knudsen Corporation	District II RAC	ORIGINAL

FIELD CLARIFICATION REQUEST (FCR)

Delivery Order No.: 4324-0009	Subcontract No.: N/A	FCR No.: 4324-0009-FCR-FS010
CLARIFICATION OF ITEMS		Page 1 of 14

Reference Documents: Full-Scale Operational Plan, Rev. 2 and QAPP for Full Scale Operations Plan, Rev. 0

Problem / Change Description:

Several items in the Full Scale Operation Plan and QAPP require clarification to support process and operational activities. See resolution section for details of clarifications.

Initiated by	Signature:	Organization: Morrison Knudsen Corporation	Date: 8/18/98

Resolution:

Item #1: Clarify soil stockpile at the Biofacility covering requirements as shown on Pages 2 of 14 and 3 of 14 attached.

Item #2: Clarify sampling frequency of retention ponds to include Navy EPD direction. See pages 4 of 14, 5 of 14, 6 of 14, and 7 of 14 attached.

Item #3: Clarify cleaning of SCARAB between buildings. See pages 8 of 14 and 9 of 14 attached.

Item #4: Delete "Removal of ponding water on asphalt" requirement. See page 10 of 14 attached. Based on operational experience, the small puddles of water on the asphalt have not created any hazards or contamination concerns.

Item #5: Clarify grinder/mixer time of "a minimum of ten minutes" to approximately ten minutes. See page 11 of 14 attached. Based on operational performance of the SCARAB, the ten minute minimum in the tub grinder is not critical for adequate blending.

Item #6: Clarify the use of the 4' 7" measuring stick for determining field measurement locations. Based on operational experience, the height of the windrow reduces over time. Therefore, the mid point of the windrow side dimension is the more consistent location for monitoring and sampling. See pages 12 of 14, 13 of 14, and 14 of 14 attached.

with 1 comment page 14 of 14

If this FCR affects a subcontract, indicate CID number: N/A

Approval by MK PE	Signature: V. Venkatesh signature on file	Date:	Approval by ROICC/NTR or RPM	Signature:	Date
Approval by MK PjM	Signature: D Ball	Date: 8/25/98	Additional Reviews: By/Date Christine D. Freeman 9/4/98 NSWC Crane Env. Prot. Dept.		
Approval by MK QC	Signature: R. J. Spencer	Date: 8/26/98			
Approval by MK REG SPT.	Signature: S. Cory signature on file	Date:	Approved w/ 1 comment on Item 6 page 14 of 14 prove still needed listing		

Regulator Approval/Notification Recommended:
Yes ☑ No ☐ 10/26/98

A:FCRFS010.DOC

4. Ensure all rotating equipment guards are in place and functional prior to equipment operation.

5.0 PROCEDURE

Soil will be excavated from the excavation areas and screened as specified in the Soil Excavation Plan, Appendix E.

5.1 Transporting Soil

Screened soil will be transported from the excavation areas or from stockpile at the Bioremediation Facility building using the semi-tractor and live-bottom trailer. Soil at NSWC Crane averages 1.1 tons per cubic yard. The empty weight of each tractor-trailer rig is approximately 16.3 tons. Loaded with 15 cubic yards of soil (16.5 tons), the total load of 32.8 tons will not exceed the 36 ton capacity limit of two bridges on the NSWC Crane base. Transportation route from the excavation sites to the composting facility is shown in the Soil Excavation Plan, Appendix E. Prior to leaving the composting facility, the exterior of the tractor-trailer rig will be decontaminated at the equipment decontamination facility located at the composting facility exit as discussed in Field SOP 7.0.

Screened soil may be transported and stockpiled in one of the buildings at the Bioremediation Facility, if necessary with approval of NSWC Crane EPD. Stockpiled soil will be covered **during windy conditions** to prevent dust from emminating.

5.2 Loading Soil into Windrows

The general sequence of activities for loading soil into the windrows is as follows:

1. The semi-tractor trailer rig loaded with soil arrives at the windrow and the volume and weight of soil is recorded on the *Record of Recipe* form (See Field SOP 3.0). At this time, the *Record of Recipe* form has already been partially completed during the amendment proportioning and mixing procedure, Field SOP 3.0.

2. The semi-tractor trailer enters the compost building.

3. The Hopper/Conveyor is connected to the rear of the semi-tractor trailer via two swivel hooks and latches.

4. Once positioned to the left of the first amendment pile, the engine of the Hopper/Conveyor will be started.

5. Next the bottom flap at the rear of the trailer will be opened to a minimum of six inches.

5.5 POST-EXCAVATION SOIL SAMPLING

Once soil has been removed, the open excavation at Mine Fill A will be sampled. ~~and covered.~~ After analytical results are obtained and determined to meet the cleanup levels, the excavation shall be backfilled from an approved on-site borrow source. The on-site borrow source will be sampled and approved based on analytical results prior to temporary backfilling operations.

The purpose of sampling the excavation is to determine the level of contamination remaining, with respect to explosives, totals of site-specific metals and site-specific VOCs. **The VOC method described in the approved QAPP shall be used.** A sampling grid will be laid out along the base of the excavation(s), using a nodal spacing as provided in Figures E1-1 through E1-4 of this Plan. Each grid block will be sampled using procedures described in the approved Full-Scale QAPP [MK, 1998a] for pre-excavation sampling. However, only one composite sample and one grab sample (for VOCs) will be collected from each grid block. The composite sample will be analyzed for totals of site-specific metals and explosives, and will be collected from the surface to six-inch interval in a manner similar to pre-excavation composite samples. The grab sample will be analyzed for site-specific VOCs, and will be collected from the center of the grid block, six inches below ground surface, using a drive sampler.

Pin flags will be placed every 20 feet along sidewalls greater than one foot in depth. Samples will be collected at each pin flag location, using a drive sampler. One sample will be collected from 0-6 inches into the sidewall surface at the midpoint between the surface and bottom of excavation. The sample will be analyzed for site-specific metals, explosives analysis, and site-specific VOCs analysis.

APPENDIX B

WASTE DISPOSAL DOCUMENTATION

(7 pages)

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
ice tank	5 gal metal	explosives	Bio Facility	40 lbs

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*	CODE	DATE
Gordon D. McMaan	0911	1/20/99

SIGNATURE *(Transporter)*	ORGANIZATION	DATE
Peter N. Thurlin	Morrison Knudsen	

SIGNATURE *(Operator at Treatment Facility)*	TREATMENT FACILITY	DATE
[illegible]	NBC	1-20-99

DISTRIBUTION

The following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
[illegible]	Can	Explosive	[illegible]	38 lbs.

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*	CODE	DATE
Christine D. Freeman		9/22/98
SIGNATURE *(Transporter)*	**ORGANIZATION**	**DATE**
[illegible]		9/22/98
SIGNATURE *(Operator at Treatment Facility)*	**TREATMENT FACILITY**	**DATE**
[illegible]	A056	9-22-98

DISTRIBUTION

following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

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NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
liquid	5 gal. metal	acetone w/explosives	B facility	4 lbs

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*		CODE	DATE
[illegible]		0911	7/15/98
SIGNATURE *(Transporter)*	**ORGANIZATION**		**DATE**
[illegible]	Morrison Knudsen		7/15/98
SIGNATURE *(Operator at Treatment Facility)*	**TREATMENT FACILITY**		**DATE**
[illegible]	ABC		7-15-98

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following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
quid	5gal. metal	acetone w/explosives	Biofacility	5gal, 40lbs.

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*		CODE	DATE
Thomas J. Brant x-6166		09510	6/19/98
SIGNATURE *(Transporter)*	ORGANIZATION		DATE
[illegible]	Morrison Knudsen		6/19/98
SIGNATURE *(Operator at Treatment Facility)*	TREATMENT FACILITY		DATE
[illegible]	NBG		6-19-98

DISTRIBUTION

T' ollowing copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
liquid	5gal metal	acetone w/explosives	Bio Facility	5gal, 40lbs

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*		CODE	DATE
Martin D. Freeman 4123 (MK)		0911	5/13/98
SIGNATURE *(Transporter)*	ORGANIZATION		DATE
Mike Maddox	MK		5/13/98
SIGNATURE *(Operator at Treatment Facility)*	TREATMENT FACILITY		DATE
[illegible]	NBG		5-13-98

DISTRIBUTION

The following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
liquid	5gal. metal	acetone & high explosives	Bio Facility	2.5 gallons

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*	CODE	DATE
James U. Hunsicker	095	22 Dec 97

SIGNATURE *(Transporter)*	ORGANIZATION	DATE
Mike Maddox	MK	22 Dec 97

SIGNATURE *(Operator at Treatment Facility)*	TREATMENT FACILITY	DATE
[illegible]	ABC	12-23-97

DISTRIBUTION

T' following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

CONTAMINATED SCRAP MANIFEST
NWSCC 6280/4 (REV. 6-84)

The following material is hereby certified as being contaminated with explosives and/or pyrotechnics

TYPE OF SCRAP	TYPE OF CONTAINER	TYPE OF CONTAMINATION*	BUILDING/AREA AND CODE	APPROXIMATE QUANTITY (lb.)
Liquid	5 gal. Plastic	Acetone [illegible]	Bio facility	2 gallons [illegible]

*Indicate if material is mixed with water or other chemical solvents. Identify the specific chemical solvent used.

SIGNATURE *(Generator or Facility Supervisor-Extension No.)*		CODE	DATE
[illegible]		9510	4/22/97
SIGNATURE *(Transporter)*	ORGANIZATION		DATE
[illegible]	PK		[illegible]
SIGNATURE *(Operator at Treatment Facility)*	TREATMENT FACILITY		DATE
[illegible]	NRO		4-22-97

DISTRIBUTION

The following copies shall be withdrawn by the respective personnel and sent to Code 0924, Building 2516, within 5 work days.

Gold - Generator; Yellow - Transporter; White - Treatment Facility Operator

NOTE: Generator - retains Pink; Operator of Treatment Facility retains Green

APPENDIX C

INITIAL CHARACTERIZATION SAMPLING GRID LOCATION DRAWINGS

FIGURE	TITLE
C1	ICS RESULTS, MINE FILL A, BUILDING 153/154
C2	ICS RESULTS, MINE FILL A, BUILDING 158/159
C3	ICS RESULTS, MINE FILL A, BUILDING 152
C4	ICS RESULTS, MINE FILL A, BUILDING 157
C5	ICS RESULTS, MINE FILL A, BUILDING 160
C6	ICS RESULTS, MINE FILL A, BUILDING 151

APPENDIX D

GRID EXCAVATION SAMPLING SUMMARY

(24 pages)

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
1	MPSICS01			X	MPSPES05			X	MFAPES153		X	
	MPSICS02			X	MPSPES06	X	X		MFAPES154	X	X	
	MFAICS293	X	X									
	MFAICS294	X	X									
	MFAICS295	X	X									
	MFAICS296	X	X									
	MFAICS297	X	X									
2	MPSICS03			X	MPSPES07			X	MFAPES155			X
	MPSICS04			X	MPSPES08	X	X		MFAPES156	X	X	
	MFAICS298		X									
	MFAICS299	X	X									
	MFAICS300	X	X									
	MFAICS301	X	X									
3	MPSICS05			X	MFAPES111			X				
	MPSICS06			X	MFAPES112	X	X					
4	MPSICS07			X	MFAPES113			X				
	MPSICS08			X	MFAPES114	X	X					
					MFAPES115			X				
					MFAPES116	X	X					
5	MPSICS09			X	MFAPES121			X				
	MPSICS10			X	MFAPES122	X	X					
	MPSICS11			X								
6	MPSICS12			X	MFAPES077		X					
	MPSICS13			X	MFAPES078	X	X					
7	MPSICS14			X	MFAPES075	X	X					
	MPSICS15		X		MFAPES076	X	X					
8	MPSICS16	X	X		MFAPES071		X					
	MPSICS17			X	MFAPES072	X	X					

TABLE D-1
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NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
9	MPSICS18		X		MFAPES079	X	X					
	MPSICS19		X		MFAPES080	X	X					
	MPSICS20		X									
10	MPSICS21			X	MFAPES175			**X**				
	MPSICS22			X	MFAPES176	X	X					
11	MPSICS23			X	MFAPES177			**X**				
	MPSICS24			X	MFAPES178	X	X					
12	MPSICS25			X	MFAPES181			**X**				
	MPSICS26			X	MFAPES182	X	X					
13	MFAICS113			X	MFAPES099	X	X					
	MFAICS114	X	X		MFAPES100	X	X					
	MFAICS115			X								
14	MFAICS116			X	MFAPES101		X					
	MFAICS117	X	X		MFAPES102	X	X					
	MFAICS118			X								
15	MFAICS50			X	MFAPES149		X					
	MFAICS51	X	X		MFAPES150	X	X					
	MFAICS52		X									
16	MFAICS27			X	MFAPES081		X					
	MFAICS28	X	X		MFAPES082	X	X					
	MFAICS29	X	X									
17	MFAICS30			X	MFAPES069			**X**				
	MFAICS31	X	X		MFAPES070	X	X					
	MFAICS32			X								
	MFAICS33	X	X									
18	MFAICS34			X	MFAPES067		X					
	MFAICS35	X	X		MFAPES068	X	X					
	MFAICS36			X								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
19	MFAICS37		X									
	MFAICS38	X	X									
	MFAICS39	X	X									
	MFAICS40		X									
20	MFAICS41			X	MFAPES027		X					
	MFAICS42	X	X		MFAPES028	X	X					
21	MFAICS43	X	X									
	MFAICS44	X	X									
	MFAICS45	X	X									
22	MFAICS46			X	MFAPES029	X	X					
	MFAICS47	X	X		MFAPES030	X	X					
	MFAICS48	X	X									
	MFAICS49			X								
23	MFAICS53			**X**								
	MFAICS54	X	X									
	MFAICS55		X									
24	MFAICS56			**X**								
	MFAICS57	X	X									
	MFAICS58		X									
	MFAICS59		X									
25	MFAICS60		X									
	MFAICS61	X	X									
	MFAICS62	X	X									
	MFAICS63		X									
26	MFAICS64			**X**								
	MFAICS65	X	X									
	MFAICS66			**X**								
27	MFAICS67			X	***MFAPES284***			**X**				
	MFAICS68	X	X		***MFAPES285***	X	X					
	MFAICS69			X								

TABLE D-1
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NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
28	MFAICS70			X	***MFAPES282***			**X**				
	MFAICS71	X	X		***MFAPES283***	X	X					
	MFAICS72			X								
29	MFAICS73			**X**								
	MFAICS74	X	X									
	MFAICS75			**X**								
30	MFAICS76			X	***MFAPES290***	X	X					
	MFAICS77	X	X		***MFAPES291***	X	X					
	MFAICS78		X									
31	MFAICS79			X	***MFAPES286***		X					
	MFAICS80			X	***MFAPES287***	X	X					
	MFAICS81	X	X									
	MFAICS82	X	X									
32	MFAICS83	X	X		***MFAPES288***	X	X					
	MFAICS84	X	X		***MFAPES289***	X	X					
	MFAICS85	X	X									
33	MFAICS86			**X**								
	MFAICS87	X	X									
	MFAICS88	X	X									
	MFAICS89			**X**								
	MFAICS90	X	X									
34	MFAICS91			**X**								
	MFAICS92	X	X									
	MFAICS93		X									
35	MFAICS94			**X**								
	MFAICS95	X	X									
	MFAICS96			**X**								
36	MFAICS97			**X**								
	MFAICS98	X	X									
	MFAICS99			**X**								

TABLE D-1
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NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
37	MFAICS100			X	***MFAPES298***			**X**				
	MFAICS101	X	X		***MFAPES299***	X	X					
	MFAICS102			X								
	MFAICS103			X								
38	MFAICS104			**X**								
	MFAICS105	X	X									
	MFAICS106		X									
39	MFAICS107			X	***MFAPES294***		X					
	MFAICS108	X	X		***MFAPES295***	X	X					
	MFAICS109		X									
40	MFAICS110			**X**								
	MFAICS111	X	X									
	MFAICS112			**X**								
41	MFAICS126			X	MFAPES017		X					
	MFAICS127	X	X		MFAPES018	X	X					
	MFAICS128			X								
42	MFAICS181			X	MFAPES019		X					
	MFAICS182	X	X		MFAPES020	X	X					
	MFAICS183		X									
	MFAICS184		X									
43	MFAICS132			X	MFAPES143		X					
	MFAICS133	X	X		MFAPES144	X	X					
	MFAICS134		X									
44	MFAICS157	X	X									
	MFAICS158	X	X									
	MFAICS159	X	X									
45	MFAICS154			X	MFAPES129	X	X					
	MFAICS155	X	X		MFAPES130	X	X					
	MFAICS156		X									

TABLE D-1
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NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
46	MFAICS191	X	X									
	MFAICS192	X	X									
	MFAICS193	X	X									
47	MFAICS194	X	X									
	MFAICS195	X	X									
	MFAICS196	X	X									
48	MFAICS151			X	MFAPES131	X	X					
	MFAICS152	X	X		MFAPES132	X	X					
	MFAICS153		X									
49	MFAICS197			X	MFAPES141		X					
	MFAICS198	X	X		MFAPES142	X	X					
	MFAICS199	X	X									
50	MFAICS148			X	MFAPES133	X	X					
	MFAICS149	X	X		MFAPES134	X	X					
	MFAICS150	X	X									
51	MFAICS200			X	MFAPES161	X	X					
	MFAICS201	X	X		MFAPES162	X	X					
	MFAICS202	X	X									
52	MFAICS145			X	MFAPES135	X	X					
	MFAICS146	X	X		MFAPES136	X	X					
	MFAICS147		X									
53	MFAICS203			X	MFAPES165		X					
	MFAICS204	X	X		MFAPES166	X	X					
	MFAICS205	X	X									
	MFAICS206	X	X									
54	MFAICS141			X	MFAPES137		X					
	MFAICS142			X	MFAPES138	X	X					
	MFAICS143	X	X									
	MFAICS144		X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
55	MFAICS207			X	MFAPES167	X	X					
	MFAICS208	X	X		MFAPES168	X	X					
	MFAICS209	X	X									
56	MFAICS138			X	MFAPES139			**X**				
	MFAICS139	X	X		MFAPES140	X	X					
	MFAICS140			X								
57	MFAICS210			X	MFAPES169		X					
	MFAICS211	X	X		MFAPES170	X	X					
	MFAICS212			X								
58	MFAICS135			X	MFAPES197			**X**				
	MFAICS136	X	X		MFAPES198	X	X					
	MFAICS137		X									
59	MFAICS213			X	MFAPES199			**X**				
	MFAICS214	X	X		MFAPES200	X	X					
	MFAICS215											
60	MFAICS185			X	***MFAPES296***	X	X					
	MFAICS186	X	X		***MFAPES297***	X	X					
	MFAICS187		X									
61	MFAICS188	X	X									
	MFAICS189	X	X									
	MFAICS190	X	X									
62	MFAICS129			X	MFAPES179			**X**				
	MFAICS130	X	X		MFAPES180	X	X					
	MFAICS131			X								
63	MFAICS164			X	MFAPES183			**X**				
	MFAICS165	X	X		MFAPES184	X	X					
	MFAICS166			X								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
64	MFAICS119			X	MFAPES173			X				
	MFAICS120	X	X		MFAPES174	X	X					
	MFAICS121			X								
	MFAICS122			X								
65	MFAICS123			X	MFAPES171			X				
	MFAICS124	X	X		MFAPES172	X	X					
	MFAICS125			X								
66	MFAICS178			X	MFAPES157	X	X					
	MFAICS179	X	X		MFAPES158	X	X					
	MFAICS180		X									
67	MFAICS173			X	MFAPES163		X					
	MFAICS174	X	X		MFAPES164	X	X					
	MFAICS175	X	X									
	MFAICS176	X	X									
	MFAICS177	X	X									
68	MFAICS170		X									
	MFAICS171	X	X									
	MFAICS172	X	X									
69	MFAICS167	X	X									
	MFAICS168	X	X									
	MFAICS169	X	X									
70	MFAICS160			X	MFAPES195	X	X					
	MFAICS161	X	X		MFAPES196	X	X					
	MFAICS162			X								
	MFAICS163			X								
71	MFAICS380			X	MFAPES215		X					
	MFAICS381	X	X		MFAPES216	X	X					
	MFAICS382			X								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
72	MFAICS383			X	MFAPES213			**X**				
	MFAICS384	X	X		MFAPES214	X	X					
	MFAICS385			X								
73	MFAICS386			X	MFAPES211	X	X					
	MFAICS387	X	X		MFAPES212	X	X					
	MFAICS388		X									
74	MFAICS389			X	MFAPES209	X	X					
	MFAICS390	X	X		MFAPES210	X	X					
	MFAICS391			X								
75	MFAICS392			X	MFAPES201	X	X					
	MFAICS393			X	MFAPES202	X	X					
	MFAICS394	X	X									
	MFAICS395			X								
76	MFAICS396			X	MFAPES203	X	X					
	MFAICS397	X	X		MFAPES204	X	X					
	MFAICS398			X								
77	MFAICS399			X	MFAPES205		X					
	MFAICS400	X	X		MFAPES206	X	X					
	MFAICS401		X									
78	MFAICS411			X	***MFAPES269***		X					
	MFAICS412	X	X		***MFAPES270***	X	X					
	MFAICS413			X	***MFAPES271***	X	X					
					MFAPES272		X					
					MFAPES273	X	X					
79	MFAICS414	X	X									
	MFAICS415	X	X									
	MFAICS416	X	X									
	MFAICS417	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
80	MFAICS418		X									
	MFAICS419	X	X									
	MFAICS420	X	X									
81	MFAICS421		X									
	MFAICS422	X	X									
	MFAICS423	X	X									
82	MFAICS437			X	***MFAPES274***	X	X					
	MFAICS438	X	X		***MFAPES275***	X	X					
	MFAICS439		X									
83	MFAICS440	X	X		***MFAPES276***		X					
	MFAICS441	X	X		***MFAPES277***	X	X					
	MFAICS442			X								
84	MFAICS443			X	***MFAPES278***	X	X					
	MFAICS444	X	X		***MFAPES279***	X	X					
	MFAICS445		X									
85	MFAICS351	X	X									
	MFAICS352	X	X									
	MFAICS353	X	X									
	MFAICS354	X	X									
86	MFAICS355	X	X									
	MFAICS356	X	X									
	MFAICS357	X	X									
87	MFAICS358	X	X									
	MFAICS359	X	X									
	MFAICS360	X	X									
88	MFAICS402			X	MFAPES207	X	X					
	MFAICS403	X	X		MFAPES208	X	X					
	MFAICS404		X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
89	MFAICS433		X									
	MFAICS434	X	X									
	MFAICS435	X	X									
	MFAICS436	X	X									
90	MFAICS430			X	***MFAPES265***	X	X					
	MFAICS431	X	X		***MFAPES266***	X	X					
	MFAICS432			X	***MFAPES267***	X	X					
					MFAPES268	X	X					
91	MFAICS427	X	X									
	MFAICS428	X	X									
	MFAICS429	X	X									
92	MFAICS424			X	***MFAPES280***		X					
	MFAICS425	X	X		***MFAPES281***	X	X					
	MFAICS426		X									
93	MFAICS377	X	X									
	MFAICS378	X	X									
	MFAICS379	X	X									
94	MFAICS408	X	X									
	MFAICS409	X	X									
	MFAICS410	X	X									
95	MFAICS405		X									
	MFAICS406	X	X									
	MFAICS407	X	X									
96	MFAICS229			X	***MFAPES260***			X	***MFAPES262***	X	X	
	MFAICS230	X	X		***MFAPES261***	X	X		***MFAPES263***	X	X	
	MFAICS231			X					***MFAPES264***		X	
97	MFAICS232			X	***MFAPES258***	X*	X*					
	MFAICS233	X	X		***MFAPES259***	X	X					
	MFAICS234			X								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
98	MFAICS235			X	***MFAPES256***	X*	X*					
	MFAICS236	X	X		***MFAPES257***	X	X					
	MFAICS237			X								
99	MFAICS238			X	***MFAPES254***		X*					
	MFAICS239	X	X		***MFAPES254FD***		X*					
	MFAICS240			X	***MFAPES255***	X	X					
100	MFAICS497			X	***MFAPES253***	X	X					
	MFAICS498	X	X		***MFAPES237***	X	X					
	MFAICS499			X								
	MFAICS500			X								
101	MFAICS507			X	***MFAPES239***		X					
	MFAICS508	X	X		***MFAPES240***	X	X					
	MFAICS509		X									
102	MFAICS510			X	***MFAPES247***		X					
	MFAICS511	X	X		***MFAPES248***	X	X					
	MFAICS512											
103	MFAICS526			X	***MFAPES235***			**X**				
	MFAICS527	X	X		***MFAPES236***	X	X					
	MFAICS528			X								
104	MFAICS523			X	***MFAPES233***		X*					
	MFAICS524	X	X		***MFAPES234***	X	X					
	MFAICS525	X	X									
105	MFAICS519		X		***MFAPES231***	X*	X*					
	MFAICS520			X	***MFAPES232***	X	X					
	MFAICS521	X	X									
	MFAICS522			X								
106	MFAICS222			X	***MFAPES223***			**X**				
	MFAICS223	X	X		***MFAPES224***	X	X					
	MFAICS224			X								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
107	MFAICS487			X	***MFAPES225***	X*	X*					
	MFAICS488	X	X		***MFAPES226***	X	X					
	MFAICS489			X								
	MFAICS490	X	X									
108	MFAICS244			X	***MFAPES227***	X*	X*					
	MFAICS245	X	X		***MFAPES228***	X	X					
	MFAICS246	X	X									
	MFAICS247	X	X									
109	MFAICS241		X		***MFAPES229***		X*					
	MFAICS242	X	X		***MFAPES229FD***		X*					
	MFAICS243		X		***MFAPES230***	X	X					
110	MFAICS491	X	X									
	MFAICS492	X	X									
	MFAICS493	X	X									
111	MFAICS248	X	X									
	MFAICS249	X	X									
	MFAICS250	X	X									
112	MFAICS501			X	***MFAPES241***	X	X					
	MFAICS502	X	X		***MFAPES242***	X	X					
	MFAICS503		X		***MFAPES243***		X					
					MFAPES244	X	X					
					MFAPES245	X	X					
					MFAPES246	X	X					
113	MFAICS504	X	X									
	MFAICS505	X	X									
	MFAICS506	X	X									
114	MFAICS513			X	***MFAPES249***		X					
	MFAICS514	X	X		***MFAPES250***	X	X					
	MFAICS515		X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
115	MFAICS516	X	X									
	MFAICS517	X	X									
	MFAICS518	X	X									
116	MFAICS225		X									
	MFAICS226		X									
	MFAICS227	X	X									
	MFAICS228	X	X									
117	MFAICS219			X	***MFAPES217***	X*	X*					
	MFAICS220	X	X		***MFAPES218***	X	X					
	MFAICS221		X		***MFAPES219***	X*	X*					
					MFAPES220	X	X					
					MFAPES221	X*	X*					
					MFAPES222	X	X					
118	MFAICS216	X	X									
	MFAICS217	X	X									
	MFAICS218	X	X									
119	MFAICS494	X	X									
	MFAICS495	X	X									
	MFAICS496	X	X									
120	MFAICS481	X	X									
	MFAICS482	X	X									
	MFAICS483	X	X									
121	MFAICS484	X	X									
	MFAICS485	X	X									
	MFAICS486	X	X									
122					MFAPES093		X					
					MFAPES094	X	X					
123					MFAPES103		X					
					MFAPES104	X	X					

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
124					MFAPES105		X					
					MFAPES106	X	X					
125					MFAPES107	X	X					
					MFAPES108	X	X					
126					MFAPES109			**X**				
					MFAPES110	X	X					
127	MFAICS251			X	MFAPES095			**X**				
	MFAICS252	X	X		MFAPES096	X	X					
	MFAICS253	X	X									
128	MFAICS254			X	MFAPES097			**X**				
	MFAICS255	X	X		MFAPES098	X	X					
	MFAICS256		X									
129	MFAICS257		X									
	MFAICS258	X	X									
	MFAICS259		X									
130					***MFAPES292***	X	X					
					MFAPES293	X	X					
131	MFAICS260			**X**								
	MFAICS261	X	X									
	MFAICS262			**X**								
132	MFAICS263			**X**								
	MFAICS264	X	X									
	MFAICS265		X									
133	MFAICS266			**X**								
	MFAICS267			**X**								
	MFAICS268	X	X									
	MFAICS269			**X**								

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
134	MFAICS274			X	MFAPES117			**X**				
	MFAICS275	X	X		MFAPES118	X	X					
	MFAICS276			X	MFAPES119			**X**				
					MFAPES120			**X**				
135	MFAICS270			**X**								
	MFAICS271	X	X									
	MFAICS272		X									
	MFAICS273	X	X									
136	MFAICS302			X	MFAPES025	X	X					
	MFAICS303	X	X		MFAPES026	X	X					
	MFAICS304	X	X									
137	MFAICS277			X	MFAPES085		X					
	MFAICS278	X	X		MFAPES086	X	X					
	MFAICS279		X									
138	MFAICS280			X	MFAPES083		X					
	MFAICS281	X	X		MFAPES084	X	X					
	MFAICS282			X								
139	MFAICS283			X	MFAPES073		X					
	MFAICS284	X	X		MFAPES074	X	X					
	MFAICS285			X								
140	MFAICS286			X	MFAPES031		X					
	MFAICS287	X	X		MFAPES032	X	X					
	MFAICS288	X	X		MFAPES033	X	X					
	MFAICS289			X	MFAPES034	X	X					
141	MFAICS305	X	X									
	MFAICS306	X	X									
	MFAICS307	X	X									
142	MFAICS290			X	MFAPES151		X					
	MFAICS291	X	X		MFAPES152	X	X					
	MFAICS292			X								

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NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
143	MFAICS324			X	MFAPES147		X					
	MFAICS325	X	X		MFAPES148	X	X					
	MFAICS326			X								
144	MFAICS327			X	MFAPES021		X					
	MFAICS328	X	X		MFAPES022	X	X					
	MFAICS329			X								
145	MFAICS321			X	MFAPES015		X					
	MFAICS322	X	X		MFAPES016	X	X					
	MFAICS323			X								
146	MFAICS318			X	MFAPES013		X					
	MFAICS319	X	X		MFAPES014	X	X					
	MFAICS320			X								
147	MFAICS311			X	MFAPES011		X					
	MFAICS312	X	X		MFAPES012	X	X					
	MFAICS313			X								
148	MFAICS308			X	MFAPES009	X	X					
	MFAICS309	X	X		MFAPES010	X	X					
	MFAICS310		X									
149	MFAICS334			X	MFAPES185			X				
	MFAICS335	X	X		MFAPES186	X	X					
	MFAICS336			X								
150	MFAICS337			X	MFAPES189			X				
	MFAICS338	X	X		MFAPES190	X	X					
	MFAICS339	X	X									
151	MFAICS330			X	MFAPES193		X					
	MFAICS331			X	MFAPES194	X	X					
	MFAICS332	X	X									
	MFAICS333		X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
152	MFAICS340	X	X									
	MFAICS341	X	X									
	MFAICS342	X	X									
153	MFAICS343			X	MFAPES187		X					
	MFAICS344	X	X		MFAPES188	X	X					
	MFAICS345	X	X									
154	MFAICS314	X	X									
	MFAICS315	X	X									
	MFAICS316	X	X									
	MFAICS317	X	X									
155	MFAICS346	X	X									
	MFAICS347	X	X									
156	MFAICS348	X	X									
	MFAICS349	X	X									
	MFAICS350	X	X									
157	MFAICS361	X	X									
	MFAICS362	X	X									
	MFAICS363	X	X									
158	MFAICS364	X	X									
	MFAICS365	X	X									
	MFAICS366	X	X									
159	MFAICS367	X	X									
	MFAICS368	X	X									
	MFAICS369	X	X									
160	MFAICS370	X	X									
	MFAICS371	X	X									
	MFAICS372	X	X									
161	MFAICS373	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
162	MFAICS374	X	X									
	MFAICS375	X	X									
	MFAICS376	X	X									
163	MFAICS446			X	MFAPES035		X					
	MFAICS447	X	X		MFAPES036	X	X					
	MFAICS448		X		MFAPES037	X	X					
					MFAPES038	X	X					
164	MFAICS449			X	MFAPES039		X					
	MFAICS450	X	X		MFAPES040	X	X					
	MFAICS451		X		MFAPES041	X	X					
					MFAPES042	X	X					
165	MFAICS452			X	MFAPES043		X					
	MFAICS453	X	X		MFAPES044	X	X					
	MFAICS454		X		MFAPES045	X	X					
					MFAPES046	X	X					
166	MFAICS465			X	MFAPES055		X		MFAPES145	X	X	
	MFAICS466	X	X		MFAPES056	X	X		MFAPES146	X	X	
	MFAICS467		X		MFAPES057			X				
					MFAPES058	X	X					
					MFAPES059		X					
					MFAPES060	X	X					
167	MFAICS463			X	MFAPES061		X					
	MFAICS464	X	X		MFAPES062	X	X					
					MFAPES063		X					
					MFAPES064	X	X					
					MFAPES065		X					
					MFAPES066	X	X					
168	MFAICS460	X	X									
	MFAICS461	X	X									
	MFAICS462	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
169	MFAICS456	X	X									
	MFAICS457	X	X									
	MFAICS458	X	X									
	MFAICS459	X	X									
170	MFAICS468	X	X									
	MFAICS469	X	X									
	MFAICS470	X	X									
171	MFAICS471			**X**								
	MFAICS472	X	X									
	MFAICS473			**X**								
172	MFAICS474			**X**								
	MFAICS475	X	X									
	MFAICS476		X									
173	MFAICS477			**X**								
	MFAICS478			**X**								
	MFAICS479	X	X									
	MFAICS480	X	X									
174	MFAICS535	X	X									
	MFAICS536	X	X									
	MFAICS537	X	X									
	MFAICS538	X	X									
175	MFAICS539		X									
	MFAICS540	X	X									
	MFAICS541		X									
	MFAICS542		X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
176	MFAICS549			X	MFAPES047		X					
	MFAICS551			X	MFAPES048	X	X					
	MFAICS550	X	X		MFAPES049	X	X					
					MFAPES050	X	X					
					MFAPES051	X	X					
					MFAPES052	X	X					
					MFAPES053	X	X					
					MFAPES054	X	X					
177	MFAICS543	X	X									
	MFAICS544	X	X									
	MFAICS545		X									
178	MFAICS555	X	X									
	MFAICS555-FD	X	X									
	MFAICS556	X	X									
	MFAICS557	X	X									
179	MFAICS558	X	X									
	MFAICS559	X	X									
	MFAICS560	X	X									
180	MFAICS552	X	X									
	MFAICS554	X	X									
	MFAICS553	X	X									
181	MFAICS529		X									
	MFAICS530	X	X									
	MFAICS531	X	X									
182	MFAICS532		X		MFAPES191	X	X					
	MFAICS533	X	X		MFAPES192	X	X					
	MFAICS534	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
183	MFAICS561			X	MFAPES159	X	X					
	MFAICS562FD			X	MFAPES160	X	X					
	MFAICS563	X	X									
	MFAICS564	X	X									
184	MFAICS565	X	X									
	MFAICS566	X	X									
	MFAICS567	X	X									
185	MFAICS568			X	***MFAPES251***	X	X					
	MFAICS569	X	X		***MFAPES252***	X	X					
	MFAICS570		X									
	MFAICS571	X	X									
	MFAICS572	X	X									
	MFAICS573	X	X									
	MFAICS574FD			X								
186	MFAICS588		X									
	MFAICS589	X	X									
	MFAICS590	X	X									
187	MFAICS591	X	X									
	MFAICS592	X	X									
	MFAICS593	X	X									
	MFAICS593FD	X	X									
188	MFAICS594	X	X									
	MFAICS595	X	X									
	MFAICS596	X	X									
189	MFAICS600	X	X									
	MFAICS601	X	X									
	MFAICS602	X	X									
	MFAICS602FD	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
190	MFAICS597	X	X									
	MFAICS598	X	X									
	MFAICS599	X	X									
191	MFAICS585	X	X									
	MFAICS586	X	X									
	MFAICS587	X	X									
192	MFAICS582	X	X									
	MFAICS582FD	X	X									
	MFAICS583	X	X									
	MFAICS584	X	X									
193	MFAICS579	X	X									
	MFAICS580	X	X									
	MFAICS581	X	X									
194	MFAICS576	X	X									
	MFAICS577	X	X									
	MFAICS578	X	X									
195	MFAICS606	X	X									
	MFAICS607	X	X									
	MFAICS608	X	X									
196	MFAICS603	X	X									
	MFAICS604	X	X									
	MFAICS605	X	X									
197	MFAICS612	X	X									
	MFAICS612FD	X	X									
	MFAICS613	X	X									
	MFAICS614	X	X									
198	MFAICS609	X	X									
	MFAICS610	X	X									
	MFAICS611	X	X									

TABLE D-1
MINE FILL A GRID EXCAVATION SAMPLING SUMMARY
NSWC CRANE

INITIAL CHARACTERIZATION					POST-EXCAVATION				POST-EXCAVATION (Add'l Excavation)			
Grid Number	ICS Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	PES Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded	Further Remediation Site Sample ID	Resident. Clean-up Met	Indust. Clean-Up Met	Clean-Up Levels Exceeded
199	MFAICS615	X	X									
	MFAICS616	X	X									
	MFAICS617	X	X									
200					MFAPES088			**X**				
					MFAPES089	X	X					
					MFAPES090			**X**				
201					MFAPES091		X					
					MFAPES092	X	X					
202					MFAPES123			**X**				
					MFAPES124	X	X					
203					MFAPES125			**X**				
					MFAPES126	X	X					
					MFAPES127			**X**				
					MFAPES128	X	X					

Note: All samples denoted by ***bold and italicized site ID's*** were collected by TolTest, Inc.
- A bold **"X"** indicates that the sample was from an area that was not excavated to cleanup criteria
ICS - Initial Characterization Sample
PES - Post-Excavation Sample
* - Arsenic is not a contaminant of concern for MFA however sample results exceeded clean-up criteria which may be due to high background levels of the compound at the site.

APPENDIX E

INITIAL CHARACTERIZATION SAMPLE RESULTS

TABLE		PAGES
E-1	Mine Fill A Initial Characterization Sampling Results	106 pages
E-2	Mine Fill A Initial Characterization QC Sample Results	9 pages

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MPSICS01	2/19/97	1	6 - 12	6 U	6 U	6 U	12 U	12 U	6 U	3 J	6 U	2 J
MPSICS02	2/19/97	1	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS03	2/20/97	2	6 - 12	6 U	6 U	6 U	12 U	12 U	6 U	2 J	6 U	6 U
MPSICS04	2/20/97	2	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS05	2/24/97	3	6 - 12	6 U	6 U	6 U	12 U	12 U	2 JB	6 U	6 U	6 U
MPSICS06	2/24/97	3	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS07	2/24/97	4	6 - 12	6 U	6 U	6 U	12 U	13	2 JB	6 U	2 J	6 U
MPSICS08	2/24/97	4	18 - 24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS09	2/25/97	5	6 - 12	6 U	6 U	6 U	12 U	10 J	2 JB	2 JB	1 J	2 J
MPSICS10	2/25/97	5	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS11	2/25/97	5	6 - 12	6 U	6 U	6 U	12 U	12 U	1 JB	2 JB	6 U	6 U
MPSICS12	2/25/97	6	6 - 12	6 U	6 U	6 U	12 U	12 U	1 JB	2 JB	6 U	6 U
MPSICS13	2/25/97	6	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS14	2/27/97	7	6 - 12	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MPSICS15	2/27/97	7	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS16	2/28/97	8	6 - 12	6 U	6 U	6 U	12 U	30	6 U	6 U	6 U	6 U
MPSICS17	2/28/97	8	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS18	2/28/97	9	6 - 12	6 U	6 U	6 U	13 U	8 J	6 U	6 U	6 U	6 U
MPSICS19	2/28/97	9	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS20	2/28/97	9	24 - 30	6 U	6 U	6 U	12 U	10 U	6 U	6 U	6 U	6 U
MPSICS21	3/11/97	10	6 - 12	7 U	7 U	7 U	13 U	8 JB	7 U	7 U	7 U	2 J
MPSICS22	3/11/97	10	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS23	3/11/97	11	6 - 12	6 U	6 U	3 J	12 U	11 JB	6 U	6 U	6 U	6 U
MPSICS24	3/11/97	11	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSICS25	3/11/97	12	6 - 12	6 U	6 U	6 U	12 U	9 JB	6 U	6 U	11	2 J
MPSICS26	3/11/97	12	24 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS27	11/12/97	16	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS28	11/12/97	16	12 - 18	5 U	5 U	5 U	10 U	5 JB	5 U	5 U	5 U	3 J
MFAICS29	11/12/97	16	20 - 24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS30	11/12/97	17	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS31	11/12/97	17	12 - 18	5 U	5 U	5 U	10 U	8 JB	5 U	2 J	5 U	2 J

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MPSICS01	2/19/97	1	6 - 12	1250 U	77000	1300 U	N/A	**690000 D**	1250 U	3250 U	**66000**
MPSICS02	2/19/97	1	24 - 30	1250 U	59000	1300 U	N/A	**480000 D**	1250 U	3250 U	7900 U
MPSICS03	2/20/97	2	6 - 12	1250 U	120000	1300 U	N/A	**100000 D**	1250 U	3250 U	**210000 D**
MPSICS04	2/20/97	2	24 - 30	250 U	5800	260 U	N/A	**31000**	250 U	650 U	4600
MPSICS05	2/24/97	3	6 - 12	6250 U	1200000	6500 U	N/A	**14000000 D**	8800 P	16200 U	**3000000 D**
MPSICS06	2/24/97	3	24 - 30	250 U	13000	260 U	N/A	**71000 D**	810	650 U	8800 U
MPSICS07	2/24/97	4	6 - 12	250 U	110000	260 U	N/A	**660000 D**	250 U	650 U	10000
MPSICS08	2/24/97	4	18 - 24	250 U	27000	260 U	N/A	**250000 D**	250 U	650 U	1200 P
MPSICS09	2/25/97	5	6 - 12	250 U	130000 D	260 U	N/A	**3000000 D**	250 U	650 U	300 P
MPSICS10	2/25/97	5	24 - 30	250 U	9000 DJ	260 U	N/A	**35000 D**	250 U	650 U	3000
MPSICS11	2/25/97	5	6 - 12	250 U	140000 D	260 U	N/A	**680000 D**	250 U	650 U	250 U
MPSICS12	2/25/97	6	6 - 12	250 U	300000 DJ	260 U	N/A	**17000000 D**	250 U	650 U	2100
MPSICS13	2/25/97	6	24 - 30	250 U	17000	260 U	N/A	**87000 D**	250 U	650 U	450
MPSICS14	2/27/97	7	6 - 12	250 U	9000	260 U	N/A	**25000**	250 U	650 U	540 P
MPSICS15	2/27/97	7	24 - 30	250 U	6500	260 U	N/A	8000	250 U	650 U	250 U
MPSICS16	2/28/97	8	6 - 12	250 U	3400	260 U	N/A	2200	250 U	650 U	250 U
MPSICS17	2/28/97	8	24 - 30	250 U	340000 DJ	260 U	N/A	**1700000 D**	250 U	650 U	9900
MPSICS18	2/28/97	9	6 - 12	250 U	12000	260 U	N/A	12000	250 U	650 U	250 U
MPSICS19	2/28/97	9	24 - 30	250 U	1600 J	260 U	N/A	9300	250 U	650 U	250 U
MPSICS20	2/28/97	9	24 - 30	250 U	1000 J	260 U	N/A	6600	250 U	650 U	250 U
MPSICS21	3/11/97	10	6 - 12	250 U	37000	260 U	N/A	**180000 D**	300	650 U	1900
MPSICS22	3/11/97	10	24 - 30	250 U	18000	260 U	N/A	**180000 D**	250 U	650 U	8700
MPSICS23	3/11/97	11	6 - 12	250 U	46000	260 U	N/A	**560000 D**	250 U	650 U	**260000 D**
MPSICS24	3/11/97	11	24 - 30	250 U	15000	260 U	N/A	**150000 D**	250 U	650 U	63000
MPSICS25	3/11/97	12	6 - 12	250 U	100000 D	260 U	N/A	**830000 D**	840	650 U	12000
MPSICS26	3/11/97	12	24 - 30	250 U	46000	260 U	N/A	**410000 D**	660	650 U	**76000 D**
MFAICS27	11/12/97	16	0 - 12	3120 U	62200	3250 U	N/A	**249000**	3120 U	8120 U	3120 U
MFAICS28	11/12/97	16	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS29	11/12/97	16	20 - 24	250 U	2300	260 U	N/A	***5280***	250 U	650 U	375
MFAICS30	11/12/97	17	0 - 12	***12500 U***	359000	13000 U	N/A	**1520000**	***12500 U***	32500 U	12500 U
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MPSICS01	2/19/97	1	6 - 12	1250 U	1300 U	1400 P	1250 U	1250 U	1250 U	1250 U
MPSICS02	2/19/97	1	24 - 30	1250 U	1300 U	850 J	1250 U	1250 U	1250 U	1250 U
MPSICS03	2/20/97	2	6 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MPSICS04	2/20/97	2	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS05	2/24/97	3	6 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MPSICS06	2/24/97	3	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS07	2/24/97	4	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS08	2/24/97	4	18 - 24	250 U	260 U	740	1100	250 U	250 U	250 U
MPSICS09	2/25/97	5	6 - 12	250 U	260 U	250 U	190 J	250 U	250 U	250 U
MPSICS10	2/25/97	5	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS11	2/25/97	5	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS12	2/25/97	6	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS13	2/25/97	6	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS14	2/27/97	7	6 - 12	250 U	260 U	280	250 U	250 U	250 U	250 U
MPSICS15	2/27/97	7	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS16	2/28/97	8	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS17	2/28/97	8	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS18	2/28/97	9	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS19	2/28/97	9	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS20	2/28/97	9	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS21	3/11/97	10	6 - 12	250 U	260 U	250 U	980	250 U	250 U	250 U
MPSICS22	3/11/97	10	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS23	3/11/97	11	6 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS24	3/11/97	11	24 - 30	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MPSICS25	3/11/97	12	6 - 12	250 U	260 U	250 U	4100	250 U	250 U	250 U
MPSICS26	3/11/97	12	24 - 30	250 U	260 U	940	250 U	250 U	250 U	250 U
MFAICS27	11/12/97	16	0 - 12	3120 U	3250 U	3120 U	3120 U	3120 U	3120 U	3120 U
MFAICS28	11/12/97	16	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS29	11/12/97	16	20 - 24	250 U	260 U	838	402	250 U	250 U	250 U
MFAICS30	11/12/97	17	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MPSICS01	2/19/97	1	6 - 12	N/A	N/A	110000	251 U	20300	18800	N/A	N/A	N/A
MPSICS02	2/19/97	1	24 - 30	N/A	N/A	69500	243 U	14600	13300	N/A	N/A	N/A
MPSICS03	2/20/97	2	6 - 12	N/A	N/A	114000	250 U	18900	22400	N/A	N/A	N/A
MPSICS04	2/20/97	2	24 - 30	N/A	N/A	97400	251 U	15700	17300	N/A	N/A	N/A
MPSICS05	2/24/97	3	6 - 12	N/A	N/A	105000	248 U	11100	18400	N/A	N/A	N/A
MPSICS06	2/24/97	3	24 - 30	N/A	N/A	77000	249 U	11300	12800	N/A	N/A	N/A
MPSICS07	2/24/97	4	6 - 12	N/A	N/A	77900	247 U	11700	13000	N/A	N/A	N/A
MPSICS08	2/24/97	4	18 - 24	N/A	N/A	90600	250 U	12500	16300	N/A	N/A	N/A
MPSICS09	2/25/97	5	6 - 12	N/A	N/A	48600	300 U	10300	10300	N/A	N/A	N/A
MPSICS10	2/25/97	5	24 - 30	N/A	N/A	49700	300 U	11100	8600	N/A	N/A	N/A
MPSICS11	2/25/97	5	6 - 12	N/A	N/A	41900	300 U	14100	9200	N/A	N/A	N/A
MPSICS12	2/25/97	6	6 - 12	N/A	N/A	48400	300 U	15600	11800	N/A	N/A	N/A
MPSICS13	2/25/97	6	24 - 30	N/A	N/A	70200	300 U	8800	7400	N/A	N/A	N/A
MPSICS14	2/27/97	7	6 - 12	N/A	N/A	55700	40 U	15200	19000 E	N/A	N/A	N/A
MPSICS15	2/27/97	7	24 - 30	N/A	N/A	24500	40 U	13900	13600 E	N/A	N/A	N/A
MPSICS16	2/28/97	8	6 - 12	N/A	N/A	35700	40 U	11500	8400 E	N/A	N/A	N/A
MPSICS17	2/28/97	8	24 - 30	N/A	N/A	73500	40 U	16200	15900 E	N/A	N/A	N/A
MPSICS18	2/28/97	9	6 - 12	N/A	N/A	57700	40 U	21900	12500 E	N/A	N/A	N/A
MPSICS19	2/28/97	9	24 - 30	N/A	N/A	35200	40 U	10400	7000 E	N/A	N/A	N/A
MPSICS20	2/28/97	9	24 - 30	N/A	N/A	40500	40 U	9600	7200 E	N/A	N/A	N/A
MPSICS21	3/11/97	10	6 - 12	N/A	N/A	77200	70 U	14800	14300	N/A	N/A	N/A
MPSICS22	3/11/97	10	24 - 30	N/A	N/A	39400	60 U	11700	12800	N/A	N/A	N/A
MPSICS23	3/11/97	11	6 - 12	N/A	N/A	55000	60 U	14100	11300	N/A	N/A	N/A
MPSICS24	3/11/97	11	24 - 30	N/A	N/A	59500	60 U	15300	10700	N/A	N/A	N/A
MPSICS25	3/11/97	12	6 - 12	N/A	N/A	69800	60 U	18500	15800	N/A	N/A	N/A
MPSICS26	3/11/97	12	24 - 30	N/A	N/A	65500	60 U	16700	14600	N/A	N/A	N/A
MFAICS27	11/12/97	16	0 - 12	N/A	N/A	42900	130 U	14400 N	13000 N	N/A	N/A	N/A
MFAICS28	11/12/97	16	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS29	11/12/97	16	20 - 24	N/A	N/A	177000	120 U	8400 N	9400 N	N/A	N/A	N/A
MFAICS30	11/12/97	17	0 - 12	N/A	N/A	71900	130 U	13000 N	23200 N	N/A	N/A	N/A
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MPSICS01	2/19/97	1	6 - 12	100 U	730	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS02	2/19/97	1	24 - 30	100 U	960	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS03	2/20/97	2	6 - 12	100 U	888	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS04	2/20/97	2	24 - 30	100 U	670	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS05	2/24/97	3	6 - 12	100 U	770	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS06	2/24/97	3	24 - 30	100 U	910	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS07	2/24/97	4	6 - 12	100 U	1020	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS08	2/24/97	4	18 - 24	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS09	2/25/97	5	6 - 12	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS10	2/25/97	5	24 - 30	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS11	2/25/97	5	6 - 12	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS12	2/25/97	6	6 - 12	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS13	2/25/97	6	24 - 30	100 U	900	4 U	5 U	40 U	1 U	100 U	5 U
MPSICS14	2/27/97	7	6 - 12	2.1 U	671	0.820 B	1 U	5.2 B	1 U	6.2 B	1 U
MPSICS15	2/27/97	7	24 - 30	2.1 U	1090	1.3 B	1 U	9.6 B	1 U	3.4 U	1 U
MPSICS16	2/28/97	8	6 - 12	2.1 U	650	0.820 B	1 U	14.8 B	1 U	13 B	1 U
MPSICS17	2/28/97	8	24 - 30	2.1 U	1280	1.7 B	1 U	16.3 B	1 U	9.5 B	1 U
MPSICS18	2/28/97	9	6 - 12	2.1 U	464	0.450 B	1 U	24.2 B	1 U	10.9 B	1 U
MPSICS19	2/28/97	9	24 - 30	2.1 U	525	0.960 B	1 U	87.4 B	1 U	13.4 B	1 U
MPSICS20	2/28/97	9	24 - 30	2.1 U	625	0.350 B	1.1 B	44.9 B	1 U	10.8 B	1 U
MPSICS21	3/11/97	10	6 - 12	2.1 U	674	2.4 B	1 U	1.6 B	1 U	17.3 B	1 U
MPSICS22	3/11/97	10	24 - 30	2.1 U	406	0.950 B	1 U	16.5 B	1 U	9.9 B	1 U
MPSICS23	3/11/97	11	6 - 12	2.1 U	478	0.360 B	1.9 B	18.6 B	1 U	4.9 B	1 U
MPSICS24	3/11/97	11	24 - 30	2.1 U	649	0.980 B	1 U	20.6 B	1 U	3.8 B	1 U
MPSICS25	3/11/97	12	6 - 12	2.1 U	552	0.3 U	1.4 B	2 B	1 U	8.1 B	1 U
MPSICS26	3/11/97	12	24 - 30	2.1 U	689	0.310 B	9 B	45.7 B	1 U	9.7 B	1 U
MFAICS27	11/12/97	16	0 - 12	2.1 U	1180	0.3 U	1 U	12.2 B	1 U	3.4 U	1 NU
MFAICS28	11/12/97	16	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS29	11/12/97	16	20 - 24	2.1 U	1450	0.3 U	1 U	10.5 B	1 U	3.4 U	1 NU
MFAICS30	11/12/97	17	0 - 12	2.1 U	1780	0.3 U	1 U	8.7 B	1 U	3.4 U	1 NU
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS31	11/12/97	17	12 - 18	5 U	5 U	5 U	10 U	8 JB	5 U	2 J	5 U	2 J
MFAICS32	11/12/97	17	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS33	11/12/97	17	30 - 36	5 U	5 U	5 U	10 U	8 JB	5 U	2 J	5 U	2 J
MFAICS34	11/12/97	18	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS35	11/12/97	18	12 - 18	5 U	5 U	5 U	10 U	2 JB	5 U	5 U	5 U	5 U
MFAICS36	11/12/97	18	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS37	11/13/97	19	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS38	11/13/97	19	12 - 18	5 U	5 U	5 U	10 U	10	5 U	1 J	5 U	5 U
MFAICS39	11/13/97	19	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS40	11/13/97	19	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS41	11/13/97	20	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS42	11/13/97	20	12 - 18	5 U	5 U	5 U	10 U	3 JB	5 U	2 J	5 U	5 U
MFAICS43	11/13/97	21	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS44	11/13/97	21	12 - 18	5 U	5 U	5 U	10 U	39 B	5 U	5 U	5 U	3 J
MFAICS45	11/13/97	21	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS46	11/13/97	22	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS47	11/13/97	22	12 - 18	5 U	5 U	5 U	10 U	11 B	5 U	5 U	5 U	1 J
MFAICS48	11/13/97	22	12 - 18	5 U	5 U	5 U	10 U	10 U	5 U	2 J	5 U	2 J
MFAICS49	11/13/97	22	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS50	11/14/97	15	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS51	11/14/97	15	12 - 18	6 U	6 U	6 U	12 U	12	6 U	1 J	6 U	6 U
MFAICS52	11/14/97	15	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS53	11/18/97	23	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS54	11/18/97	23	12 - 18	6 U	6 U	6 U	12 U	3 J	6 U	8	6 U	6 U
MFAICS55	11/18/97	23	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS56	11/18/97	24	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS57	11/18/97	24	12 - 18	6 U	6 U	6 U	12 U	2 J	6 U	9	6 U	6 U
MFAICS58	11/18/97	24	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS59	11/18/97	24	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS60	11/19/97	25	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS61	11/19/97	25	12 - 18	6 U	6 U	6 U	12 U	4 J	6 U	4 J	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS32	11/12/97	17	24 - 36	***12500 U***	166000	13000 U	N/A	**1120000**	***12500 U***	32500 U	12500 U
MFAICS33	11/12/97	17	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS34	11/12/97	18	0 - 12	***31200 U***	432000	***32500 U***	N/A	**2360000**	***31200 U***	81200 U	***40400***
MFAICS35	11/12/97	18	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS36	11/12/97	18	24 - 36	6250 U	55000 U	6500 U	N/A	**143000**	***6250 U***	16200 U	6250 U
MFAICS37	11/13/97	19	0 - 12	250 U	4950	260 U	N/A	***12900***	250 U	650 U	250 U
MFAICS38	11/13/97	19	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS39	11/13/97	19	24 - 36	250 U	4310	260 U	N/A	3330	250 U	650 U	250 U
MFAICS40	11/13/97	19	0 - 12	250 U	43300	260 U	N/A	***15500***	250 U	650 U	413 P
MFAICS41	11/13/97	20	0 - 12	***125000 U***	186000 J	***130000 U***	N/A	**1160000**	***125000 U***	325000 U	***125000 U***
MFAICS42	11/13/97	20	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS43	11/13/97	21	0 - 12	250 U	3760	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS44	11/13/97	21	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS45	11/13/97	21	24 - 36	250 U	6260	260 U	N/A	898 PJ	250 U	650 U	250 U
MFAICS46	11/13/97	22	0 - 12	**125000 U**	1450000	**130000 U**	N/A	**9580000**	**125000 U**	325000 U	**159000**
MFAICS47	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS48	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS49	11/13/97	22	24 - 36	**125000 U**	245000 J	**130000 U**	N/A	**1870000**	**125000 U**	325000 U	**125000 U**
MFAICS50	11/14/97	15	0 - 12	***12500 U***	319000	13000 U	N/A	**1510000**	***12500 U***	32500 U	12500 U
MFAICS51	11/14/97	15	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS52	11/14/97	15	24 - 36	250 U	1500 J	260 U	N/A	***5220***	250 U	650 U	250 U
MFAICS53	11/18/97	23	0 - 12	1250 U	25500	1300 U	N/A	**43800**	1250 U	3250 U	1250 U
MFAICS54	11/18/97	23	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS55	11/18/97	23	24 - 36	1250 U	11200	1300 U	N/A	***5070***	1250 U	3250 U	1250 U
MFAICS56	11/18/97	24	0 - 12	1250 U	61200	1300 U	N/A	**134000**	1250 U	3250 U	3160
MFAICS57	11/18/97	24	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS58	11/18/97	24	24 - 36	1250 U	4230 J	1300 U	N/A	***11600***	1250 U	3250 U	1250 U
MFAICS59	11/18/97	24	24 - 36	1250 U	3450 J	1300 U	N/A	***7880***	1250 U	3250 U	1250 U
MFAICS60	11/19/97	25	0 - 12	***12500 U***	11000 U	13000 U	N/A	***5000 U***	***12500 U***	32500 U	12500 U
MFAICS61	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS32	11/12/97	17	24 - 36	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS33	11/12/97	17	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS34	11/12/97	18	0 - 12	31200 U	32500 U	31200 U	31200 U	31200 U	31200 U	31200 U
MFAICS35	11/12/97	18	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS36	11/12/97	18	24 - 36	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS37	11/13/97	19	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS38	11/13/97	19	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS39	11/13/97	19	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS40	11/13/97	19	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS41	11/13/97	20	0 - 12	125000 U	***130000 U***	125000 U	***125000 U***	125000 U	125000 U	125000 U
MFAICS42	11/13/97	20	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS43	11/13/97	21	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS44	11/13/97	21	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS45	11/13/97	21	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS46	11/13/97	22	0 - 12	125000 U	***130000 U***	125000 U	***125000 U***	125000 U	125000 U	125000 U
MFAICS47	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS48	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS49	11/13/97	22	24 - 36	125000 U	***130000 U***	125000 U	125000 U	125000 U	125000 U	125000 U
MFAICS50	11/14/97	15	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS51	11/14/97	15	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS52	11/14/97	15	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS53	11/18/97	23	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS54	11/18/97	23	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS55	11/18/97	23	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS56	11/18/97	24	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS57	11/18/97	24	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS58	11/18/97	24	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS59	11/18/97	24	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS60	11/19/97	25	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS61	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS32	11/12/97	17	24 - 36	N/A	N/A	57700	130 U	9100 N	14900 N	N/A	N/A	N/A
MFAICS33	11/12/97	17	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS34	11/12/97	18	0 - 12	N/A	N/A	73600	130 U	12900 N	19100 N	N/A	N/A	N/A
MFAICS35	11/12/97	18	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS36	11/12/97	18	24 - 36	N/A	N/A	72900	130 U	16000 N	14700 N	N/A	N/A	N/A
MFAICS37	11/13/97	19	0 - 12	N/A	N/A	103000	130 *U	18800	27800 N	N/A	N/A	N/A
MFAICS38	11/13/97	19	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS39	11/13/97	19	24 - 36	N/A	N/A	30000	130 *U	19200	18500 N	N/A	N/A	N/A
MFAICS40	11/13/97	19	0 - 12	N/A	N/A	67900	140 *U	15000	14900 N	N/A	N/A	N/A
MFAICS41	11/13/97	20	0 - 12	N/A	N/A	41000	130 *U	12600	12200 N	N/A	N/A	N/A
MFAICS42	11/13/97	20	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS43	11/13/97	21	0 - 12	N/A	N/A	233000	130 *U	16500	15400 N	N/A	N/A	N/A
MFAICS44	11/13/97	21	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS45	11/13/97	21	24 - 36	N/A	N/A	36700	120 *U	15200	14000 N	N/A	N/A	N/A
MFAICS46	11/13/97	22	0 - 12	N/A	N/A	51000	130 *U	15700	20800 N	N/A	N/A	N/A
MFAICS47	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS48	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS49	11/13/97	22	24 - 36	N/A	N/A	81300	130 *U	29900	23400 N	N/A	N/A	N/A
MFAICS50	11/14/97	15	0 - 12	N/A	N/A	67900	140 U	19200	24400	N/A	N/A	N/A
MFAICS51	11/14/97	15	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS52	11/14/97	15	24 - 36	N/A	N/A	57100	140 U	24400	21300	N/A	N/A	N/A
MFAICS53	11/18/97	23	0 - 12	N/A	N/A	60100 E	130 U	13600	15900	N/A	N/A	N/A
MFAICS54	11/18/97	23	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS55	11/18/97	23	24 - 36	N/A	N/A	62400 E	130 U	16400	13500	N/A	N/A	N/A
MFAICS56	11/18/97	24	0 - 12	N/A	N/A	60900 E	130 U	35900	13800	N/A	N/A	N/A
MFAICS57	11/18/97	24	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS58	11/18/97	24	24 - 36	N/A	N/A	32200 E	130 U	21200	11700	N/A	N/A	N/A
MFAICS59	11/18/97	24	24 - 36	N/A	N/A	32900 E	130 U	10100	10900	N/A	N/A	N/A
MFAICS60	11/19/97	25	0 - 12	N/A	N/A	60700	60 U	15200	16400	N/A	N/A	N/A
MFAICS61	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS31	11/12/97	17	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS32	11/12/97	17	24 - 36	2.1 U	1570	0.3 U	1 U	2.6 B	1 U	3.4 U	1 NU
MFAICS33	11/12/97	17	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS34	11/12/97	18	0 - 12	2.1 U	2410	0.420 B	1 U	3.7 B	1 U	3.4 U	1 NU
MFAICS35	11/12/97	18	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS36	11/12/97	18	24 - 36	2.1 U	1220	0.3 U	1 U	18.5 B	1 U	3.4 U	1 NU
MFAICS37	11/13/97	19	0 - 12	2.1 U	1340	0.3 U	1 U	129 N	1 NU	3.4 U	1 NU
MFAICS38	11/13/97	19	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS39	11/13/97	19	24 - 36	2.1 U	1310	0.3 U	1 U	8.9 NB	1 NU	3.4 U	1 NU
MFAICS40	11/13/97	19	0 - 12	2.1 U	1620	0.430 B	1 U	14.5 NB	1 NU	3.4 U	1 NU
MFAICS41	11/13/97	20	0 - 12	2.1 U	1670	0.320 B	1 U	1270 N	1 NU	3.4 U	1 NU
MFAICS42	11/13/97	20	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS43	11/13/97	21	0 - 12	2.1 U	1640	0.660 B	1 U	954 N	1 NU	3.7 B	1 NU
MFAICS44	11/13/97	21	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS45	11/13/97	21	24 - 36	2.1 U	1100	0.3 U	1 U	9.8 NB	1 NU	3.4 U	1 NU
MFAICS46	11/13/97	22	0 - 12	2.1 U	1450	0.3 U	1 U	10.6 NB	1 NU	3.4 U	1 NU
MFAICS47	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS48	11/13/97	22	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS49	11/13/97	22	24 - 36	2.1 U	1580	0.3 U	1 U	12.1 NB	1 NU	3.4 U	1 NU
MFAICS50	11/14/97	15	0 - 12	2.1 U	1610	1.4 B	1.4 B	45.9	1 U	3.4 U	1 U
MFAICS51	11/14/97	15	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS52	11/14/97	15	24 - 36	2.1 U	1410	0.3 U	1 U	14.1 B	1 U	3.4 U	1 U
MFAICS53	11/18/97	23	0 - 12	2.1 U	906	0.480 B	1 U	0.9 U	1 U	5.9 B	1 U
MFAICS54	11/18/97	23	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS55	11/18/97	23	24 - 36	2.1 U	1230	0.3 U	1.2 B	6.9 B	1 U	4.3 B	1 U
MFAICS56	11/18/97	24	0 - 12	2.1 U	1260	0.360 B	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS57	11/18/97	24	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS58	11/18/97	24	24 - 36	2.1 U	1090	0.3 U	1 U	1.2 B	1 U	3.4 U	1 U
MFAICS59	11/18/97	24	24 - 36	2.1 U	1340	0.3 U	1 U	1.8 B	1.1 B	3.4 U	1 U
MFAICS60	11/19/97	25	0 - 12	2.1 U	1170	0.3 U	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS61	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS62	11/19/97	25	12 - 18	6 U	6 U	6 U	12 U	5 J	6 U	5 J	6 U	6 U
MFAICS63	11/19/97	25	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS64	11/19/97	26	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS65	11/19/97	26	12 - 18	6 U	6 U	6 U	11 U	5 J	6 U	5 J	6 U	6 U
MFAICS66	11/19/97	26	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS67	11/19/97	27	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS68	11/19/97	27	12 - 18	6 U	6 U	6 U	12 U	3 J	6 U	4 J	6 U	6 U
MFAICS69	11/19/97	27	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS70	11/19/97	28	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS71	11/19/97	28	12 - 18	6 U	6 U	6 U	13 U	4 J	6 U	6	6 U	6 U
MFAICS72	11/19/97	28	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS73	11/20/97	29	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS74	11/20/97	29	12 - 18	6 U	6 U	6 U	12 U	8 J	6 U	5 J	6 U	6 U
MFAICS75	11/20/97	29	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS76	11/20/97	30	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS77	11/20/97	30	12 - 18	6 U	6 U	6 U	11 U	2 J	6 U	6	6 U	6 U
MFAICS78	11/20/97	30	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS79	11/20/97	31	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS80	11/20/97	31	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS81	11/20/97	31	12 - 18	6 U	6 U	6 U	12 U	2 J	6 U	4 J	6 U	6 U
MFAICS82	11/20/97	31	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS83	11/24/97	32	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS84	11/24/97	32	12 - 18	6 U	6 U	6 U	12 U	17	6 U	6 U	6 U	6 U
MFAICS85	11/24/97	32	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS86	11/24/97	33	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS87	11/24/97	33	12 - 18	6 U	6 U	6 U	12 U	32	6 U	6 U	6 U	6 U
MFAICS88	11/24/97	33	12 - 18	6 U	6 U	6 U	12 U	7 J	6 U	6 U	6 U	6 U
MFAICS89	11/24/97	33	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS90	11/24/97	33	30 - 36	6 U	6 U	6 U	12 U	14	6 U	6 U	6 U	6 U
MFAICS91	11/24/97	34	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS92	11/24/97	34	12 - 18	6 U	6 U	6 U	12 U	8 J	6 U	6 U	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS62	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS63	11/19/97	25	24 - 36	250 U	2200 U	260 U	N/A	***8930***	250 U	650 U	250 U
MFAICS64	11/19/97	26	0 - 12	6250 U	87100	6500 U	N/A	**510000**	***6250 U***	16200 U	6250 U
MFAICS65	11/19/97	26	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS66	11/19/97	26	24 - 36	6250 U	55000 U	6500 U	N/A	**71500**	***6250 U***	16200 U	6250 U
MFAICS67	11/19/97	27	0 - 12	***31200 U***	472000	***32500 U***	N/A	**3780000**	31200 U	81200 U	**793000**
MFAICS68	11/19/97	27	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS69	11/19/97	27	24 - 36	1250 U	8140 J	1300 U	N/A	**31100**	1250 U	3250 U	7270
MFAICS70	11/19/97	28	0 - 12	***62500 U***	752000	***65000 U***	N/A	**5940000**	**62500 U**	162000 U	**165000**
MFAICS71	11/19/97	28	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS72	11/19/97	28	24 - 36	1250 U	5380 J	1300 U	N/A	**23400**	1250 U	3250 U	3500
MFAICS73	11/20/97	29	0 - 12	***31200 U***	472000	***32500 U***	N/A	**3590000**	***31200 U***	81200 U	***31200 U***
MFAICS74	11/20/97	29	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS75	11/20/97	29	24 - 36	250 U	4780	260 U	N/A	**21800**	250 U	650 U	278
MFAICS76	11/20/97	30	0 - 12	1250 U	30800	1300 U	N/A	**61000**	1250 U	3250 U	1250 U
MFAICS77	11/20/97	30	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS78	11/20/97	30	24 - 36	250 U	2200 U	260 U	N/A	***4220***	250 U	650 U	250 U
MFAICS79	11/20/97	31	0 - 12	***31200 U***	347000	***32500 U***	N/A	**1250000**	***31200 U***	81200 U	***31200 U***
MFAICS80	11/20/97	31	0 - 12	6250 U	62300	6500 U	N/A	**174000**	***6250 U***	16200 U	6250 U
MFAICS81	11/20/97	31	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS82	11/20/97	31	24 - 36	250 U	2840	260 U	N/A	2520	250 U	650 U	250 U
MFAICS83	11/24/97	32	0 - 12	250 U	6810	260 U	N/A	1000 U	250 U	650 U	269
MFAICS84	11/24/97	32	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS85	11/24/97	32	24 - 36	250 U	2200 U	260 U	N/A	1030	250 U	650 U	515
MFAICS86	11/24/97	33	0 - 12	**125000 U**	236000 J	**130000 U**	N/A	**1760000**	**125000 U**	325000 U	**125000 U**
MFAICS87	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS88	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS89	11/24/97	33	24 - 36	3120 U	26900 J	3250 U	N/A	**189000**	3120 U	8120 U	3120 U
MFAICS90	11/24/97	33	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS91	11/24/97	34	0 - 12	***12500 U***	120000	**130000 U**	N/A	**611000**	***12500 U***	32500 U	12500 U
MFAICS92	11/24/97	34	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS62	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS63	11/19/97	25	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS64	11/19/97	26	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS65	11/19/97	26	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS66	11/19/97	26	24 - 36	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS67	11/19/97	27	0 - 12	***312000 U***	32500 U	***312000 U***	***312000 U***	31200 U	31200 U	31200 U
MFAICS68	11/19/97	27	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS69	11/19/97	27	24 - 36	1250 U	1300 U	1250 U	1940	1250 U	1250 U	1250 U
MFAICS70	11/19/97	28	0 - 12	62500 U	65000 U	62500 U	62500 U	62500 U	62500 U	62500 U
MFAICS71	11/19/97	28	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS72	11/19/97	28	24 - 36	1250 U	1300 U	1370	986 J	1250 U	1250 U	1250 U
MFAICS73	11/20/97	29	0 - 12	31200 U	32500 U	31200 U	31200 U	31200 U	31200 U	31200 U
MFAICS74	11/20/97	29	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS75	11/20/97	29	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS76	11/20/97	30	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS77	11/20/97	30	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS78	11/20/97	30	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS79	11/20/97	31	0 - 12	31200 U	32500 U	31200 U	31200 U	31200 U	31200 U	31200 U
MFAICS80	11/20/97	31	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS81	11/20/97	31	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS82	11/20/97	31	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS83	11/24/97	32	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS84	11/24/97	32	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS85	11/24/97	32	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS86	11/24/97	33	0 - 12	125000 U	***130000 U***	125000 U	***125000 U***	125000 U	125000 U	125000 U
MFAICS87	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS88	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS89	11/24/97	33	24 - 36	3120 U	3250 U	3120 U	3120 U	3120 U	3120 U	3120 U
MFAICS90	11/24/97	33	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS91	11/24/97	34	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS92	11/24/97	34	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS62	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS63	11/19/97	25	24 - 36	N/A	N/A	31000	60 U	23500	18000	N/A	N/A	N/A
MFAICS64	11/19/97	26	0 - 12	N/A	N/A	63300	60 U	16100	12100	N/A	N/A	N/A
MFAICS65	11/19/97	26	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS66	11/19/97	26	24 - 36	N/A	N/A	71200	60 U	12900	12400	N/A	N/A	N/A
MFAICS67	11/19/97	27	0 - 12	N/A	N/A	62000	200 B	13300	27900	N/A	N/A	N/A
MFAICS68	11/19/97	27	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS69	11/19/97	27	24 - 36	N/A	N/A	60300	60 U	14500	13100	N/A	N/A	N/A
MFAICS70	11/19/97	28	0 - 12	N/A	N/A	70300	180 B	12400	17900	N/A	N/A	N/A
MFAICS71	11/19/97	28	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS72	11/19/97	28	24 - 36	N/A	N/A	64200	60 U	12400	13700	N/A	N/A	N/A
MFAICS73	11/20/97	29	0 - 12	N/A	N/A	67700	60 U	15500	16000	N/A	N/A	N/A
MFAICS74	11/20/97	29	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS75	11/20/97	29	24 - 36	N/A	N/A	55600	60 U	15100	14700	N/A	N/A	N/A
MFAICS76	11/20/97	30	0 - 12	N/A	N/A	48600	60 U	15200	12900	N/A	N/A	N/A
MFAICS77	11/20/97	30	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS78	11/20/97	30	24 - 36	N/A	N/A	75100	60 U	13000	9100	N/A	N/A	N/A
MFAICS79	11/20/97	31	0 - 12	N/A	N/A	73300	60 U	19600	12200	N/A	N/A	N/A
MFAICS80	11/20/97	31	0 - 12	N/A	N/A	90600	60 U	13300	13600	N/A	N/A	N/A
MFAICS81	11/20/97	31	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS82	11/20/97	31	24 - 36	N/A	N/A	69000	60 U	17100	13400	N/A	N/A	N/A
MFAICS83	11/24/97	32	0 - 12	N/A	N/A	70600	40 U	16700 N	16400 N	N/A	N/A	N/A
MFAICS84	11/24/97	32	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS85	11/24/97	32	24 - 36	N/A	N/A	79200	40 U	16000 N	13200 N	N/A	N/A	N/A
MFAICS86	11/24/97	33	0 - 12	N/A	N/A	80400	40 U	15400 N	21700 N	N/A	N/A	N/A
MFAICS87	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS88	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS89	11/24/97	33	24 - 36	N/A	N/A	64100	40 U	15900 N	11500 N	N/A	N/A	N/A
MFAICS90	11/24/97	33	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS91	11/24/97	34	0 - 12	N/A	N/A	45900	50 U	13600 N	11200 N	N/A	N/A	N/A
MFAICS92	11/24/97	34	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in Inches)								
MFAICS62	11/19/97	25	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS63	11/19/97	25	24 - 36	2.1 U	1050	0.3 U	1 U	4.3 B	1 U	3.4 U	1 U
MFAICS64	11/19/97	26	0 - 12	2.1 U	1290	0.370 B	1 U	9.8 B	1 U	6.2 B	1 U
MFAICS65	11/19/97	26	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS66	11/19/97	26	24 - 36	2.1 U	1310	0.3 U	1 U	0.9 U	1 U	3.9 B	1 U
MFAICS67	11/19/97	27	0 - 12	2.1 U	1530	0.940 B	1 U	0.9 U	1 U	5.9 B	1 U
MFAICS68	11/19/97	27	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS69	11/19/97	27	24 - 36	2.1 U	1240	0.3 U	1 U	2.3 B	1 U	7.2 B	1 U
MFAICS70	11/19/97	28	0 - 12	2.3 B	1590	0.3 U	1 U	0.9 U	1 U	5.3 B	1 U
MFAICS71	11/19/97	28	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS72	11/19/97	28	24 - 36	3.2 B	1570	0.340 B	1 U	0.9 U	1 U	3.7 B	1 U
MFAICS73	11/20/97	29	0 - 12	2.1 U	1320	0.3 U	1 U	4.3 B	1 U	3.4 U	1 U
MFAICS74	11/20/97	29	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS75	11/20/97	29	24 - 36	2.1 U	1310	0.3 U	1 U	3.2 B	1 U	3.4 U	1 U
MFAICS76	11/20/97	30	0 - 12	2.1 U	1090	0.410 B	1 U	2 B	1 U	4.5 B	1 U
MFAICS77	11/20/97	30	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS78	11/20/97	30	24 - 36	2.1 U	1210	0.320 B	1 U	4.1 B	1 U	4.2 B	1 U
MFAICS79	11/20/97	31	0 - 12	2.1 U	1400	0.3 U	1 U	1.3 B	1 U	4.1 B	1 U
MFAICS80	11/20/97	31	0 - 12	2.1 U	1500	0.340 B	1 U	1.6 B	1 U	3.4 U	1 U
MFAICS81	11/20/97	31	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS82	11/20/97	31	24 - 36	2.4 B	1380	1.9 B	1 U	1.2 B	1 U	3.8 B	1 U
MFAICS83	11/24/97	32	0 - 12	32 U	1520 EN	1.3 U	3.4 NB	27.4 B	1 U	28 U	1.4 U
MFAICS84	11/24/97	32	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS85	11/24/97	32	24 - 36	32 U	1230 EN	1.3 U	3.2 NB	23.2 B	1 U	28 U	1.4 U
MFAICS86	11/24/97	33	0 - 12	32 U	937 EN	1.3 U	4.1 NB	17.7 B	2.7	28 U	1.4 U
MFAICS87	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS88	11/24/97	33	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS89	11/24/97	33	24 - 36	32 U	2140 EN	1.3 U	5.1 N	33.6 B	1 U	28 U	1.4 U
MFAICS90	11/24/97	33	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS91	11/24/97	34	0 - 12	32 U	960 EN	1.3 U	3.1 NB	14.5 B	1 U	28 U	1.4 U
MFAICS92	11/24/97	34	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS93	11/24/97	34	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS94	11/25/97	35	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS95	11/25/97	35	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS96	11/25/97	35	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS97	11/25/97	36	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS98	11/25/97	36	12 - 18	6 U	6 U	6 U	11 U	11 U	6 U	6 U	6 U	6 U
MFAICS99	11/25/97	36	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS100	11/25/97	37	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS101	11/25/97	37	12 - 18	6 U	6 U	6 U	11 U	5 J	6 U	6 U	6 U	6 U
MFAICS102	11/25/97	37	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS103	11/25/97	37	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS104	11/25/97	38	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS105	11/25/97	38	12 - 18	6 U	6 U	6 U	12 U	7 J	6 U	6 U	6 U	6 U
MFAICS106	11/25/97	38	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS107	11/25/97	39	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS108	11/25/97	39	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS109	11/25/97	39	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS110	12/1/97	40	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS111	12/1/97	40	12 - 18	6 U	6 U	6 U	12 U	25	6 U	13	6 U	6 U
MFAICS112	12/1/97	40	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS113	12/1/97	13	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS114	12/1/97	13	12 - 18	6 U	6 U	6 U	12 U	24	6 U	8	2 J	6 U
MFAICS115	12/1/97	13	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS116	12/1/97	14	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS117	12/1/97	14	12 - 18	6 U	6 U	6 U	13 U	16	6 U	7	6 U	6 U
MFAICS118	12/1/97	14	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS119	12/2/97	64	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS120	12/2/97	64	12 - 18	6 U	6 U	6 U	12 U	120	6 U	1 J	6 U	6 U
MFAICS121	12/2/97	64	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS122	12/2/97	64	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS123	12/2/97	65	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS93	11/24/97	34	24 - 36	250 U	2510	260 U	N/A	***13100***	250 U	650 U	250 U
MFAICS94	11/25/97	35	0 - 12	***12500 U***	203000	13000 U	N/A	**1080000**	***12500 U***	32500 U	12500 U
MFAICS95	11/25/97	35	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS96	11/25/97	35	24 - 36	625 U	6440	650 U	N/A	**37700**	625 U	1620 U	625 U
MFAICS97	11/25/97	36	0 - 12	***12500 U***	292000	13000 U	N/A	**1950000**	***12500 U***	32500 U	12500 U
MFAICS98	11/25/97	36	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS99	11/25/97	36	24 - 36	625 U	5630	650 U	N/A	**32000**	625 U	1620 U	143 J
MFAICS100	11/25/97	37	0 - 12	1250 U	40100	1300 U	N/A	**44000**	1250 U	3250 U	1250 U
MFAICS101	11/25/97	37	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS102	11/25/97	37	0 - 12	625 U	36600	650 U	N/A	**115000**	625 U	1620 U	625 U
MFAICS103	11/25/97	37	24 - 36	250 U	13100	260 U	N/A	**26100**	250 U	650 U	250 U
MFAICS104	11/25/97	38	0 - 12	***12500 U***	257000	13000 U	N/A	**1260000**	***12500 U***	32500 U	12500 U
MFAICS105	11/25/97	38	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS106	11/25/97	38	24 - 36	250 U	4430	260 U	N/A	15900	250 U	650 U	250 U
MFAICS107	11/25/97	39	0 - 12	***12500 U***	134000	13000 U	N/A	**504000**	***12500 U***	32500 U	12500 U
MFAICS108	11/25/97	39	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS109	11/25/97	39	24 - 36	250 U	6590	260 U	N/A	***14400***	250 U	650 U	250 U
MFAICS110	12/1/97	40	0 - 12	6250 U	198000	6500 U	N/A	**971000**	***6250 U***	16200 U	6250 U
MFAICS111	12/1/97	40	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS112	12/1/97	40	24 - 36	1250 U	11600	1300 U	N/A	**77200**	1250 U	3250 U	1250 U
MFAICS113	12/1/97	13	0 - 12	6250 U	150000	6500 U	N/A	**784000**	***6250 U***	16200 U	6250 U
MFAICS114	12/1/97	13	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS115	12/1/97	13	24 - 36	1250 U	9550 J	1300 U	N/A	**44300**	1250 U	3250 U	1250 U
MFAICS116	12/1/97	14	0 - 12	6250 U	233000	6500 U	N/A	**320000**	***6250 U***	16200 U	6250 U
MFAICS117	12/1/97	14	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS118	12/1/97	14	24 - 36	1250 U	4090 J	1300 U	N/A	**22000**	1250 U	3250 U	1250 U
MFAICS119	12/2/97	64	0 - 12	6250 U	166000	6500 U	N/A	**1150000**	3160 PJ	16200 U	**321000**
MFAICS120	12/2/97	64	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS121	12/2/97	64	24 - 36	***6250 U***	18100 PJ	6500 U	N/A	**96900**	14500	16200 U	2790 J
MFAICS122	12/2/97	64	24 - 36	1250 U	10400 J	1300 U	N/A	**76300**	***25400***	3250 U	***30400***
MFAICS123	12/2/97	65	0 - 12	6250 U	173000	6500 U	N/A	**1240000**	***6250 U***	16200 U	3140 J

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS93	11/24/97	34	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS94	11/25/97	35	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS95	11/25/97	35	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS96	11/25/97	35	24 - 36	625 U	650 U	625 U	625 U	625 U	625 U	625 U
MFAICS97	11/25/97	36	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS98	11/25/97	36	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS99	11/25/97	36	24 - 36	625 U	650 U	625 U	170 J	625 U	625 U	625 U
MFAICS100	11/25/97	37	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS101	11/25/97	37	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS102	11/25/97	37	0 - 12	625 U	650 U	625 U	625 U	625 U	625 U	625 U
MFAICS103	11/25/97	37	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS104	11/25/97	38	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS105	11/25/97	38	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS106	11/25/97	38	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS107	11/25/97	39	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS108	11/25/97	39	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS109	11/25/97	39	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS110	12/1/97	40	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS111	12/1/97	40	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS112	12/1/97	40	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS113	12/1/97	13	0 - 12	6250 U	6500 U	6250 U	979 J	6250 U	6250 U	6250 U
MFAICS114	12/1/97	13	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS115	12/1/97	13	24 - 36	1250 U	1300 U	1250 U	304 J	1250 U	1250 U	1250 U
MFAICS116	12/1/97	14	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS117	12/1/97	14	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS118	12/1/97	14	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS119	12/2/97	64	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS120	12/2/97	64	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS121	12/2/97	64	24 - 36	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS122	12/2/97	64	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS123	12/2/97	65	0 - 12	6250 U	6500 U	6250 U	3660 J	6250 U	6250 U	6250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS93	11/24/97	34	24 - 36	N/A	N/A	45700	40 U	11300 N	10300 N	N/A	N/A	N/A
MFAICS94	11/25/97	35	0 - 12	N/A	N/A	61900 N	130 NU	13900 EN	17600 N	N/A	N/A	N/A
MFAICS95	11/25/97	35	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS96	11/25/97	35	24 - 36	N/A	N/A	37000 N	130 NU	13400 EN	11600 N	N/A	N/A	N/A
MFAICS97	11/25/97	36	0 - 12	N/A	N/A	101000 N	130 NU	14400 EN	16700 N	N/A	N/A	N/A
MFAICS98	11/25/97	36	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS99	11/25/97	36	24 - 36	N/A	N/A	75800 N	120 NU	13800 EN	12700 N	N/A	N/A	N/A
MFAICS100	11/25/97	37	0 - 12	N/A	N/A	107000 N	130 NU	14500 EN	33800 N	N/A	N/A	N/A
MFAICS101	11/25/97	37	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS102	11/25/97	37	0 - 12	N/A	N/A	108000 N	130 NU	12500 EN	37000 N	N/A	N/A	N/A
MFAICS103	11/25/97	37	24 - 36	N/A	N/A	69700 N	120 NU	14900 EN	11800 N	N/A	N/A	N/A
MFAICS104	11/25/97	38	0 - 12	N/A	N/A	68400 N	130 NU	13700 EN	27900 N	N/A	N/A	N/A
MFAICS105	11/25/97	38	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS106	11/25/97	38	24 - 36	N/A	N/A	86200 N	130 NU	12700 EN	14600 N	N/A	N/A	N/A
MFAICS107	11/25/97	39	0 - 12	N/A	N/A	96800 N	360 NB	12900 EN	77500 N	N/A	N/A	N/A
MFAICS108	11/25/97	39	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS109	11/25/97	39	24 - 36	N/A	N/A	96500 N	120 NU	24100 EN	21100 N	N/A	N/A	N/A
MFAICS110	12/1/97	40	0 - 12	N/A	N/A	93600	12900	21000	1100	N/A	N/A	N/A
MFAICS111	12/1/97	40	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS112	12/1/97	40	24 - 36	N/A	N/A	70900	14200	15800	970	N/A	N/A	N/A
MFAICS113	12/1/97	13	0 - 12	N/A	N/A	75300	12300	15200	1000	N/A	N/A	N/A
MFAICS114	12/1/97	13	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS115	12/1/97	13	24 - 36	N/A	N/A	81100	13200	16600	1000	N/A	N/A	N/A
MFAICS116	12/1/97	14	0 - 12	N/A	N/A	63700	18400	14300	1400	N/A	N/A	N/A
MFAICS117	12/1/97	14	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS118	12/1/97	14	24 - 36	N/A	N/A	78800	14400	17600	1100	N/A	N/A	N/A
MFAICS119	12/2/97	64	0 - 12	N/A	N/A	64900	210 B	13700	31100 N*	N/A	N/A	N/A
MFAICS120	12/2/97	64	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS121	12/2/97	64	24 - 36	N/A	N/A	39600	130 U	11700	10800 N*	N/A	N/A	N/A
MFAICS122	12/2/97	64	24 - 36	N/A	N/A	43500	130 U	12000	11800 N*	N/A	N/A	N/A
MFAICS123	12/2/97	65	0 - 12	N/A	N/A	76500	360 B	10200	26100 N*	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS93	11/24/97	34	24 - 36	32 U	1010 EN	1.3 U	4.3 NB	12 U	1 U	28 U	1.4 U
MFAICS94	11/25/97	35	0 - 12	2.1 U	1420	0.3 U	1 U	7.1 B	1 U	7.4 B	1 U
MFAICS95	11/25/97	35	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS96	11/25/97	35	24 - 36	2.1 U	1670	0.3 U	1 U	3.6 B	1 U	1 U	4.1 B
MFAICS97	11/25/97	36	0 - 12	2.1 U	1540	0.410 B	1 U	7.2 B	1 U	1 U	5.7 B
MFAICS98	11/25/97	36	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS99	11/25/97	36	24 - 36	2.1 U	1320	0.450 B	1 U	2.3 B	1 U	1 U	8.3 B
MFAICS100	11/25/97	37	0 - 12	2.1 U	1610	0.360 B	1 U	36.3 B	1 U	1 U	6.6 B
MFAICS101	11/25/97	37	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS102	11/25/97	37	0 - 12	2.1 U	1600	0.430 B	1 U	7.3 B	1.7 B	1 U	9.4 B
MFAICS103	11/25/97	37	24 - 36	2.1 U	1670	0.3 U	1 U	4.2 B	1 U	1 U	8.1 B
MFAICS104	11/25/97	38	0 - 12	2.1 U	1600	0.390 B	1 U	3 B	1 U	1 U	9.2 B
MFAICS105	11/25/97	38	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS106	11/25/97	38	24 - 36	2.1 U	1660	0.340 B	1 U	1.9 B	1 U	1 U	8.3 B
MFAICS107	11/25/97	39	0 - 12	2.1 U	1800	2.9 B	1 U	15.8 B	1.4 B	1 U	4.9 B
MFAICS108	11/25/97	39	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS109	11/25/97	39	24 - 36	2.1 U	1550	0.830 B	1 U	2.8 B	1 U	1 U	7.9 B
MFAICS110	12/1/97	40	0 - 12	32 U	1200 N	1.3 U	1.9 U	12 U	1 U	29.8 B	1.4 U
MFAICS111	12/1/97	40	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS112	12/1/97	40	24 - 36	32.7 B	1680 N	1.3 U	1.9 U	12 U	1 U	50.5 B	1.4 U
MFAICS113	12/1/97	13	0 - 12	32 U	1490 N	1.3 U	1.9 U	12 U	1 U	28 U	1.4 U
MFAICS114	12/1/97	13	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS115	12/1/97	13	24 - 36	32 U	1280 N	1.3 U	1.9 U	12 U	1 U	28 U	1.4 U
MFAICS116	12/1/97	14	0 - 12	32 U	1350 N	1.3 U	1.9 U	15.3 B	1 U	28 U	1.4 U
MFAICS117	12/1/97	14	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS118	12/1/97	14	24 - 36	32 U	1450 N	1.4 B	3.5 B	12 U	1 U	28 U	1.4 U
MFAICS119	12/2/97	64	0 - 12	32 U	1460 EN	2.1 B	5.9 N	28.2 NB	1 U	35 B	1.4 U
MFAICS120	12/2/97	64	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS121	12/2/97	64	24 - 36	32 U	1570 EN	2 B	1.9 NU	21.2 NB		28 U	1.4 U
MFAICS122	12/2/97	64	24 - 36	32 U	1240 EN	1.3 U	3.9 NB	18.6 NB	1 U	28 U	1.4 U
MFAICS123	12/2/97	65	0 - 12	32 U	1440 EN	1.3 U	1.9 NU	14.6 NB	1 U	28 U	1.4 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS124	12/2/97	65	12 - 18	6 U	6 U	6 U	12 U	68	6 U	6 U	6 U	6 U
MFAICS125	12/2/97	65	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS126	12/2/97	41	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS127	12/2/97	41	12 - 18	6 U	6 U	6 U	12 U	99	6 U	1 J	6 U	6 U
MFAICS128	12/2/97	41	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS129	12/4/97	62	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS130	12/4/97	62	12 - 18	6 U	6 U	6 U	5 JB	12 U	6 U	9	6 U	6 U
MFAICS131	12/4/97	62	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS132	12/4/97	43	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS133	12/4/97	43	12 - 18	6 U	6 U	6 U	11 U	11 U	6 U	14	6 U	6 U
MFAICS134	12/4/97	43	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS135	12/5/97	58	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS136	12/5/97	58	12 - 18	6 U	6 U	6 U	13 U	32	6 U	46	6 U	6 U
MFAICS137	12/5/97	58	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS138	12/5/97	56	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS139	12/5/97	56	12 - 18	6 U	6 U	10	12 U	25	6 U	75	2 J	6 U
MFAICS140	12/5/97	56	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS141	12/8/97	54	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS142	12/8/97	54	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS143	12/8/97	54	12 - 18	6 U	6 U	23	12 U	15	6 U	75	6 U	6 U
MFAICS144	12/8/97	54	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS145	12/8/97	52	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS146	12/8/97	52	12 - 18	6 U	6 U	6 U	12 U	11 J	6 U	52	2 J	6 U
MFAICS147	12/8/97	52	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS148	12/8/97	50	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS149	12/8/97	50	12 - 18	6 U	6 U	6 U	12 U	9 J	6 U	44	6 U	6 U
MFAICS150	12/8/97	50	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS151	12/8/97	48	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS152	12/8/97	48	12 - 18	6 U	6 U	6 U	12 U	6 J	6 U	34	6 U	6 U
MFAICS153	12/8/97	48	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS154	12/9/97	45	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS124	12/2/97	65	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS125	12/2/97	65	24 - 36	1250 U	5670 J	1300 U	N/A	**32900**	2690	3250 U	7000
MFAICS126	12/2/97	41	0 - 12	***12500 U***	192000	13000 U	N/A	**1310000**	***12500 U***	32500 U	12500 U
MFAICS127	12/2/97	41	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS128	12/2/97	41	24 - 36	1250 U	4150 J	1300 U	N/A	**21200**	1250 U	3250 U	1250 U
MFAICS129	12/4/97	62	0 - 12	***12500 U***	178000	13000 U	N/A	**1410000**	***12500 U***	32500 U	**151000**
MFAICS130	12/4/97	62	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS131	12/4/97	62	24 - 36	1250 U	9630 J	1300 U	N/A	**86700**	696 J	3250 U	***28200***
MFAICS132	12/4/97	43	0 - 12	3120 U	43400	3250 U	N/A	**171000**	3120 U	8120 U	862 J
MFAICS133	12/4/97	43	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS134	12/4/97	43	24 - 36	250 U	5570	260 U	N/A	***9270***	250 U	650 U	120 J
MFAICS135	12/5/97	58	0 - 12	3120 U	38800	3250 U	N/A	**314000**	3120 U	8120 U	***15200***
MFAICS136	12/5/97	58	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS137	12/5/97	58	24 - 36	250 U	4320	260 U	N/A	***13000***	181 J	650 U	9900
MFAICS138	12/5/97	56	0 - 12	3120 U	54300	3250 U	N/A	**358000**	3120 U	8120 U	4660
MFAICS139	12/5/97	56	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS140	12/5/97	56	24 - 36	625 U	8380	650 U	N/A	**33800**	1150	1620 U	***16000***
MFAICS141	12/8/97	54	0 - 12	6250 U	146000	6500 U	N/A	**1050000**	***6250 U***	16200 U	10500
MFAICS142	12/8/97	54	0 - 12	6250 U	158000	6500 U	N/A	**1110000**	***6250 U***	16200 U	10700
MFAICS143	12/8/97	54	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS144	12/8/97	54	24 - 36	250 U	4020	260 U	N/A	***7490***	250 U	650 U	319
MFAICS145	12/8/97	52	0 - 12	1250 U	27400	1300 U	N/A	**73000**	1250 U	3250 U	1140 J
MFAICS146	12/8/97	52	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS147	12/8/97	52	24 - 36	250 U	1570 J	260 U	N/A	***4420***	250 U	650 U	158 J
MFAICS148	12/8/97	50	0 - 12	1250 U	52200	1300 U	N/A	**99400**	1250 U	3250 U	2610
MFAICS149	12/8/97	50	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS150	12/8/97	50	24 - 36	250 U	619 J	260 U	N/A	1330	250 U	650 U	250 U
MFAICS151	12/8/97	48	0 - 12	3120 U	136000	3250 U	N/A	**406000**	3120 U	8120 U	3120 U
MFAICS152	12/8/97	48	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS153	12/8/97	48	24 - 36	250 U	3150	260 U	N/A	***9430***	250 U	650 U	250 U
MFAICS154	12/9/97	45	0 - 12	1250 U	51800	1300 U	N/A	**145000**	1250 U	3250 U	1250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS124	12/2/97	65	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS125	12/2/97	65	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS126	12/2/97	41	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS127	12/2/97	41	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS128	12/2/97	41	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS129	12/4/97	62	0 - 12	12500 U	13000 U	12500 U	12500 U	12500 U	12500 U	12500 U
MFAICS130	12/4/97	62	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS131	12/4/97	62	24 - 36	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS132	12/4/97	43	0 - 12	3120 U	3250 U	3120 U	3120 U	3120 U	3120 U	3120 U
MFAICS133	12/4/97	43	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS134	12/4/97	43	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS135	12/5/97	58	0 - 12	3120 U	3250 U	3120 U	3120 U	3120 U	3120 U	3120 U
MFAICS136	12/5/97	58	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS137	12/5/97	58	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS138	12/5/97	56	0 - 12	3120 U	3250 U	571 J	3120 U	3120 U	3120 U	3120 U
MFAICS139	12/5/97	56	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS140	12/5/97	56	24 - 36	625 U	650 U	625 U	625 U	625 U	625 U	625 U
MFAICS141	12/8/97	54	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS142	12/8/97	54	0 - 12	6250 U	6500 U	6250 U	6250 U	6250 U	6250 U	6250 U
MFAICS143	12/8/97	54	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS144	12/8/97	54	24 - 36	250 U	260 U	250 U	219 JP	250 U	250 U	250 U
MFAICS145	12/8/97	52	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS146	12/8/97	52	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS147	12/8/97	52	24 - 36	250 U	260 U	250 U	128 J	250 U	250 U	250 U
MFAICS148	12/8/97	50	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS149	12/8/97	50	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS150	12/8/97	50	24 - 36	250 U	260 U	250 U	172 J	250 U	250 U	250 U
MFAICS151	12/8/97	48	0 - 12	3120 U	3250 U	3120 U	3120 U	3120 U	3120 U	3120 U
MFAICS152	12/8/97	48	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS153	12/8/97	48	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS154	12/9/97	45	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS124	12/2/97	65	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS125	12/2/97	65	24 - 36	N/A	N/A	67400	130 U	12000	12400 N*	N/A	N/A	N/A
MFAICS126	12/2/97	41	0 - 12	N/A	N/A	67000	130 U	11400	17600 N*	N/A	N/A	N/A
MFAICS127	12/2/97	41	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS128	12/2/97	41	24 - 36	N/A	N/A	75900	130 U	14000	13000 N*	N/A	N/A	N/A
MFAICS129	12/4/97	62	0 - 12	N/A	N/A	67800 N	110 NU	15000	14700 N	N/A	N/A	N/A
MFAICS130	12/4/97	62	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS131	12/4/97	62	24 - 36	N/A	N/A	57300 N	80 NU	16900	13000 N	N/A	N/A	N/A
MFAICS132	12/4/97	43	0 - 12	N/A	N/A	71700 N	100 NB	13800	40600 N	N/A	N/A	N/A
MFAICS133	12/4/97	43	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS134	12/4/97	43	24 - 36	N/A	N/A	57000 N	120 NU	13600	12000 N	N/A	N/A	N/A
MFAICS135	12/5/97	58	0 - 12	N/A	N/A	81500	50 N*U	16400 N*	12800 N	N/A	N/A	N/A
MFAICS136	12/5/97	58	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS137	12/5/97	58	24 - 36	N/A	N/A	55.1	0.090 U	14.8	11.1	N/A	N/A	N/A
MFAICS138	12/5/97	56	0 - 12	N/A	N/A	53.9	0.090 U	11.9	13.7	N/A	N/A	N/A
MFAICS139	12/5/97	56	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS140	12/5/97	56	24 - 36	N/A	N/A	60.8	0.120 U	16.4	14.1	N/A	N/A	N/A
MFAICS141	12/8/97	54	0 - 12	N/A	N/A	78000	40 N*U	18700 N*	12100 N	N/A	N/A	N/A
MFAICS142	12/8/97	54	0 - 12	N/A	N/A	69000	60 N*U	21800 N*	13700 N	N/A	N/A	N/A
MFAICS143	12/8/97	54	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS144	12/8/97	54	24 - 36	N/A	N/A	54000	40 N*U	16600 N*	10500 N	N/A	N/A	N/A
MFAICS145	12/8/97	52	0 - 12	N/A	N/A	69100	50 N*U	14600 N*	13800 N	N/A	N/A	N/A
MFAICS146	12/8/97	52	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS147	12/8/97	52	24 - 36	N/A	N/A	50300	40 N*U	11200 N*	8200 N	N/A	N/A	N/A
MFAICS148	12/8/97	50	0 - 12	N/A	N/A	70200	50 N*U	17100 N*	12400 N	N/A	N/A	N/A
MFAICS149	12/8/97	50	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS150	12/8/97	50	24 - 36	N/A	N/A	77300	60 N*U	15100 N*	10000 N	N/A	N/A	N/A
MFAICS151	12/8/97	48	0 - 12	N/A	N/A	76900	60 N*U	17800 N*	19000 N	N/A	N/A	N/A
MFAICS152	12/8/97	48	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS153	12/8/97	48	24 - 36	N/A	N/A	60700	50 N*U	18100 N*	13100 N	N/A	N/A	N/A
MFAICS154	12/9/97	45	0 - 12	N/A	N/A	49800	30 N*U	11300 N*	16700 N	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS124	12/2/97	65	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS125	12/2/97	65	24 - 36	32 U	1270 EN	1.3 U	1.9 NU	12 NU	1 U	28 U	1.4 U
MFAICS126	12/2/97	41	0 - 12	32 U	1300 EN	1.3 U	1.9 NU	12 NU	1 U	28 U	1.4 U
MFAICS127	12/2/97	41	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS128	12/2/97	41	24 - 36	32 U	1350 EN	1.3 U	1.9 NU	46.4 N	1 U	28 U	1.4 U
MFAICS129	12/4/97	62	0 - 12	32 U	1420 N	1.3 U	1.9 U	12 NU	1 NU	28 U	1.4 U
MFAICS130	12/4/97	62	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS131	12/4/97	62	24 - 36	32 U	1030 N	1.6 B	1.9 U	12 NU	1 NU	28 U	1.4 U
MFAICS132	12/4/97	43	0 - 12	32 U	1670 N	3.2 B	1.9 U	12 NU	1 NU	37.4 B	1.4 U
MFAICS133	12/4/97	43	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS134	12/4/97	43	24 - 36	32 U	1380 N	1.3 U	1.9 U	19.9 NB	1 NU	28 U	1.4 U
MFAICS135	12/5/97	58	0 - 12	2.1 U	990	0.480 B	1 U	4.5 B	1.8 N*B	3.4 U	1 U
MFAICS136	12/5/97	58	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS137	12/5/97	58	24 - 36	2.1 U	1190 E	0.370 B	1 U	9.2 B	1 U	3.4 U	1 U
MFAICS138	12/5/97	56	0 - 12	2.1 U	1290 E	0.430 B	1 U	5.1 B	1 U	3.4 U	1 U
MFAICS139	12/5/97	56	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS140	12/5/97	56	24 - 36	2.1 U	1110 E	0.3 U	1 U	2.5 B	1 B	3.4 U	1 U
MFAICS141	12/8/97	54	0 - 12	2.1 U	1270	0.470 B	1.1 B	3 B	1.3 N*B	3.6 B	1 U
MFAICS142	12/8/97	54	0 - 12	2.1 U	1240	0.3 U	1 U	1.5 B	1.2 N*B	3.5 B	1 U
MFAICS143	12/8/97	54	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS144	12/8/97	54	24 - 36	2.1 U	1140	0.3 U	1.1 B	4.1 B	1 N*U	3.4 U	1 U
MFAICS145	12/8/97	52	0 - 12	2.1 U	1450	0.3 U	1 U	0.9 U	1 N*U	3.4 U	1 U
MFAICS146	12/8/97	52	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS147	12/8/97	52	24 - 36	2.1 U	2000	0.3 U	1 B	3 B	1.1 N*B	3.4 U	1.1 B
MFAICS148	12/8/97	50	0 - 12	2.1 U	1410	0.3 U	1 U	0.9 U	1.9 N*B	3.6 B	1.5 B
MFAICS149	12/8/97	50	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS150	12/8/97	50	24 - 36	2.1 U	1190	0.3 U	1 U	6.7 B	1.1 N*B	3.4 U	1 U
MFAICS151	12/8/97	48	0 - 12	2.1 U	1240	0.3 U	1 U	1.1 B	1 N*U	3.4 U	1.3 B
MFAICS152	12/8/97	48	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS153	12/8/97	48	24 - 36	2.1 U	1190	0.3 U	1 U	2.3 B	2.3 N*	4.4 B	1 U
MFAICS154	12/9/97	45	0 - 12	2.1 U	1370	1 B	1.2 B	3.4 B	1 N*U	3.4 U	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS155	12/9/97	45	12 - 18	6 U	6 U	16	12 U	13	6 U	32	6 U	6 U
MFAICS156	12/9/97	45	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS157	12/10/97	44	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS158	12/10/97	44	12 - 18	6 U	6 U	6 U	12 U	9 J	6 U	5 J	6 U	6 U
MFAICS159	12/10/97	44	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS160	12/11/97	70	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS161	12/11/97	70	12 - 18	6 U	6 U	6 U	12 U	9 J	6 U	6 U	6 U	6 U
MFAICS162	12/11/97	70	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS163	12/11/97	70	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS164	12/11/97	63	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS165	12/11/97	63	12 - 18	6 U	6 U	20	12 U	11 J	6 U	76	1 J	6 U
MFAICS166	12/11/97	63	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS167	12/11/97	69	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS168	12/11/97	69	12 - 18	6 U	6 U	10	13 U	18	6 U	70	6 U	6 U
MFAICS169	12/11/97	69	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS170	12/15/97	68	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS171	12/15/97	68	12 - 18	6 U	6 U	6 U	11 U	90	6 U	16	6 U	6 U
MFAICS172	12/15/97	68	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS173	12/29/97	67	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS174	12/29/97	67	12 - 18	6 U	6 U	6 U	7 JB	6 JB	6 U	2 J	6 U	6 U
MFAICS175	12/29/97	67	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS176	12/29/97	67	12 - 18	6 U	6 U	6	12 U	6 JB	6 U	6 U	6 U	6 U
MFAICS177	12/29/97	67	12 - 18	6 U	6 U	8	12 U	8 JB	1 J	6 U	6 U	6 U
MFAICS178	12/29/97	66	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS179	12/29/97	66	12 - 18	6 U	6 U	16	12 U	11 JB	6 U	10	2 J	6 U
MFAICS180	12/29/97	66	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS181	12/30/97	42	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS182	12/30/97	42	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	4 J	6 U	6 U
MFAICS183	12/30/97	42	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS184	12/30/97	42	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS185	12/30/97	60	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS155	12/9/97	45	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS156	12/9/97	45	24 - 36	250 U	4050	260 U	N/A	***7460***	250 U	650 U	250 U
MFAICS157	12/10/97	44	0 - 12	250 U	8030	260 U	N/A	930 J	250 U	650 U	250 U
MFAICS158	12/10/97	44	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS159	12/10/97	44	24 - 36	250 U	4800	260 U	N/A	926 J	250 U	650 U	250 U
MFAICS160	12/11/97	70	0 - 12	1250 U	GT 710000 E	1300 U	N/A	**GT 5600000 E**	***3350***	3250 U	**GT 4530000 E**
MFAICS161	12/11/97	70	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS162	12/11/97	70	24 - 36	1250 U	10200 J	1300 U	N/A	**97300**	1250 U	3250 U	***26900***
MFAICS163	12/11/97	70	24 - 36	1250 U	16100	1300 U	N/A	**129000**	1250 U	3250 U	***49000***
MFAICS164	12/11/97	63	0 - 12	250 U	GT 52400 E	260 U	N/A	**GT 372000 E**	472	650 U	***GT 35800 E***
MFAICS165	12/11/97	63	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS166	12/11/97	63	24 - 36	1250 U	60400 P	1300 U	N/A	**GT 418000 PE**	1250 U	3250 U	***40500 P***
MFAICS167	12/11/97	69	0 - 12	250 U	584 J	260 U	N/A	2540	250 U	650 U	1240
MFAICS168	12/11/97	69	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS169	12/11/97	69	24 - 36	250 U	593 J	260 U	N/A	3900	250 U	650 U	73.4 J
MFAICS170	12/15/97	68	0 - 12	250 U	5920	260 U	N/A	***4260***	250 U	650 U	664
MFAICS171	12/15/97	68	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS172	12/15/97	68	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS173	12/29/97	67	0 - 12	1250 U	15500	1300 U	N/A	**81000**	1250 U	3250 U	4740
MFAICS174	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS175	12/29/97	67	24 - 36	250 U	314 J	260 U	N/A	619 J	250 U	650 U	250 U
MFAICS176	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS177	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS178	12/29/97	66	0 - 12	250 U	GT 216000 E	260 U	N/A	**GT 818000 E**	250 U	650 U	10200
MFAICS179	12/29/97	66	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS180	12/29/97	66	24 - 36	250 U	1860 J	260 U	N/A	7710	250 U	650 U	250 U
MFAICS181	12/30/97	42	0 - 12	1250 U	95700	1300 U	N/A	**256000**	1250 U	3250 U	1250 U
MFAICS182	12/30/97	42	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS183	12/30/97	42	24 - 36	250 U	6410	260 U	N/A	***11600***	250 U	650 U	250 U
MFAICS184	12/30/97	42	24 - 36	250 U	3640	260 U	N/A	***8270***	250 U	650 U	250 U
MFAICS185	12/30/97	60	0 - 12	1250 U	285000	1300 U	N/A	**GT 2490000 E**	1250 U	3250 U	8610

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS155	12/9/97	45	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS156	12/9/97	45	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS157	12/10/97	44	0 - 12	250 U	260 U	250 U	398	250 U	250 U	250 U
MFAICS158	12/10/97	44	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS159	12/10/97	44	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS160	12/11/97	70	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS161	12/11/97	70	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS162	12/11/97	70	24 - 36	1250 U	1300 U	2920 P	1250 U	1250 U	1250 U	1250 U
MFAICS163	12/11/97	70	24 - 36	1250 U	1300 U	2990 P	1250 U	1250 U	1250 U	1250 U
MFAICS164	12/11/97	63	0 - 12	250 U	260 U	799 P	3140	250 U	250 U	250 U
MFAICS165	12/11/97	63	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS166	12/11/97	63	24 - 36	1250 U	1300 U	1250 U	3170	1250 U	1250 U	1250 U
MFAICS167	12/11/97	69	0 - 12	250 U	260 U	250 U	129 J	250 U	250 U	250 U
MFAICS168	12/11/97	69	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS169	12/11/97	69	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS170	12/15/97	68	0 - 12	250 U	260 U	250 U	182 J	250 U	250 U	250 U
MFAICS171	12/15/97	68	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS172	12/15/97	68	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS173	12/29/97	67	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS174	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS175	12/29/97	67	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS176	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS177	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS178	12/29/97	66	0 - 12	250 U	260 U	323	999	250 U	250 U	250 U
MFAICS179	12/29/97	66	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS180	12/29/97	66	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS181	12/30/97	42	0 - 12	1250 U	1300 U	1250 U	1250 U	1250 U	1250 U	1250 U
MFAICS182	12/30/97	42	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS183	12/30/97	42	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS184	12/30/97	42	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS185	12/30/97	60	0 - 12	1250 U	1300 U	1250 U	1160 J	1250 U	1250 U	1250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS155	12/9/97	45	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS156	12/9/97	45	24 - 36	N/A	N/A	48200	50 N*U	15800 N*	9400 N	N/A	N/A	N/A
MFAICS157	12/10/97	44	0 - 12	N/A	N/A	89100	270 B	11900	71000	N/A	N/A	N/A
MFAICS158	12/10/97	44	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS159	12/10/97	44	24 - 36	N/A	N/A	74100	60 U	15300	15200	N/A	N/A	N/A
MFAICS160	12/11/97	70	0 - 12	N/A	N/A	60600	60 U	13400	19300 E	N/A	N/A	N/A
MFAICS161	12/11/97	70	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS162	12/11/97	70	24 - 36	N/A	N/A	87000	60 U	12600	12100 E	N/A	N/A	N/A
MFAICS163	12/11/97	70	24 - 36	N/A	N/A	64700	60 U	12200	9900 E	N/A	N/A	N/A
MFAICS164	12/11/97	63	0 - 12	N/A	N/A	61500	60 U	15500	10600 E	N/A	N/A	N/A
MFAICS165	12/11/97	63	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS166	12/11/97	63	24 - 36	N/A	N/A	87400	60 U	25300	16400 E	N/A	N/A	N/A
MFAICS167	12/11/97	69	0 - 12	N/A	N/A	83100	70 U	13900	19500 E	N/A	N/A	N/A
MFAICS168	12/11/97	69	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS169	12/11/97	69	24 - 36	N/A	N/A	66600	60 U	14600	11100 E	N/A	N/A	N/A
MFAICS170	12/15/97	68	0 - 12	N/A	N/A	46400	60 U	13000	9400	N/A	N/A	N/A
MFAICS171	12/15/97	68	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS172	12/15/97	68	24 - 36	N/A	N/A	35000	60 U	16000	8600	N/A	N/A	N/A
MFAICS173	12/29/97	67	0 - 12	N/A	N/A	51800	60 U	13900	13500	N/A	N/A	N/A
MFAICS174	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS175	12/29/97	67	24 - 36	N/A	N/A	27500	60 U	12500	6500	N/A	N/A	N/A
MFAICS176	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS177	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS178	12/29/97	66	0 - 12	N/A	N/A	52200	70 U	12300	19500	N/A	N/A	N/A
MFAICS179	12/29/97	66	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS180	12/29/97	66	24 - 36	N/A	N/A	37000	60 U	14000	11000	N/A	N/A	N/A
MFAICS181	12/30/97	42	0 - 12	N/A	N/A	56900 E	60 U	9000	13000	N/A	N/A	N/A
MFAICS182	12/30/97	42	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS183	12/30/97	42	24 - 36	N/A	N/A	102000 E	60 U	15900	10100	N/A	N/A	N/A
MFAICS184	12/30/97	42	24 - 36	N/A	N/A	71200 E	60 U	17000	12200	N/A	N/A	N/A
MFAICS185	12/30/97	60	0 - 12	N/A	N/A	42500 E	100 B	9400	22000	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS155	12/9/97	45	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS156	12/9/97	45	24 - 36	2.1 U	1270	0.3 U	1 U	2.3 B	1 N*U	3.4 U	1 U
MFAICS157	12/10/97	44	0 - 12	2.1 U	1480	1.8 B	1.4 B	14.8 B	2.2	3.4 U	1 U
MFAICS158	12/10/97	44	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS159	12/10/97	44	24 - 36	2.1 U	1350	0.650 B	1.1 B	5 B	1 U	3.4 U	1 U
MFAICS160	12/11/97	70	0 - 12	2.1 U	1 NB	0.3 U	84.3 N	0.9 U	1 U	3.4 U	1 U
MFAICS161	12/11/97	70	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS162	12/11/97	70	24 - 36	4.6 B	1570 N	0.720 B	2.2 NB	18.7 B	1 U	5.9 B	1 U
MFAICS163	12/11/97	70	24 - 36	5.9 B	1610 N	0.430 B	3.2 NB	18.2 B	1 U	6.6 B	1 U
MFAICS164	12/11/97	63	0 - 12	2.1 U	1110 N	0.3 U	1 NU	2.3 B	1 U	3.4 U	1 U
MFAICS165	12/11/97	63	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS166	12/11/97	63	24 - 36	2.1 U	1550 N	0.3 U	1 NU	1.6 B	1 U	3.4 U	1 U
MFAICS167	12/11/97	69	0 - 12	2.1 U	1220 N	0.4 B	1 NU	0.9 U	1 U	3.4 U	1 U
MFAICS168	12/11/97	69	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS169	12/11/97	69	24 - 36	5.8 B	1400 N	0.340 B	1.7 NB	15.4 B	1 U	3.4 U	1 U
MFAICS170	12/15/97	68	0 - 12	2.1 U	1070 E	0.3 U	1 U	1.1 B	2.3	4.3 B	1 U
MFAICS171	12/15/97	68	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS172	12/15/97	68	24 - 36	2.1 U	938 E	0.3 U	1 U	6.5 B	1 U	4.3 B	1 U
MFAICS173	12/29/97	67	0 - 12	2.3 B	1690	0.540 B	1 U	5.7 B	1 U	4 B	1 U
MFAICS174	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS175	12/29/97	67	24 - 36	2.3 B	1010	0.390 B	1 U	37.1 B	1 U	3.4 U	1 U
MFAICS176	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS177	12/29/97	67	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS178	12/29/97	66	0 - 12	2.1 U	1320	0.760 B	1 U	4.7 B	1 U	3.5 B	1 U
MFAICS179	12/29/97	66	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS180	12/29/97	66	24 - 36	5.9 B	1300	0.440 B	1 U	12.5 B	1 U	5.7 B	1 U
MFAICS181	12/30/97	42	0 - 12	2.1 U	1450 E	0.610 B	1 U	4.7 B	1 U	5.1 B	1 U
MFAICS182	12/30/97	42	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS183	12/30/97	42	24 - 36	2.1 U	1360 E	0.320 B	1 U	10.2 B	1 U	4.1 B	1 U
MFAICS184	12/30/97	42	24 - 36	3.1 B	1500 E	0.3 U	1 U	48	1 U	5 B	1 U
MFAICS185	12/30/97	60	0 - 12	2.1 U	1310 E	2.4 B	4.6 B	107	1 U	5.9 B	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS186	12/30/97	60	12 - 18	6 U	6 U	6 U	13 U	4 J	6 U	4 J	6 U	6 U
MFAICS187	12/30/97	60	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS188	12/30/97	61	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS189	12/30/97	61	12 - 18	6 U	6 U	6 U	12 U	5 J	6 U	5 J	6 U	6 U
MFAICS190	12/30/97	61	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS191	12/31/97	46	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS192	12/31/97	46	12 - 18	6 U	6 U	6 U	12 U	2 J	6 U	1 J	6 U	6 U
MFAICS193	12/31/97	46	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS194	12/31/97	47	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS195	12/31/97	47	12 - 18	6 U	6 U	6 U	12 U	5 J	6 U	4 J	2 J	6 U
MFAICS196	12/31/97	47	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS197	1/2/98	49	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS198	1/2/98	49	12 - 18	6 U	6 U	6 U	12 U	3 J	6 U	3 J	6 U	6 U
MFAICS199	1/2/98	49	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS200	1/2/98	51	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS201	1/2/98	51	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	3 J	6 U	6 U
MFAICS202	1/2/98	51	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS203	1/2/98	53	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS204	1/2/98	53	12 - 18	6 U	6 U	6 U	12 U	4 J	6 U	6 U	6 U	6 U
MFAICS205	1/2/98	53	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS206	1/2/98	53	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS207	1/5/98	55	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS208	1/5/98	55	12 - 18	6 U	6 U	6 U	12 U	4 J	6 U	9	6 U	6 U
MFAICS209	1/5/98	55	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS210	1/5/98	57	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS211	1/5/98	57	12 - 18	6 U	6 U	6 U	12 U	10 U	6 U	3 J	6 U	6 U
MFAICS212	1/5/98	57	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS213	1/5/98	59	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS214	1/5/98	59	12 - 18	6 U	6 U	6 U	12 U	10 U	6 U	6	6 U	6 U
MFAICS215	1/5/98	59	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS216	1/13/98	118	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS186	12/30/97	60	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS187	12/30/97	60	24 - 36	250 U	1230 J	260 U	N/A	***12900***	250 U	650 U	250 U
MFAICS188	12/30/97	61	0 - 12	250 U	5880	260 U	N/A	1610	250 U	650 U	125 J
MFAICS189	12/30/97	61	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS190	12/30/97	61	24 - 36	250 U	882 J	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS191	12/31/97	46	0 - 12	235 U	8280	244 U	N/A	939 U	235 U	610 U	235 U
MFAICS192	12/31/97	46	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS193	12/31/97	46	24 - 36	240 U	2090 J	250 U	N/A	789 J	240 U	625 U	240 U
MFAICS194	12/31/97	47	0 - 12	237 U	261 J	246 U	N/A	948 U	237 U	616 U	103 J
MFAICS195	12/31/97	47	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS196	12/31/97	47	24 - 36	237 U	475 J	246 U	N/A	948 U	237 U	616 U	237 U
MFAICS197	1/2/98	49	0 - 12	239 U	46600	249 U	N/A	**64200 D**	239 U	622 U	135 J
MFAICS198	1/2/98	49	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS199	1/2/98	49	24 - 36	237 U	1500 J	246 U	N/A	986 J	237 U	616 U	237 U
MFAICS200	1/2/98	51	0 - 12	232 U	156000 D	242 U	N/A	**GT 671000 ED**	232 U	605 U	11100
MFAICS201	1/2/98	51	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS202	1/2/98	51	24 - 36	238 U	500 J	248 U	N/A	2160	238 U	619 U	238 U
MFAICS203	1/2/98	53	0 - 12	239 U	64800	249 U	N/A	**184000 D**	239 U	622 U	356
MFAICS204	1/2/98	53	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS205	1/2/98	53	24 - 36	238 U	1560 J	248 U	N/A	732 J	238 U	619 U	238 U
MFAICS206	1/2/98	53	24 - 36	229 U	1200 J	238 U	N/A	1290 J	229 U	596 U	229 U
MFAICS207	1/5/98	55	0 - 12	238 U	37300	248 U	N/A	**169000 D**	238 U	619 U	526
MFAICS208	1/5/98	55	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS209	1/5/98	55	24 - 36	236 U	1410 J	245 U	N/A	1910	236 U	613 U	236 U
MFAICS210	1/5/98	57	0 - 12	248 U	23400	257 U	N/A	**111000 D**	248 U	644 U	237 J
MFAICS211	1/5/98	57	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS212	1/5/98	57	24 - 36	232 U	21000	242 U	N/A	**26400**	232 U	605 U	141 J
MFAICS213	1/5/98	59	0 - 12	1250 U	140000	1300 U	N/A	**906000 D**	1250 U	3250 U	1300
MFAICS214	1/5/98	59	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS215	1/5/98	59	24 - 36	243 U	11200	252 U	N/A	**84200 D**	243 U	631 U	1480
MFAICS216	1/13/98	118	0 - 12	248 U	1430 J	257 U	N/A	924 J	248 U	644 U	514

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS186	12/30/97	60	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS187	12/30/97	60	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS188	12/30/97	61	0 - 12	250 U	260 U	250 U	223 PJ	250 U	250 U	250 U
MFAICS189	12/30/97	61	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS190	12/30/97	61	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS191	12/31/97	46	0 - 12	235 U	244 U	235 U	235 U	235 U	235 U	235 U
MFAICS192	12/31/97	46	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS193	12/31/97	46	24 - 36	240 U	250 U	240 U	240 U	240 U	240 U	240 U
MFAICS194	12/31/97	47	0 - 12	237 U	246 U	237 U	237 U	237 U	237 U	237 U
MFAICS195	12/31/97	47	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS196	12/31/97	47	24 - 36	237 U	246 U	237 U	237 U	237 U	237 U	237 U
MFAICS197	1/2/98	49	0 - 12	239 U	249 U	239 U	239 U	239 U	239 U	239 U
MFAICS198	1/2/98	49	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS199	1/2/98	49	24 - 36	237 U	246 U	237 U	237 U	237 U	237 U	237 U
MFAICS200	1/2/98	51	0 - 12	232 U	242 U	232 U	232 U	232 U	232 U	232 U
MFAICS201	1/2/98	51	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS202	1/2/98	51	24 - 36	238 U	248 U	238 U	238 U	238 U	238 U	238 U
MFAICS203	1/2/98	53	0 - 12	239 U	249 U	239 U	366 P	239 U	239 U	239 U
MFAICS204	1/2/98	53	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS205	1/2/98	53	24 - 36	238 U	248 U	238 U	238 U	238 U	238 U	238 U
MFAICS206	1/2/98	53	24 - 36	229 U	238 U	229 U	229 U	229 U	229 U	229 U
MFAICS207	1/5/98	55	0 - 12	238 U	248 U	238 U	410 P	238 U	238 U	238 U
MFAICS208	1/5/98	55	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS209	1/5/98	55	24 - 36	236 U	245 U	236 U	177 J	236 U	236 U	236 U
MFAICS210	1/5/98	57	0 - 12	248 U	257 U	248 U	724 P	248 U	248 U	248 U
MFAICS211	1/5/98	57	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS212	1/5/98	57	24 - 36	232 U	242 U	232 U	232 U	232 U	232 U	232 U
MFAICS213	1/5/98	59	0 - 12	1250 U	1300 U	1250 U	1260	1250 U	1250 U	1250 U
MFAICS214	1/5/98	59	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS215	1/5/98	59	24 - 36	243 U	252 U	243 U	846	243 U	243 U	243 U
MFAICS216	1/13/98	118	0 - 12	248 U	257 U	248 U	701	248 U	248 U	248 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS186	12/30/97	60	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS187	12/30/97	60	24 - 36	N/A	N/A	67700 E	60 U	14400	10800	N/A	N/A	N/A
MFAICS188	12/30/97	61	0 - 12	N/A	N/A	60100 E	60 U	14300	28200	N/A	N/A	N/A
MFAICS189	12/30/97	61	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS190	12/30/97	61	24 - 36	N/A	N/A	50400 E	60 U	13600	9900	N/A	N/A	N/A
MFAICS191	12/31/97	46	0 - 12	N/A	N/A	69900	60 U	13800	26600	N/A	N/A	N/A
MFAICS192	12/31/97	46	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS193	12/31/97	46	24 - 36	N/A	N/A	41700	60 U	13900	14300	N/A	N/A	N/A
MFAICS194	12/31/97	47	0 - 12	N/A	N/A	96700	60 U	9600	17400	N/A	N/A	N/A
MFAICS195	12/31/97	47	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS196	12/31/97	47	24 - 36	N/A	N/A	93100	60 U	11100	17000	N/A	N/A	N/A
MFAICS197	1/2/98	49	0 - 12	N/A	N/A	58300	60 U	11000	19000	N/A	N/A	N/A
MFAICS198	1/2/98	49	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS199	1/2/98	49	24 - 36	N/A	N/A	63300	60 U	16300	12000	N/A	N/A	N/A
MFAICS200	1/2/98	51	0 - 12	N/A	N/A	57300	60 U	10900	15300	N/A	N/A	N/A
MFAICS201	1/2/98	51	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS202	1/2/98	51	24 - 36	N/A	N/A	74600	60 U	10100	11300	N/A	N/A	N/A
MFAICS203	1/2/98	53	0 - 12	N/A	N/A	59900	60 U	10600	10400	N/A	N/A	N/A
MFAICS204	1/2/98	53	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS205	1/2/98	53	24 - 36	N/A	N/A	51400	60 U	14700	11900	N/A	N/A	N/A
MFAICS206	1/2/98	53	24 - 36	N/A	N/A	32100	50 U	12100	9400	N/A	N/A	N/A
MFAICS207	1/5/98	55	0 - 12	N/A	N/A	59600	60 U	14500 N	16800 N	N/A	N/A	N/A
MFAICS208	1/5/98	55	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS209	1/5/98	55	24 - 36	N/A	N/A	55400	60 U	13600 N	11700 N	N/A	N/A	N/A
MFAICS210	1/5/98	57	0 - 12	N/A	N/A	53900	50 U	14900 N	15500 N	N/A	N/A	N/A
MFAICS211	1/5/98	57	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS212	1/5/98	57	24 - 36	N/A	N/A	57000	60 U	12000 N	11900 N	N/A	N/A	N/A
MFAICS213	1/5/98	59	0 - 12	N/A	N/A	81900	60 U	13700 N	15200 N	N/A	N/A	N/A
MFAICS214	1/5/98	59	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS215	1/5/98	59	24 - 36	N/A	N/A	58100	60 U	15800 N	13000 N	N/A	N/A	N/A
MFAICS216	1/13/98	118	0 - 12	N/A	N/A	59900	60 U	21200 N	17900 E	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS186	12/30/97	60	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS187	12/30/97	60	24 - 36	4 B	1770 E	3.5 B	1 U	25.5 B	1 U	3.8 B	1 U
MFAICS188	12/30/97	61	0 - 12	2.1 U	1380 E	0.7 B	1 U	6.8 B	1 U	3.7 B	1 U
MFAICS189	12/30/97	61	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS190	12/30/97	61	24 - 36	2.1 U	1280 E	0.3 U	1 U	6.8 B	1 U	5.3 B	1 U
MFAICS191	12/31/97	46	0 - 12	2.1 U	1380 EN	0.320 B	1 U	42 E	1 U	3.4 U	1 U
MFAICS192	12/31/97	46	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS193	12/31/97	46	24 - 36	2.1 U	1560 EN	0.3 U	1 U	1260 E	1 U	3.4 U	1 U
MFAICS194	12/31/97	47	0 - 12	2.1 U	1510 EN	0.3 U	2.2 B	262 E	1 U	3.4 U	1 U
MFAICS195	12/31/97	47	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS196	12/31/97	47	24 - 36	2.1 U	1460 EN	0.3 U	1 U	50.8 E	1 U	3.4 U	1 U
MFAICS197	1/2/98	49	0 - 12	2.1 U	1710 EN	0.3 U	1 U	96.2 E	1 U	3.4 U	1 U
MFAICS198	1/2/98	49	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS199	1/2/98	49	24 - 36	2.1 U	1370 EN	0.3 U	1.7 B	80.4 E	1 U	5.4 B	1 U
MFAICS200	1/2/98	51	0 - 12	2.1 U	1490 EN	0.3 U	1 U	9.7 EB	1 U	3.4 U	1 U
MFAICS201	1/2/98	51	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS202	1/2/98	51	24 - 36	2.1 U	1610 EN	0.460 B	2.3 B	10.3 EB	1 U	8.1 B	1 U
MFAICS203	1/2/98	53	0 - 12	2.1 U	1280 EN	0.3 U	1 U	2.8 EB	1 U	3.4 U	1 U
MFAICS204	1/2/98	53	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS205	1/2/98	53	24 - 36	2.1 U	1170 EN	0.3 U	1 U	3.6 EB	1 U	3.4 U	1 U
MFAICS206	1/2/98	53	24 - 36	2.1 U	1060 EN	0.3 U	1 U	19.3 EB	1 U	3.4 U	1 U
MFAICS207	1/5/98	55	0 - 12	2.1 U	900	0.580 B	4.3 B	4.5 B	1 U	3.4 U	1 U
MFAICS208	1/5/98	55	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS209	1/5/98	55	24 - 36	2.1 U	1190	1.5 B	1 U	5.8 B	1 U	3.4 U	1 U
MFAICS210	1/5/98	57	0 - 12	2.1 U	1290	1.5 B	1 U	2.6 B	1 U	3.4 U	1 U
MFAICS211	1/5/98	57	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS212	1/5/98	57	24 - 36	2.1 U	1140	0.780 B	1 U	13 B	1 U	3.4 U	1 U
MFAICS213	1/5/98	59	0 - 12	2.1 U	1340	0.610 B	1 U	2.4 B	1 U	3.4 U	1 U
MFAICS214	1/5/98	59	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS215	1/5/98	59	24 - 36	2.1 U	1260	0.760 B	1 U	8.8 B	1 U	3.8 B	1 U
MFAICS216	1/13/98	118	0 - 12	2.1 U	2050 EN	1 B	1.3 B	8.1 B	1 U	3.4 U	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS217	1/13/98	118	12 - 18	6 U	6 U	6 U	12 U	10 JB	6 U	11 B	6 U	6 U
MFAICS218	1/13/98	118	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS219	1/13/98	117	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS220	1/13/98	117	12 - 18	6 U	6 U	8	13 U	30 B	6 U	21 B	1 J	6 U
MFAICS221	1/13/98	117	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS222	1/14/98	106	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS223	1/14/98	106	12 - 18	6 U	6 U	4 J	12 U	11 J	1 J	3 JB	6 U	6 U
MFAICS224	1/14/98	106	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS225	1/15/98	116	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS226	1/15/98	116	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS227	1/15/98	116	12 - 18	6 U	6 U	6 U	13 U	6 J	6 U	2 JB	6 U	6 U
MFAICS228	1/15/98	116	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS229	1/16/98	96	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS230	1/16/98	96	12 - 18	6 U	6 U	6 U	12 U	10 J	6 U	3 JB	6 U	6 U
MFAICS231	1/16/98	96	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS232	1/16/98	97	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS233	1/16/98	97	12 - 18	6 U	6 U	1 J	12 U	8 J	6 U	2 JB	6 U	6 U
MFAICS234	1/16/98	97	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS235	1/19/98	98	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS236	1/19/98	98	12 - 18	6 U	6 U	6 U	12 U	4 J	6 U	2 JB	6 U	6 U
MFAICS237	1/19/98	98	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS238	1/20/98	99	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS239	1/20/98	99	12 - 18	6 U	2 J	7	12 U	15	2 J	10 B	2 J	2 J
MFAICS240	1/20/98	99	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS241	1/20/98	109	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS242	1/20/98	109	12 - 18	6 U	6 U	4 J	12 U	7 J	6 U	4 JB	6 U	6 U
MFAICS243	1/20/98	109	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS244	1/21/98	108	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS245	1/21/98	108	12 - 18	6 U	2 J	5 J	12 U	8 JB	2 J	21 B	6 U	2 J
MFAICS246	1/21/98	108	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS247	1/21/98	108	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS217	1/13/98	118	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS218	1/13/98	118	24 - 36	250 U	1180 J	260 U	N/A	1230	250 U	650 U	188 J
MFAICS219	1/13/98	117	0 - 12	246 U	17500	256 U	N/A	**76500 D**	246 U	640 U	***17000***
MFAICS220	1/13/98	117	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS221	1/13/98	117	24 - 36	238 U	3250	248 U	N/A	***6680***	238 U	619 U	105 J
MFAICS222	1/14/98	106	0 - 12	***12200 U***	217000	12700 U	N/A	**1920000**	***12200 U***	31900 U	**159000**
MFAICS223	1/14/98	106	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS224	1/14/98	106	24 - 36	237 U	2120 J	246 U	N/A	***12800***	237 U	616 U	**GT 260000 E**
MFAICS225	1/15/98	116	0 - 12	234 U	5600	243 U	N/A	***5410***	234 U	607 U	694
MFAICS226	1/15/98	116	0 - 12	239 U	4820	249 U	N/A	***4950***	239 U	622 U	576
MFAICS227	1/15/98	116	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS228	1/15/98	116	24 - 36	248 U	1020 J	257 U	N/A	1600	248 U	644 U	257
MFAICS229	1/16/98	96	0 - 12	***12100 U***	121000	12600 U	N/A	**1210000**	***12100 U***	31600 U	**224000**
MFAICS230	1/16/98	96	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS231	1/16/98	96	24 - 36	248 U	4280	257 U	N/A	**20600**	552	644 U	2490
MFAICS232	1/16/98	97	0 - 12	***11800 U***	112000	12300 U	N/A	**1010000**	***11800 U***	30800 U	**359000**
MFAICS233	1/16/98	97	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS234	1/16/98	97	24 - 36	248 U	24400	257 U	N/A	**GT 189000 E**	1670	644 U	**GT 257000 E**
MFAICS235	1/19/98	98	0 - 12	***11700 U***	121000	12100 U	N/A	**1160000**	***11700 U***	30400 U	**913000**
MFAICS236	1/19/98	98	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS237	1/19/98	98	24 - 36	239 U	4330	249 U	N/A	**25200**	***13000***	622 U	**GT 172000 E**
MFAICS238	1/20/98	99	0 - 12	1250 U	38100	1300 U	N/A	**GT 329000 E**	510 J	3250 U	**184000**
MFAICS239	1/20/98	99	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS240	1/20/98	99	24 - 36	1230 U	5880 J	1280 U	N/A	**69000**	***4670***	3200 U	**124000**
MFAICS241	1/20/98	109	0 - 12	239 U	6930	249 U	N/A	***16500***	244 J	622 U	8560
MFAICS242	1/20/98	109	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS243	1/20/98	109	24 - 36	1240 U	3900 J	1290 U	N/A	***7590***	1240 U	3220 U	1610
MFAICS244	1/21/98	108	0 - 12	245 U	36100	255 U	N/A	**126000 D**	245 U	637 U	1180
MFAICS245	1/21/98	108	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS246	1/21/98	108	24 - 36	239 U	1890 J	249 U	N/A	2660	239 U	622 U	824 P
MFAICS247	1/21/98	108	24 - 36	229 U	1750 J	238 U	N/A	2160	229 U	596 U	2010 P

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS217	1/13/98	118	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS218	1/13/98	118	24 - 36	250 U	260 U	250 U	407	250 U	250 U	250 U
MFAICS219	1/13/98	117	0 - 12	246 U	256 U	569	1890	246 U	246 U	246 U
MFAICS220	1/13/98	117	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS221	1/13/98	117	24 - 36	238 U	248 U	238 U	238 U	238 U	238 U	238 U
MFAICS222	1/14/98	106	0 - 12	12200 U	12700 U	12200 U	17500	12200 U	12200 U	12200 U
MFAICS223	1/14/98	106	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS224	1/14/98	106	24 - 36	237 U	246 U	237 U	237 U	237 U	237 U	237 U
MFAICS225	1/15/98	116	0 - 12	234 U	243 U	234 U	618	234 U	234 U	234 U
MFAICS226	1/15/98	116	0 - 12	239 U	249 U	239 U	574	239 U	239 U	239 U
MFAICS227	1/15/98	116	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS228	1/15/98	116	24 - 36	248 U	257 U	248 U	248 U	248 U	248 U	248 U
MFAICS229	1/16/98	96	0 - 12	12100 U	12600 U	12100 U	12100 U	12100 U	12100 U	12100 U
MFAICS230	1/16/98	96	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS231	1/16/98	96	24 - 36	248 U	257 U	248 U	923	646 P	248 U	248 U
MFAICS232	1/16/98	97	0 - 12	11800 U	12300 U	11800 U	11800 U	11800 U	11800 U	11800 U
MFAICS233	1/16/98	97	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS234	1/16/98	97	24 - 36	248 U	257 U	248 U	248 U	248 U	248 U	248 U
MFAICS235	1/19/98	98	0 - 12	11700 U	12100 U	11700 U	11700 U	11700 U	11700 U	11700 U
MFAICS236	1/19/98	98	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS237	1/19/98	98	24 - 36	239 U	249 U	1840	239 U	239 U	239 U	239 U
MFAICS238	1/20/98	99	0 - 12	1250 U	1300 U	1250 U	1250 U	1290	1250 U	1250 U
MFAICS239	1/20/98	99	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS240	1/20/98	99	24 - 36	1230 U	1280 U	1230 U	1230 U	1230 U	1230 U	1230 U
MFAICS241	1/20/98	109	0 - 12	239 U	249 U	934 P	239 U	239 U	239 U	239 U
MFAICS242	1/20/98	109	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS243	1/20/98	109	24 - 36	1240 U	1290 U	1240 U	1240 U	1240 U	1240 U	1240 U
MFAICS244	1/21/98	108	0 - 12	245 U	255 U	573 P	1360	245 U	245 U	245 U
MFAICS245	1/21/98	108	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS246	1/21/98	108	24 - 36	239 U	249 U	289 P	357 P	239 U	239 U	239 U
MFAICS247	1/21/98	108	24 - 36	373	238 U	1220 P	1170	229 U	229 U	229 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS217	1/13/98	118	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS218	1/13/98	118	24 - 36	N/A	N/A	93500	60 U	14600 N	14200 E	N/A	N/A	N/A
MFAICS219	1/13/98	117	0 - 12	N/A	N/A	67300	60 U	14400 N	25000 E	N/A	N/A	N/A
MFAICS220	1/13/98	117	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS221	1/13/98	117	24 - 36	N/A	N/A	73800	60 U	17100 N	10600 E	N/A	N/A	N/A
MFAICS222	1/14/98	106	0 - 12	N/A	N/A	66800	240 B	15900 N*	54800 E	N/A	N/A	N/A
MFAICS223	1/14/98	106	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS224	1/14/98	106	24 - 36	N/A	N/A	70600	60 U	17600 N*	11500 E	N/A	N/A	N/A
MFAICS225	1/15/98	116	0 - 12	N/A	N/A	73400	300 B	15600 N*	32900 E	N/A	N/A	N/A
MFAICS226	1/15/98	116	0 - 12	N/A	N/A	70500	130 B	16200 N*	20400 E	N/A	N/A	N/A
MFAICS227	1/15/98	116	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS228	1/15/98	116	24 - 36	N/A	N/A	50700	60 U	17300 N*	10600 E	N/A	N/A	N/A
MFAICS229	1/16/98	96	0 - 12	N/A	N/A	61400	50 U	21300 N*	27600 E	N/A	N/A	N/A
MFAICS230	1/16/98	96	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS231	1/16/98	96	24 - 36	N/A	N/A	70700	60 U	17800 N*	12400 E	N/A	N/A	N/A
MFAICS232	1/16/98	97	0 - 12	N/A	N/A	54700	430 B	13700 N*	18900 E	N/A	N/A	N/A
MFAICS233	1/16/98	97	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS234	1/16/98	97	24 - 36	N/A	N/A	71000	60 U	16600 N*	18900 E	N/A	N/A	N/A
MFAICS235	1/19/98	98	0 - 12	N/A	N/A	93200	60 B	17900 N*	17900 E	N/A	N/A	N/A
MFAICS236	1/19/98	98	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS237	1/19/98	98	24 - 36	N/A	N/A	70200	60 U	12900 N*	12000 E	N/A	N/A	N/A
MFAICS238	1/20/98	99	0 - 12	N/A	N/A	81400	150 B	13800 E	24700 E	N/A	N/A	N/A
MFAICS239	1/20/98	99	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS240	1/20/98	99	24 - 36	N/A	N/A	75300	60 U	14200 E	11500 E	N/A	N/A	N/A
MFAICS241	1/20/98	109	0 - 12	N/A	N/A	78500	60 U	15000 E	17400 E	N/A	N/A	N/A
MFAICS242	1/20/98	109	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS243	1/20/98	109	24 - 36	N/A	N/A	79800	60 U	13500 E	15600 E	N/A	N/A	N/A
MFAICS244	1/21/98	108	0 - 12	N/A	N/A	78600	60 U	16600	13900	N/A	N/A	N/A
MFAICS245	1/21/98	108	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS246	1/21/98	108	24 - 36	N/A	N/A	66600	60 U	15800	11300	N/A	N/A	N/A
MFAICS247	1/21/98	108	24 - 36	N/A	N/A	57900	60 U	15200	9800	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS217	1/13/98	118	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS218	1/13/98	118	24 - 36	2.1 U	1630 EN	0.420 B	1 U	2.1 B	1 U	3.4 U	1 U
MFAICS219	1/13/98	117	0 - 12	4.8 B	1670 EN	0.830 B	1.1 B	1.9 B	1 U	3.4 U	1 U
MFAICS220	1/13/98	117	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS221	1/13/98	117	24 - 36	2.1 U	3300 EN	0.530 B	1.8 B	20.6 B	1 U	3.9 B	1 U
MFAICS222	1/14/98	106	0 - 12	2.1 U	1600	1.8 B	1 B	33.9 ENB	1 U	3.4 U	1 U
MFAICS223	1/14/98	106	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS224	1/14/98	106	24 - 36	2.2 B	1170	0.3 U	1 B	6.7 ENB	1 U	5 B	1 U
MFAICS225	1/15/98	116	0 - 12	2.9 B	1550	1.1 B	1 U	4.2 ENB	1 U	3.8 B	1 U
MFAICS226	1/15/98	116	0 - 12	2.1 U	1450	1.1 B	1 U	3.6 ENB	1.3 B	3.4 U	1 U
MFAICS227	1/15/98	116	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS228	1/15/98	116	24 - 36	2.1 U	1320	0.3 U	1 U	5.5 ENB	1 U	4.1 B	1 U
MFAICS229	1/16/98	96	0 - 12	2.1 U	1390	1.4 B	1.5 B	7.2 ENB	1 U	5.2 B	1 U
MFAICS230	1/16/98	96	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS231	1/16/98	96	24 - 36	2.1 U	1430	0.680 B	1.7 B	5.5 ENB	1 U	4.2 B	1 U
MFAICS232	1/16/98	97	0 - 12	2.1 U	1380	0.530 B	1 U	1.9 ENB	1 U	3.4 U	1 U
MFAICS233	1/16/98	97	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS234	1/16/98	97	24 - 36	2.1 U	1240	0.3 U	1 B	1.8 ENB	1 U	3.9 B	1 U
MFAICS235	1/19/98	98	0 - 12	2.1 U	1500	0.730 B	1.2 B	150 EN	1 U	3.8 B	1 U
MFAICS236	1/19/98	98	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS237	1/19/98	98	24 - 36	2.1 U	1680	0.3 U	1.4 B	3.9 ENB	1 U	4.6 B	1 U
MFAICS238	1/20/98	99	0 - 12	2.1 U	1310 N*	1.1 N*B	2.8 N*B	157 EN	1 U	3.4 U	1 N*U
MFAICS239	1/20/98	99	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS240	1/20/98	99	24 - 36	2.1 U	1630 N*	0.610 N*B	1.8 N*B	32 ENB	1 U	3.4 U	1 N*U
MFAICS241	1/20/98	109	0 - 12	2.1 U	1300 N*	2.6 N*B	2.5 N*B	6.9 ENB	1 U	3.4 U	1 N*U
MFAICS242	1/20/98	109	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS243	1/20/98	109	24 - 36	2.1 U	1320 N*	0.340 N*B	1.9 N*B	5.7 ENB	1 U	3.4 U	1 N*U
MFAICS244	1/21/98	108	0 - 12	2.1 U	1010 E	0.420 B	2 B	2.3 B	1 *U	3.4 U	1 U
MFAICS245	1/21/98	108	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS246	1/21/98	108	24 - 36	2.1 U	1100 E	0.510 B	2.7 B	377	1 *U	3.4 U	1 U
MFAICS247	1/21/98	108	24 - 36	2.1 U	1330 E	0.3 U	3 B	4.5 B	1 *U	4.9 B	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS248	1/21/98	111	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS249	1/21/98	111	12 - 18	6 U	6 U	3 J	12 U	3 JB	6 U	20 B	6 U	6 U
MFAICS250	1/21/98	111	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS251	1/26/98	127	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS252	1/26/98	127	12 - 18	6 U	6 U	6 U	12 U	15	2 JB	3 J	6 U	2 J
MFAICS253	1/26/98	127	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS254	1/26/98	128	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS255	1/26/98	128	12 - 18	6 U	6 U	6 U	12 U	12 U	1 JB	2 J	6 U	6 U
MFAICS256	1/26/98	128	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS257	1/26/98	129	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS258	1/26/98	129	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	2 J	6 U	6 U
MFAICS259	1/26/98	129	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS260	1/27/98	131	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS261	1/27/98	131	12 - 18	6 U	6 U	2 J	12 U	12 U	6 U	3 J	6 U	6 U
MFAICS262	1/27/98	131	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS263	1/28/98	132	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS264	1/28/98	132	12 - 18	6 U	6 U	6 U	12 U	12 U	2 JB	1 J	6 U	6 U
MFAICS265	1/28/98	132	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS266	1/28/98	133	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS267	1/28/98	133	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS268	1/28/98	133	12 - 18	6 U	6 U	6 U	12 U	2 J	1 JB	2 J	6 U	6 U
MFAICS269	1/28/98	133	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS270	1/29/98	135	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS271	1/29/98	135	12 - 18	6 U	6 U	6 U	12 U	8 J	6 U	6 U	6 U	6 U
MFAICS272	1/29/98	135	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS273	1/29/98	135	30 - 36	6 U	6 U	8	13 U	39	6 U	2 J	6 U	6 U
MFAICS274	1/29/98	134	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS275	1/29/98	134	12 - 18	6 U	6 U	6 U	12 U	6 J	1 JB	2 J	6 U	6 U
MFAICS276	1/29/98	134	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS277	1/30/98	137	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS278	1/30/98	137	12 - 18	6 U	6 U	6 U	12 U	7 JB	6 U	2 J	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS248	1/21/98	111	0 - 12	244 U	1640 J	254 U	N/A	746 J	244 U	634 U	321
MFAICS249	1/21/98	111	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS250	1/21/98	111	24 - 36	235 U	2060 U	244 U	N/A	939 U	235 U	610 U	235 U
MFAICS251	1/26/98	127	0 - 12	250 U	48200	260 U	N/A	**56300 D**	250 U	650 U	165 J
MFAICS252	1/26/98	127	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS253	1/26/98	127	24 - 36	250 U	13200	260 U	N/A	2750	250 U	650 U	250 U
MFAICS254	1/26/98	128	0 - 12	250 U	134000 D	260 U	N/A	**582000 D**	250 U	650 U	376
MFAICS255	1/26/98	128	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS256	1/26/98	128	24 - 36	250 U	4530	260 U	N/A	***8340***	250 U	650 U	250 U
MFAICS257	1/26/98	129	0 - 12	250 U	13500	260 U	N/A	***10000***	250 U	650 U	250 U
MFAICS258	1/26/98	129	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS259	1/26/98	129	24 - 36	250 U	1210 J	260 U	N/A	***4150***	250 U	650 U	250 U
MFAICS260	1/27/98	131	0 - 12	250 U	95400 D	260 U	N/A	**152000 D**	250 U	650 U	250 U
MFAICS261	1/27/98	131	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS262	1/27/98	131	24 - 36	250 U	6960	260 U	N/A	**20800**	250 U	650 U	143 J
MFAICS263	1/28/98	132	0 - 12	250 U	320000 D	260 U	N/A	**813000 D**	250 U	650 U	250 U
MFAICS264	1/28/98	132	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS265	1/28/98	132	24 - 36	250 U	5110	260 U	N/A	***9830***	250 U	650 U	250 U
MFAICS266	1/28/98	133	0 - 12	250 U	60200	260 U	N/A	**143000 D**	250 U	650 U	250 U
MFAICS267	1/28/98	133	24 - 36	250 U	32900	260 U	N/A	**90100 D**	250 U	650 U	250 U
MFAICS268	1/28/98	133	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS269	1/28/98	133	24 - 36	250 U	7040	260 U	N/A	**21200**	250 U	650 U	250 U
MFAICS270	1/29/98	135	0 - 12	250 U	7200	260 U	N/A	**33400**	250 U	650 U	250 U
MFAICS271	1/29/98	135	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS272	1/29/98	135	24 - 36	250 U	6240	260 U	N/A	***13700***	250 U	650 U	910
MFAICS273	1/29/98	135	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS274	1/29/98	134	0 - 12	250 U	67600	260 U	N/A	**303000 D**	250 U	650 U	250 U
MFAICS275	1/29/98	134	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS276	1/29/98	134	24 - 36	250 U	7500	260 U	N/A	**42700**	250 U	650 U	250 U
MFAICS277	1/30/98	137	0 - 12	250 U	108000 DJ	260 U	N/A	**542000 D**	250 U	650 U	154 J
MFAICS278	1/30/98	137	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS248	1/21/98	111	0 - 12	244 U	254 U	257 P	307	244 U	244 U	244 U
MFAICS249	1/21/98	111	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS250	1/21/98	111	24 - 36	235 U	244 U	235 U	235 U	235 U	235 U	235 U
MFAICS251	1/26/98	127	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS252	1/26/98	127	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS253	1/26/98	127	24 - 36	250 U	260 U	250 U	368	250 U	250 U	250 U
MFAICS254	1/26/98	128	0 - 12	250 U	260 U	377 P	488 P	250 U	250 U	250 U
MFAICS255	1/26/98	128	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS256	1/26/98	128	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS257	1/26/98	129	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS258	1/26/98	129	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS259	1/26/98	129	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS260	1/27/98	131	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS261	1/27/98	131	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS262	1/27/98	131	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS263	1/28/98	132	0 - 12	250 U	260 U	346 JP	250 U	250 U	250 U	250 U
MFAICS264	1/28/98	132	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS265	1/28/98	132	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS266	1/28/98	133	0 - 12	250 U	260 U	239 J	250 U	250 U	250 U	250 U
MFAICS267	1/28/98	133	24 - 36	250 U	260 U	192 J	321	250 U	250 U	250 U
MFAICS268	1/28/98	133	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS269	1/28/98	133	24 - 36	250 U	260 U	197 J	250 U	250 U	250 U	250 U
MFAICS270	1/29/98	135	0 - 12	250 U	260 U	250 U	472 P	250 U	250 U	250 U
MFAICS271	1/29/98	135	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS272	1/29/98	135	24 - 36	250 U	260 U	341	250 U	250 U	250 U	250 U
MFAICS273	1/29/98	135	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS274	1/29/98	134	0 - 12	250 U	260 U	307 P	250 U	250 U	250 U	250 U
MFAICS275	1/29/98	134	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS276	1/29/98	134	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS277	1/30/98	137	0 - 12	250 U	260 U	250 U	425	250 U	250 U	250 U
MFAICS278	1/30/98	137	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS248	1/21/98	111	0 - 12	N/A	N/A	67200	60 U	14100	17600	N/A	N/A	N/A
MFAICS249	1/21/98	111	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS250	1/21/98	111	24 - 36	N/A	N/A	76000	60 U	14300	11100	N/A	N/A	N/A
MFAICS251	1/26/98	127	0 - 12	N/A	N/A	75700	590	13000	12900	N/A	N/A	N/A
MFAICS252	1/26/98	127	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS253	1/26/98	127	24 - 36	N/A	N/A	49700	440 B	16900	18500	N/A	N/A	N/A
MFAICS254	1/26/98	128	0 - 12	N/A	N/A	72100	570	17000	11700	N/A	N/A	N/A
MFAICS255	1/26/98	128	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS256	1/26/98	128	24 - 36	N/A	N/A	73400	440 B	15800	11800	N/A	N/A	N/A
MFAICS257	1/26/98	129	0 - 12	N/A	N/A	74600	510	20100	17000	N/A	N/A	N/A
MFAICS258	1/26/98	129	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS259	1/26/98	129	24 - 36	N/A	N/A	59700	520	17900	11700	N/A	N/A	N/A
MFAICS260	1/27/98	131	0 - 12	N/A	N/A	43400	620	14700	12400	N/A	N/A	N/A
MFAICS261	1/27/98	131	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS262	1/27/98	131	24 - 36	N/A	N/A	65500	570	14900	11900	N/A	N/A	N/A
MFAICS263	1/28/98	132	0 - 12	N/A	N/A	66000	60 U	17200 N	16900 N	N/A	N/A	N/A
MFAICS264	1/28/98	132	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS265	1/28/98	132	24 - 36	N/A	N/A	76800	60 U	17500 N	13200 N	N/A	N/A	N/A
MFAICS266	1/28/98	133	0 - 12	N/A	N/A	116000	2500	42600 N	49800 N	N/A	N/A	N/A
MFAICS267	1/28/98	133	24 - 36	N/A	N/A	133000	3600	48000 N	69000 N	N/A	N/A	N/A
MFAICS268	1/28/98	133	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS269	1/28/98	133	24 - 36	N/A	N/A	72900	60 U	16400 N	11600 N	N/A	N/A	N/A
MFAICS270	1/29/98	135	0 - 12	N/A	N/A	92700	60 U	15600 N	25600 N	N/A	N/A	N/A
MFAICS271	1/29/98	135	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS272	1/29/98	135	24 - 36	N/A	N/A	93900	60 U	14900 N	12100 N	N/A	N/A	N/A
MFAICS273	1/29/98	135	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS274	1/29/98	134	0 - 12	N/A	N/A	70900	60 U	12400 N	15700 N	N/A	N/A	N/A
MFAICS275	1/29/98	134	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS276	1/29/98	134	24 - 36	N/A	N/A	63900	60 U	17300 N	17000 N	N/A	N/A	N/A
MFAICS277	1/30/98	137	0 - 12	N/A	N/A	60700	60 U	17700	12600	N/A	N/A	N/A
MFAICS278	1/30/98	137	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS248	1/21/98	111	0 - 12	2.1 U	1200 E	0.540 B	2.1 B	5.3 B	1 *U	5.7 B	1 U
MFAICS249	1/21/98	111	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS250	1/21/98	111	24 - 36	2.1 U	1400 E	0.330 B	2.4 B	4.2 B	1 *U	3.6 B	1 U
MFAICS251	1/26/98	127	0 - 12	2.1 U	1450	1.3 B	1.1 B	3.7 B	1 U	3.4 U	1 U
MFAICS252	1/26/98	127	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS253	1/26/98	127	24 - 36	2.8 B	1250	1 B	1.2 B	4.6 B	1 U	3.4 U	1 U
MFAICS254	1/26/98	128	0 - 12	2.1 U	1400	0.560 B	1.4 B	5 B	1 U	3.4 U	1 U
MFAICS255	1/26/98	128	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS256	1/26/98	128	24 - 36	2.1 U	1680	1.2 B	1.5 B	7 B	1 U	3.4 U	1 U
MFAICS257	1/26/98	129	0 - 12	2.1 U	1150	0.920 B	1 B	8.9 B	1 U	3.4 U	1 U
MFAICS258	1/26/98	129	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS259	1/26/98	129	24 - 36	3.7 B	989	2 B	1.2 B	12.1 B	1 U	3.4 U	1 U
MFAICS260	1/27/98	131	0 - 12	2.1 U	1210	1.6 B	1.2 B	12 B	1 U	3.4 U	1 U
MFAICS261	1/27/98	131	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS262	1/27/98	131	24 - 36	2.1 U	1700	1.7 B	1.3 B	4.8 B	1 U	3.8 B	1 U
MFAICS263	1/28/98	132	0 - 12	2.1 U	1120 EN*	0.440 NB	1.2 N*B	1.6 NB	1 U	3.4 NU	1 N*U
MFAICS264	1/28/98	132	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS265	1/28/98	132	24 - 36	2.7 B	1200 EN*	0.410 NB	1 N*U	2.2 NB	1 U	3.4 NU	1 N*U
MFAICS266	1/28/98	133	0 - 12	3.9 B	1530 EN*	16.2 N	9.1 N*	13.7 NB	1 U	3.4 NU	10 N*
MFAICS267	1/28/98	133	24 - 36	2.1 U	2940 EN*	11.9 N	7.7 N*	8.3 NB	1 U	3.4 NU	2.8 N*B
MFAICS268	1/28/98	133	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS269	1/28/98	133	24 - 36	2.1 U	1450 EN*	0.570 NB	1.3 N*B	1.5 NB	1 U	3.4 NU	1 N*U
MFAICS270	1/29/98	135	0 - 12	2.4 B	1120 EN*	0.410 NB	1.2 N*B	6.2 NB	1 U	3.4 NU	1.5 N*B
MFAICS271	1/29/98	135	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS272	1/29/98	135	24 - 36	2.1 U	1550 EN*	0.9 NB	4.1 N*B	9.6 NB	1 U	3.4 NU	1 N*U
MFAICS273	1/29/98	135	30 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS274	1/29/98	134	0 - 12	2.1 U	1450 EN*	0.480 NB	1.9 N*B	1.3 NB	1 U	3.4 NU	2.6 N*B
MFAICS275	1/29/98	134	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS276	1/29/98	134	24 - 36	2.1 U	1300 EN*	0.370 NB	1.2 N*B	2.4 NB	1 U	3.4 NU	4 N*B
MFAICS277	1/30/98	137	0 - 12	2.3 B	1410 E	0.650 B	1.2 B	11.7 B	1 U	3.7 B	1.2 B
MFAICS278	1/30/98	137	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS279	1/30/98	137	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS280	1/30/98	138	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS281	1/30/98	138	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	2 J	6 U	6 U
MFAICS282	1/30/98	138	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS283	2/2/98	139	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS284	2/2/98	139	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	1 J	6 U	6 U
MFAICS285	2/2/98	139	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS286	2/2/98	140	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS287	2/2/98	140	12 - 18	6 U	6 U	6 U	12 U	13 B	6 U	6 U	6 U	6 U
MFAICS288	2/2/98	140	12 - 18	6 U	6 U	6 U	13 U	8 JB	6 U	6 U	6 U	6 U
MFAICS289	2/2/98	140	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS290	2/3/98	142	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS291	2/3/98	142	12 - 18	6 U	6 U	6 U	12 U	5 JB	6 U	3 JB	6 U	6 U
MFAICS292	2/3/98	142	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS293	2/2/98	HOLE 1	27 - 33	6 U	6 U	6 U	12 U	12 U	6 U	6 B	6 U	6 U
MFAICS294	2/2/98	HOLE 1	27 - 33	6 U	6 U	6 U	12 U	12 U	2 JB	7 B	6 U	6 U
MFAICS295	2/2/98	HOLE 1	42 - 52	6 U	6 U	6 U	11 U	11 U	6 U	6 U	6 U	6 U
MFAICS296	2/2/98	HOLE 1	78 - 88	5 U	5 U	5 U	11 U	11 U	5 U	6 B	5 U	5 U
MFAICS297	2/2/98	HOLE 1	114 - 124	6 U	6 U	6 U	11 U	11 U	6 U	10 B	6 U	6 U
MFAICS298	2/2/98	HOLE 2	20 - 28	6 U	6 U	6 U	12 U	12 U	6 U	8 B	6 U	6 U
MFAICS299	2/2/98	HOLE 2	36 - 46	6 U	6 U	6 U	12 U	12 U	6 U	9 B	6 U	6 U
MFAICS300	2/2/98	HOLE 2	80 - 90	6 U	6 U	6 U	11 U	11 U	6 U	7 B	6 U	6 U
MFAICS301	2/2/98	HOLE 2	98 - 108	6 U	6 U	6 U	11 U	11 U	6 U	6 U	6 U	6 U
MFAICS302	2/3/98	136	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS303	2/3/98	136	12 - 18	6 U	6 U	6 U	13 U	4 JB	6 U	3 JB	6 U	6 U
MFAICS304	2/3/98	136	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS305	2/4/98	141	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS306	2/4/98	141	12 - 18	6 U	6 U	6 U	12 U	11 J	6 U	11	6 U	6 U
MFAICS307	2/4/98	141	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS308	2/9/98	148	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS309	2/9/98	148	12 - 18	6 U	6 U	6 U	12 U	16	6 U	13	1 J	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS279	1/30/98	137	24 - 36	250 U	741 J	260 U	N/A	***5400***	250 U	650 U	250 U
MFAICS280	1/30/98	138	0 - 12	250 U	12900	260 U	N/A	**41300 D**	250 U	650 U	250 U
MFAICS281	1/30/98	138	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS282	1/30/98	138	24 - 36	250 U	12300	260 U	N/A	**41600 D**	250 U	650 U	250 U
MFAICS283	2/2/98	139	0 - 12	250 U	129000 D	260 U	N/A	**532000 D**	250 U	650 U	250 U
MFAICS284	2/2/98	139	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS285	2/2/98	139	24 - 36	250 U	4080	260 U	N/A	**18200**	250 U	650 U	250 U
MFAICS286	2/2/98	140	0 - 12	250 U	101000 DJ	260 U	N/A	**371000 D**	250 U	650 U	122 J
MFAICS287	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS288	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS289	2/2/98	140	24 - 36	250 U	9110	260 U	N/A	**38200 D**	250 U	650 U	250 U
MFAICS290	2/3/98	142	0 - 12	250 U	76500 D	260 U	N/A	**317000 D**	250 U	650 U	1510
MFAICS291	2/3/98	142	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS292	2/3/98	142	24 - 36	250 U	15900	260 U	N/A	**72300 D**	250 U	650 U	778
MFAICS293	2/2/98	HOLE 1	27 - 33	250 U	373 J	260 U	N/A	2970	2420	650 U	13500
MFAICS294	2/2/98	HOLE 1	27 - 33	250 U	399 J	260 U	N/A	2820	1500	650 U	12000
MFAICS295	2/2/98	HOLE 1	42 - 52	250 U	2200 U	260 U	N/A	281 J	250 U	650 U	1790
MFAICS296	2/2/98	HOLE 1	78 - 88	250 U	2200 U	260 U	N/A	129 J	250 U	650 U	240 J
MFAICS297	2/2/98	HOLE 1	114 - 124	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	912
MFAICS298	2/2/98	HOLE 2	20 - 28	250 U	1940 J	260 U	N/A	***8160***	***11600***	650 U	***31500 D***
MFAICS299	2/2/98	HOLE 2	36 - 46	250 U	171 J	260 U	N/A	1420	537	650 U	2540
MFAICS300	2/2/98	HOLE 2	80 - 90	250 U	2200 U	260 U	N/A	1120	210 J	650 U	848
MFAICS301	2/2/98	HOLE 2	98 - 108	250 U	2200 U	260 U	N/A	241 J	250 U	650 U	336
MFAICS302	2/3/98	136	0 - 12	250 U	75000 D	260 U	N/A	**204000 D**	250 U	650 U	2090
MFAICS303	2/3/98	136	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS304	2/3/98	136	24 - 36	250 U	1470 J	260 U	N/A	3300	250 U	650 U	250 U
MFAICS305	2/4/98	141	0 - 12	250 U	382 J	260 U	N/A	1000 U	250 U	650 U	110 J
MFAICS306	2/4/98	141	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS307	2/4/98	141	24 - 36	250 U	867 J	260 U	N/A	748 J	250 U	650 U	365
MFAICS308	2/9/98	148	0 - 12	250 U	23800	260 U	N/A	**17400**	250 U	650 U	518
MFAICS309	2/9/98	148	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS279	1/30/98	137	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS280	1/30/98	138	0 - 12	250 U	260 U	250 U	223 J	250 U	250 U	250 U
MFAICS281	1/30/98	138	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS282	1/30/98	138	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS283	2/2/98	139	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS284	2/2/98	139	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS285	2/2/98	139	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS286	2/2/98	140	0 - 12	250 U	260 U	250 U	335	250 U	250 U	250 U
MFAICS287	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS288	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS289	2/2/98	140	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS290	2/3/98	142	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS291	2/3/98	142	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS292	2/3/98	142	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS293	2/2/98	HOLE 1	27 - 33	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS294	2/2/98	HOLE 1	27 - 33	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS295	2/2/98	HOLE 1	42 - 52	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS296	2/2/98	HOLE 1	78 - 88	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS297	2/2/98	HOLE 1	114 - 124	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS298	2/2/98	HOLE 2	20 - 28	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS299	2/2/98	HOLE 2	36 - 46	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS300	2/2/98	HOLE 2	80 - 90	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS301	2/2/98	HOLE 2	98 - 108	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS302	2/3/98	136	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS303	2/3/98	136	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS304	2/3/98	136	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS305	2/4/98	141	0 - 12	250 U	260 U	250 U	181 J	250 U	250 U	250 U
MFAICS306	2/4/98	141	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS307	2/4/98	141	24 - 36	250 U	260 U	347 P	423	250 U	250 U	250 U
MFAICS308	2/9/98	148	0 - 12	250 U	260 U	250 U	382	250 U	250 U	250 U
MFAICS309	2/9/98	148	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS279	1/30/98	137	24 - 36	N/A	N/A	127000	60 U	8600	6100	N/A	N/A	N/A
MFAICS280	1/30/98	138	0 - 12	N/A	N/A	53000	60 U	15200	11600	N/A	N/A	N/A
MFAICS281	1/30/98	138	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS282	1/30/98	138	24 - 36	N/A	N/A	52100	60 U	13900	8000	N/A	N/A	N/A
MFAICS283	2/2/98	139	0 - 12	N/A	N/A	54800	60 U	20100	13900	N/A	N/A	N/A
MFAICS284	2/2/98	139	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS285	2/2/98	139	24 - 36	N/A	N/A	25100	60 U	9000	5800	N/A	N/A	N/A
MFAICS286	2/2/98	140	0 - 12	N/A	N/A	56600	60 U	13300	13800	N/A	N/A	N/A
MFAICS287	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS288	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS289	2/2/98	140	24 - 36	N/A	N/A	37000	60 U	13800	8400	N/A	N/A	N/A
MFAICS290	2/3/98	142	0 - 12	N/A	N/A	64300	60 U	15800 E	18700	N/A	N/A	N/A
MFAICS291	2/3/98	142	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS292	2/3/98	142	24 - 36	N/A	N/A	43600	60 U	17600 E	11900	N/A	N/A	N/A
MFAICS293	2/2/98	HOLE 1	27 - 33	N/A	N/A	139000 N*	60 U	25800 E	13900	N/A	N/A	N/A
MFAICS294	2/2/98	HOLE 1	27 - 33	N/A	N/A	103000 N*	60 U	27900 E	17600	N/A	N/A	N/A
MFAICS295	2/2/98	HOLE 1	42 - 52	N/A	N/A	40500 N*	60 U	15300 E	9100	N/A	N/A	N/A
MFAICS296	2/2/98	HOLE 1	78 - 88	N/A	N/A	28300 N*	50 U	17800 E	11400	N/A	N/A	N/A
MFAICS297	2/2/98	HOLE 1	114 - 124	N/A	N/A	41200 N*	50 U	22800 E	11600	N/A	N/A	N/A
MFAICS298	2/2/98	HOLE 2	20 - 28	N/A	N/A	74400 N*	60 U	19800 E	14700	N/A	N/A	N/A
MFAICS299	2/2/98	HOLE 2	36 - 46	N/A	N/A	426000 N*	60 U	21700 E	13300	N/A	N/A	N/A
MFAICS300	2/2/98	HOLE 2	80 - 90	N/A	N/A	26000 N*	50 U	15700 E	9200	N/A	N/A	N/A
MFAICS301	2/2/98	HOLE 2	98 - 108	N/A	N/A	32000 N*	50 U	21000 E	12300	N/A	N/A	N/A
MFAICS302	2/3/98	136	0 - 12	N/A	N/A	79200	60 U	20100 E	21200	N/A	N/A	N/A
MFAICS303	2/3/98	136	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS304	2/3/98	136	24 - 36	N/A	N/A	68900	60 U	14100 E	11300	N/A	N/A	N/A
MFAICS305	2/4/98	141	0 - 12	N/A	N/A	55700	40 U	46800	9300	N/A	N/A	N/A
MFAICS306	2/4/98	141	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS307	2/4/98	141	24 - 36	N/A	N/A	117000	40 U	39800	19800	N/A	N/A	N/A
MFAICS308	2/9/98	148	0 - 12	N/A	N/A	41900	90 B	8800	13400	N/A	N/A	N/A
MFAICS309	2/9/98	148	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS279	1/30/98	137	24 - 36	4.3 B	1790 E	0.3 U	1.4 B	8.7 B	1 U	4.4 B	1.3 B
MFAICS280	1/30/98	138	0 - 12	3.1 B	1300 E	0.550 B	1 U	9.7 B	1 U	3.4 U	1 U
MFAICS281	1/30/98	138	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS282	1/30/98	138	24 - 36	2.7 B	2010 E	0.320 B	1.2 B	8 B	1 U	3.4 U	1 U
MFAICS283	2/2/98	139	0 - 12	4.7 B	1250 E	0.870 B	1.3 B	3.7 B	1 U	3.4 U	2.2 B
MFAICS284	2/2/98	139	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS285	2/2/98	139	24 - 36	2.1 U	1220 E	0.360 B	1.2 B	8.6 B	1 U	3.4 U	1 U
MFAICS286	2/2/98	140	0 - 12	2.1 U	1080 E	0.580 B	1 U	2.7 B	1 U	3.4 U	1.4 B
MFAICS287	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS288	2/2/98	140	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS289	2/2/98	140	24 - 36	2.1 U	1330 E	0.370 B	1.4 B	7.8 B	1 U	3.4 U	1.3 B
MFAICS290	2/3/98	142	0 - 12	2.1 U	517	0.5 NB	1 B	0.9 NU	1 U	3.4 U	1 U
MFAICS291	2/3/98	142	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS292	2/3/98	142	24 - 36	2.1 U	367	0.380 NB	1.1 B	4.5 NB	1 U	3.4 U	1 U
MFAICS293	2/2/98	HOLE 1	27 - 33	2.1 U	918	0.330 B	1 U	9.5 B	1 U	3.4 U	1 U
MFAICS294	2/2/98	HOLE 1	.27 - 33	2.1 U	790	0.620 B	1 U	8.8 B	1 U	3.4 U	1 U
MFAICS295	2/2/98	HOLE 1	42 - 52	2.1 U	825	0.3 U	1 U	2.9 B	1 U	3.4 U	1 U
MFAICS296	2/2/98	HOLE 1	78 - 88	2.1 U	936	0.3 U	1.1 B	1.3 B	1 U	3.4 U	1 U
MFAICS297	2/2/98	HOLE 1	114 - 124	2.1 U	816	0.3 U	1 U	2.8 B	1 U	3.4 U	1 U
MFAICS298	2/2/98	HOLE 2	20 - 28	2.1 U	1160	4.3	1.4 B	6.7 B	1 U	3.4 U	1 U
MFAICS299	2/2/98	HOLE 2	36 - 46	2.1 U	919	0.3 U	1 U	4.6 B	1 U	3.4 U	1 U
MFAICS300	2/2/98	HOLE 2	80 - 90	2.1 U	830	0.3 U	1 U	1.5 B	1 U	3.4 U	1 U
MFAICS301	2/2/98	HOLE 2	98 - 108	2.1 U	981	0.3 U	1 U	1.5 B	1 U	3.4 U	1 U
MFAICS302	2/3/98	136	0 - 12	2.1 U	808	0.670 NB	1 U	13.9 NB	1 U	3.4 U	1 U
MFAICS303	2/3/98	136	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS304	2/3/98	136	24 - 36	2.5 B	294	0.3 NU	2.2 B	14.2 NB	1 U	3.4 U	1 U
MFAICS305	2/4/98	141	0 - 12	2.1 U	1270 EN	0.710 B	1.2 B	2.4 B	1 *U	3.4 U	1 U
MFAICS306	2/4/98	141	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS307	2/4/98	141	24 - 36	2.1 U	1010 EN	0.3 U	1.2 B	1.3 B	1 *U	3.4 U	1 U
MFAICS308	2/9/98	148	0 - 12	2.1 U	1480 EN	0.3 U	1.6 B	8.9 B	1 *U	3.4 U	1 U
MFAICS309	2/9/98	148	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS310	2/9/98	148	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS311	2/9/98	147	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS312	2/9/98	147	12 - 18	6 U	6 U	6 U	12 U	14	6 U	21	6 U	6 U
MFAICS313	2/9/98	147	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS314	2/10/98	154	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS315	2/10/98	154	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS316	2/10/98	154	12 - 18	6 U	6 U	6 U	13 U	11 J	6 U	14	6 U	6 U
MFAICS317	2/10/98	154	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS318	2/12/98	146	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS319	2/12/98	146	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS320	2/12/98	146	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS321	2/13/98	145	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS322	2/13/98	145	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	1 J	6 U
MFAICS323	2/13/98	145	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS324	2/13/98	143	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS325	2/13/98	143	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS326	2/13/98	143	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS327	2/23/98	144	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS328	2/23/98	144	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS329	2/23/98	144	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS330	2/23/98	151	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS331	2/23/98	151	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS332	2/23/98	151	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS333	2/23/98	151	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS334	2/23/98	149	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS335	2/23/98	149	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS336	2/23/98	149	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS337	2/24/98	150	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS338	2/24/98	150	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS339	2/24/98	150	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS340	2/24/98	152	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS310	2/9/98	148	24 - 36	250 U	6680	260 U	N/A	***9390***	250 U	650 U	250 U
MFAICS311	2/9/98	147	0 - 12	250 U	74200 DJ	260 U	N/A	**292000 D**	250 U	650 U	130 J
MFAICS312	2/9/98	147	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS313	2/9/98	147	24 - 36	250 U	4940	260 U	N/A	**17800**	250 U	650 U	250 U
MFAICS314	2/10/98	154	0 - 12	250 U	2090 J	260 U	N/A	1430	250 U	650 U	250 U
MFAICS315	2/10/98	154	0 - 12	250 U	1700 J	260 U	N/A	1360	250 U	650 U	250 U
MFAICS316	2/10/98	154	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS317	2/10/98	154	24 - 36	250 U	582 J	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS318	2/12/98	146	0 - 12	250 U	151000 D	260 U	N/A	**972000 D**	250 U	650 U	333
MFAICS319	2/12/98	146	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS320	2/12/98	146	24 - 36	250 U	51600	260 U	N/A	**322000 D**	250 U	650 U	238 J
MFAICS321	2/13/98	145	0 - 12	250 U	97400 DJ	260 U	N/A	**569000 D**	250 U	650 U	10600
MFAICS322	2/13/98	145	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS323	2/13/98	145	24 - 36	250 U	12100	260 U	N/A	**60000 D**	250 U	650 U	2230
MFAICS324	2/13/98	143	0 - 12	250 U	64100	260 U	N/A	**395000 D**	250 U	650 U	136 J
MFAICS325	2/13/98	143	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS326	2/13/98	143	24 - 36	250 U	19500	260 U	N/A	**28400 D**	250 U	650 U	4690
MFAICS327	2/23/98	144	0 - 12	248 U	221000 D	257 U	N/A	**1690000 D**	248 U	644 U	***43400 D***
MFAICS328	2/23/98	144	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS329	2/23/98	144	24 - 36	250 U	3560	260 U	N/A	**17400**	250 U	650 U	132 J
MFAICS330	2/23/98	151	0 - 12	246 U	16500	256 U	N/A	**29400 D**	246 U	640 U	2390
MFAICS331	2/23/98	151	0 - 12	249 U	24500	259 U	N/A	**40600 D**	249 U	647 U	3220
MFAICS332	2/23/98	151	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS333	2/23/98	151	24 - 36	245 U	1610 J	255 U	N/A	***7210***	245 U	637 U	302
MFAICS334	2/23/98	149	0 - 12	246 U	869000 DJ	256 U	N/A	**8330000 D**	2400 P	640 U	**332000 D**
MFAICS335	2/23/98	149	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS336	2/23/98	149	24 - 36	250 U	12500	260 U	N/A	**54700 D**	250 U	650 U	744
MFAICS337	2/24/98	150	0 - 12	250 U	134000 D	260 U	N/A	**628000 D**	250 U	650 U	899
MFAICS338	2/24/98	150	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS339	2/24/98	150	24 - 36	250 U	626 J	260 U	N/A	3830	250 U	650 U	250 U
MFAICS340	2/24/98	152	0 - 12	250 U	8250	260 U	N/A	1490	250 U	650 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS310	2/9/98	148	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS311	2/9/98	147	0 - 12	250 U	260 U	299 P	718	250 U	250 U	250 U
MFAICS312	2/9/98	147	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS313	2/9/98	147	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS314	2/10/98	154	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS315	2/10/98	154	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS316	2/10/98	154	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS317	2/10/98	154	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS318	2/12/98	146	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS319	2/12/98	146	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS320	2/12/98	146	24 - 36	250 U	260 U	250 U	516	250 U	250 U	250 U
MFAICS321	2/13/98	145	0 - 12	250 U	260 U	1090 P	3640	250 U	250 U	250 U
MFAICS322	2/13/98	145	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS323	2/13/98	145	24 - 36	250 U	260 U	311 P	588	250 U	250 U	250 U
MFAICS324	2/13/98	143	0 - 12	250 U	260 U	250 U	282 P	250 U	250 U	250 U
MFAICS325	2/13/98	143	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS326	2/13/98	143	24 - 36	250 U	260 U	250 U	251 P	250 U	250 U	250 U
MFAICS327	2/23/98	144	0 - 12	248 U	257 U	2930	7700	248 U	248 U	248 U
MFAICS328	2/23/98	144	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS329	2/23/98	144	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS330	2/23/98	151	0 - 12	246 U	256 U	246 U	246 U	246 U	246 U	246 U
MFAICS331	2/23/98	151	0 - 12	249 U	259 U	249 U	249 U	249 U	249 U	249 U
MFAICS332	2/23/98	151	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS333	2/23/98	151	24 - 36	245 U	255 U	245 U	245 U	245 U	245 U	245 U
MFAICS334	2/23/98	149	0 - 12	246 U	256 U	8430 P	***123000 UD***	246 U	246 U	246 U
MFAICS335	2/23/98	149	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS336	2/23/98	149	24 - 36	250 U	260 U	250 U	857	250 U	250 U	250 U
MFAICS337	2/24/98	150	0 - 12	250 U	260 U	412 P	1050 P	250 U	250 U	250 U
MFAICS338	2/24/98	150	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS339	2/24/98	150	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS340	2/24/98	152	0 - 12	250 U	260 U	250 U	139 J	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS310	2/9/98	148	24 - 36	N/A	N/A	60000	340 B	11300	7900	N/A	N/A	N/A
MFAICS311	2/9/98	147	0 - 12	N/A	N/A	73500	40 U	14500	11100	N/A	N/A	N/A
MFAICS312	2/9/98	147	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS313	2/9/98	147	24 - 36	N/A	N/A	74700	40 U	14200	7100	N/A	N/A	N/A
MFAICS314	2/10/98	154	0 - 12	N/A	N/A	66500	60 B	16300	11600	N/A	N/A	N/A
MFAICS315	2/10/98	154	0 - 12	N/A	N/A	63800	40 B	16700	11100	N/A	N/A	N/A
MFAICS316	2/10/98	154	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS317	2/10/98	154	24 - 36	N/A	N/A	48300	40 U	18000	6700	N/A	N/A	N/A
MFAICS318	2/12/98	146	0 - 12	N/A	N/A	73300	40 U	13100	12000 E	N/A	N/A	N/A
MFAICS319	2/12/98	146	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS320	2/12/98	146	24 - 36	N/A	N/A	76400	40 U	12700	7500 E	N/A	N/A	N/A
MFAICS321	2/13/98	145	0 - 12	N/A	N/A	44100	30 U	10100	7200 E	N/A	N/A	N/A
MFAICS322	2/13/98	145	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS323	2/13/98	145	24 - 36	N/A	N/A	47500	40 U	16400	5400 E	N/A	N/A	N/A
MFAICS324	2/13/98	143	0 - 12	N/A	N/A	71400	40 U	16700	9600 E	N/A	N/A	N/A
MFAICS325	2/13/98	143	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS326	2/13/98	143	24 - 36	N/A	N/A	70700	40 U	18900	9700 E	N/A	N/A	N/A
MFAICS327	2/23/98	144	0 - 12	N/A	N/A	67100	60 U	14600 N	12600 EN	N/A	N/A	N/A
MFAICS328	2/23/98	144	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS329	2/23/98	144	24 - 36	N/A	N/A	79900	60 U	16900 N	11000 EN	N/A	N/A	N/A
MFAICS330	2/23/98	151	0 - 12	N/A	N/A	51100	210 B	10900 N	16500 EN	N/A	N/A	N/A
MFAICS331	2/23/98	151	0 - 12	N/A	N/A	74600	170 B	16100 N	25400 EN	N/A	N/A	N/A
MFAICS332	2/23/98	151	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS333	2/23/98	151	24 - 36	N/A	N/A	67000	70 U	14900 N	12700 EN	N/A	N/A	N/A
MFAICS334	2/23/98	149	0 - 12	N/A	N/A	70400	60 U	24500 N	28300 EN	N/A	N/A	N/A
MFAICS335	2/23/98	149	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS336	2/23/98	149	24 - 36	N/A	N/A	76100	60 U	17200 N	14500 EN	N/A	N/A	N/A
MFAICS337	2/24/98	150	0 - 12	N/A	N/A	55900	60 U	11300 N	23300 N*	N/A	N/A	N/A
MFAICS338	2/24/98	150	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS339	2/24/98	150	24 - 36	N/A	N/A	66000	60 U	10800 N	10300 N*	N/A	N/A	N/A
MFAICS340	2/24/98	152	0 - 12	N/A	N/A	73300	60 U	12700 N	12900 N*	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS310	2/9/98	148	24 - 36	2.1 U	1300 EN	0.3 U	1.3 B	3 B	1 *U	3.4 U	1 U
MFAICS311	2/9/98	147	0 - 12	2.1 U	1410 EN	0.3 U	1 U	2.5 B	1 *U	3.4 U	1 U
MFAICS312	2/9/98	147	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS313	2/9/98	147	24 - 36	2.1 U	1410 EN	0.3 U	1 U	3.3 B	1 *U	3.8 B	1 U
MFAICS314	2/10/98	154	0 - 12	2.9 B	1220 EN	0.340 B	1.6 B	9.9 B	1 *U	3.4 U	1 U
MFAICS315	2/10/98	154	0 - 12	2.1 U	1200 EN	0.310 B	1.4 B	11.4 B	1 *U	3.4 U	1 U
MFAICS316	2/10/98	154	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS317	2/10/98	154	24 - 36	2.1 U	1420 EN	0.3 U	1.3 B	11.4 B	1 *U	3.4 U	1 U
MFAICS318	2/12/98	146	0 - 12	2.1 U	1000	0.5 B	1.5 B	3.9 B	1 U	3.4 U	1 U
MFAICS319	2/12/98	146	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS320	2/12/98	146	24 - 36	4 B	1380	0.440 B	1.1 B	7.7 B	1 U	3.4 U	1 U
MFAICS321	2/13/98	145	0 - 12	4 B	1210	0.450 B	1.5 B	4.6 B	1 U	3.4 U	1 U
MFAICS322	2/13/98	145	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS323	2/13/98	145	24 - 36	2.4 B	851	0.3 U	1.1 B	2.7 B	1 U	3.4 U	1 U
MFAICS324	2/13/98	143	0 - 12	2.1 U	1800	0.3 U	2.6 B	2.9 B	1 U	3.4 U	1 U
MFAICS325	2/13/98	143	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS326	2/13/98	143	24 - 36	3.7 B	1180	5.6	2 B	4.7 B	1 U	3.4 U	1 U
MFAICS327	2/23/98	144	0 - 12	2.7 B	2520 EN	1.1 B	2.5 B	5.5 B	1 U	3.6 B	1 U
MFAICS328	2/23/98	144	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS329	2/23/98	144	24 - 36	4.6 B	2140 EN	0.3 U	1.2 B	10.1 B	1 U	5 B	1 U
MFAICS330	2/23/98	151	0 - 12	2.1 U	1510 EN	0.740 B	1 B	1.6 B	1 U	3.8 B	1.2 B
MFAICS331	2/23/98	151	0 - 12	2.1 U	1560 EN	0.910 B	1.1 B	2.9 B	1 U	4.7 B	1 U
MFAICS332	2/23/98	151	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS333	2/23/98	151	24 - 36	9.7 B	1830 EN	1.7 B	3.8 B	24.8 B	1 U	5.7 B	1 U
MFAICS334	2/23/98	149	0 - 12	2.1 U	1300 EN	1.5 B	2.3 B	7 B	1 U	6 B	1 U
MFAICS335	2/23/98	149	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS336	2/23/98	149	24 - 36	3.8 B	1460 EN	1.1 B	2.7 B	14.5 B	1 U	6.6 B	1 U
MFAICS337	2/24/98	150	0 - 12	2.1 U	1550	1.2 B	1.5 B	2 B	1 U	3.4 U	1 U
MFAICS338	2/24/98	150	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS339	2/24/98	150	24 - 36	2.1 U	1410	0.560 B	3 B	30 B	1 U	8 B	1 U
MFAICS340	2/24/98	152	0 - 12	2.1 U	1300	0.610 B	1 U	3.6 B	1 U	3.4 U	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS341	2/24/98	152	12 - 18	5 U	5 U	5 U	11 U	25	5 U	5 U	5 U	5 U
MFAICS342	2/24/98	152	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS343	2/24/98	153	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS344	2/24/98	153	12 - 18	5 U	5 U	5 U	11 U	11 U	5 U	5 U	5 U	5 U
MFAICS345	2/24/98	153	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS346	2/24/98	155	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS347	2/24/98	155	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS348	2/25/98	156	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS349	2/25/98	156	12 - 18	6 U	6 U	6 U	11 U	11 U	6 U	6 U	6 U	6 U
MFAICS350	2/25/98	156	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS351	2/25/98	85	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS352	2/25/98	85	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS353	2/25/98	85	12 - 18	6 U	6 U	6 U	13 U	33	6 U	6 U	6 U	6 U
MFAICS354	2/25/98	85	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS355	2/25/98	86	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS356	2/25/98	86	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS357	2/25/98	86	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS358	2/25/98	87	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS359	2/25/98	87	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS360	2/25/98	87	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS361	2/26/98	157	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS362	2/26/98	157	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	23	6 U	6 U
MFAICS363	2/26/98	157	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS364	2/26/98	158	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS365	2/26/98	158	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 JB	6 U	6 U
MFAICS366	2/26/98	158	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS367	2/26/98	159	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS368	2/26/98	159	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 J	6 U	6 U
MFAICS369	2/26/98	159	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS370	2/26/98	160	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS371	2/26/98	160	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 J	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS341	2/24/98	152	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS342	2/24/98	152	24 - 36	250 U	2580	260 U	N/A	1860	250 U	650 U	250 U
MFAICS343	2/24/98	153	0 - 12	250 U	24700	260 U	N/A	**80300 D**	250 U	650 U	250 U
MFAICS344	2/24/98	153	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS345	2/24/98	153	24 - 36	250 U	1050 J	260 U	N/A	1380	250 U	650 U	250 U
MFAICS346	2/24/98	155	0 - 12	250 U	8060	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS347	2/24/98	155	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS348	2/25/98	156	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS349	2/25/98	156	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS350	2/25/98	156	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS351	2/25/98	85	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS352	2/25/98	85	0 - 12	250 U	2330	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS353	2/25/98	85	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS354	2/25/98	85	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS355	2/25/98	86	0 - 12	250 U	4360	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS356	2/25/98	86	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS357	2/25/98	86	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS358	2/25/98	87	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS359	2/25/98	87	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS360	2/25/98	87	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS361	2/26/98	157	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS362	2/26/98	157	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS363	2/26/98	157	24 - 36	246 U	2170 U	256 U	N/A	985 U	246 U	640 U	246 U
MFAICS364	2/26/98	158	0 - 12	244 U	2150 U	254 U	N/A	976 U	244 U	634 U	244 U
MFAICS365	2/26/98	158	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS366	2/26/98	158	24 - 36	244 U	2150 U	254 U	N/A	976 U	244 U	634 U	244 U
MFAICS367	2/26/98	159	0 - 12	248 U	5780	257 U	N/A	1200	248 U	644 U	248 U
MFAICS368	2/26/98	159	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS369	2/26/98	159	24 - 36	245 U	2160 U	255 U	N/A	1220	245 U	637 U	245 U
MFAICS370	2/26/98	160	0 - 12	246 U	2170 U	256 U	N/A	985 U	246 U	640 U	264
MFAICS371	2/26/98	160	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS341	2/24/98	152	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS342	2/24/98	152	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS343	2/24/98	153	0 - 12	250 U	260 U	250 U	147 J	250 U	250 U	250 U
MFAICS344	2/24/98	153	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS345	2/24/98	153	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS346	2/24/98	155	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS347	2/24/98	155	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS348	2/25/98	156	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS349	2/25/98	156	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS350	2/25/98	156	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS351	2/25/98	85	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS352	2/25/98	85	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS353	2/25/98	85	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS354	2/25/98	85	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS355	2/25/98	86	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS356	2/25/98	86	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS357	2/25/98	86	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS358	2/25/98	87	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS359	2/25/98	87	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS360	2/25/98	87	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS361	2/26/98	157	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS362	2/26/98	157	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS363	2/26/98	157	24 - 36	246 U	256 U	246 U	246 U	246 U	246 U	246 U
MFAICS364	2/26/98	158	0 - 12	244 U	254 U	244 U	244 U	244 U	244 U	244 U
MFAICS365	2/26/98	158	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS366	2/26/98	158	24 - 36	244 U	254 U	244 U	244 U	244 U	244 U	244 U
MFAICS367	2/26/98	159	0 - 12	248 U	257 U	248 U	248 U	248 U	248 U	248 U
MFAICS368	2/26/98	159	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS369	2/26/98	159	24 - 36	245 U	255 U	245 U	245 U	245 U	245 U	245 U
MFAICS370	2/26/98	160	0 - 12	246 U	256 U	246 U	246 U	246 U	246 U	246 U
MFAICS371	2/26/98	160	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS341	2/24/98	152	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS342	2/24/98	152	24 - 36	N/A	N/A	52200	60 U	13500 N	9800 N*	N/A	N/A	N/A
MFAICS343	2/24/98	153	0 - 12	N/A.	N/A	58000	60 U	14900 N	13900 N*	N/A	N/A	N/A
MFAICS344	2/24/98	153	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS345	2/24/98	153	24 - 36	N/A	N/A	56300	60 U	14700 N	10100 N*	N/A	N/A	N/A
MFAICS346	2/24/98	155	0 - 12	N/A	N/A	75500	60 U	16700 N	13100 N*	N/A	N/A	N/A
MFAICS347	2/24/98	155	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS348	2/25/98	156	0 - 12	N/A	N/A	78900	60 U	14600	13800	N/A	N/A	N/A
MFAICS349	2/25/98	156	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS350	2/25/98	156	24 - 36	N/A	N/A	96000	60 U	18900	9500	N/A	N/A	N/A
MFAICS351	2/25/98	85	0 - 12	N/A	N/A	60400	60 U	15100	16400	N/A	N/A	N/A
MFAICS352	2/25/98	85	0 - 12	N/A	N/A	47100	60 U	17100	13500	N/A	N/A	N/A
MFAICS353	2/25/98	85	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS354	2/25/98	85	24 - 36	N/A	N/A	35600	60 U	13700	8200	N/A	N/A	N/A
MFAICS355	2/25/98	86	0 - 12	N/A	N/A	76300	60 U	17900	14100	N/A	N/A	N/A
MFAICS356	2/25/98	86	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS357	2/25/98	86	24 - 36	N/A	N/A	71300	60 U	18600	13500	N/A	N/A	N/A
MFAICS358	2/25/98	87	0 - 12	N/A	N/A	71100	60 U	19700	18400	N/A	N/A	N/A
MFAICS359	2/25/98	87	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS360	2/25/98	87	24 - 36	N/A	N/A	64300	60 U	16600	13900	N/A	N/A	N/A
MFAICS361	2/26/98	157	0 - 12	N/A	N/A	79300	680	19400 E	15500 E	N/A	N/A	N/A
MFAICS362	2/26/98	157	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS363	2/26/98	157	24 - 36	N/A	N/A	98200	520	21400 E	14000 E	N/A	N/A	N/A
MFAICS364	2/26/98	158	0 - 12	N/A	N/A	79400	700	18500 E	17300 E	N/A	N/A	N/A
MFAICS365	2/26/98	158	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS366	2/26/98	158	24 - 36	N/A	N/A	57600	690	20900 E	13200 E	N/A	N/A	N/A
MFAICS367	2/26/98	159	0 - 12	N/A	N/A	50700	470 B	13400 E	9100 E	N/A	N/A	N/A
MFAICS368	2/26/98	159	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS369	2/26/98	159	24 - 36	N/A	N/A	57400	780	21900 E	13700 E	N/A	N/A	N/A
MFAICS370	2/26/98	160	0 - 12	N/A	N/A	50600	450 B	8300 E	10400 E	N/A	N/A	N/A
MFAICS371	2/26/98	160	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS341	2/24/98	152	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS342	2/24/98	152	24 - 36	2.1 U	1450	0.370 B	1.8 B	10.5 B	1 U	4.5 B	1 U
MFAICS343	2/24/98	153	0 - 12	2.1 U	1360	0.540 B	1.3 B	5.1 B	1 U	3.4 U	1 U
MFAICS344	2/24/98	153	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS345	2/24/98	153	24 - 36	2.1 U	1540	0.460 B	1.3 B	10.8 B	1 U	5.3 B	1 U
MFAICS346	2/24/98	155	0 - 12	2.1 U	1570	0.970 B	1 U	6 B	1 U	4.6 B	1 U
MFAICS347	2/24/98	155	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS348	2/25/98	156	0 - 12	2.1 U	1310 E	0.520 B	1 U	0.970 B	1.3 B	3.4 U	1 U
MFAICS349	2/25/98	156	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS350	2/25/98	156	24 - 36	2.1 U	567 E	0.3 U	1 U	11.3 B	1 U	5.3 B	1 U
MFAICS351	2/25/98	85	0 - 12	2.1 U	1070 E	0.3 U	1 U	1 B	1.9 B	3.4 U	1 U
MFAICS352	2/25/98	85	0 - 12	2.1 U	1050 E	0.360 B	1 U	1.9 B	1.3 B	3.4 U	1 U
MFAICS353	2/25/98	85	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS354	2/25/98	85	24 - 36	2.1 U	589 E	0.3 U	1 U	2.9 B	1.3 B	3.4 U	1 U
MFAICS355	2/25/98	86	0 - 12	2.1 U	1130 E	0.540 B	1 U	0.9 U	1.3 B	3.4 U	1 U
MFAICS356	2/25/98	86	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS357	2/25/98	86	24 - 36	2.1 U	857 E	0.3 U	1 U	1.7 B	1.2 B	3.4 U	1 U
MFAICS358	2/25/98	87	0 - 12	2.1 U	1330 E	0.3 U	1 U	0.9 U	1.2 B	3.4 U	1 U
MFAICS359	2/25/98	87	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS360	2/25/98	87	24 - 36	2.1 U	1020 E	0.3 U	1 U	3.1 B	1.3 B	4 B	1 U
MFAICS361	2/26/98	157	0 - 12	2.9 B	1340 E	0.810 B	1.7 B	1.8 B	1 U	4.7 B	1.3 B
MFAICS362	2/26/98	157	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS363	2/26/98	157	24 - 36	3.4 B	1290 E	0.3 U	1 B	0.9 U	1 U	6.3 B	1.2 B
MFAICS364	2/26/98	158	0 - 12	2.1 U	1270 E	0.470 B	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS365	2/26/98	158	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS366	2/26/98	158	24 - 36	3.2 B	1070 E	0.470 B	1.6 B	2.9 B	1 U	4.5 B	1 U
MFAICS367	2/26/98	159	0 - 12	2.1 U	1060 E	0.3 U	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS368	2/26/98	159	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS369	2/26/98	159	24 - 36	2.1 U	1180 E	0.3 U	1 U	1.2 B	1 U	4.4 B	3.4 B
MFAICS370	2/26/98	160	0 - 12	2.9 B	1060 E	0.960 B	1.9 B	1.3 B	1 U	4.2 B	1 U
MFAICS371	2/26/98	160	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS372	2/26/98	160	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS373	2/27/98	161	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS374	2/27/98	162	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS375	2/27/98	162	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS376	2/27/98	162	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS377	2/27/98	93	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS378	2/27/98	93	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 J	6 U	6 U
MFAICS379	2/27/98	93	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS380	2/27/98	71	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS381	2/27/98	71	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	5 JB	6 U	6 U
MFAICS382	2/27/98	71	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS383	2/27/98	72	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS384	2/27/98	72	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 JB	6 U	6 U
MFAICS385	2/27/98	72	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS386	3/2/98	73	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS387	3/2/98	73	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS388	3/2/98	73	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS389	3/2/98	74	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS390	3/2/98	74	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS391	3/2/98	74	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS392	3/2/98	75	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS393	3/2/98	75	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS394	3/2/98	75	12 - 18	7 U	7 U	7 U	13 U	13 U	7 U	7 U	7 U	7 U
MFAICS395	3/2/98	75	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS396	3/2/98	76	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS397	3/2/98	76	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS398	3/2/98	76	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS399	3/2/98	77	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS400	3/2/98	77	12 - 18	6 U	6 U	6 U	12 U	40	6 U	6 U	6 U	6 U
MFAICS401	3/2/98	77	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS402	3/3/98	88	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS372	2/26/98	160	0 - 12	246 U	2170 U	256 U	N/A	985 U	246 U	640 U	566
MFAICS373	2/27/98	161	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS374	2/27/98	162	0 - 12	243 U	2140 U	252 U	N/A	971 U	243 U	631 U	243 U
MFAICS375	2/27/98	162	24 - 36	246 U	2170 U	256 U	N/A	985 U	246 U	640 U	246 U
MFAICS376	2/27/98	162	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS377	2/27/98	93	0 - 12	249 U	2190 U	259 U	N/A	995 U	249 U	647 U	60 J
MFAICS378	2/27/98	93	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS379	2/27/98	93	24 - 36	249 U	2190 U	259 U	N/A	260 J	249 U	647 U	249 U
MFAICS380	2/27/98	71	0 - 12	248 U	56000	257 U	N/A	**210000 D**	248 U	644 U	372
MFAICS381	2/27/98	71	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS382	2/27/98	71	24 - 36	248 U	4440	257 U	N/A	**18000**	***3920***	644 U	**661000 D**
MFAICS383	2/27/98	72	0 - 12	248 U	92200 DJ	257 U	N/A	**591000 D**	248 U	644 U	455
MFAICS384	2/27/98	72	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS385	2/27/98	72	24 - 36	250 U	4140	260 U	N/A	***9490***	1720 P	650 U	**411000 D**
MFAICS386	3/2/98	73	0 - 12	250 U	19100	260 U	N/A	**27900**	250 U	650 U	393
MFAICS387	3/2/98	73	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS388	3/2/98	73	24 - 36	250 U	1990 J	260 U	N/A	***6920***	250 U	650 U	7200
MFAICS389	3/2/98	74	0 - 12	250 U	59800	260 U	N/A	**405000 D**	250 U	650 U	574
MFAICS390	3/2/98	74	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS391	3/2/98	74	24 - 36	249 U	12400	259 U	N/A	**498000 UD**	***10700***	647 U	**1370000 D**
MFAICS392	3/2/98	75	0 - 12	250 U	167000 DJ	260 U	N/A	**1310000 D**	250 U	650 U	2680
MFAICS393	3/2/98	75	0 - 12	250 U	112000 D	260 U	N/A	**766000 D**	250 U	650 U	811
MFAICS394	3/2/98	75	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS395	3/2/98	75	24 - 36	250 U	34700	260 U	N/A	**275000 D**	250 U	650 U	753
MFAICS396	3/2/98	76	0 - 12	250 U	41000	260 U	N/A	**252000 D**	250 U	650 U	471
MFAICS397	3/2/98	76	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS398	3/2/98	76	24 - 36	250 U	11400	260 U	N/A	**40600 D**	250 U	650 U	250 U
MFAICS399	3/2/98	77	0 - 12	250 U	66200	260 U	N/A	**476000 D**	250 U	650 U	480
MFAICS400	3/2/98	77	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS401	3/2/98	77	24 - 36	248 U	5620	257 U	N/A	***12000***	334	644 U	***15200***
MFAICS402	3/3/98	88	0 - 12	250 U	33100	260 U	N/A	**282000 D**	250 U	650 U	***21100 D***

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS372	2/26/98	160	0 - 12	246 U	256 U	246 U	246 U	246 U	246 U	246 U
MFAICS373	2/27/98	161	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS374	2/27/98	162	0 - 12	243 U	252 U	243 U	243 U	243 U	243 U	243 U
MFAICS375	2/27/98	162	24 - 36	246 U	256 U	246 U	246 U	246 U	246 U	246 U
MFAICS376	2/27/98	162	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS377	2/27/98	93	0 - 12	249 U	259 U	249 U	249 U	249 U	249 U	249 U
MFAICS378	2/27/98	93	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS379	2/27/98	93	24 - 36	249 U	259 U	249 U	249 U	249 U	249 U	249 U
MFAICS380	2/27/98	71	0 - 12	248 U	257 U	354 P	776 P	248 U	248 U	248 U
MFAICS381	2/27/98	71	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS382	2/27/98	71	24 - 36	248 U	257 U	2950	248 U	248 U	352	248 U
MFAICS383	2/27/98	72	0 - 12	248 U	257 U	390 P	797 P	248 U	248 U	248 U
MFAICS384	2/27/98	72	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS385	2/27/98	72	24 - 36	250 U	260 U	1610 P	250 U	250 U	250 U	250 U
MFAICS386	3/2/98	73	0 - 12	250 U	260 U	314 P	396	250 U	250 U	250 U
MFAICS387	3/2/98	73	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS388	3/2/98	73	24 - 36	250 U	260 U	250 U	521	250 U	250 U	250 U
MFAICS389	3/2/98	74	0 - 12	250 U	260 U	436 P	797 P	250 U	250 U	250 U
MFAICS390	3/2/98	74	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS391	3/2/98	74	24 - 36	309	259 U	3200	249 U	249 U	249 U	249 U
MFAICS392	3/2/98	75	0 - 12	250 U	260 U	1250 P	2040 P	250 U	250 U	250 U
MFAICS393	3/2/98	75	0 - 12	250 U	260 U	775	1340	250 U	250 U	250 U
MFAICS394	3/2/98	75	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS395	3/2/98	75	24 - 36	250 U	260 U	250 U	821 P	250 U	250 U	250 U
MFAICS396	3/2/98	76	0 - 12	250 U	260 U	628 P	714 P	250 U	250 U	250 U
MFAICS397	3/2/98	76	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS398	3/2/98	76	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS399	3/2/98	77	0 - 12	250 U	260 U	334 P	726 P	250 U	250 U	250 U
MFAICS400	3/2/98	77	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS401	3/2/98	77	24 - 36	248 U	257 U	632 P	1050 P	248 U	248 U	248 U
MFAICS402	3/3/98	88	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS372	2/26/98	160	0 - 12	N/A	N/A	26900	470 B	7000 E	8200 E	N/A	N/A	N/A
MFAICS373	2/27/98	161	0 - 12	N/A	N/A	33500 E	60 U	7700	10600 N	N/A	N/A	N/A
MFAICS374	2/27/98	162	0 - 12	N/A	N/A	71300 E	60 U	10900	10900 N	N/A	N/A	N/A
MFAICS375	2/27/98	162	24 - 36	N/A	N/A	36700 E	60 U	8400	9000 N	N/A	N/A	N/A
MFAICS376	2/27/98	162	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS377	2/27/98	93	0 - 12	N/A	N/A	92600 E	60 U	20500	26400 N	N/A	N/A	N/A
MFAICS378	2/27/98	93	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS379	2/27/98	93	24 - 36	N/A	N/A	41000 E	60 U	13400	9800 N	N/A	N/A	N/A
MFAICS380	2/27/98	71	0 - 12	N/A	N/A	97000 E	60 U	16200	23100 N	N/A	N/A	N/A
MFAICS381	2/27/98	71	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS382	2/27/98	71	24 - 36	N/A	N/A	109000 E	60 U	19900	35000 N	N/A	N/A	N/A
MFAICS383	2/27/98	72	0 - 12	N/A	N/A	136000 E	60 U	17500	21900 N	N/A	N/A	N/A
MFAICS384	2/27/98	72	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS385	2/27/98	72	24 - 36	N/A	N/A	112000 E	60 U	17900	15800 N	N/A	N/A	N/A
MFAICS386	3/2/98	73	0 - 12	N/A	N/A	81900 E	60 U	13400	14100 EN	N/A	N/A	N/A
MFAICS387	3/2/98	73	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS388	3/2/98	73	24 - 36	N/A	N/A	134000 E	60 U	17700	17300 EN	N/A	N/A	N/A
MFAICS389	3/2/98	74	0 - 12	N/A	N/A	101000 E	60 U	18000	19200 EN	N/A	N/A	N/A
MFAICS390	3/2/98	74	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS391	3/2/98	74	24 - 36	N/A	N/A	166000 E	60 U	23600	14700 EN	N/A	N/A	N/A
MFAICS392	3/2/98	75	0 - 12	N/A	N/A	97300 E	60 U	17600	18600 EN	N/A	N/A	N/A
MFAICS393	3/2/98	75	0 - 12	N/A	N/A	92700 E	60 U	16700	26700 EN	N/A	N/A	N/A
MFAICS394	3/2/98	75	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS395	3/2/98	75	24 - 36	N/A	N/A	42100 E	60 U	20600	9200 EN	N/A	N/A	N/A
MFAICS396	3/2/98	76	0 - 12	N/A	N/A	128000 E	60 U	21800	21200 EN	N/A	N/A	N/A
MFAICS397	3/2/98	76	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS398	3/2/98	76	24 - 36	N/A	N/A	70700 E	60 U	25900	18300 EN	N/A	N/A	N/A
MFAICS399	3/2/98	77	0 - 12	N/A	N/A	93400 E	60 U	17300	19400 EN	N/A	N/A	N/A
MFAICS400	3/2/98	77	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS401	3/2/98	77	24 - 36	N/A	N/A	83200 E	60 U	13400	11100 EN	N/A	N/A	N/A
MFAICS402	3/3/98	88	0 - 12	N/A	N/A	92800	590	21200 N	193000	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS372	2/26/98	160	0 - 12	2.1 U	1110 E	0.820 B	1.9 B	0.9 U	1 U	3.4 U	1 U
MFAICS373	2/27/98	161	0 - 12	2.1 U	1070 E	0.530 B	1 U	1.7 B	1 U	6.6 B	1 U
MFAICS374	2/27/98	162	0 - 12	2.1 U	1230 E	0.630 B	1 U	2.4 B	1 U	3.4 U	1 U
MFAICS375	2/27/98	162	24 - 36	2.1 U	1130 E	0.320 B	1.6 B	3.8 B	1 U	3.4 U	1 U
MFAICS376	2/27/98	162	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS377	2/27/98	93	0 - 12	2.1 U	1150 E	0.950 B	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS378	2/27/98	93	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS379	2/27/98	93	24 - 36	2.1 U	1450 E	0.3 U	1 U	7.6 B	1 U	3.4 U	4.3 B
MFAICS380	2/27/98	71	0 - 12	2.1 U	1440 E	0.550 B	1 U	0.9 U	1 U	3.4 U	1 U
MFAICS381	2/27/98	71	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS382	2/27/98	71	24 - 36	2.1 U	1610 E	0.490 B	1.5 B	2.1 B	1 U	3.4 U	1 U
MFAICS383	2/27/98	72	0 - 12	2.1 U	1160 E	0.420 B	1 U	3.2 B	1 U	4.6 B	1 U
MFAICS384	2/27/98	72	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS385	2/27/98	72	24 - 36	2.1 U	1340 E	0.3 U	1 B	0.9 U	1 U	3.4 U	1 U
MFAICS386	3/2/98	73	0 - 12	2.1 U	2170 N	0.3 U	1.1 B	1.2 B	1 U	3.4 U	1 U
MFAICS387	3/2/98	73	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS388	3/2/98	73	24 - 36	2.1 B	3170 N	0.3 U	1.3 B	2.5 B	1 U	5.2 B	3.8 B
MFAICS389	3/2/98	74	0 - 12	2.6 B	1300 N	0.440 B	1.2 B	1.1 B	1 U	4.6 B	1 U
MFAICS390	3/2/98	74	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS391	3/2/98	74	24 - 36	2.1 U	1370 N	0.3 U	1 U	2.5 B	1 U	3.4 U	3 B
MFAICS392	3/2/98	75	0 - 12	2.1 U	1330 N	0.630 B	1 U	3 B	1 U	4.1 B	1 U
MFAICS393	3/2/98	75	0 - 12	2.1 U	1540 N	2 B	1 U	0.910 B	1 U	3.4 U	1 U
MFAICS394	3/2/98	75	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS395	3/2/98	75	24 - 36	2.1 U	1640 N	0.3 U	1.9 B	2.5 B	1 U	4.3 B	1 U
MFAICS396	3/2/98	76	0 - 12	27.4 B	1150 N	0.730 B	1 U	3 B	1 U	6.9 B	1 U
MFAICS397	3/2/98	76	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS398	3/2/98	76	24 - 36	3.1 B	1180 N	0.660 B	1.5 B	4 B	1 U	3.4 U	1 U
MFAICS399	3/2/98	77	0 - 12	2.6 B	1230 N	0.670 B	1.3 B	1.9 B	1 U	3.4 U	1 U
MFAICS400	3/2/98	77	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS401	3/2/98	77	24 - 36	2.1 U	2180 N	0.3 U	1.3 B	4.7 B	1 U	3.4 U	1 U
MFAICS402	3/3/98	88	0 - 12	3.7 B	2420 E	2.6 B	1.5 B	1850	1 NU	3.4 U	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS403	3/3/98	88	12 - 18	6 U	6 U	11 U	11 U	11 U	6 U	6 U	6 U	6 U
MFAICS404	3/3/98	88	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS405	3/4/98	95	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS406	3/4/98	95	12 - 18	6 U	6 U	13 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS407	3/4/98	95	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS408	3/4/98	94	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS409	3/4/98	94	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS410	3/4/98	94	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS411	3/4/98	78	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS412	3/4/98	78	12 - 18	6 U	6 U	12 U	12 U	130	6 U	6 U	6 U	6 U
MFAICS413	3/4/98	78	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS414	3/6/98	79	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS415	3/6/98	79	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS416	3/6/98	79	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	21	6 U	6 U
MFAICS417	3/6/98	79	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS418	3/6/98	80	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS419	3/6/98	80	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6	6 U	6 U
MFAICS420	3/6/98	80	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS421	3/6/98	81	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS422	3/6/98	81	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	13	6 U	6 U
MFAICS423	3/6/98	81	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS424	3/9/98	92	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS425	3/9/98	92	12 - 18	7 U	7 U	7 U	14 U	14 U	7 U	7 U	7 U	7 U
MFAICS426	3/9/98	92	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS427	3/12/98	91	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS428	3/12/98	91	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	11	6 U	6 U
MFAICS429	3/12/98	91	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS430	3/12/98	90	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS431	3/12/98	90	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	18	6 U	6 U
MFAICS432	3/12/98	90	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS433	3/12/98	89	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS403	3/3/98	88	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS404	3/3/98	88	24 - 36	250 U	2140 J	260 U	N/A	***4300***	250 U	650 U	250 U
MFAICS405	3/4/98	95	0 - 12	250 U	773 J	260 U	N/A	1000 U	***5020***	650 U	***19700 D***
MFAICS406	3/4/98	95	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS407	3/4/98	95	24 - 36	250 U	382 J	260 U	N/A	1060	1620	650 U	2150
MFAICS408	3/4/98	94	0 - 12	250 U	4200	260 U	N/A	1000 U	250 U	650 U	392
MFAICS409	3/4/98	94	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS410	3/4/98	94	24 - 36	250 U	605 J	260 U	N/A	1040	304	650 U	253
MFAICS411	3/4/98	78	0 - 12	250 U	162000 D	260 U	N/A	**1160000 D**	250 U	650 U	11900
MFAICS412	3/4/98	78	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS413	3/4/98	78	24 - 36	250 U	7620	260 U	N/A	**53000 D**	***14600***	650 U	***34800 D***
MFAICS414	3/6/98	79	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS415	3/6/98	79	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS416	3/6/98	79	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS417	3/6/98	79	24 - 36	250 U	2280	260 U	N/A	1000 U	250 U	650 U	336
MFAICS418	3/6/98	80	0 - 12	250 U	10700	260 U	N/A	***16000***	250 U	650 U	1270
MFAICS419	3/6/98	80	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS420	3/6/98	80	24 - 36	250 U	3380	260 U	N/A	2010	250 U	650 U	404
MFAICS421	3/6/98	81	0 - 12	250 U	6600	260 U	N/A	***15100***	250 U	650 U	763
MFAICS422	3/6/98	81	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS423	3/6/98	81	24 - 36	248 U	2180 U	257 U	N/A	1280	248 U	644 U	248 U
MFAICS424	3/9/98	92	0 - 12	250 U	20600	260 U	N/A	**44200 D**	250 U	650 U	1750
MFAICS425	3/9/98	92	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS426	3/9/98	92	24 - 36	250 U	2200 U	260 U	N/A	***5520***	250 U	650 U	250 U
MFAICS427	3/12/98	91	0 - 12	250 U	902 JP	260 U	N/A	84.9 J	250 U	650 U	90.8 J
MFAICS428	3/12/98	91	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS429	3/12/98	91	24 - 36	250 U	3040	260 U	N/A	724 J	250 U	650 U	281
MFAICS430	3/12/98	90	0 - 12	250 U	57500	260 U	N/A	**20400**	97 J	650 U	4060
MFAICS431	3/12/98	90	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS432	3/12/98	90	24 - 36	250 U	20100	260 U	N/A	**112000 D**	250 U	650 U	306
MFAICS433	3/12/98	89	0 - 12	250 U	2740	260 U	N/A	575 J	617	650 U	***53900 D***

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS403	3/3/98	88	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS404	3/3/98	88	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS405	3/4/98	95	0 - 12	250 U	260 U	299 P	250 U	250 U	250 U	250 U
MFAICS406	3/4/98	95	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS407	3/4/98	95	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS408	3/4/98	94	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS409	3/4/98	94	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS410	3/4/98	94	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS411	3/4/98	78	0 - 12	250 U	260 U	1390 P	3740	250 U	250 U	250 U
MFAICS412	3/4/98	78	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS413	3/4/98	78	24 - 36	250 U	260 U	1590 P	250 U	250 U	250 U	250 U
MFAICS414	3/6/98	79	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS415	3/6/98	79	0 - 12	250 U	260 U	250 U	264	250 U	250 U	250 U
MFAICS416	3/6/98	79	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS417	3/6/98	79	24 - 36	250 U	260 U	254	375	250 U	250 U	250 U
MFAICS418	3/6/98	80	0 - 12	250 U	260 U	272	578	250 U	250 U	250 U
MFAICS419	3/6/98	80	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS420	3/6/98	80	24 - 36	250 U	260 U	250 U	441	250 U	250 U	250 U
MFAICS421	3/6/98	81	0 - 12	250 U	260 U	262	503	250 U	250 U	250 U
MFAICS422	3/6/98	81	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS423	3/6/98	81	24 - 36	248 U	257 U	248 U	273	248 U	248 U	248 U
MFAICS424	3/9/98	92	0 - 12	250 U	260 U	418	1160	250 U	250 U	250 U
MFAICS425	3/9/98	92	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS426	3/9/98	92	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS427	3/12/98	91	0 - 12	250 U	260 U	250 U	66.4 J	250 U	250 U	250 U
MFAICS428	3/12/98	91	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS429	3/12/98	91	24 - 36	250 U	260 U	250 U	128 J	250 U	250 U	250 U
MFAICS430	3/12/98	90	0 - 12	250 U	260 U	3340	3070	250 U	250 U	250 U
MFAICS431	3/12/98	90	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS432	3/12/98	90	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS433	3/12/98	89	0 - 12	250 U	260 U	845 P	250 U	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS403	3/3/98	88	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS404	3/3/98	88	24 - 36	N/A	N/A	99200	380 B	18600 N	14400	N/A	N/A	N/A
MFAICS405	3/4/98	95	0 - 12	N/A	N/A	69000	410 B	23900 N	14900	N/A	N/A	N/A
MFAICS406	3/4/98	95	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS407	3/4/98	95	24 - 36	N/A	N/A	124000	270 B	18800 N	9400	N/A	N/A	N/A
MFAICS408	3/4/98	94	0 - 12	N/A	N/A	69600	520	22000 N	14500	N/A	N/A	N/A
MFAICS409	3/4/98	94	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS410	3/4/98	94	24 - 36	N/A	N/A	43600	240 B	17800 N	9400	N/A	N/A	N/A
MFAICS411	3/4/98	78	0 - 12	N/A	N/A	75300	440 B	19800 N	17600	N/A	N/A	N/A
MFAICS412	3/4/98	78	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS413	3/4/98	78	24 - 36	N/A	N/A	96900	381 B	20400 N	14100	N/A	N/A	N/A
MFAICS414	3/6/98	79	0 - 12	N/A	N/A	106000 N*	70 B	24500 N*	25200 N*	N/A	N/A	N/A
MFAICS415	3/6/98	79	0 - 12	N/A	N/A	106000 N*	120 B	21500 N*	21400 N*	N/A	N/A	N/A
MFAICS416	3/6/98	79	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS417	3/6/98	79	24 - 36	N/A	N/A	105000 N*	60 U	25300 N*	14000 N*	N/A	N/A	N/A
MFAICS418	3/6/98	80	0 - 12	N/A	N/A	92900 N*	60 U	22000 N*	21200 N*	N/A	N/A	N/A
MFAICS419	3/6/98	80	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS420	3/6/98	80	24 - 36	N/A	N/A	100000 N*	60 U	21600 N*	15400 N*	N/A	N/A	N/A
MFAICS421	3/6/98	81	0 - 12	N/A	N/A	98000 N*	200 B	23200 N*	36000 N*	N/A	N/A	N/A
MFAICS422	3/6/98	81	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS423	3/6/98	81	24 - 36	N/A	N/A	88600 N*	60 U	21500 N*	14500 N*	N/A	N/A	N/A
MFAICS424	3/9/98	92	0 - 12	N/A	N/A	97700 N*	60 U	25900 N*	26200 N*	N/A	N/A	N/A
MFAICS425	3/9/98	92	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS426	3/9/98	92	24 - 36	N/A	N/A	59200 N*	60 U	24800 N*	12300 N*	N/A	N/A	N/A
MFAICS427	3/12/98	91	0 - 12	N/A	N/A	94300	200 B	19200	17900	N/A	N/A	N/A
MFAICS428	3/12/98	91	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS429	3/12/98	91	24 - 36	N/A	N/A	84900	780	21500	23700	N/A	N/A	N/A
MFAICS430	3/12/98	90	0 - 12	N/A	N/A	91000	320 B	19100	31400	N/A	N/A	N/A
MFAICS431	3/12/98	90	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS432	3/12/98	90	24 - 36	N/A	N/A	80100	190 B	17800	22100	N/A	N/A	N/A
MFAICS433	3/12/98	89	0 - 12	N/A	N/A	78800	190 B	15200	15100	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS403	3/3/98	88	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS404	3/3/98	88	24 - 36	3.7 B	1720 E	0.560 B	2.2 B	3.4 B	1 NU	3.4 U	1 U
MFAICS405	3/4/98	95	0 - 12	4.4 B	1180 E	0.790 B	1.2 B	3.4 B	1 NU	3.4 U	1 U
MFAICS406	3/4/98	95	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS407	3/4/98	95	24 - 36	4.3 B	1190 E	0.3 U	1.3 B	2 B	1 NU	3.4 U	1 U
MFAICS408	3/4/98	94	0 - 12	2.1 U	1080 E	0.750 B	1 U	6.6 B	1 NU	3.4 U	1 U
MFAICS409	3/4/98	94	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS410	3/4/98	94	24 - 36	5 B	1080 E	0.3 U	1.8 B	8.1 B	1 NU	3.4 U	1 U
MFAICS411	3/4/98	78	0 - 12	5.8 B	1220 E	0.930 B	1.4 B	1.7 B	1 NU	3.4 U	1.6 B
MFAICS412	3/4/98	78	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS413	3/4/98	78	24 - 36								
MFAICS414	3/6/98	79	0 - 12	2.1 U	1210 E	0.940 N*B	1 N*U	0.950 B	1 U	4.6 B	1 U
MFAICS415	3/6/98	79	0 - 12	2.1 U	1240 E	1.3 N*B	1 N*U	0.9 U	1 U	3.4 U	1 U
MFAICS416	3/6/98	79	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS417	3/6/98	79	24 - 36	2.1 U	1370 E	0.3 N*U	1 N*U	0.9 U	1 U	3.5 B	1 U
MFAICS418	3/6/98	80	0 - 12	2.1 U	1260 E	2.7 N*B	1 N*U	1.9 B	1 U	3.4 U	2.8 B
MFAICS419	3/6/98	80	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS420	3/6/98	80	24 - 36	2.1 U	1260 E	1.7 N*B	1.6 N*B	35.1 B	1 U	4.4 B	1 U
MFAICS421	3/6/98	81	0 - 12	2.1 U	1240 E	0.740 N*B	1 N*U	1.5 B	1 B	3.4 U	1 U
MFAICS422	3/6/98	81	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS423	3/6/98	81	24 - 36	2.1 U	1450 E	0.490 N*B	1 N*U	1.1 B	1 U	4.3 B	1 U
MFAICS424	3/9/98	92	0 - 12	2.1 U	1440 E	4.1 N*	1 N*U	5.4 B	1 U	5 B	1 U
MFAICS425	3/9/98	92	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS426	3/9/98	92	24 - 36	2.1 U	1390 E	0.350 N*B	1.8 N*B	8.5 B	1.1 B	3.9 B	1 U
MFAICS427	3/12/98	91	0 - 12	2.1 U	2290 N	1.5 B	1 U	2.1 B	1 N*U	4.5 B	1 U
MFAICS428	3/12/98	91	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS429	3/12/98	91	24 - 36	2.1 U	2330 N	0.470 B	2 B	3.3 B	1 N*U	4.8 B	1 U
MFAICS430	3/12/98	90	0 - 12	2.1 U	1540 N	0.8 B	1 U	4.1 B	1 N*U	3.4 U	1 U
MFAICS431	3/12/98	90	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS432	3/12/98	90	24 - 36	2.1 U	1720 N	1.5 B	1 U	1.4 B	1 N*U	4 B	1 U
MFAICS433	3/12/98	89	0 - 12	2.1 U	1650 N	0.580 B	1.9 B	0.9 U	1 N*U	4.4 B	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS434	3/12/98	89	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	15	6 U	6 U
MFAICS435	3/12/98	89	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS436	3/12/98	89	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS437	3/13/98	82	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS438	3/13/98	82	12 - 18	6 U	6 U	13 U	13 U	13 U	6 U	20	6 U	6 U
MFAICS439	3/13/98	82	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS440	3/13/98	83	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS441	3/13/98	83	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	18	6 U	6 U
MFAICS442	3/13/98	83	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS443	3/13/98	84	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS444	3/13/98	84	12 - 18	6 U	6 U	12 U	12 U	12 U	6 U	19	6 U	6 U
MFAICS445	3/13/98	84	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS446	3/16/98	163	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS447	3/16/98	163	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS448	3/16/98	163	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS449	3/16/98	164	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS450	3/16/98	164	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS451	3/16/98	164	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS452	3/16/98	165	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS453	3/16/98	165	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS454	3/16/98	165	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS456	3/19/98	169	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS457	3/19/98	169	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS458	3/19/98	169	12 - 18	5 U	5 U	5 U	11 U	11 U	5 U	11 B	5 U	5 U
MFAICS459	3/19/98	169	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS460	3/19/98	168	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS461	3/19/98	168	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	14 B	6 U	6 U
MFAICS462	3/19/98	168	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS463	3/19/98	167	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS464	3/19/98	167	12 - 18	6 U	6 U	6 U	12 U	12 U	1 JB	15 B	6 U	6 U
MFAICS465	3/19/98	166	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS434	3/12/98	89	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS435	3/12/98	89	24 - 36	250 U	1910 J	260 U	N/A	2130	250 U	650 U	318
MFAICS436	3/12/98	89	24 - 36	250 U	2700	260 U	N/A	787 J	250 U	650 U	422
MFAICS437	3/13/98	82	0 - 12	250 U	43200	260 U	N/A	**209000 D**	250 U	650 U	396
MFAICS438	3/13/98	82	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS439	3/13/98	82	24 - 36	250 U	6060	260 U	N/A	***11500***	2470	650 U	11500
MFAICS440	3/13/98	83	0 - 12	250 U	3780	260 U	N/A	1920	250 U	650 U	72.4 J
MFAICS441	3/13/98	83	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS442	3/13/98	83	24 - 36	250 U	8450	260 U	N/A	**26800**	174 J	650 U	***61400 D***
MFAICS443	3/13/98	84	0 - 12	250 U	17000	260 U	N/A	**19800**	250 U	650 U	14900
MFAICS444	3/13/98	84	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS445	3/13/98	84	24 - 36	250 U	5940	260 U	N/A	***13000***	250 U	650 U	390
MFAICS446	3/16/98	163	0 - 12	250 U	106000 D	260 U	N/A	**168000 D**	250 U	650 U	250 U
MFAICS447	3/16/98	163	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS448	3/16/98	163	24 - 36	250 U	6880	260 U	N/A	***10200***	250 U	650 U	250 U
MFAICS449	3/16/98	164	0 - 12	250 U	113000 D	260 U	N/A	**273000 D**	250 U	650 U	250 U
MFAICS450	3/16/98	164	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS451	3/16/98	164	24 - 36	250 U	3380	260 U	N/A	***8460***	250 U	650 U	250 U
MFAICS452	3/16/98	165	0 - 12	250 U	186000 D	260 U	N/A	**699000 D**	250 U	650 U	250 U
MFAICS453	3/16/98	165	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS454	3/16/98	165	24 - 36	250 U	3060	260 U	N/A	***11300***	250 U	650 U	250 U
MFAICS456	3/19/98	169	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS457	3/19/98	169	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS458	3/19/98	169	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS459	3/19/98	169	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS460	3/19/98	168	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS461	3/19/98	168	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS462	3/19/98	168	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS463	3/19/98	167	0 - 12	250 U	160000 D	260 U	N/A	**106000 D**	250 U	650 U	250 U
MFAICS464	3/19/98	167	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS465	3/19/98	166	0 - 12	250 U	105000 D	260 U	N/A	**121000 D**	250 U	650 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS434	3/12/98	89	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS435	3/12/98	89	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS436	3/12/98	89	24 - 36	250 U	260 U	250 U	104 J	250 U	250 U	250 U
MFAICS437	3/13/98	82	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS438	3/13/98	82	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS439	3/13/98	82	24 - 36	250 U	260 U	661 P	836 P	250 U	250 U	250 U
MFAICS440	3/13/98	83	0 - 12	250 U	260 U	250 U	234 J	250 U	250 U	250 U
MFAICS441	3/13/98	83	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS442	3/13/98	83	24 - 36	250 U	260 U	1430 P	250 U	250 U	250 U	250 U
MFAICS443	3/13/98	84	0 - 12	250 U	260 U	1300 P	10600	250 U	250 U	250 U
MFAICS444	3/13/98	84	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS445	3/13/98	84	24 - 36	250 U	260 U	250 U	475	250 U	250 U	250 U
MFAICS446	3/16/98	163	0 - 12	250 U	260 U	470 P	495 P	250 U	250 U	250 U
MFAICS447	3/16/98	163	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS448	3/16/98	163	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS449	3/16/98	164	0 - 12	250 U	260 U	311 P	561 P	250 U	250 U	250 U
MFAICS450	3/16/98	164	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS451	3/16/98	164	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS452	3/16/98	165	0 - 12	250 U	260 U	298 P	523 P	250 U	250 U	250 U
MFAICS453	3/16/98	165	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS454	3/16/98	165	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS456	3/19/98	169	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS457	3/19/98	169	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS458	3/19/98	169	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS459	3/19/98	169	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS460	3/19/98	168	0 - 12	250 U	260 U	250 U	251	250 U	250 U	250 U
MFAICS461	3/19/98	168	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS462	3/19/98	168	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS463	3/19/98	167	0 - 12	250 U	260 U	272	480	250 U	250 U	250 U
MFAICS464	3/19/98	167	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS465	3/19/98	166	0 - 12	250 U	260 U	250 U	287	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS434	3/12/98	89	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS435	3/12/98	89	24 - 36	N/A	N/A	84900	80 B	20300	15400	N/A	N/A	N/A
MFAICS436	3/12/98	89	24 - 36	N/A	N/A	82200	90 B	19300	12500	N/A	N/A	N/A
MFAICS437	3/13/98	82	0 - 12	N/A	N/A	94300	250 B	20500	23300	N/A	N/A	N/A
MFAICS438	3/13/98	82	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS439	3/13/98	82	24 - 36	N/A	N/A	110000	70 B	17700	16100	N/A	N/A	N/A
MFAICS440	3/13/98	83	0 - 12	N/A	N/A	94000	190 B	19300	18400	N/A	N/A	N/A
MFAICS441	3/13/98	83	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS442	3/13/98	83	24 - 36	N/A	N/A	138000	90 B	20100	16100	N/A	N/A	N/A
MFAICS443	3/13/98	84	0 - 12	N/A	N/A	106000	390 B	17700	34500	N/A	N/A	N/A
MFAICS444	3/13/98	84	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS445	3/13/98	84	24 - 36	N/A	N/A	81200	60 U	16900	11700	N/A	N/A	N/A
MFAICS446	3/16/98	163	0 - 12	N/A	N/A	75300	150 B	18600	17900	N/A	N/A	N/A
MFAICS447	3/16/98	163	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS448	3/16/98	163	24 - 36	N/A	N/A	36400	60 U	18100	10200	N/A	N/A	N/A
MFAICS449	3/16/98	164	0 - 12	N/A	N/A	65200	120 B	16900	15700	N/A	N/A	N/A
MFAICS450	3/16/98	164	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS451	3/16/98	164	24 - 36	N/A	N/A	48000	60 U	21200	9400	N/A	N/A	N/A
MFAICS452	3/16/98	165	0 - 12	N/A	N/A	70400	200 B	20500	17500	N/A	N/A	N/A
MFAICS453	3/16/98	165	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS454	3/16/98	165	24 - 36	N/A	N/A	40500	60 U	15400	8300	N/A	N/A	N/A
MFAICS456	3/19/98	169	0 - 12	N/A	N/A	78400 N	1300	11400	18300 N	N/A	N/A	N/A
MFAICS457	3/19/98	169	0 - 12	N/A	N/A	90400 N	1200	23600	26600 N	N/A	N/A	N/A
MFAICS458	3/19/98	169	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS459	3/19/98	169	24 - 36	N/A	N/A	56500 N	930	15800	12500 N	N/A	N/A	N/A
MFAICS460	3/19/98	168	0 - 12	N/A	N/A	84600 N	780	11900	20600 N	N/A	N/A	N/A
MFAICS461	3/19/98	168	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS462	3/19/98	168	24 - 36	N/A	N/A	47300 N	660	16000	10100 N	N/A	N/A	N/A
MFAICS463	3/19/98	167	0 - 12	N/A	N/A	57100 N	760	17400	15200 N	N/A	N/A	N/A
MFAICS464	3/19/98	167	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS465	3/19/98	166	0 - 12	N/A	N/A	56200 N	880	18500	15500 N	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS434	3/12/98	89	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS435	3/12/98	89	24 - 36	2.1 U	2230 N	0.660 B	1.4 B	1.1 B	1 N*U	5.6 B	1 U
MFAICS436	3/12/98	89	24 - 36	2.1 U	1500 N	0.3 U	1.3 B	0.9 U	1 N*U	4.6 B	1 U
MFAICS437	3/13/98	82	0 - 12	2.1 U	1680 N	1.3 B	1.1 B	0.9 U	1 N*U	3.6 B	1 U
MFAICS438	3/13/98	82	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS439	3/13/98	82	24 - 36	2.1 U	1420 N	0.3 U	1 B	2.1 B	1 N*U	3.4 U	1 U
MFAICS440	3/13/98	83	0 - 12	2.1 U	1480 N	1.6 B	1.2 B	1.7 B	1 N*U	3.4 U	1 U
MFAICS441	3/13/98	83	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS442	3/13/98	83	24 - 36	2.1 U	1390 N	1.1 B	1.4 B	1.2 B	1 N*U	3.4 U	1 U
MFAICS443	3/13/98	84	0 - 12	2.1 U	2180 N	1.2 B	1.1 B	6.2 B	1 N*U	3.4 U	1 U
MFAICS444	3/13/98	84	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS445	3/13/98	84	24 - 36	2.1 U	1830 N	0.3 U	1.4 B	0.960 B	1 N*U	7.3 B	1 U
MFAICS446	3/16/98	163	0 - 12	2.6 B	1780	1.3 B	1.5 B	9.6 B	1 U	5 B	1 U
MFAICS447	3/16/98	163	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS448	3/16/98	163	24 - 36	3.5 B	2310	0.430 B	2.2 B	14.2 B	1 U	3.4 U	1 U
MFAICS449	3/16/98	164	0 - 12	2.1 U	1160	1.3 B	1.2 B	12.6 B	1 U	3.4 U	1 U
MFAICS450	3/16/98	164	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS451	3/16/98	164	24 - 36	3.3 B	1290	0.3 U	2 B	14 B	1 U	3.4 U	1 U
MFAICS452	3/16/98	165	0 - 12	2.6 B	1960	2.1 B	1.7 B	7.1 B	1 U	3.4 U	1 U
MFAICS453	3/16/98	165	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS454	3/16/98	165	24 - 36	2.1 B	1750	0.350 B	2.1 B	15.8 B	1 U	3.4 U	1 U
MFAICS456	3/19/98	169	0 - 12	2.2 B	2060 N	2.4 B	2.8 B	9.5 B	1 NU	5 B	1 U
MFAICS457	3/19/98	169	0 - 12	2.1 U	1790 N	1.7 B	2.7 B	6.3 B	1 NU	3.4 U	1.4 B
MFAICS458	3/19/98	169	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS459	3/19/98	169	24 - 36	2.1 U	1120 N	0.490 B	1 U	3.4 B	1 NU	3.4 U	1 U
MFAICS460	3/19/98	168	0 - 12	2.8 B	1600 N	1 B	1.7 B	4.3 B	1 NU	3.4 U	1 U
MFAICS461	3/19/98	168	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS462	3/19/98	168	24 - 36	3.5 B	1070 N	0.390 B	1.4 B	7.2 B	1 NU	3.4 U	1 U
MFAICS463	3/19/98	167	0 - 12	2.1 U	0.380 NB	0.3 U	1 U	0.9 U	2.5 N	3.4 U	1.1 B
MFAICS464	3/19/98	167	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS465	3/19/98	166	0 - 12	2.1 U	969 N	0.540 B	1.4 B	5.9 B	2.4 N	3.4 U	2 B

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS466	3/19/98	166	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	11 B	6 U	6 U
MFAICS467	3/19/98	166	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS468	3/23/98	170	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS469	3/23/98	170	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS470	3/23/98	170	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS471	3/23/98	171	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS472	3/23/98	171	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	4 JB	6 U	6 U
MFAICS473	3/23/98	171	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS474	3/23/98	172	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS475	3/23/98	172	12 - 18	6 U	6 U	6 U	12 U	12 U	2 JB	5 JB	6 U	6 U
MFAICS476	3/23/98	172	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS477	3/24/98	173	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS478	3/24/98	173	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS479	3/24/98	173	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS480	3/24/98	173	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS481	3/24/98	120	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS482	3/24/98	120	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	4 JB	6 U	6 U
MFAICS483	3/24/98	120	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS484	3/24/98	121	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS485	3/24/98	121	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS486	3/24/98	121	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS487	3/25/98	107	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS488	3/25/98	107	12 - 18	6 U	6 U	6 U	13 U	13 U	2 JB	3 JB	6 U	6 U
MFAICS489	3/25/98	107	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS490	3/25/98	107	12 - 18	6 U	6 U	6 U	12 U	12 U	1 JB	3 JB	6 U	6 U
MFAICS491	3/26/98	110	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS492	3/26/98	110	12 - 18	6 U	6 U	6 U	12 U	9 J	2 JB	4 JB	6 U	6 U
MFAICS493	3/26/98	110	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS494	3/26/98	119	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS495	3/26/98	119	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	4 JB	6 U	6 U
MFAICS496	3/26/98	119	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS466	3/19/98	166	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS467	3/19/98	166	24 - 36	250 U	3050	260 U	N/A	***7660***	250 U	650 U	250 U
MFAICS468	3/23/98	170	0 - 12	250 U	3980 P	260 U	N/A	2030	250 U	650 U	250 U
MFAICS469	3/23/98	170	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS470	3/23/98	170	24 - 36	250 U	4050	260 U	N/A	3630	250 U	650 U	250 U
MFAICS471	3/23/98	171	0 - 12	250 U	GT 120000 E	260 U	N/A	**GT 386000 E**	250 U	650 U	250 U
MFAICS472	3/23/98	171	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS473	3/23/98	171	24 - 36	250 U	16000	260 U	N/A	**30400 D**	250 U	650 U	250 U
MFAICS474	3/23/98	172	0 - 12	250 U	108000 D	260 U	N/A	**157000 D**	250 U	650 U	250 U
MFAICS475	3/23/98	172	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS476	3/23/98	172	24 - 36	250 U	8480	260 U	N/A	***8240***	250 U	650 U	250 U
MFAICS477	3/24/98	173	0 - 12	250 U	102000 DJ	260 U	N/A	**368000 D**	250 U	650 U	250 U
MFAICS478	3/24/98	173	0 - 12	250 U	112000 D	260 U	N/A	**339000 D**	250 U	650 U	250 U
MFAICS479	3/24/98	173	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS480	3/24/98	173	24 - 36	250 U	310 J	260 U	N/A	1600	250 U	650 U	250 U
MFAICS481	3/24/98	120	0 - 12	250 U	313 J	260 U	N/A	850 J	250 U	650 U	137 J
MFAICS482	3/24/98	120	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS483	3/24/98	120	24 - 36	250 U	778 J	260 U	N/A	1420	135 J	650 U	606
MFAICS484	3/24/98	121	0 - 12	250 U	556 J	260 U	N/A	490 J	250 U	650 U	109 J
MFAICS485	3/24/98	121	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS486	3/24/98	121	24 - 36	250 U	399 J	260 U	N/A	692 J	250 U	650 U	91.4 J
MFAICS487	3/25/98	107	0 - 12	250 U	75100 DJ	260 U	N/A	**653000 D**	849	650 U	**579000 D**
MFAICS488	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS489	3/25/98	107	24 - 36	250 U	1680 J	260 U	N/A	***5740***	2210	650 U	**960000 D**
MFAICS490	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS491	3/26/98	110	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	272
MFAICS492	3/26/98	110	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS493	3/26/98	110	24 - 36	250 U	629 J	260 U	N/A	398 J	250 U	650 U	250 U
MFAICS494	3/26/98	119	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	116 J
MFAICS495	3/26/98	119	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS496	3/26/98	119	24 - 36	250 U	240 J	260 U	N/A	1000 U	250 U	650 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS466	3/19/98	166	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS467	3/19/98	166	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS468	3/23/98	170	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS469	3/23/98	170	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS470	3/23/98	170	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS471	3/23/98	171	0 - 12	250 U	260 U	295 P	544 P	250 U	250 U	250 U
MFAICS472	3/23/98	171	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS473	3/23/98	171	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS474	3/23/98	172	0 - 12	250 U	260 U	324 P	510 P	250 U	250 U	250 U
MFAICS475	3/23/98	172	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS476	3/23/98	172	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS477	3/24/98	173	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS478	3/24/98	173	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS479	3/24/98	173	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS480	3/24/98	173	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS481	3/24/98	120	0 - 12	250 U	260 U	250 P	512	250 U	250 U	250 U
MFAICS482	3/24/98	120	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS483	3/24/98	120	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS484	3/24/98	121	0 - 12	250 U	260 U	250 U	96.9 JP	250 U	250 U	250 U
MFAICS485	3/24/98	121	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS486	3/24/98	121	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS487	3/25/98	107	0 - 12	366	260 U	6590	250 U	250 U	250 U	250 U
MFAICS488	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS489	3/25/98	107	24 - 36	250 U	260 U	1960 P	250 U	250 U	250 U	250 U
MFAICS490	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS491	3/26/98	110	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS492	3/26/98	110	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS493	3/26/98	110	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS494	3/26/98	119	0 - 12	250 U	260 U	250 U	122 J	250 U	250 U	250 U
MFAICS495	3/26/98	119	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS496	3/26/98	119	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS466	3/19/98	166	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS467	3/19/98	166	24 - 36	N/A	N/A	133000 N	640	15800	13300 N	N/A	N/A	N/A
MFAICS468	3/23/98	170	0 - 12	N/A	N/A	130000	2400	60000	61000	N/A	N/A	N/A
MFAICS469	3/23/98	170	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS470	3/23/98	170	24 - 36	N/A	N/A	68700	60 U	21300	15000	N/A	N/A	N/A
MFAICS471	3/23/98	171	0 - 12	N/A	N/A	92800	1700	31400	37400	N/A	N/A	N/A
MFAICS472	3/23/98	171	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS473	3/23/98	171	24 - 36	N/A	N/A	61900	190 B	32800	17000	N/A	N/A	N/A
MFAICS474	3/23/98	172	0 - 12	N/A	N/A	64900	300 B	19300	14500	N/A	N/A	N/A
MFAICS475	3/23/98	172	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS476	3/23/98	172	24 - 36	N/A	N/A	51700	160 B	21500	15300	N/A	N/A	N/A
MFAICS477	3/24/98	173	0 - 12	N/A	N/A	74400	290 B	24500	33900	N/A	N/A	N/A
MFAICS478	3/24/98	173	0 - 12	N/A	N/A	60000	400 B	21200	22900	N/A	N/A	N/A
MFAICS479	3/24/98	173	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS480	3/24/98	173	24 - 36	N/A	N/A	57600	60 U	27200	11000	N/A	N/A	N/A
MFAICS481	3/24/98	120	0 - 12	N/A	N/A	74000	260 B	16900	23600	N/A	N/A	N/A
MFAICS482	3/24/98	120	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS483	3/24/98	120	24 - 36	N/A	N/A	46500	230 B	15400	9600	N/A	N/A	N/A
MFAICS484	3/24/98	121	0 - 12	N/A	N/A	70100	470 B	14800	40200	N/A	N/A	N/A
MFAICS485	3/24/98	121	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS486	3/24/98	121	24 - 36	N/A	N/A	73700	100 B	13600	8700	N/A	N/A	N/A
MFAICS487	3/25/98	107	0 - 12	N/A	N/A	68200	150 B	19300 N	16300 E	N/A	N/A	N/A
MFAICS488	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS489	3/25/98	107	24 - 36	N/A	N/A	59800	60 B	17400 N	12200 E	N/A	N/A	N/A
MFAICS490	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS491	3/26/98	110	0 - 12	N/A	N/A	78800	150 B	14300 N	19300 E	N/A	N/A	N/A
MFAICS492	3/26/98	110	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS493	3/26/98	110	24 - 36	N/A	N/A	40100	60 U	12600 N	8100 E	N/A	N/A	N/A
MFAICS494	3/26/98	119	0 - 12	N/A	N/A	77600	160 B	23600 N	17800 E	N/A	N/A	N/A
MFAICS495	3/26/98	119	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS496	3/26/98	119	24 - 36	N/A	N/A	70400	60 U	30800 N	30500 E	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS466	3/19/98	166	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS467	3/19/98	166	24 - 36	3.4 B	1210 N	0.330 B	1.3 B	12.5 B	1 NU	3.5 B	1 B
MFAICS468	3/23/98	170	0 - 12	2.1 U	1670	17.6	3 NB	17.1 NB	1 U	4 B	1 U
MFAICS469	3/23/98	170	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS470	3/23/98	170	24 - 36	2.2 B	931	0.3 U	1.5 NB	3.4 NB	1 U	4.9 B	1 U
MFAICS471	3/23/98	171	0 - 12	2.1 U	1620	10.2	2.4 NB	8.9 NB	1 U	3.6 B	1 U
MFAICS472	3/23/98	171	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS473	3/23/98	171	24 - 36	2.1 U	922	1.8 B	1.4 NB	7.7 NB	1 U	3.4 U	1 U
MFAICS474	3/23/98	172	0 - 12	2.1 U	1130	2.1 B	1.2 NB	21 NB	1 U	3.5 B	1 U
MFAICS475	3/23/98	172	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS476	3/23/98	172	24 - 36	2.1 U	2390	0.3 U	1.7 NB	7.6 NB	1 U	3.4 U	1 U
MFAICS477	3/24/98	173	0 - 12	2.3 B	1350	1.4 B	1 NU	3.5 NB	1 U	3.4 U	1 U
MFAICS478	3/24/98	173	0 - 12	2.1 U	1460	1.5 B	1.2 NB	3.9 NB	1 U	3.7 B	1 U
MFAICS479	3/24/98	173	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS480	3/24/98	173	24 - 36	2.1 U	1100	0.310 B	1.2 NB	16.8 NB	1 U	4.5 B	1 U
MFAICS481	3/24/98	120	0 - 12	2.5 B	1510	1.2 B	1.4 NB	1.1 NB	4.5	3.4 U	1 U
MFAICS482	3/24/98	120	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS483	3/24/98	120	24 - 36	2.6 B	1590	0.360 B	1.6 NB	5 NB	1 U	3.4 U	1 U
MFAICS484	3/24/98	121	0 - 12	2.1 U	1440	2.2 B	1.2 NB	12 NB	4.9	3.4 U	1 U
MFAICS485	3/24/98	121	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS486	3/24/98	121	24 - 36	2.1 U	1300	0.4 B	1.4 NB	5.3 NB	1 U	3.4 U	1 U
MFAICS487	3/25/98	107	0 - 12	3.4 B	1120	0.750 B	1 B	1.9 B	1.6 NB	3.4 U	1 U
MFAICS488	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS489	3/25/98	107	24 - 36	3.6 B	875	0.770 B	1.2 B	1.7 B	1 NU	3.4 U	1 U
MFAICS490	3/25/98	107	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS491	3/26/98	110	0 - 12	2.1 B	1720	0.490 B	1.1 B	0.9 U	1 NU	3.4 U	1 U
MFAICS492	3/26/98	110	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS493	3/26/98	110	24 - 36	3.2 B	1080	0.3 U	1.7 B	6.2 B	1 NU	3.4 U	1 U
MFAICS494	3/26/98	119	0 - 12	2.1 U	1050	0.690 B	1 U	2.8 B	1 NU	3.7 B	1 U
MFAICS495	3/26/98	119	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS496	3/26/98	119	24 - 36	5.3 B	1010	0.3 U	1.1 B	7 B	1 NU	3.4 U	1 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS497	3/26/98	100	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS498	3/26/98	100	12 - 18	6 U	6 U	6 U	13 U	13 U	2 JB	3 JB	6 U	6 U
MFAICS499	3/26/98	100	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS500	3/26/98	100	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS501	3/27/98	112	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS502	3/27/98	112	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	8 B	6 U	6 U
MFAICS503	3/27/98	112	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS504	3/27/98	113	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS505	3/27/98	113	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6	6 U	6 U
MFAICS506	3/27/98	113	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS507	3/30/98	101	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS508	3/30/98	101	12 - 18	6 U	6 U	6 U	12 U	20	6 U	8 B	6 U	6 U
MFAICS509	3/30/98	101	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS510	3/31/98	102	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS511	3/31/98	102	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	7 B	6 U	6 U
MFAICS512	3/31/98	102	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS513	3/31/98	114	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS514	3/31/98	114	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 B	6 U	6 U
MFAICS515	3/31/98	114	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS516	4/1/98	115	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS517	4/1/98	115	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6	6 U	6 U
MFAICS518	4/1/98	115	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS519	4/1/98	105	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS520	4/1/98	105	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS521	4/1/98	105	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6	6 U	6 U
MFAICS522	4/1/98	105	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS523	4/2/98	104	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS524	4/2/98	104	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	5 J	6 U	6 U
MFAICS525	4/2/98	104	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS526	4/3/98	103	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS527	4/3/98	103	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	7 B	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS497	3/26/98	100	0 - 12	**1250000 U**	515000 J	**1300000 U**	N/A	**3990000 J**	**1250000 U**	***3250000 U***	**8530000**
MFAICS498	3/26/98	100	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS499	3/26/98	100	24 - 36	250 U	75800 DJ	260 U	N/A	**758000 D**	535	650 U	**327000 D**
MFAICS500	3/26/98	100	24 - 36	250 U	96400 DJ	260 U	N/A	**915000 D**	572	650 U	**524000 D**
MFAICS501	3/27/98	112	0 - 12	250 U	26700	260 U	N/A	**168000 D**	250 U	650 U	739
MFAICS502	3/27/98	112	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS503	3/27/98	112	24 - 36	250 U	2220	260 U	N/A	***4850***	277	650 U	650
MFAICS504	3/27/98	113	0 - 12	250 U	1510 J	260 U	N/A	1000 U	250 U	650 U	121 J
MFAICS505	3/27/98	113	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS506	3/27/98	113	24 - 36	250 U	595 J	260 U	N/A	1070	250 U	650 U	250 U
MFAICS507	3/30/98	101	0 - 12	250 U	33500	260 U	N/A	**214000 D**	847	650 U	12600
MFAICS508	3/30/98	101	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS509	3/30/98	101	24 - 36	250 U	3970	260 U	N/A	***15000***	838	650 U	12600
MFAICS510	3/31/98	102	0 - 12	250 U	113000	260 U	N/A	**GT 743000 E**	250 U	650 U	2390
MFAICS511	3/31/98	102	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS512	3/31/98	102	24 - 36	250 U	4290	260 U	N/A	**32000 D**	250 U	650 U	1070
MFAICS513	3/31/98	114	0 - 12	250 U	48700	260 U	N/A	**239000 D**	250 U	650 U	530
MFAICS514	3/31/98	114	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS515	3/31/98	114	24 - 36	250 U	3700	260 U	N/A	***8990***	250 U	650 U	1420
MFAICS516	4/1/98	115	0 - 12	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	858
MFAICS517	4/1/98	115	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS518	4/1/98	115	24 - 36	250 U	309 J	260 U	N/A	549 J	250 U	650 U	250 U
MFAICS519	4/1/98	105	0 - 12	250 U	6720	260 U	N/A	***9120***	250 U	650 U	438
MFAICS520	4/1/98	105	0 - 12	250 U	15700	260 U	N/A	**67900 D**	250 U	650 U	1560
MFAICS521	4/1/98	105	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS522	4/1/98	105	24 - 36	250 U	4840	260 U	N/A	**63200 D**	250 U	650 U	3410
MFAICS523	4/2/98	104	0 - 12	250 U	11200	260 U	N/A	**119000 D**	250 U	650 U	515
MFAICS524	4/2/98	104	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS525	4/2/98	104	24 - 36	250 U	550 J	260 U	N/A	168 J	250 U	650 U	1760
MFAICS526	4/3/98	103	0 - 12	250 U	59500	260 U	N/A	**532000 D**	250 U	650 U	**64800 D**
MFAICS527	4/3/98	103	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS497	3/26/98	100	0 - 12	***1250000 U***	**1300000 U**	***1250000 U***	**1250000 U**	***1250000 U***	***1250000 U***	***1250000 U***
MFAICS498	3/26/98	100	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS499	3/26/98	100	24 - 36	250 U	260 U	14700	250 U	250 U	250 U	250 U
MFAICS500	3/26/98	100	24 - 36	253	260 U	8460	250 U	250 U	250 U	250 U
MFAICS501	3/27/98	112	0 - 12	250 U	260 U	250 U	674	250 U	250 U	250 U
MFAICS502	3/27/98	112	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS503	3/27/98	112	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS504	3/27/98	113	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS505	3/27/98	113	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS506	3/27/98	113	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS507	3/30/98	101	0 - 12	286	260 U	3700	2960	250 U	250 U	250 U
MFAICS508	3/30/98	101	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS509	3/30/98	101	24 - 36	317	260 U	3800	3040	250 U	250 U	250 U
MFAICS510	3/31/98	102	0 - 12	250 U	260 U	584 P	3110	250 U	250 U	250 U
MFAICS511	3/31/98	102	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS512	3/31/98	102	24 - 36	250 U	260 U	298 P	1290	250 U	250 U	250 U
MFAICS513	3/31/98	114	0 - 12	250 U	260 U	250 U	543	250 U	250 U	250 U
MFAICS514	3/31/98	114	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS515	3/31/98	114	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS516	4/1/98	115	0 - 12	250 U	260 U	250 U	402	250 U	250 U	250 U
MFAICS517	4/1/98	115	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS518	4/1/98	115	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS519	4/1/98	105	0 - 12	250 U	260 U	250 U	404	250 U	250 U	250 U
MFAICS520	4/1/98	105	0 - 12	250 U	260 U	830	1370	250 U	250 U	250 U
MFAICS521	4/1/98	105	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS522	4/1/98	105	24 - 36	250 U	260 U	250 U	499	250 U	250 U	250 U
MFAICS523	4/2/98	104	0 - 12	250 U	260 U	612 P	1310	250 U	250 U	250 U
MFAICS524	4/2/98	104	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS525	4/2/98	104	24 - 36	250 U	260 U	437 P	1370	250 U	250 U	250 U
MFAICS526	4/3/98	103	0 - 12	250 U	260 U	1670	3820	250 U	250 U	250 U
MFAICS527	4/3/98	103	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS497	3/26/98	100	0 - 12	N/A	N/A	78200	320 B	14600 N	18400 E	N/A	N/A	N/A
MFAICS498	3/26/98	100	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS499	3/26/98	100	24 - 36	N/A	N/A	97400	450 B	20200 N	18400 E	N/A	N/A	N/A
MFAICS500	3/26/98	100	24 - 36	N/A	N/A	83400	390 B	15500 N	14100 E	N/A	N/A	N/A
MFAICS501	3/27/98	112	0 - 12	N/A	N/A	64100	210 NB	10000	21800 N	N/A	N/A	N/A
MFAICS502	3/27/98	112	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS503	3/27/98	112	24 - 36	N/A	N/A	39800	60 NU	9600	8900 N	N/A	N/A	N/A
MFAICS504	3/27/98	113	0 - 12	N/A	N/A	61100	100 NB	12700	14900 N	N/A	N/A	N/A
MFAICS505	3/27/98	113	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS506	3/27/98	113	24 - 36	N/A	N/A	47700	60 NU	13400	9100 N	N/A	N/A	N/A
MFAICS507	3/30/98	101	0 - 12	N/A	N/A	63900	350 NB	15000	14300 N	N/A	N/A	N/A
MFAICS508	3/30/98	101	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS509	3/30/98	101	24 - 36	N/A	N/A	79100	110 NB	10800	12100 N	N/A	N/A	N/A
MFAICS510	3/31/98	102	0 - 12	N/A	N/A	94300	640 N	14000	15800 N	N/A	N/A	N/A
MFAICS511	3/31/98	102	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS512	3/31/98	102	24 - 36	N/A	N/A	55800	80 NB	12900	10200 N	N/A	N/A	N/A
MFAICS513	3/31/98	114	0 - 12	N/A	N/A	59200	180 NB	11800	17100 N	N/A	N/A	N/A
MFAICS514	3/31/98	114	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS515	3/31/98	114	24 - 36	N/A	N/A	51800	60 NU	12000	11200 N	N/A	N/A	N/A
MFAICS516	4/1/98	115	0 - 12	N/A	N/A	75800	460 B	17100 E	21400 EN*	N/A	N/A	N/A
MFAICS517	4/1/98	115	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS518	4/1/98	115	24 - 36	N/A	N/A	46900	220 B	12500 E	8500 EN*	N/A	N/A	N/A
MFAICS519	4/1/98	105	0 - 12	N/A	N/A	65100	640	16400 E	66000 EN*	N/A	N/A	N/A
MFAICS520	4/1/98	105	0 - 12	N/A	N/A	63800	660	16900 E	31700 EN*	N/A	N/A	N/A
MFAICS521	4/1/98	105	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS522	4/1/98	105	24 - 36	N/A	N/A	59900	220 B	14700 E	13900 EN*	N/A	N/A	N/A
MFAICS523	4/2/98	104	0 - 12	N/A	N/A	64000	360 B	14800 E	20700 EN*	N/A	N/A	N/A
MFAICS524	4/2/98	104	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS525	4/2/98	104	24 - 36	N/A	N/A	74400	240 B	15200 E	15900 EN*	N/A	N/A	N/A
MFAICS526	4/3/98	103	0 - 12	N/A	N/A	63200	400 B	12700	16500	N/A	N/A	N/A
MFAICS527	4/3/98	103	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS497	3/26/98	100	0 - 12	3 B	1510	0.850 B	1.4 B	1.2 B	1 NU	3.4 U	1 U
MFAICS498	3/26/98	100	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS499	3/26/98	100	24 - 36	4 B	1190	4.7	1 U	6.1 B	1 NU	3.4 U	1 U
MFAICS500	3/26/98	100	24 - 36	6.3 B	1290	5.8	1 U	6.5 B	1 NU	3.4 U	1 U
MFAICS501	3/27/98	112	0 - 12	2.5 U	1400	1.1 B	1.7 B	1.7 U	0.380 N	2.8 U	1.8 B
MFAICS502	3/27/98	112	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS503	3/27/98	112	24 - 36	2.5 U	1020	0.5 U	1.7 B	3.4 B	0.1 N*U	2.8 U	1.2 U
MFAICS504	3/27/98	113	0 - 12	2.5 U	875	0.5 U	1.3 B	1.7 U	0.1 N*U	2.8 U	1.2 U
MFAICS505	3/27/98	113	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS506	3/27/98	113	24 - 36	2.5 U	1050	0.790 B	1.9 B	3 B	0.1 N*U	2.8 U	1.2 U
MFAICS507	3/30/98	101	0 - 12	2.5 U	1350	1 B	1.9 B	1.7 U	0.1 N*U	2.8 U	1.2 U
MFAICS508	3/30/98	101	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS509	3/30/98	101	24 - 36	2.5 U	1210	0.740 B	0.980 B	2.4 B	0.1 N*U	2.8 U	1.2 U
MFAICS510	3/31/98	102	0 - 12	2.5 U	1190	1.7 B	2.6 B	1.7 U	0.1 N*U	2.8 U	1.2 U
MFAICS511	3/31/98	102	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS512	3/31/98	102	24 - 36	2.5 U	943	0.5 U	1.9 B	1.7 U	0.1 N*U	2.8 U	1.2 U
MFAICS513	3/31/98	114	0 - 12	2.5 U	1310	0.940 B	1.5 B	146	0.1 N*U	2.8 U	1.2 U
MFAICS514	3/31/98	114	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS515	3/31/98	114	24 - 36	2.5 U	984	0.5 U	1.3 B	5.8 B	0.1 N*U	2.8 U	1.2 U
MFAICS516	4/1/98	115	0 - 12	2.5 U	1530	1.7 B	0.8 U	1.7 U	1 U	2.8 U	1.2 U
MFAICS517	4/1/98	115	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS518	4/1/98	115	24 - 36	2.5 U	979	0.5 U	0.8 U	4.9 B	1 U	2.8 U	1.2 U
MFAICS519	4/1/98	105	0 - 12	2.5 U	1130	1.9 B	0.960 B	12.5 B	1 U	2.8 U	1.2 U
MFAICS520	4/1/98	105	0 - 12	2.5 U	1140	1.7 B	1.6 B	7.2 B	1 U	2.8 U	1.2 U
MFAICS521	4/1/98	105	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS522	4/1/98	105	24 - 36	2.5 U	1040	0.5 U	0.920 B	1.8 B	1 U	2.8 U	1.2 U
MFAICS523	4/2/98	104	0 - 12	2.5 U	1060	1.4 B	1 B	2.8 B	1 U	2.8 U	1.2 U
MFAICS524	4/2/98	104	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS525	4/2/98	104	24 - 36	2.5 U	1050	0.5 U	0.950 B	1.7 U	1 U	2.8 U	1.2 U
MFAICS526	4/3/98	103	0 - 12	2.1 U	1360	2.6 B	1 U	1.9 B	1 *U	4.3 B	1 U
MFAICS527	4/3/98	103	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS528	4/3/98	103	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS529	4/3/98	181	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS530	4/3/98	181	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	6 B	6 U	6 U
MFAICS531	4/3/98	181	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS532	4/6/98	182	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS533	4/6/98	182	12 - 18	6 U	6 U	6 U	11 U	11 U	6 U	6 B	6 U	6 U
MFAICS534	4/6/98	182	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS535	4/6/98	174	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS536	4/6/98	174	12 - 18	6 U	6 U	6 U	13 U	13 U	6 U	5 JB	6 U	6 U
MFAICS537	4/6/98	174	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS538	4/6/98	174	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	4 JB	6 U	6 U
MFAICS539	4/7/98	175	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS540	4/7/98	175	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	11 B	6 U	6 U
MFAICS541	4/7/98	175	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS542	4/7/98	175	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS543	4/7/98	177	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS544	4/7/98	177	12 - 18	6 U	6 U	6 U	12 U	12 U	6 U	8 B	6 U	6 U
MFAICS545	4/7/98	177	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS546	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS547	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS548	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS549	4/20/98	176	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS550	4/24/98	176	12 - 12	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS551	4/20/98	176	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS552	4/20/98	180	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS553	4/24/98	180	12 - 12	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS554	4/20/98	180	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS555	4/24/98	178	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS555FD	4/24/98	178	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS556	4/24/98	178	12 - 12	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS528	4/3/98	103	24 - 36	250 U	11600	260 U	N/A	**104000 D**	475	650 U	**80100 D**
MFAICS529	4/3/98	181	0 - 12	250 U	1280 J	260 U	N/A	***7490***	250 U	650 U	1300
MFAICS530	4/3/98	181	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS531	4/3/98	181	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS532	4/6/98	182	0 - 12	250 U	15300	260 U	N/A	**27500 D**	250 U	650 U	832
MFAICS533	4/6/98	182	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS534	4/6/98	182	24 - 36	250 U	2200 U	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS535	4/6/98	174	0 - 12	250 U	12400	260 U	N/A	1000 U	250 U	650 U	250 U
MFAICS536	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS537	4/6/98	174	24 - 36	250 U	2200 U	260 U	N/A	1340	250 U	650 U	250 U
MFAICS538	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS539	4/7/98	175	0 - 12	250 U	29600	260 U	N/A	***7950***	250 U	650 U	250 U
MFAICS540	4/7/98	175	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS541	4/7/98	175	24 - 36	250 U	3910	260 U	N/A	***8390***	250 U	650 U	250 U
MFAICS542	4/7/98	175	24 - 36	250 U	2200 U	260 U	N/A	***4300***	250 U	650 U	250 U
MFAICS543	4/7/98	177	0 - 12	250 U	39300	260 U	N/A	1030	250 U	650 U	250 U
MFAICS544	4/7/98	177	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS545	4/7/98	177	24 - 36	250 U	2280	260 U	N/A	***5460***	250 U	650 U	250 U
MFAICS546	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS547	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS548	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS549	4/20/98	176	0 - 12	250 U	277000 D	260 U	250 U	**694000 D**	250 U	650 U	250 U
MFAICS550	4/24/98	176	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS551	4/20/98	176	24 - 36	250 U	6260	260 U	250 U	**17800**	250 U	650 U	88.5 J
MFAICS552	4/20/98	180	0 - 12	250 U	2790	260 U	250 U	720 J	250 U	650 U	250 U
MFAICS553	4/24/98	180	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS554	4/20/98	180	24 - 36	250 U	2440	260 U	250 U	993 J	250 U	650 U	250 U
MFAICS555	4/24/98	178	0 - 12	250 U	4360	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS555FD	4/24/98	178	0 - 12	250 U	5520	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS556	4/24/98	178	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS528	4/3/98	103	24 - 36	250 U	506	1620	1630	250 U	250 U	250 U
MFAICS529	4/3/98	181	0 - 12	250 U	260 U	252 P	559	250 U	250 U	250 U
MFAICS530	4/3/98	181	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS531	4/3/98	181	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS532	4/6/98	182	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS533	4/6/98	182	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS534	4/6/98	182	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS535	4/6/98	174	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS536	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS537	4/6/98	174	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS538	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS539	4/7/98	175	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS540	4/7/98	175	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS541	4/7/98	175	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS542	4/7/98	175	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS543	4/7/98	177	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS544	4/7/98	177	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS545	4/7/98	177	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS546	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS547	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS548	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS549	4/20/98	176	0 - 12	250 U	260 U	274 P	250 U	250 U	250 U	250 U
MFAICS550	4/24/98	176	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS551	4/20/98	176	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS552	4/20/98	180	0 - 12	250 U	260 U	250 U	155 J	250 U	250 U	250 U
MFAICS553	4/24/98	180	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS554	4/20/98	180	24 - 36	250 U	260 U	250 U	130 J	250 U	250 U	250 U
MFAICS555	4/24/98	178	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS555FD	4/24/98	178	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS556	4/24/98	178	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS528	4/3/98	103	24 - 36	N/A	N/A	72100	60 U	19600	11400	N/A	N/A	N/A
MFAICS529	4/3/98	181	0 - 12	N/A	N/A	75800	130 B	14400	17000	N/A	N/A	N/A
MFAICS530	4/3/98	181	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS531	4/3/98	181	24 - 36	N/A	N/A	35000	60 U	12000	8200	N/A	N/A	N/A
MFAICS532	4/6/98	182	0 - 12	N/A	N/A	62200	180 B	13800	18300	N/A	N/A	N/A
MFAICS533	4/6/98	182	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS534	4/6/98	182	24 - 36	N/A	N/A	80700	60 U	13200	14400	N/A	N/A	N/A
MFAICS535	4/6/98	174	0 - 12	N/A	N/A	56100	60 U	21600	12900	N/A	N/A	N/A
MFAICS536	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS537	4/6/98	174	24 - 36	N/A	N/A	35200	60 U	26500	8300	N/A	N/A	N/A
MFAICS538	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS539	4/7/98	175	0 - 12	N/A	N/A	79200	60 U	24200	16300 EN	N/A	N/A	N/A
MFAICS540	4/7/98	175	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS541	4/7/98	175	24 - 36	N/A	N/A	50800	60 U	20900	11300 EN	N/A	N/A	N/A
MFAICS542	4/7/98	175	24 - 36	N/A.	N/A	39400	60 U	12400	8400 EN	N/A	N/A	N/A
MFAICS543	4/7/98	177	0 - 12	N/A	N/A	83200	60 U	18000	16300 EN	N/A	N/A	N/A
MFAICS544	4/7/98	177	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS545	4/7/98	177	24 - 36	N/A	N/A	33900	60 U	12900	8400 EN	N/A	N/A	N/A
MFAICS546	4/13/98	STOCKPILE	0 - 0	13400000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS547	4/13/98	STOCKPILE	0 - 0	16000000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS548	4/13/98	STOCKPILE	0 - 0	12900000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS549	4/20/98	176	0 - 12	15700000	**9000 N**	89500	120 B	15600 N*	18500 N	40 U	1100 N	210 U
MFAICS550	4/24/98	176	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS551	4/20/98	176	24 - 36	11000000	**6700 N**	39400	60 U	15200 N*	9600 N	40 U	590 NB	230 B
MFAICS552	4/20/98	180	0 - 12	14200000	**13000 N**	90500	70 B	18200 N*	22700 N	50 U	1300 N	220 U
MFAICS553	4/24/98	180	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS554	4/20/98	180	24 - 36	12100000	**14000 N**	53400	60 U	24100 N*	15000 N	40 U	1300 N	210 U
MFAICS555	4/24/98	178	0 - 12	12900000	**7900 N***	111000	130 B	13500 N*	16300 N*	40 U	860	210 U
MFAICS555FD	4/24/98	178	0 - 12	12300000	**7400 N***	117000	120 B	12500 N*	17400 N*	40 U	930	210 U
MFAICS556	4/24/98	178	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS528	4/3/98	103	24 - 36	2.1 U	1450	0.680 B	1.3 B	3.1 B	1 *U	4.8 B	1 U
MFAICS529	4/3/98	181	0 - 12	2.1 U	1360	1.2 B	1 U	5 B	1 *U	3.5 B	1 U
MFAICS530	4/3/98	181	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS531	4/3/98	181	24 - 36	2.1 U	1070	0.3 U	1.2 B	6.6 B	1 *U	3.4 U	1 U
MFAICS532	4/6/98	182	0 - 12	2.1 U	1320	0.790 B	2.6 B	0.9 U	1 *U	5.2 B	1 U
MFAICS533	4/6/98	182	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS534	4/6/98	182	24 - 36	2.1 U	1660	0.380 B	3.1 B	1.1 B	1 *U	4.3 B	1 U
MFAICS535	4/6/98	174	0 - 12	2.1 U	1210	1.1 B	1 U	10.9 B	1 *U	3.4 U	1 U
MFAICS536	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS537	4/6/98	174	24 - 36	2.1 U	1090	0.3 U	1.5 B	10.8 B	1 *U	4.3 B	1 U
MFAICS538	4/6/98	174	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS539	4/7/98	175	0 - 12	2.1 U	880	0.3 U	1 B	7 B	1 U	3.4 U	1 U
MFAICS540	4/7/98	175	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS541	4/7/98	175	24 - 36	2.1 U	1100	0.3 U	1.1 B	8 B	1 U	3.4 U	1 U
MFAICS542	4/7/98	175	24 - 36	2.1 U	1080	0.470 B	1 U	10.3 B	1 U	3.4 U	1 U
MFAICS543	4/7/98	177	0 - 12	2.1 U	972	0.3 U	1 U	2.3 B	1 U	3.7 B	1 U
MFAICS544	4/7/98	177	12 - 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS545	4/7/98	177	24 - 36	2.1 U	1010	0.3 U	1 U	13.2 B	1 U	4 B	1 U
MFAICS546	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS547	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS548	4/13/98	STOCKPILE	0 - 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS549	4/20/98	176	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS550	4/24/98	176	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS551	4/20/98	176	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS552	4/20/98	180	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS553	4/24/98	180	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS554	4/20/98	180	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS555	4/24/98	178	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS555FD	4/24/98	178	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS556	4/24/98	178	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS557	4/24/98	178	30 - 30	6 U	6 U	6 U	12 U	12 U	6 U	6 U	6 U	6 U
MFAICS558	4/24/98	179	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS559	4/24/98	179	12 - 12	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS560	4/24/98	179	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS561	5/11/98	183	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS562FD	5/11/98	183	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS563	5/11/98	183	12 - 12	5 U	5 U	5 U	11 U	1100 U	5 U	5 U	5 U	5 U
MFAICS564	5/11/98	183	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS565	5/14/98	184	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS566	5/14/98	184	12 - 12	5 U	5 U	5 U	1100 U	1100 U	5 U	5 U	5 U	5 U
MFAICS567	5/14/98	184	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS568	5/14/98	185	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS569	5/14/98	185	12 - 12	5 U	5 U	5 U	11 U	94	5 U	5 U	5 U	5 U
MFAICS570	5/14/98	185	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS571	5/14/98	185	12 - 12	5 U	5 U	5 U	11 U	200	5 U	5 U	5 U	5 U
MFAICS572	5/14/98	185	12 - 12	6 U	6 U	6 U	13 U	13 U	6 U	6 U	6 U	6 U
MFAICS573	5/14/98	185	12 - 12	5 U	5 U	5 U	11 U	11 U	5 U	5 U	5 U	5 U
MFAICS574FD	5/14/98	185	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS575	5/18/98	COMPOST ST	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS576	5/27/98	194	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS577	5/27/98	194	12 - 12	6 U	6 U	6 U	12 U	11 J	6 U	8	6 U	6 U
MFAICS578	5/27/98	194	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS579	5/27/98	193	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS580	5/27/98	193	12 - 12	6 U	6 U	6 U	12 U	3 J	6 U	8	6 U	6 U
MFAICS581	5/27/98	193	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS582	5/28/98	192	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS582FD	5/28/98	192	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS583	5/28/98	192	12 - 12	6 U	6 U	6 U	12 U	2 J	6 U	14	6 U	6 U
MFAICS584	5/28/98	192	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS585	5/28/98	191	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS586	5/28/98	191	12 - 12	6 U	6 U	6 U	12 U	4 J	6 U	20	6 U	6 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS557	4/24/98	178	30 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS558	4/24/98	179	0 - 12	250 U	4540	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS559	4/24/98	179	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS560	4/24/98	179	24 - 36	250 U	2200 U	260 U	250 U	1530	250 U	650 U	250 U
MFAICS561	5/11/98	183	0 - 12	250 U	44600	260 U	250 U	**53300**	250 U	650 U	250 U
MFAICS562FD	5/11/98	183	0 - 12	250 U	26700	260 U	250 U	**25200 D**	250 U	650 U	250 U
MFAICS563	5/11/98	183	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS564	5/11/98	183	24 - 36	250 U	2020 J	260 U	250 U	984 J	250 U	650 U	250 U
MFAICS565	5/14/98	184	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	417
MFAICS566	5/14/98	184	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS567	5/14/98	184	24 - 36	250 U	191 J	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS568	5/14/98	185	0 - 12	250 U	107000 D	260 U	250 U	**693000 D**	1050 P	650 U	**690000 D**
MFAICS569	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS570	5/14/98	185	24 - 36	250 U	2030 J	260 U	250 U	***6800***	250 U	650 U	1060
MFAICS571	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS572	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS573	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS574FD	5/14/98	185	24 - 36	250 U	1890 J	260 U	250 U	**18900**	250 U	650 U	1390
MFAICS575	5/18/98	COMPOST ST	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS576	5/27/98	194	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS577	5/27/98	194	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS578	5/27/98	194	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS579	5/27/98	193	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS580	5/27/98	193	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS581	5/27/98	193	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS582	5/28/98	192	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS582FD	5/28/98	192	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS583	5/28/98	192	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS584	5/28/98	192	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS585	5/28/98	191	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS586	5/28/98	191	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID #	DEPTH (in inches)							
MFAICS557	4/24/98	178	30 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS558	4/24/98	179	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS559	4/24/98	179	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS560	4/24/98	179	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS561	5/11/98	183	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS562FD	5/11/98	183	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS563	5/11/98	183	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS564	5/11/98	183	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS565	5/14/98	184	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS566	5/14/98	184	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS567	5/14/98	184	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS568	5/14/98	185	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS569	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS570	5/14/98	185	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS571	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS572	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS573	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS574FD	5/14/98	185	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS575	5/18/98	COMPOST ST	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS576	5/27/98	194	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS577	5/27/98	194	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS578	5/27/98	194	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS579	5/27/98	193	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS580	5/27/98	193	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS581	5/27/98	193	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS582	5/28/98	192	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS582FD	5/28/98	192	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS583	5/28/98	192	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS584	5/28/98	192	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS585	5/28/98	191	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS586	5/28/98	191	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS557	4/24/98	178	30 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS558	4/24/98	179	0 - 12	16000000	**9200 N***	81500	160 B	15800 N*	17400 N*	40 U	1400	220 U
MFAICS559	4/24/98	179	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS560	4/24/98	179	24 - 36	14900000	**15800 N***	45700	60 U	33500 N*	17800 N*	40 U	1400	200 U
MFAICS561	5/11/98	183	0 - 12	21200000	**9600 B**	80000	320 B	22500	19200 E	40	1100 B	150 U
MFAICS562FD	5/11/98	183	0 - 12	21500000	**8700 B**	84800	220 B	22800	18900 E	40 U	1200 B	140 U
MFAICS563	5/11/98	183	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS564	5/11/98	183	24 - 36	21300000	**9600 B**	88200	100 B	25500	15400 E	40 U	1000 B	140 U
MFAICS565	5/14/98	184	0 - 12	11200000 *	**19600 B**	59700	110 B	15700	16500 N	40 NU	1100 B	140 U
MFAICS566	5/14/98	184	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS567	5/14/98	184	24 - 36	17000000 *	**9300 B**	90200	40 U	26700	15600 N	40 NU	1300 B	150 U
MFAICS568	5/14/98	185	0 - 12	27200000 *	**7200 B**	75200	170 B	19000	21200 N	40 NU	940 B	150 U
MFAICS569	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS570	5/14/98	185	24 - 36	11100000 *	**4100 B**	50300	40 U	13600	9300 NB	40 NU	540 B	140 U
MFAICS571	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS572	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS573	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS574FD	5/14/98	185	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS575	5/18/98	COMPOST ST	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS576	5/27/98	194	0 - 12	15400000	**4800 B**	58700	40 U	17300	9200 B	40 U	480 U	140 U
MFAICS577	5/27/98	194	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS578	5/27/98	194	24 - 36	20500000	**8600 B**	105000	40 U	24900	14100	40 U	510 U	150 U
MFAICS579	5/27/98	193	0 - 12	16700000	**8200 B**	85800	570 B	25900	22900	40 U	480 U	140 U
MFAICS580	5/27/98	193	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS581	5/27/98	193	24 - 36	15700000	**6000 B**	68100	40 U	17900	11600 B	40 U	480 U	140 U
MFAICS582	5/28/98	192	0 - 12	15500000	**8000**	92200 N	40 U	19500 N*	29300 N*	40 U	470 NU	140 U
MFAICS582FD	5/28/98	192	0 - 12	16800000	**8000**	100000 N	40 U	19700 N*	18300 N*	40 U	530 UN	160 U
MFAICS583	5/28/98	192	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS584	5/28/98	192	24 - 36	16500000	**8400**	73700 N	40 U	20200 N*	14200 N*	40 U	500 NU	150 U
MFAICS585	5/28/98	191	0 - 12	17800000	**6100**	65300 N	40 U	21300 N*	36100 N*	40 U	490 NU	150 U
MFAICS586	5/28/98	191	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS557	4/24/98	178	30 - 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS558	4/24/98	179	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS559	4/24/98	179	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS560	4/24/98	179	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS561	5/11/98	183	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS562FD	5/11/98	183	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS563	5/11/98	183	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS564	5/11/98	183	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS565	5/14/98	184	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS566	5/14/98	184	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS567	5/14/98	184	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS568	5/14/98	185	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS569	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS570	5/14/98	185	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS571	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS572	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS573	5/14/98	185	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS574FD	5/14/98	185	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS575	5/18/98	COMPOST ST	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS576	5/27/98	194	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS577	5/27/98	194	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS578	5/27/98	194	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS579	5/27/98	193	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS580	5/27/98	193	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS581	5/27/98	193	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS582	5/28/98	192	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS582FD	5/28/98	192	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS583	5/28/98	192	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS584	5/28/98	192	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS585	5/28/98	191	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS586	5/28/98	191	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS587	5/28/98	191	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS588	5/28/98	186	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS589	5/28/98	186	12 - 12	6 U	6 U	6 U	12 U	8 JB	6 U	6 B	6 U	6 U
MFAICS590	5/28/98	186	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS591	5/28/98	187	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS592	5/28/98	187	12 - 12	6 U	6 U	6 U	13 U	4 J	6 U	24	6 U	6 U
MFAICS593	5/28/98	187	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593FD	5/28/98	187	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS594	5/29/98	188	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS595	5/29/98	188	12 - 12	5 U	5 U	5 U	10 U	5 J	5 U	15	5 U	5 U
MFAICS596	5/29/98	188	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS597	5/29/98	190	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS598	5/29/98	190	12 - 12	5 U	5 U	5 U	10 U	19	5 U	14	5 U	5 U
MFAICS599	5/29/98	190	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS600	6/1/98	189	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS601	6/1/98	189	12 - 12	5 U	5 U	5 U	11 U	10 J	5 U	12 B	5 U	5 U
MFAICS602	6/1/98	189	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602FD	6/1/98	189	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS603	6/1/98	196	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS604	6/1/98	196	12 - 12	6 U	6 U	6 U	13 U	13 U	6 U	4 JB	6 U	6 U
MFAICS605	6/1/98	196	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS606	6/1/98	195	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS607	6/1/98	195	12 - 12	6 U	6 U	6 U	14 U	35	6 U	14 B	6 U	6 U
MFAICS608	6/1/98	195	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS609	6/17/98	198	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS610	6/17/98	198	12 - 12	5 U	5 U	5 U	11 U	8 J	5 U	2 J	5 U	5 U
MFAICS611	6/17/98	198	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS612	6/17/98	197	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS612FD	6/17/98	197	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS613	6/17/98	197	12 - 12	5 U	5 U	5 U	11 U	19	5 U	2 J	5 U	5 U
MFAICS614	6/17/98	197	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS587	5/28/98	191	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS588	5/28/98	186	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	***39400 D***
MFAICS589	5/28/98	186	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS590	5/28/98	186	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	1690
MFAICS591	5/28/98	187	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS592	5/28/98	187	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593	5/28/98	187	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	678 P
MFAICS593FD	5/28/98	187	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	575
MFAICS594	5/29/98	188	0 - 12	250 U	2200 U	260 U	250 U	682 J	250 U	650 U	1180 P
MFAICS595	5/29/98	188	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS596	5/29/98	188	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS597	5/29/98	190	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	1560
MFAICS598	5/29/98	190	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS599	5/29/98	190	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	4640
MFAICS600	6/1/98	189	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS601	6/1/98	189	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602	6/1/98	189	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS602FD	6/1/98	189	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS603	6/1/98	196	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	560
MFAICS604	6/1/98	196	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS605	6/1/98	196	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS606	6/1/98	195	0 - 12	250 U	1260 J	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS607	6/1/98	195	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS608	6/1/98	195	24 - 36	250 U	1720 J	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS609	6/17/98	198	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS610	6/17/98	198	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS611	6/17/98	198	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS612	6/17/98	197	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS612FD	6/17/98	197	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS613	6/17/98	197	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS614	6/17/98	197	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS587	5/28/98	191	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS588	5/28/98	186	0 - 12	250 U	260 U	1030 P	250 U	250 U	250 U	250 U
MFAICS589	5/28/98	186	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS590	5/28/98	186	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS591	5/28/98	187	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS592	5/28/98	187	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593	5/28/98	187	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS593FD	5/28/98	187	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS594	5/29/98	188	0 - 12	250 U	260 U	768 P	1680 P	250 U	250 U	250 U
MFAICS595	5/29/98	188	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS596	5/29/98	188	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS597	5/29/98	190	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS598	5/29/98	190	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS599	5/29/98	190	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS600	6/1/98	189	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS601	6/1/98	189	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602	6/1/98	189	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS602FD	6/1/98	189	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS603	6/1/98	196	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS604	6/1/98	196	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS605	6/1/98	196	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS606	6/1/98	195	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS607	6/1/98	195	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS608	6/1/98	195	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS609	6/17/98	198	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS610	6/17/98	198	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS611	6/17/98	198	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS612	6/17/98	197	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS612FD	6/17/98	197	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS613	6/17/98	197	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS614	6/17/98	197	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS587	5/28/98	191	24 - 36	13200000	**3800**	57300 N	40 U	14200 N*	11600 N*	40 U	470 NU	140 U
MFAICS588	5/28/98	186	0 - 12	11800000	**3200**	78500 N	120 B	20400 N*	17700 N*	40 U	470 NU	140 B
MFAICS589	5/28/98	186	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS590	5/28/98	186	24 - 36	11900000	**6800**	101000 N	470	21100 N*	35300 N*	40 U	510 NU	150 U
MFAICS591	5/28/98	187	0 - 12	14900000	**4200**	89500 N	40 U	26200 N*	27100 N*	40 U	520 NU	160 U
MFAICS592	5/28/98	187	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593	5/28/98	187	24 - 36	15400000	**2900**	114000 N	40 U	25700 N*	15900 N*	40 U	470 NU	140 U
MFAICS593FD	5/28/98	187	24 - 36	13800000	***2300***	117000 N	40 U	23700 N*	14700 N*	40 U	470 NU	140 U
MFAICS594	5/29/98	188	0 - 12	8500000	**23400**	73100	840	19800	47600	40 U	450 U	130 U
MFAICS595	5/29/98	188	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS596	5/29/98	188	24 - 36	13700000	**5300 B**	80400	40 B	20600	16200	40 U	470 U	140 U
MFAICS597	5/29/98	190	0 - 12	11600000	**4300 B**	67800	330 B	21200	19900	40 U	470 U	140 U
MFAICS598	5/29/98	190	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS599	5/29/98	190	24 - 36	17800000	**4000 B**	109000	40 U	24800	12800	40 U	470 U	140 U
MFAICS600	6/1/98	189	0 - 12	17900000	**6500 B**	125000 *	40 *U	22800 *	16300	40 *U	720 B	140 *U
MFAICS601	6/1/98	189	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602	6/1/98	189	24 - 36	15800000	**7000 B**	91900 *	40 *U	21000 *	14100	40 *U	480 U	140 *U
MFAICS602FD	6/1/98	189	24 - 36	16500000	**9200 B**	93400 *	40 *U	20300 *	15400	40 *U	790 B	150 *U
MFAICS603	6/1/98	196	0 - 12	13300000	**57300**	63000 *	90 *B	15400 *	18500	40 *U	680 B	150 *U
MFAICS604	6/1/98	196	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS605	6/1/98	196	24 - 36	11800000	**5700 B**	58700 *	40 *U	14700 *	13400	40 *U	500 B	140 *U
MFAICS606	6/1/98	195	0 - 12	17900000	**10900 B**	87400 *	40 *U	20800 *	18200	50 *	710 B	150 *U
MFAICS607	6/1/98	195	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS608	6/1/98	195	24 - 36	15600000	**7200 B**	64000 *	40 *U	18600 *	11300 B	40 *U	490 U	150 *U
MFAICS609	6/17/98	198	0 - 12	18900000	**12900 B**	77300	40 U	23400	16900	90	1000 B	140 U
MFAICS610	6/17/98	198	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS611	6/17/98	198	24 - 36	16900000	**7200 B**	58800	30 U	21600	10400 B	70	770 B	140 U
MFAICS612	6/17/98	197	0 - 12	18800000	**9900 B**	89600	40 U	22900	18900	50 B	900 B	150 U
MFAICS612FD	6/17/98	197	0 - 12	18300000	**9500 B**	79600	40 U	21900	21000	50 B	1100 B	170 U
MFAICS613	6/17/98	197	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS614	6/17/98	197	24 - 36	14400000	**6300 B**	50700	40 U	18200	10900 B	40 U	470 U	140 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS587	5/28/98	191	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS588	5/28/98	186	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS589	5/28/98	186	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS590	5/28/98	186	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS591	5/28/98	187	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS592	5/28/98	187	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593	5/28/98	187	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS593FD	5/28/98	187	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS594	5/29/98	188	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS595	5/29/98	188	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS596	5/29/98	188	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS597	5/29/98	190	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS598	5/29/98	190	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS599	5/29/98	190	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS600	6/1/98	189	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS601	6/1/98	189	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602	6/1/98	189	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS602FD	6/1/98	189	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS603	6/1/98	196	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS604	6/1/98	196	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS605	6/1/98	196	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS606	6/1/98	195	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS607	6/1/98	195	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS608	6/1/98	195	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS609	6/17/98	198	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS610	6/17/98	198	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS611	6/17/98	198	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS612	6/17/98	197	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS612FD	6/17/98	197	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS613	6/17/98	197	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS614	6/17/98	197	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				VOLATILES								
ANALYTE				1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
IM Industrial Cleanup Goal (Human Health)				1,700,000	550	27,000,000	2,800,000	8,800,000	530	18,000	880,000	320,000
IM Residential Cleanup Goal (Human Health)				500,000	400	7,100,000	770,000	2,000,000	30	7,800	790,000	320,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH	**14,000	**10,000	**4,000,000			**120,000			
ID	DATE	#	(in inches)									
MFAICS615	7/22/98	199	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS616	7/22/98	199	12 - 12	5 U	5 U	5 U	5 U	7 JB	5 U	5 U	5 U	5 U
MFAICS617	7/22/98	199	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES							
ANALYTE				DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)				68,000	34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)				6,500	3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH			**40,000					
ID	DATE	#	(in inches)								
MFAICS615	7/22/98	199	0 - 12	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U
MFAICS616	7/22/98	199	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS617	7/22/98	199	24 - 36	250 U	2200 U	260 U	250 U	1000 U	250 U	650 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				EXPLOSIVES						
ANALYTE				2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
IM Industrial Cleanup Goal (Human Health)				1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000
IM Residential Cleanup Goal (Human Health)				130,000	65,000	130,000	65,000	650,000	650,000	650,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH							
ID	DATE	#	(in inches)							
MFAICS615	7/22/98	199	0 - 12	250 U	260 U	250 U	250 U	250 U	250 U	250 U
MFAICS616	7/22/98	199	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS617	7/22/98	199	24 - 36	250 U	260 U	250 U	250 U	250 U	250 U	250 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				METALS								
ANALYTE				ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)				100,000,000	2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)				77,000,000	320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement				UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE	SAMPLE	GRID	DEPTH		**100,000	**2,000,000	**20,000	**100,000	**100,000	**4,000	**20,000	**100,000
ID	DATE	#	(in inches)									
MFAICS615	7/22/98	199	0 - 12	13000000	**6200 B**	199000	480 B	22100	28200	40 U	480 U	140 U
MFAICS616	7/22/98	199	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS617	7/22/98	199	24 - 36	18900000	4200 B	97100	40 U	25500	11900	40 U	470 U	140 U

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

				TCLP METALS							
ANALYTE				TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
IM Industrial Cleanup Goal (Human Health)											
IM Residential Cleanup Goal (Human Health)											
Units of Measurement				UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
SITE	SAMPLE	GRID	DEPTH	5,000	100,000	1,000	5,000	5,000	200	1,000	5,000
ID	DATE	#	(in inches)								
MFAICS615	7/22/98	199	0 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS616	7/22/98	199	12 - 12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS617	7/22/98	199	24 - 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-1
MINE FILL A INITIAL CHARACTERIZATION SAMPLE RESULTS
NSWC CRANE

Notes:

* - Duplicate analysis not within control limits.
** - Value to be used for comparison after 4/13/98 (comparable to TCLP value times 20)
B (organics) = detected in corresponding method blank
B (metals) - reported value is greater than instrument detection limit but less than reporting limit
D - secondary dilution required for analysis
E (organics) - Value is greater than highest calibration standard
E (metals)- Serial dilution performed on sample and was outside of acceptable limits
J - estimated value
MEK = Methyl Ethyl Ketone
MIBK = Methyl Isobutyl Ketone
N - Spike sample recovery not within control limits
N/A - Not Analyzed
P - Greater than 40% difference detected between the two GC columns
U - not detected
UG/KG - micrograms per kilogram
UG/L - micrograms per liter
Values **BOLD** and OUTLINED exceed Industrial Cleanup Goals
Values **BOLD** and ***ITALICS*** exceed Residential Cleanup Goals

T. E E-2

MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
MPSFA0220	02/20/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**76**	**23**	**7**	LT 5 U	LT 5 U
MPSFB0220	02/20/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**14**	**5**	LT 5 U	LT 5 U	2 JB
MPSRB0220	02/20/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**13**	4 J	LT 5 U	LT 5 U	LT 5 U
MPSTB0219	02/20/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	1 JB
MPSTB0224	02/24/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	1 JB
MPSRB0225	02/25/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	11	4 J	LT 5 U	LT 5 U	LT 5 U
MPSTB0225	02/25/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MPSFA0311	03/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	7 J	1 J	LT 5 U	LT 5 U	LT 5 U
MPSFB0311	03/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	**39**	LT 5 U	LT 5 U	LT 5 U
MPSRB0311	03/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	7 J	1 J	LT 5 U	LT 5 U	LT 5 U
MPSTB0311A	03/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MPSTB0311B	03/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB1112	11/12/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB1113	11/13/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR1114	11/14/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1114	11/14/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAICSR1119	11/19/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB1119	11/19/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR1124	11/24/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1124	11/24/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR1125	11/25/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1125	11/25/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT1201	12/01/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT103	12/02/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR1204	12/04/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**10**	LT 5 U	2 JB	LT 5 U	LT 5 U
MFAT1204	12/04/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT1208	12/08/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
TRIP120997	12/09/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT1211	12/11/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	4 JB	LT 5 U	4 JB	LT 5 U	LT 5 U
TRIP121597	12/15/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	**28 B**	LT 5 U	LT 5 U
MFAICS1229	12/29/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1229	12/29/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB1230	12/30/1997	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	**5 B**	LT 5 U	LT 5 U
MFAB0102	01/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	8 JB	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0102	01/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0102	01/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	4 JB	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB0105	01/05/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	3 JB	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0113	01/13/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U

TABLE E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT	2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT
MPSFA0220	02/20/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSFB0220	02/20/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSRB0220	02/20/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSTB0219	02/20/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSTB0224	02/24/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSRB0225	02/25/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSTB0225	02/25/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSFA0311	03/11/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSFB0311	03/11/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSRB0311	03/11/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MPSTB0311A	03/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSTB0311B	03/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1112	11/12/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1113	11/13/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1114	11/14/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB1114	11/14/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICSR1119	11/19/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1119	11/19/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1124	11/24/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	**29.3**	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB1124	11/24/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1125	11/25/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB1125	11/25/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1201	12/01/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT103	12/02/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1204	12/04/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1204	12/04/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1208	12/08/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP120997	12/09/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1211	12/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP121597	12/15/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS1229	12/29/1997	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB1229	12/29/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1230	12/30/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAB0102	01/02/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAR0102	01/02/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB0102	01/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0105	01/05/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0113	01/13/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

T. .E E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	4-NT	ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
MPSFA0220	02/20/1997	UG/L	LT 8 U	N/A	LT 2.1 U	**26.4**	LT 0.3 U	LT 1 U	**4.5**	LT 0.12 U	LT 3.4 U	LT 1 U
MPSFB0220	02/20/1997	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.12 U	LT 3.4 U	LT 1 U
MPSRB0220	02/20/1997	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.12 U	LT 3.4 U	LT 1 U
MPSTB0219	02/20/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSTB0224	02/24/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSRB0225	02/25/1997	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	1.6 B	0.950 B	LT 0.12 U	LT 3.4 U	LT 1 U
MPSTB0225	02/25/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSFA0311	03/11/1997	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MPSFB0311	03/11/1997	UG/L	LT 8 U	N/A	LT 2.1 U	**27**	LT 0.3 U	LT 1 U	1.1 B	LT 0.1 U	LT 3.4 U	LT 1 U
MPSRB0311	03/11/1997	UG/L	LT 8 U	N/A	2.7 B	0.680 B	LT 0.3 U	1.3 B	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MPSTB0311A	03/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSTB0311B	03/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1112	11/12/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1113	11/13/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1114	11/14/1997	UG/L	LT 8 U	N/A	N/A	0.320 B	0.370 B	LT 1 U	LT 0.9 U	N/A	N/A	N/A
MFATB1114	11/14/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICSR1119	11/19/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1119	11/19/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1124	11/24/1997	UG/L	LT 8 U	N/A	N/A	0.360 B	LT 0.3 U	LT 1 U	LT 0.9 U	N/A	N/A	N/A
MFATB1124	11/24/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1125	11/25/1997	UG/L	LT 8 U	N/A	N/A	0.4 B	LT 0.3 U	LT 1 U	LT 0.9 U	N/A	N/A	N/A
MFATB1125	11/25/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1201	12/01/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT103	12/02/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR1204	12/04/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1204	12/04/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1208	12/08/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP120997	12/09/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT1211	12/11/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP121597	12/15/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICS1229	12/29/1997	UG/L	LT 8 U	N/A	N/A	0.680 B	LT 0.3 U	LT 1 U	LT 0.9 U	N/A	N/A	N/A
MFATB1229	12/29/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB1230	12/30/1997	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAB0102	01/02/1998	UG/L	LT 8 U	N/A	N/A	1.1 B	**4.7**	2.7 B	27.6 B	N/A	N/A	N/A
MFAR0102	01/02/1998	UG/L	LT 8 U	N/A	N/A	0.520 B	LT 0.3 U	LT 1 U	1.2 B	N/A	N/A	N/A
MFATB0102	01/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0105	01/05/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0113	01/13/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
MFAT0116	01/16/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0120	01/20/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0120	01/20/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	3 JB	LT 5 U	**5 B**	LT 5 U	LT 5 U
MFAT0122	01/22/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	3 JB	LT 5 U	**8 B**	LT 5 U	LT 5 U
MFAR0127	01/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0127	01/26/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFATB0129	01/29/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0202	02/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0202B	02/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0202	02/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0203	02/03/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0210	02/10/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	4 JB	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0213	02/13/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0216	02/16/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0223	02/23/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	2 J	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0224	02/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0224	02/24/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0225	02/25/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
MFAR0226	02/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0226	02/26/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
MFAR0302	03/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0302	03/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0304	03/04/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0304	03/04/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
MFAT0309	03/06/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0312	03/12/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0313	03/12/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0316	03/16/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAB0317	03/17/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0317	03/17/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0318	03/18/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0319	03/19/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0323	03/23/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0324	03/24/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0326	03/26/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**20**	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0326	03/26/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR0330	03/30/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0331	03/31/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U

T. E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE	SAMPLE		DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT	2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT
ID	DATE	UNITS														
MFAT0116	01/16/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0120	01/20/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0120	01/20/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0122	01/22/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0127	01/26/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0127	01/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0129	01/29/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0202	02/02/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAR0202B	02/02/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0202	02/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0203	02/03/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0210	02/10/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0213	02/13/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0216	02/16/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0223	02/23/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0224	02/24/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0224	02/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0225	02/25/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0226	02/26/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0226	02/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0302	03/02/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0302	03/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0304	03/04/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0304	03/04/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0309	03/06/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0312	03/12/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0313	03/12/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0316	03/16/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAB0317	03/17/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFATB0317	03/17/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0318	03/18/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0319	03/19/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0323	03/23/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0324	03/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0326	03/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0326	03/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0330	03/30/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0331	03/31/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	4-NT	ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
MFAT0116	01/16/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0120	01/20/1998	UG/L	LT 8 U	N/A	N/A	1.1 B	LT 0.3 U	4.1 B	LT 0.9 U	N/A	N/A	N/A
MFAT0120	01/20/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0122	01/22/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0127	01/26/1998	UG/L	LT 8 U	N/A	N/A	2.2 B	2.7 B	2.3 B	1.1 B	N/A	N/A	N/A
MFAT0127	01/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB0129	01/29/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0202	02/02/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFAR0202B	02/02/1998	UG/L	LT 8 U	N/A	LT 2.1 U	0.360 B	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0202	02/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0203	02/03/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0210	02/10/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0213	02/13/1998	UG/L	LT 8 U	N/A	LT 2.1 U	0.530 B	LT 0.3 U	LT 1 U	1.3 B	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0216	02/16/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0223	02/23/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0224	02/24/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	1.1 B	LT 1 U	1.2 B	**0.180 N**	LT 3.4 U	1.6 B
MFAT0224	02/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0225	02/25/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0226	02/26/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 N*U	LT 1 N*U	LT 0.9 U	LT 0.1 U	LT 3.4 U	1.3 B
MFAT0226	02/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0302	03/02/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	1.4 B	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0302	03/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0304	03/04/1998	UG/L	LT 8 U	N/A	LT 2.1 U	0.780 B	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0304	03/04/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0309	03/06/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0312	03/12/1998	UG/L	LT 8 U	N/A	LT 2.1 U	2.1 B	LT 0.3 U	LT 1 U	1 B	LT 1 U	LT 3.4 U	LT 1 U
MFAT0313	03/12/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0316	03/16/1998	UG/L	LT 8 U	N/A	2.5 B	0.4 B	0.840 B	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFAB0317	03/17/1998	UG/L	LT 8 U	N/A	2.5 B	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFATB0317	03/17/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0318	03/18/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0319	03/19/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0323	03/23/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	0.250 B	LT 3.4 U	LT 1 U
MFAT0324	03/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0326	03/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0326	03/26/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR0330	03/30/1998	UG/L	LT 8 U	N/A	LT 2.1 U	0.330 B	LT 0.3 U	LT 1 U	1.5 B	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0331	03/31/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

T. E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE	SAMPLE		1,1-DICHLOROETHANE	1,2-DICHLOROETHANE	MEK	MIBK	ACETONE	CHLOROFORM	METHYLENE CHLORIDE	TOLUENE	XYLENES
ID	DATE	UNITS									
MFAT0401	04/02/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
MFAB0406	04/06/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0406	04/06/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
MFAT0408	04/08/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
ICSRB042498	04/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICSTB042498	04/24/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	1 J	LT 5 U	LT 5 U	LT 5 U
TRIP051198	05/11/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	LT 10 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAICST0514	05/14/1998	UG/L	LT 5 U	LT 5 U	LT 10 U	LT 10 U	**59**	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0527981	05/27/1998	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAR-0528	05/28/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0528	05/28/1998	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U
MFAT0529	05/29/1998	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U

TABLE E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

SITE	SAMPLE		DNB	HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT	2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT
ID	DATE	UNITS														
MFAT0401	04/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAB0406	04/06/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	N/A	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0406	04/06/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0408	04/08/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICSRB042498	04/24/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
ICSTB042498	04/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP051198	05/11/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICST0514	05/14/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0527981	05/27/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR-0528	05/28/1998	UG/L	LT 4 U	LT 13 U	LT 7 U	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U
MFAT0528	05/28/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0529	05/29/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

T E-2

MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS

NSWC CRANE

SITE ID	SAMPLE DATE	UNITS	4-NT	ALUMINUM	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
MFAT0401	04/02/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAB0406	04/06/1998	UG/L	LT 8 U	N/A	LT 2.1 U	LT 0.3 U	LT 0.3 U	LT 1 U	LT 0.9 U	LT 0.1 U	LT 3.4 U	LT 1 U
MFAT0406	04/06/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0408	04/08/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICSRB042498	04/24/1998	UG/L	LT 8 U	35.2 B	LT 2.1 U	0.580 B	LT 0.3 U	LT 1 U	1.3 B	LT 0.1 *U	LT 3.4 U	LT 1 U
ICSTB042498	04/24/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRIP051198	05/11/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAICST0514	05/14/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0527981	05/27/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAR-0528	05/28/1998	UG/L	LT 8 U	65.5 B	LT 2.9 U	3.3 B	LT 0.3 U	LT 0.7 U	2.1 B	LT 0.1 U	LT 3.1 U	LT 1.4 U
MFAT0528	05/28/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAT0529	05/29/1998	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE E-2
MINE FILL A INITIAL CHARACTERIZATION QC SAMPLE RESULTS
NSWC CRANE

Notes:

* - Duplicate analysis not within control limits.
** - Value to be used for comparison after 4/13/98 (comparable to TCLP value times 20)
B (organics) - Detected in corresponding method blank
B (metals) - Reported value is greater than instrument detection limit but less than reporting limit
D - Secondary dilution required for analysis
E (organics) - Value is greater than highest calibration standard
E (metals) - Serial dilution performed on sample and was outside of acceptable limits
J - Estimated value
MEK - Methyl Ethyl Ketone
MIBK - Methyl Isobutyl Ketone
N - Spike sample recovery not within control limits
N/A - Not Analyzed
P - Greater than 40% difference detected between the two GC columns
U - not detected
UG/KG - micrograms per kilogram
UG/L - micrograms per liter
Values **BOLD** are above reporting limits

APPENDIX F

SURVEYED DRAWINGS

TITLE	DATE
Mine Fill A - Building 158/159 *(Before Excavation)*	June 12, 1995 Revised 3/1/99 and 4/14/99
Mine Fill A - Building 157 *(Before Excavation)*	June 12, 1995 Revised 3/1/99 and 4/14/99
Mine Fill A - Building 153/154 *(Before Excavation)*	June 12, 1995 Revised 3/1/99 and 4/14/99
Mine Fill A - Building 152 *(Before Excavation)*	June 12, 1995 Revised 3/1/99 and 4/14/99
Mine Fill A - Sample Locations and Excavated Area, Building 158/159 *(West side of Building)*	April 13, 1999
Mine Fill A - Sample Locations and Excavated Area, Building 158/159 *(East side of Building)*	December 30, 1998
Mine Fill A - Sample Locations and Excavated Area, Building 157 *(West side of Building)*	May 12, 1999
Mine Fill A - Sample Locations and Excavated Area, Building 157 *(East side of Building)*	June 24, 1999
Mine Fill A - Sample Locations and Excavated Area, Building 153/154	October 28, 1998
Mine Fill A - Building 152 *(Sample Locations and Excavated Area - west side of Building)*	July 12, 1999
Mine Fill A - Sample Locations & Excavation Area @ Building 152 *(East side of Building)*	March 1, 1999
Mine Fill A - Building 157, As-Built Locations Done June 7, 1999 Backfill Locations *(West side of Building)*	May 12, 1999
Mine Fill A - Building 157, As-Built Locations Done October 20, 1999 Backfill Locations *(East side of Building)*	October 29, 1999
Mine Fill A - Building 158/159, As-Built Locations Done October 21,00 Backfill Locations	October 30, 2000
Mine Fill A - Building 153/154, As-Built Locations Done October 21,00 Backfill Locations	October 30, 2000
Mine Fill A - Bulding 152, As-Built Locations Done October 18, 1999	November 7, 2000

APPENDIX G

POST-EXCAVATION GRID SAMPLE LOCATION DRAWINGS

FIGURE	TITLE
G1	PES RESULTS, MINE FILL A, BUILDING 153/154
G2	PES RESULTS, MINE FILL A, BUILDING 158/159
G3	PES RESULTS, MINE FILL A, BUILDING 152
G4	PES RESULTS, MINE FILL A, BUILDING 157

APPENDIX H

POST-EXCAVATION SAMPLE RESULTS

TABLE		PAGES
H-1	Mine Fill A Post-Excavation Sample Results	45 pages
H-2	Mine Fill A Post-Excavation QC Sample Results	4 pages

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MPSPES05	08/29/97	1	6 - 12	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MPSPES06	08/29/97	1	12 - 18	MK	6 U	12 U	120 B	4 J	6 U	6 U	N/A
MPSPES07	08/29/97	2	6 - 12	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MPSPES08	08/29/97	2	12 - 18	MK	6 U	12 U	200 B	5 J	6 U	6 U	N/A
MFAPES009	07/22/98	148	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES010	07/22/98	148	6 - 6	MK	4 J	11 U	200 B	5 U	5 U	5 U	N/A
MFAPES011	07/22/98	147	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES012	07/22/98	147	6 - 6	MK	4 U	10 U	13 B	4 U	4 U	4 U	N/A
MFAPES013	07/22/98	146	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES013FD	07/22/98	146	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES014	07/22/98	146	6 - 6	MK	6 U	12 U	16 B	6 U	6 U	6 U	N/A
MFAPES015	07/22/98	145	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES016	07/22/98	145	6 - 6	MK	4 U	10 U	27 B	4 U	4 U	4 U	N/A
MFAPES017	07/22/98	41	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES018	07/22/98	41	6 - 6	MK	4 U	10 U	51 B	4 U	4 U	4 U	N/A
MFAPES019	07/22/98	42	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES020	07/22/98	42	6 - 6	MK	7 U	15 U	70 B	7 U	7 U	7 U	N/A
MFAPES021	07/22/98	144	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES022	07/22/98	144	6 - 6	MK	6 U	11 U	11 U	6 U	6 U	6 U	N/A
MFAPES025	08/03/98	136	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES026	08/03/98	136	6 - 6	MK	6 U	6 U	12	4 JB	6 U	6 J	N/A
MFAPES027	09/08/98	20	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES028	09/08/98	20	6 - 6	MK	5 U	11 U	10 J	5 U	5 U	5 U	N/A
MFAPES029	09/08/98	22	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES030	09/08/98	22	6 - 6	MK	5 U	11 U	15	5 U	5 U	5 U	N/A
MFAPES031	09/08/98	140	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES032	09/08/98	140	6 - 6	MK	6 U	12 U	16	6 U	6 U	6 U	N/A
MFAPES033	09/08/98	140	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES034	09/08/98	140	Sidewall	MK	5 U	11 U	11 U	5 U	5 U	5 U	N/A
MFAPES035	09/08/98	163	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES035FD	09/08/98	163	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES036	09/08/98	163	6 - 6	MK	4 U	10 U	21	4 U	4 U	4 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MPSPES05	08/29/97	1	6 - 12	MK	4,800	260 U	N/A	**33,800 DJ**	250 U	650 U	250 U
MPSPES06	08/29/97	1	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSPES07	08/29/97	2	6 - 12	MK	5,030	260 U	N/A	**22,800**	250 U	650 U	250 U
MPSPES08	08/29/97	2	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES009	07/22/98	148	0 - 6	MK	1,450 J	260 U	250 U	2,770	250 U	650 U	250 U
MFAPES010	07/22/98	148	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES011	07/22/98	147	0 - 6	MK	2,580	260 U	250 U	***4,510***	250 U	650 U	250 U
MFAPES012	07/22/98	147	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES013	07/22/98	146	0 - 6	MK	2,560	260 U	250 U	***6,670***	250 U	650 U	250 U
MFAPES013FD	07/22/98	146	0 - 6	MK	2,680	260 U	250 U	***7,970***	250 U	650 U	250 U
MFAPES014	07/22/98	146	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES015	07/22/98	145	0 - 6	MK	2,420	260 U	250 U	***7,600***	250 U	650 U	250 U
MFAPES016	07/22/98	145	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES017	07/22/98	41	0 - 6	MK	2,700	260 U	250 U	***10,200***	250 U	650 U	103 J
MFAPES018	07/22/98	41	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES019	07/22/98	42	0 - 6	MK	2,570	260 U	250 U	***6,780***	250 U	650 U	250 U
MFAPES020	07/22/98	42	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES021	07/22/98	144	0 - 6	MK	2,550	260 U	250 U	***6,890***	250 U	650 U	250 U
MFAPES022	07/22/98	144	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES025	08/03/98	136	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES026	08/03/98	136	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES027	09/08/98	20	0 - 6	MK	1,200 J	260 U	250 U	***4,610***	250 U	650 U	250 U
MFAPES028	09/08/98	20	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES029	09/08/98	22	0 - 6	MK	822 J	260 U	250 U	2,030	250 U	650 U	168 J
MFAPES030	09/08/98	22	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES031	09/08/98	140	0 - 6	MK	1,550 J	260 U	250 U	***6,140***	250 U	650 U	250 U
MFAPES032	09/08/98	140	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES033	09/08/98	140	Sidewall	MK	4,600	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES034	09/08/98	140	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES035	09/08/98	163	0 - 6	MK	2,050 J	260 U	250 U	***10,700***	250 U	650 U	250 U
MFAPES035FD	09/08/98	163	0 - 6	MK	1,710 J	260 U	250 U	***5,860***	250 U	650 U	250 U
MFAPES036	09/08/98	163	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MPSPES05	08/29/97	1	6 - 12	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	N/A
MPSPES06	08/29/97	1	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSPES07	08/29/97	2	6 - 12	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	N/A
MPSPES08	08/29/97	2	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES009	07/22/98	148	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,410,000 *
MFAPES010	07/22/98	148	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES011	07/22/98	147	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,900,000 *
MFAPES012	07/22/98	147	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES013	07/22/98	146	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,200,000 *
MFAPES013FD	07/22/98	146	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	14,200,000 *
MFAPES014	07/22/98	146	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES015	07/22/98	145	0 - 6	MK	250 U	260 U	310	250 U	250 U	250 U	250 U	11,700,000 *
MFAPES016	07/22/98	145	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES017	07/22/98	41	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,200,000 *
MFAPES018	07/22/98	41	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES019	07/22/98	42	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,500,000 *
MFAPES020	07/22/98	42	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES021	07/22/98	144	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,800,000 *
MFAPES022	07/22/98	144	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES025	08/03/98	136	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,900,000
MFAPES026	08/03/98	136	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES027	09/08/98	20	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,500,000
MFAPES028	09/08/98	20	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES029	09/08/98	22	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,500,000
MFAPES030	09/08/98	22	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES031	09/08/98	140	0 - 6	MK	250 U	260 U	67.400 J	250 U	250 U	250 U	250 U	11,600,000
MFAPES032	09/08/98	140	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES033	09/08/98	140	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	19,700,000
MFAPES034	09/08/98	140	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES035	09/08/98	163	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,200,000
MFAPES035FD	09/08/98	163	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,800,000
MFAPES036	09/08/98	163	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MPSPES05	08/29/97	1	6 - 12	MK	N/A	89,100	470 B	16,200	14,700	N/A	N/A	N/A
MPSPES06	08/29/97	1	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MPSPES07	08/29/97	2	6 - 12	MK	N/A	95,700	390 B	14,700	14,700	N/A	N/A	N/A
MPSPES08	08/29/97	2	12 - 18	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES009	07/22/98	148	0 - 6	MK	N/A	48,500	30 U	11,200	9,600 B	40 NU	N/A	N/A
MFAPES010	07/22/98	148	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES011	07/22/98	147	0 - 6	MK	N/A	68,100	40 U	16,400	11,500 B	40 NU	N/A	N/A
MFAPES012	07/22/98	147	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES013	07/22/98	146	0 - 6	MK	N/A	61,800	30 U	13,200	10,700 B	40 NU	N/A	N/A
MFAPES013FD	07/22/98	146	0 - 6	MK	N/A	56,300	30 U	16,700	10,600 B	70 N	N/A	N/A
MFAPES014	07/22/98	146	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES015	07/22/98	145	0 - 6	MK	N/A	95,000	30 U	18,000	11,200 B	40 NU	N/A	N/A
MFAPES016	07/22/98	145	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES017	07/22/98	41	0 - 6	MK	N/A	75,500	30 U	20,400	11,400	40 NU	N/A	N/A
MFAPES018	07/22/98	41	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES019	07/22/98	42	0 - 6	MK	N/A	84,600	30 U	16,500	9,600 B	40 NU	N/A	N/A
MFAPES020	07/22/98	42	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES021	07/22/98	144	0 - 6	MK	N/A	50,900	30 U	12,900	9,000 B	40 NU	N/A	N/A
MFAPES022	07/22/98	144	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES025	08/03/98	136	0 - 6	MK	N/A	79,900	290 B	20,900	9,700 B	40 U	N/A	N/A
MFAPES026	08/03/98	136	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES027	09/08/98	20	0 - 6	MK	N/A	295,000	40 U	17,500 N*	9,500 B	40 NU	N/A	N/A
MFAPES028	09/08/98	20	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES029	09/08/98	22	0 - 6	MK	N/A	80,300	30	21,100 N*	36,800	40 NU	N/A	N/A
MFAPES030	09/08/98	22	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES031	09/08/98	140	0 - 6	MK	N/A	189,000	30 U	18,900 N*	10,400 B	40 NU	N/A	N/A
MFAPES032	09/08/98	140	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES033	09/08/98	140	Sidewall	MK	N/A	65,300	30 U	24,200 N*	14,500 B	120 N	N/A	N/A
MFAPES034	09/08/98	140	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES035	09/08/98	163	0 - 6	MK	N/A	48,400	30	33,100 N*	12,800 B	70 N	N/A	N/A
MFAPES035FD	09/08/98	163	0 - 6	MK	N/A	48,700	30 U	25,300 N*	14,700 B	40 NU	N/A	N/A
MFAPES036	09/08/98	163	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES037	09/09/98	163	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES038	09/09/98	163	Sidewall	MK	4 U	10 U	7 J	4 U	4 U	5 U	N/A
MFAPES039	09/09/98	164	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES040	09/09/98	164	6 - 6	MK	4 U	9 U	27	4 U	4 U	4 U	N/A
MFAPES041	09/09/98	164	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES042	09/09/98	164	Sidewall	MK	5 U	9 U	44	5 U	5 U	5 U	N/A
MFAPES043	09/09/98	165	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES044	09/09/98	165	6 - 6	MK	4 U	9 U	14	4 U	4 U	4 U	N/A
MFAPES045	09/09/98	165	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES046	09/09/98	165	Sidewall	MK	4 U	9 U	14	4 U	4 U	4 U	N/A
MFAPES047	09/10/98	176	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES048	09/10/98	176	6 - 6	MK	5 U	5 U	52	5 U	5 U	5 U	N/A
MFAPES049	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES050	09/10/98	176	Sidewall	MK	5 U	5 U	29	5 U	5 U	5 U	N/A
MFAPES051	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES052	09/10/98	176	Sidewall	MK	10 U	10 U	10 U	10 U	10 U	10 U	N/A
MFAPES053	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES054	09/10/98	176	Sidewall	MK	6 U	6 U	35	6 U	6 U	6 U	N/A
MFAPES055	09/10/98	166	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES056	09/10/98	166	6 - 6	MK	5 U	5 U	3 J	5 U	5 U	5 U	N/A
MFAPES057	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES058	09/14/98	166	Sidewall	MK	7 U	7 U	7 U	7 U	7 U	7 U	N/A
MFAPES059	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES060	09/14/98	166	Sidewall	MK	5 U	5 U	2 J	5	5 U	5 U	N/A
MFAPES061	09/14/98	167	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES062	09/14/98	167	6 - 6	MK	5 U	5 U	12	5 J	5 U	5 U	N/A
MFAPES063	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES064	09/14/98	167	Sidewall	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES065	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES066	09/14/98	167	Sidewall	MK	6 U	6 U	10	6	6 U	6 U	N/A
MFAPES067	09/30/98	18	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES067FD	09/30/98	18	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES037	09/09/98	163	Sidewall	MK	5,150	260 U	250 U	227 JP	250 U	650 U	250 U
MFAPES038	09/09/98	163	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES039	09/09/98	164	0 - 6	MK	3,350	260 U	250 U	***10,600***	250 U	650 U	250 U
MFAPES040	09/09/98	164	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES041	09/09/98	164	Sidewall	MK	6,760	260 U	250 U	549 J	250 U	650 U	250 U
MFAPES042	09/09/98	164	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES043	09/09/98	165	0 - 6	MK	2,740	260 U	250 U	***4,570***	250 U	650 U	250 U
MFAPES044	09/09/98	165	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES045	09/09/98	165	Sidewall	MK	3,830	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES046	09/09/98	165	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES047	09/10/98	176	0 - 6	MK	3,300	260 U	250 U	***4,560***	250 U	650 U	250 U
MFAPES048	09/10/98	176	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES049	09/10/98	176	Sidewall	MK	8,950	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES050	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES051	09/10/98	176	Sidewall	MK	2,040 J	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES052	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES053	09/10/98	176	Sidewall	MK	6,050	260 U	250 U	115 JP	250 U	650 U	250 U
MFAPES054	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES055	09/10/98	166	0 - 6	MK	3,860	260 U	250 U	***5,860***	250 U	650 U	250 U
MFAPES056	09/10/98	166	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES057	09/14/98	166	Sidewall	MK	8,340	260 U	250 U	**25,300**	250 U	650 U	250 U
MFAPES058	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES059	09/14/98	166	Sidewall	MK	3,900	260 U	250 U	***5,570***	250 U	650 U	250 U
MFAPES060	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES061	09/14/98	167	0 - 6	MK	1,770 J	260 U	250 U	***4,300***	250 U	650 U	250 U
MFAPES062	09/14/98	167	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES063	09/14/98	167	Sidewall	MK	7,320	260 U	250 U	***4,140***	250 U	650 U	250 U
MFAPES064	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES065	09/14/98	167	Sidewall	MK	5,470	260 U	250 U	***13,100***	250 U	650 U	250 U
MFAPES066	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES067	09/30/98	18	0 - 6	MK	2,290	260 U	250 U	***5,880***	250 U	650 U	306
MFAPES067FD	09/30/98	18	0 - 6	MK	2,330	260 U	250 U	***6,480***	250 U	650 U	113 J

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES037	09/09/98	163	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	18,300,000
MFAPES038	09/09/98	163	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES039	09/09/98	164	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,000,000
MFAPES040	09/09/98	164	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES041	09/09/98	164	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	16,200,000
MFAPES042	09/09/98	164	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES043	09/09/98	165	0 - 6	MK	250 U	260 U	252	89.100 J	250 U	250 U	250 U	9,860,000
MFAPES044	09/09/98	165	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES045	09/09/98	165	Sidewall	MK	250 U	260 U	57.700 J	133 J	250 U	250 U	250 U	16,600,000
MFAPES046	09/09/98	165	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES047	09/10/98	176	0 - 6	MK	250 U	260 U	52.400 J	73.800 J	250 U	250 U	250 U	11,000,000
MFAPES048	09/10/98	176	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES049	09/10/98	176	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,400,000
MFAPES050	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES051	09/10/98	176	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	19,200,000
MFAPES052	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES053	09/10/98	176	Sidewall	MK	250 U	260 U	54.800 J	101 J	250 U	250 U	250 U	15,800,000
MFAPES054	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES055	09/10/98	166	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,370,000
MFAPES056	09/10/98	166	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES057	09/14/98	166	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	14,400,000
MFAPES058	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES059	09/14/98	166	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,100,000
MFAPES060	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES061	09/14/98	167	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,440,000
MFAPES062	09/14/98	167	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES063	09/14/98	167	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,480,000
MFAPES064	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES065	09/14/98	167	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,770,000
MFAPES066	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES067	09/30/98	18	0 - 6	MK	250 U	260 U	127 J	210 J	250 U	250 U	250 U	8,020,000
MFAPES067FD	09/30/98	18	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES037	09/09/98	163	Sidewall	MK	N/A	71,100	200 B	24,500	18,100 B	60 N	N/A	N/A
MFAPES038	09/09/98	163	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES039	09/09/98	164	0 - 6	MK	N/A	37,700	210 B	32,800	14,100 B	40 NU	N/A	N/A
MFAPES040	09/09/98	164	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES041	09/09/98	164	Sidewall	MK	N/A	61,000	150 B	19,900	14,100 B	120 N	N/A	N/A
MFAPES042	09/09/98	164	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES043	09/09/98	165	0 - 6	MK	N/A	43,300	140 B	14,300	12,500 B	40 NU	N/A	N/A
MFAPES044	09/09/98	165	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES045	09/09/98	165	Sidewall	MK	N/A	62,300	220 B	29,800	19,300 B	40 NU	N/A	N/A
MFAPES046	09/09/98	165	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES047	09/10/98	176	0 - 6	MK	N/A	40,600	30 U	22,100	12,400 ENB	40 U	N/A	N/A
MFAPES048	09/10/98	176	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES049	09/10/98	176	Sidewall	MK	N/A	121,000	30 U	55,100	41,300 EN	40	N/A	N/A
MFAPES050	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES051	09/10/98	176	Sidewall	MK	N/A	63,800	30 U	20,800	17,100 ENB	40 U	N/A	N/A
MFAPES052	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES053	09/10/98	176	Sidewall	MK	N/A	51,000	160 B	18,900	18,200 ENB	70	N/A	N/A
MFAPES054	09/10/98	176	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES055	09/10/98	166	0 - 6	MK	N/A	37,600	30 U	14,100	10,000 ENB	40 U	N/A	N/A
MFAPES056	09/10/98	166	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES057	09/14/98	166	Sidewall	MK	N/A	53,900	260 B	19,400	12,700 B	40 U	N/A	N/A
MFAPES058	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES059	09/14/98	166	Sidewall	MK	N/A	48,700	200 B	18,200	9,600 B	40 U	N/A	N/A
MFAPES060	09/14/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES061	09/14/98	167	0 - 6	MK	N/A	36,900	200 B	16,200	9,000 B	40 U	N/A	N/A
MFAPES062	09/14/98	167	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES063	09/14/98	167	Sidewall	MK	N/A	27,700	200 B	16,000	11,000 B	40 U	N/A	N/A
MFAPES064	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES065	09/14/98	167	Sidewall	MK	N/A	24,700	470 B	12,000	10,000 B	40 U	N/A	N/A
MFAPES066	09/14/98	167	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES067	09/30/98	18	0 - 6	MK	N/A	51,800	30 U	11,200	8,800 B	70	N/A	N/A
MFAPES067FD	09/30/98	18	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES068	09/30/98	18	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES069	09/30/98	17	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES070	09/30/98	17	6 - 6	MK	5 U	5 U	5 U	4 J	5 U	5 U	N/A
MFAPES071	09/30/98	8	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES072	09/30/98	8	6 - 6	MK	5 U	5 U	5 U	8	5 U	5 U	N/A
MFAPES073	09/30/98	139	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES074	09/30/98	139	6 - 6	MK	5 U	5 U	11 B	8	5 U	5 U	N/A
MFAPES075	10/01/98	7	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES076	10/01/98	7	6 - 6	MK	5 U	5 U	44	3 J	5 U	5 U	N/A
MFAPES077	10/01/98	6	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES078	10/01/98	6	6 - 6	MK	6 U	6 U	22	4 J	6 U	6 U	N/A
MFAPES079	10/01/98	9	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES080	10/01/98	9	6 - 6	MK	5 U	5 U	45	4 J	5 U	5 U	N/A
MFAPES081	10/01/98	16	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES082	10/01/98	16	6 - 6	MK	5 U	5 U	46	4 J	5 U	5 U	N/A
MFAPES083	10/01/98	138	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES084	10/01/98	138	6 - 6	MK	6 U	6 U	6 U	4 J	6 U	6 U	N/A
MFAPES085	10/01/98	137	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES086	10/01/98	137	6 - 6	MK	5 U	5 U	26 B	9	5 U	5 U	N/A
MFAPES088	10/13/98	200	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES088FD	10/13/98	200	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES089	10/13/98	200	6 - 6	MK	5 U	5 U	38	2 J	5 U	5 U	N/A
MFAPES090	10/13/98	200	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES091	10/13/98	201	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES092	10/13/98	201	6 - 6	MK	5 U	5 U	35	3 J	5 U	5 U	N/A
MFAPES093	10/14/98	122	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES094	10/14/98	122	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES095	10/14/98	127	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES096	10/14/98	127	6 - 6	MK	5 U	5 U	21	5 U	5 U	5 U	N/A
MFAPES097	10/14/98	128	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES098	10/14/98	128	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES068	09/30/98	18	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES069	09/30/98	17	0 - 6	MK	8,820	260 U	250 U	**61,800 D**	250 U	650 U	306
MFAPES070	09/30/98	17	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES071	09/30/98	8	0 - 6	MK	4,360	260 U	250 U	***11,100***	250 U	650 U	201 J
MFAPES072	09/30/98	8	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES073	09/30/98	139	0 - 6	MK	952 J	260 U	250 U	***4,890***	250 U	650 U	135 J
MFAPES074	09/30/98	139	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES075	10/01/98	7	0 - 6	MK	1,460 J	260 U	250 U	3,410	250 U	650 U	364
MFAPES076	10/01/98	7	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES077	10/01/98	6	0 - 6	MK	1,070 J	260 U	250 U	***6,540***	250 U	650 U	250 U
MFAPES078	10/01/98	6	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES079	10/01/98	9	0 - 6	MK	1,710 J	260 U	250 U	3,370	250 U	650 U	271
MFAPES080	10/01/98	9	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES081	10/01/98	16	0 - 6	MK	949 J	260 U	250 U	***7,000***	250 U	650 U	65.4 J
MFAPES082	10/01/98	16	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES083	10/01/98	138	0 - 6	MK	1,740 J	260 U	250 U	***5,240***	250 U	650 U	104 J
MFAPES084	10/01/98	138	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES085	10/01/98	137	0 - 6	MK	1,940 J	260 U	250 U	***11,500***	250 U	650 U	250 U
MFAPES086	10/01/98	137	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES088	10/13/98	200	0 - 6	MK	11,400	260 U	250 U	**22,800**	250 U	650 U	267
MFAPES088FD	10/13/98	200	0 - 6	MK	9,130	260 U	250 U	19,400	250 U	650 U	314 P
MFAPES089	10/13/98	200	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES090	10/13/98	200	Sidewall	MK	1,220 J	260 U	250 U	**17,500**	250 U	650 U	250 U
MFAPES091	10/13/98	201	0 - 6	MK	1,540 J	248 U	238 U	***7,250***	238 U	619 U	1,340
MFAPES092	10/13/98	201	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES093	10/14/98	122	0 - 6	MK	3,690	260 U	250 U	***16,000***	250 U	650 U	140 J
MFAPES094	10/14/98	122	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES095	10/14/98	127	0 - 6	MK	27,500	260 U	250 U	**GT 103,000 E**	250 U	650 U	285 P
MFAPES096	10/14/98	127	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES097	10/14/98	128	0 - 6	MK	15,500	260 U	250 U	**108,000 D**	250 U	650 U	237 J
MFAPES098	10/14/98	128	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES068	09/30/98	18	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES069	09/30/98	17	0 - 6	MK	250 U	260 U	102 J	230 J	250 U	250 U	250 U	12,300,000
MFAPES070	09/30/98	17	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES071	09/30/98	8	0 - 6	MK	250 U	457 P	250 U	250 U	250 U	250 U	250 U	5,190,000
MFAPES072	09/30/98	8	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES073	09/30/98	139	0 - 6	MK	250 U	260 U	160 J	92.300 J	250 U	250 U	250 U	6,360,000
MFAPES074	09/30/98	139	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES075	10/01/98	7	0 - 6	MK	250 U	260 U	189 J	216 J	250 U	250 U	250 U	6,730,000
MFAPES076	10/01/98	7	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES077	10/01/98	6	0 - 6	MK	250 U	260 U	202 J	250 U	250 U	250 U	250 U	6,370,000
MFAPES078	10/01/98	6	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES079	10/01/98	9	0 - 6	MK	250 U	260 U	459	382	250 U	250 U	250 U	6,860,000
MFAPES080	10/01/98	9	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES081	10/01/98	16	0 - 6	MK	250 U	260 U	123 J	250 U	250 U	250 U	250 U	6,450,000
MFAPES082	10/01/98	16	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES083	10/01/98	138	0 - 6	MK	250 U	260 U	237 J	128 J	250 U	250 U	250 U	6,030,000
MFAPES084	10/01/98	138	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES085	10/01/98	137	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	6,330,000
MFAPES086	10/01/98	137	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES088	10/13/98	200	0 - 6	MK	250 U	178 J	250 U	250 U	250 U	250 U	250 U	7,820,000
MFAPES088FD	10/13/98	200	0 - 6	MK	250 U	260 U	214 JP	254	250 U	250 U	250 U	N/A
MFAPES089	10/13/98	200	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES090	10/13/98	200	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,540,000
MFAPES091	10/13/98	201	0 - 6	MK	238 U	248 U	189 J	237 J	238 U	238 U	238 U	3,310,000
MFAPES092	10/13/98	201	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES093	10/14/98	122	0 - 6	MK	250 U	260 U	107 J	81.800 J	250 U	250 U	250 U	13,900,000
MFAPES094	10/14/98	122	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES095	10/14/98	127	0 - 6	MK	250 U	260 U	169 J	236 JP	250 U	250 U	250 U	10,500,000
MFAPES096	10/14/98	127	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES097	10/14/98	128	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,300,000
MFAPES098	10/14/98	128	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES068	09/30/98	18	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES069	09/30/98	17	0 - 6	MK	N/A	54,000	30 U	15,700	11,800 B	160	N/A	N/A
MFAPES070	09/30/98	17	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES071	09/30/98	8	0 - 6	MK	N/A	40,300	30 U	7,300	7,400 B	50	N/A	N/A
MFAPES072	09/30/98	8	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES073	09/30/98	139	0 - 6	MK	N/A	61,100	30 U	28,000	10,300 B	50	N/A	N/A
MFAPES074	09/30/98	139	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES075	10/01/98	7	0 - 6	MK	N/A	32,000	50 B	9,700	7,300 B	200 N*	N/A	N/A
MFAPES076	10/01/98	7	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES077	10/01/98	6	0 - 6	MK	N/A	44,100	40 B	10,400	7,600 B	80 N*	N/A	N/A
MFAPES078	10/01/98	6	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES079	10/01/98	9	0 - 6	MK	N/A	41,700	70 B	14,300	12,000 B	40 N*U	N/A	N/A
MFAPES080	10/01/98	9	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES081	10/01/98	16	0 - 6	MK	N/A	78,400	30 U	19,000	9,100 B	40 N*U	N/A	N/A
MFAPES082	10/01/98	16	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES083	10/01/98	138	0 - 6	MK	N/A	53,200	30 U	12,800	13,000 B	110 N*	N/A	N/A
MFAPES084	10/01/98	138	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES085	10/01/98	137	0 - 6	MK	N/A	163,000	30 U	13,300	9,500 B	160 N*	N/A	N/A
MFAPES086	10/01/98	137	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES088	10/13/98	200	0 - 6	MK	N/A	90,500	240 B	9,100 N	10,600 B	20 U	N/A	N/A
MFAPES088FD	10/13/98	200	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES089	10/13/98	200	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES090	10/13/98	200	Sidewall	MK	N/A	60,500	40 U	11,000 N	12,700 B	80	N/A	N/A
MFAPES091	10/13/98	201	0 - 6	MK	N/A	36,200	30 U	4,400 N	3,700 B	20 U	N/A	N/A
MFAPES092	10/13/98	201	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES093	10/14/98	122	0 - 6	MK	N/A	53,700	40 U	19,000	13,100 B	40	N/A	N/A
MFAPES094	10/14/98	122	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES095	10/14/98	127	0 - 6	MK	N/A	223,000	30 U	15,400	12,000 B	40	N/A	N/A
MFAPES096	10/14/98	127	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES097	10/14/98	128	0 - 6	MK	N/A	93,000	40 U	17,100	14,800 B	40	N/A	N/A
MFAPES098	10/14/98	128	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES099	10/14/98	13	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES100	10/14/98	13	6 - 6	MK	5 U	5 U	11	10	5 U	5 U	N/A
MFAPES101	10/14/98	14	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES102	10/14/98	14	6 - 6	MK	5 U	5 U	21	5 U	5 U	5 U	N/A
MFAPES103	10/15/98	123	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES104	10/15/98	123	6 - 6	MK	5 U	5 U	21	5 U	5 U	5 U	N/A
MFAPES105	10/15/98	124	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES106	10/15/98	124	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES107	10/15/98	125	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES107FD	10/15/98	125	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES108	10/15/98	125	6 - 6	MK	5 U	5 U	68	5 U	5 U	5 U	N/A
MFAPES109	10/15/98	126	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES110	10/15/98	126	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES111	10/15/98	3	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES112	10/15/98	3	6 - 6	MK	5 U	5 U	70	5 U	5 U	5 U	N/A
MFAPES113	10/15/98	4	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES114	10/15/98	4	6 - 6	MK	5 U	5 U	16	5 U	5 U	5	N/A
MFAPES115	10/15/98	4	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES116	10/15/98	4	Sidewall	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES117	10/15/98	134	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES118	10/15/98	134	6 - 6	MK	6 U	6 U	17	6 U	6 U	6 U	N/A
MFAPES119	10/20/98	134	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES120	10/20/98	134	Sidewall	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES121	10/20/98	5	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES122	10/20/98	5	6 - 6	MK	5 U	5 U	6	5 U	5 U	5 U	N/A
MFAPES123	10/20/98	202	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES124	10/20/98	202	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES125	10/20/98	203	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES126	10/20/98	203	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES127	10/20/98	203	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES099	10/14/98	13	0 - 6	MK	457 JP	260 U	250 U	1,760	250 U	650 U	250 U
MFAPES100	10/14/98	13	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES101	10/14/98	14	0 - 6	MK	1,220 J	260 U	250 U	***6,100***	250 U	650 U	250 U
MFAPES102	10/14/98	14	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES103	10/15/98	123	0 - 6	MK	1,980 J	248 U	238 U	***5,270***	238 U	619 U	238 U
MFAPES104	10/15/98	123	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES105	10/15/98	124	0 - 6	MK	6,260	260 U	250 U	***8,210***	250 U	650 U	103 J
MFAPES106	10/15/98	124	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES107	10/15/98	125	0 - 6	MK	1,210 J	260 U	250 U	3,700	250 U	650 U	250 U
MFAPES107FD	10/15/98	125	0 - 6	MK	837 J	248 U	238 U	2,690	238 U	619 U	238 U
MFAPES108	10/15/98	125	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES109	10/15/98	126	0 - 6	MK	8,940	260 U	250 U	**28,900**	250 U	650 U	250 U
MFAPES110	10/15/98	126	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES111	10/15/98	3	0 - 6	MK	45,500	248 U	238 U	**428,000 D**	238 U	619 U	8,110
MFAPES112	10/15/98	3	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES113	10/15/98	4	0 - 6	MK	107,000 DJ	260 U	250 U	**1,000,000 D**	250 U	650 U	7,140
MFAPES114	10/15/98	4	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES115	10/15/98	4	Sidewall	MK	67,500	260 U	250 U	**555,000 D**	250 U	650 U	2,660
MFAPES116	10/15/98	4	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES117	10/15/98	134	0 - 6	MK	171,000 DJ	248 U	238 U	**1,530,000 D**	238 U	619 U	618
MFAPES118	10/15/98	134	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES119	10/20/98	134	Sidewall	MK	GT 326,000 E	248 U	238 U	**GT 1,940,000 E**	238 U	619 U	2,770
MFAPES120	10/20/98	134	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES121	10/20/98	5	0 - 6	MK	20,000	260 U	250 U	**GT 246,000 E**	250 U	650 U	14,200
MFAPES122	10/20/98	5	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES123	10/20/98	202	0 - 6	MK	10,400	260 U	250 U	**GT 55,200 E**	250 U	650 U	656
MFAPES124	10/20/98	202	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES125	10/20/98	203	0 - 6	MK	3,550	260 U	250 U	**24,800**	250 U	650 U	1,730
MFAPES126	10/20/98	203	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES127	10/20/98	203	Sidewall	MK	5,910	248 U	238 U	**25,200**	238 U	619 U	3,740

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES099	10/14/98	13	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	16,100,000
MFAPES100	10/14/98	13	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES101	10/14/98	14	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,400,000
MFAPES102	10/14/98	14	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES103	10/15/98	123	0 - 6	MK	238 U	248 U	238 U	238 U	238 U	238 U	238 U	11,400,000
MFAPES104	10/15/98	123	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES105	10/15/98	124	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,200,000
MFAPES106	10/15/98	124	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES107	10/15/98	125	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,400,000
MFAPES107FD	10/15/98	125	0 - 6	MK	238 U	248 U	238 U	238 U	238 U	238 U	238 U	11,900,000
MFAPES108	10/15/98	125	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES109	10/15/98	126	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,500,000
MFAPES110	10/15/98	126	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES111	10/15/98	3	0 - 6	MK	238 U	248 U	1,990	2,860	238 U	238 U	238 U	12,700,000
MFAPES112	10/15/98	3	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES113	10/15/98	4	0 - 6	MK	250 U	260 U	2,330	2,990	250 U	250 U	250 U	12,100,000
MFAPES114	10/15/98	4	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES115	10/15/98	4	Sidewall	MK	250 U	260 U	822	5,800	250 U	250 U	250 U	10,800,000
MFAPES116	10/15/98	4	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES117	10/15/98	134	0 - 6	MK	238 U	248 U	381	2,000	238 U	238 U	238 U	10,600,000
MFAPES118	10/15/98	134	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES119	10/20/98	134	Sidewall	MK	238 U	248 U	379	1,090	238 U	238 U	238 U	12,300,000
MFAPES120	10/20/98	134	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES121	10/20/98	5	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,000,000
MFAPES122	10/20/98	5	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES123	10/20/98	202	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,100,000
MFAPES124	10/20/98	202	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES125	10/20/98	203	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,400,000
MFAPES126	10/20/98	203	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES127	10/20/98	203	Sidewall	MK	238 U	248 U	742	238 U	238 U	238 U	238 U	10,100,000

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES099	10/14/98	13	0 - 6	MK	N/A	58,300	40 U	20,100	14,900 B	60	N/A	N/A
MFAPES100	10/14/98	13	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES101	10/14/98	14	0 - 6	MK	N/A	43,300	40 U	18,600	13,700 B	40 U	N/A	N/A
MFAPES102	10/14/98	14	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES103	10/15/98	123	0 - 6	MK	N/A	47,900	40 U	17,700	11,300 B	40 U	N/A	N/A
MFAPES104	10/15/98	123	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES105	10/15/98	124	0 - 6	MK	N/A	58,500	70 B	15,900	10,100 B	40 U	N/A	N/A
MFAPES106	10/15/98	124	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES107	10/15/98	125	0 - 6	MK	N/A	48,700	30 U	15,300	10,000 B	40 U	N/A	N/A
MFAPES107FD	10/15/98	125	0 - 6	MK	N/A	56,700	40 U	18,700	13,100 B	40 U	N/A	N/A
MFAPES108	10/15/98	125	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES109	10/15/98	126	0 - 6	MK	N/A	106,000	30 U	16,500	12,500 B	40 U	N/A	N/A
MFAPES110	10/15/98	126	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES111	10/15/98	3	0 - 6	MK	N/A	68,100	50 B	17,900	11,600 B	40 U	N/A	N/A
MFAPES112	10/15/98	3	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES113	10/15/98	4	0 - 6	MK	N/A	69,300	70 B	23,800	15,100 B	40 U	N/A	N/A
MFAPES114	10/15/98	4	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES115	10/15/98	4	Sidewall	MK	N/A	69,800	100 B	14,300	17,700 B	40 U	N/A	N/A
MFAPES116	10/15/98	4	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES117	10/15/98	134	0 - 6	MK	N/A	45,000	90 B	21,200	13,700 B	40 U	N/A	N/A
MFAPES118	10/15/98	134	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES119	10/20/98	134	Sidewall	MK	N/A	58,800	120 B	16,100 N	14,900 B	20 *B	N/A	N/A
MFAPES120	10/20/98	134	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES121	10/20/98	5	0 - 6	MK	N/A	48,700	100 B	20,800 N	9,300 B	30 *B	N/A	N/A
MFAPES122	10/20/98	5	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES123	10/20/98	202	0 - 6	MK	N/A	46,900	180 B	22,500 N	10,000 B	30 *B	N/A	N/A
MFAPES124	10/20/98	202	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES125	10/20/98	203	0 - 6	MK	N/A	102,000	160 B	17,500 N	20,700 B	50 *	N/A	N/A
MFAPES126	10/20/98	203	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES127	10/20/98	203	Sidewall	MK	N/A	91,100	140 B	12,400 N	14,200 B	160 *	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES127FD	10/20/98	203	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES128	10/20/98	203	Sidewall	MK	5 U	5 U	30	5 U	3 J	5 U	N/A
MFAPES129	10/20/98	45	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES130	10/20/98	45	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES131	10/20/98	48	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES132	10/20/98	48	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES133	10/20/98	50	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES134	10/20/98	50	6 - 6	MK	5 U	5 U	78	5 U	5 U	5 U	N/A
MFAPES135	10/20/98	52	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES136	10/20/98	52	6 - 6	MK	5 U	5 U	16	5 U	5 U	5 U	N/A
MFAPES137	10/22/98	54	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES138	10/22/98	54	6 - 6	MK	5 U	5 U	5 U	7 B	5 U	5 U	N/A
MFAPES139	10/22/98	56	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES140	10/22/98	56	6 - 6	MK	6 U	6 U	6 U	10 B	6 U	6 U	N/A
MFAPES141	10/22/98	49	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES142	10/22/98	49	6 - 6	MK	5 U	5 U	5 U	6 B	5 U	5 U	N/A
MFAPES143	10/22/98	43	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES144	10/22/98	43	6 - 6	MK	5 U	5 U	5 U	8 B	5 U	5 U	N/A
MFAPES145	10/23/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES146	10/26/98	166	Sidewall	MK	6 U	6 U	190	6 U	6 U	6 U	N/A
MFAPES147	10/26/98	143	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES147FD	10/26/98	143	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES148	10/26/98	143	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES149	10/28/98	15	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES150	10/28/98	15	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES151	10/28/98	142	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES152	10/28/98	142	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES153	10/28/98	1	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES154	10/28/98	1	6 - 6	MK	6 U	6 U	6 U	21	6 U	6 U	N/A
MFAPES155	10/26/98	2	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES156	10/26/98	2	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES127FD	10/20/98	203	Sidewall	MK	8,880	260 U	250 U	**GT 55,400 E**	250 U	650 U	6,640
MFAPES128	10/20/98	203	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES129	10/20/98	45	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES130	10/20/98	45	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES131	10/20/98	48	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES132	10/20/98	48	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES133	10/20/98	50	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES134	10/20/98	50	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES135	10/20/98	52	0 - 6	MK	968 J	260 U	250 U	3,230	250 U	650 U	350
MFAPES136	10/20/98	52	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES137	10/22/98	54	0 - 6	MK	4,260	260 U	250 U	***11,600***	250 U	650 U	648
MFAPES138	10/22/98	54	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES139	10/22/98	56	0 - 6	MK	23,400	260 U	250 U	**162,000 D**	250 U	650 U	***46,600 D***
MFAPES140	10/22/98	56	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES141	10/22/98	49	0 - 6	MK	4,160	260 U	250 U	***11,500***	250 U	650 U	389
MFAPES142	10/22/98	49	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES143	10/22/98	43	0 - 6	MK	6,690	260 U	250 U	***6,220***	250 U	650 U	250 U
MFAPES144	10/22/98	43	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES145	10/23/98	166	Sidewall	MK	12,000	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES146	10/26/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES147	10/26/98	143	0 - 6	MK	6,140	260 U	250 U	***5,530***	250 U	650 U	250 U
MFAPES147FD	10/26/98	143	0 - 6	MK	5,030	260 U	250 U	4,760	250 U	650 U	250 U
MFAPES148	10/26/98	143	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES149	10/28/98	15	0 - 6	MK	5,540	260 U	250 U	***9,510***	250 U	650 U	245 JP
MFAPES150	10/28/98	15	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES151	10/28/98	142	0 - 6	MK	4,120	260 U	250 U	***15,400***	250 U	650 U	152 JP
MFAPES152	10/28/98	142	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES153	10/28/98	1	0 - 6	MK	5,600	260 U	250 U	***9,360***	250 U	650 U	203 J
MFAPES154	10/28/98	1	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES155	10/26/98	2	0 - 6	MK	9,120	260 U	250 U	**51,400 D**	250 U	650 U	2,980
MFAPES156	10/26/98	2	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES127FD	10/20/98	203	Sidewall	MK	250 U	260 U	1,030	250 U	250 U	250 U	250 U	14,500,000
MFAPES128	10/20/98	203	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES129	10/20/98	45	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,200,000
MFAPES130	10/20/98	45	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES131	10/20/98	48	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,700,000
MFAPES132	10/20/98	48	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES133	10/20/98	50	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,300,000
MFAPES134	10/20/98	50	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES135	10/20/98	52	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,700,000
MFAPES136	10/20/98	52	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES137	10/22/98	54	0 - 6	MK	250 U	260 U	788	608	250 U	250 U	250 U	15,100,000
MFAPES138	10/22/98	54	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES139	10/22/98	56	0 - 6	MK	250 U	260 U	1,200	1,360	250 U	250 U	250 U	12,100,000
MFAPES140	10/22/98	56	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES141	10/22/98	49	0 - 6	MK	250 U	260 U	115 J	250 U	250 U	250 U	250 U	7,030,000
MFAPES142	10/22/98	49	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES143	10/22/98	43	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,500,000
MFAPES144	10/22/98	43	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES145	10/23/98	166	Sidewall	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15500000 *
MFAPES146	10/26/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES147	10/26/98	143	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12300000 *
MFAPES147FD	10/26/98	143	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10700000 *
MFAPES148	10/26/98	143	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES149	10/28/98	15	0 - 6	MK	250 U	260 U	331	304	250 U	250 U	250 U	16,000,000
MFAPES150	10/28/98	15	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES151	10/28/98	142	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,200,000
MFAPES152	10/28/98	142	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES153	10/28/98	1	0 - 6	MK	250 U	260 U	290	219 J	250 U	250 U	250 U	12,000,000
MFAPES154	10/28/98	1	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES155	10/26/98	2	0 - 6	MK	250 U	260 U	442	391	250 U	250 U	250 U	12,700,000 *
MFAPES156	10/26/98	2	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES127FD	10/20/98	203	Sidewall	MK	N/A	94,900	150 B	17,100 N	14,000 B	30 *B	N/A	N/A
MFAPES128	10/20/98	203	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES129	10/20/98	45	0 - 6	MK	N/A	60,200	120 B	16,600	11,400 B	40 *U	N/A	N/A
MFAPES130	10/20/98	45	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES131	10/20/98	48	0 - 6	MK	N/A	85,600	120 B	14,000	12,100 B	40 *U	N/A	N/A
MFAPES132	10/20/98	48	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES133	10/20/98	50	0 - 6	MK	N/A	39,000	90 B	16,200	10,300 B	40 *U	N/A	N/A
MFAPES134	10/20/98	50	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES135	10/20/98	52	0 - 6	MK	N/A	38,200	100 B	19,100	13,400 B	60 *	N/A	N/A
MFAPES136	10/20/98	52	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES137	10/22/98	54	0 - 6	MK	N/A	76,900	40 U	18,600 N	15,100 B	50 *	N/A	N/A
MFAPES138	10/22/98	54	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES139	10/22/98	56	0 - 6	MK	N/A	53,800	40 U	14,700 N	11,000 B	40 *	N/A	N/A
MFAPES140	10/22/98	56	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES141	10/22/98	49	0 - 6	MK	N/A	98,500	50 B	11,300 N	15,100 B	60 *	N/A	N/A
MFAPES142	10/22/98	49	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES143	10/22/98	43	0 - 6	MK	N/A	48,600	40 U	12,200 N	10,900 B	50 *	N/A	N/A
MFAPES144	10/22/98	43	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES145	10/23/98	166	Sidewall	MK	N/A	39,300	110 B	21,400 N*	14,100 EB	100	N/A	N/A
MFAPES146	10/26/98	166	Sidewall	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES147	10/26/98	143	0 - 6	MK	N/A	52,400	120 B	14,500 N*	8,800 EB	90	N/A	N/A
MFAPES147FD	10/26/98	143	0 - 6	MK	N/A	54,100	80 B	13,200 N*	11,800 EB	70	N/A	N/A
MFAPES148	10/26/98	143	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES149	10/28/98	15	0 - 6	MK	N/A	60,000	350 B	20,000	15,600 NB	40	N/A	N/A
MFAPES150	10/28/98	15	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES151	10/28/98	142	0 - 6	MK	N/A	60,800	280 B	16,100	12,900 NB	20 U	N/A	N/A
MFAPES152	10/28/98	142	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES153	10/28/98	1	0 - 6	MK	N/A	77,500	340 B	18,600	14,000 NB	20 U	N/A	N/A
MFAPES154	10/28/98	1	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES155	10/26/98	2	0 - 6	MK	N/A	79,100	110 B	18,700 N*	14,100 EB	40 U	N/A	N/A
MFAPES156	10/26/98	2	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES157	10/27/98	66	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES158	10/27/98	66	6 - 6	MK	6 U	6 U	6 U	26	6 U	6 U	N/A
MFAPES159	10/27/98	183	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES160	10/27/98	183	6 - 6	MK	7 U	7 U	50	38	7	7 U	N/A
MFAPES161	10/27/98	51	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES162	10/27/98	51	6 - 6	MK	6 U	6 U	6 U	16	6 U	6 U	N/A
MFAPES163	10/27/98	67	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES164	10/27/98	67	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES165	10/29/98	53	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES166	10/29/98	53	6 - 6	MK	5 U	5 U	5 U	9	5 U	5 U	N/A
MFAPES167	10/29/98	55	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES167FD	10/29/98	55	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES168	10/29/98	55	6 - 6	MK	5 U	5 U	5 U	8	5 U	5 U	N/A
MFAPES169	10/29/98	57	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES170	10/29/98	57	6 - 6	MK	5 U	5 U	5 U	8	5 U	5 U	N/A
MFAPES171	11/11/98	65	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES172	11/11/98	65	6 - 6	MK	5 U	5 U	68	5 U	5 U	5 U	N/A
MFAPES173	11/11/98	64	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES174	11/11/98	64	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES175	11/11/98	10	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES176	11/11/98	10	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES177	11/11/98	11	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES178	11/11/98	11	6 - 6	MK	5 U	5 U	17	5 U	5 U	5 U	N/A
MFAPES179	11/11/98	62	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES180	11/11/98	62	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES181	11/12/98	12	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES182	11/12/98	12	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES183	11/12/98	63	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES184	11/12/98	63	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES185	11/12/98	149	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES186	11/12/98	149	6 - 6	MK	6 U	6 U	58	6 U	6 U	6 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES157	10/27/98	66	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES158	10/27/98	66	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES159	10/27/98	183	0 - 6	MK	1,880 J	248 U	238 U	2,680	238 U	619 U	238 U
MFAPES160	10/27/98	183	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES161	10/27/98	51	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES162	10/27/98	51	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES163	10/27/98	67	0 - 6	MK	4,090	260 U	250 U	***16,000***	250 U	650 U	250 U
MFAPES164	10/27/98	67	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES165	10/29/98	53	0 - 6	MK	2,200	260 U	250 U	***6,110***	250 U	650 U	358
MFAPES166	10/29/98	53	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES167	10/29/98	55	0 - 6	MK	2,100 U	248 U	238 U	952 U	238 U	619 U	238 U
MFAPES167FD	10/29/98	55	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES168	10/29/98	55	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES169	10/29/98	57	0 - 6	MK	2,380	248 U	238 U	***5,390***	238 U	619 U	89.200 J
MFAPES170	10/29/98	57	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES171	11/11/98	65	0 - 6	MK	7,430	260 U	250 U	**56,200 D**	250 U	650 U	8,420
MFAPES172	11/11/98	65	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES173	11/11/98	64	0 - 6	MK	5,910	248 U	238 U	**47,300 D**	238 U	619 U	4,330
MFAPES174	11/11/98	64	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES175	11/11/98	10	0 - 6	MK	2,480	260 U	250 U	**20,500**	250 U	650 U	11,000
MFAPES176	11/11/98	10	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES177	11/11/98	11	0 - 6	MK	7,040	260 U	250 U	**40,000 D**	250 U	650 U	7,000
MFAPES178	11/11/98	11	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES179	11/11/98	62	0 - 6	MK	13,600	260 U	250 U	**64,000 D**	250 U	650 U	***21,600 D***
MFAPES180	11/11/98	62	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES181	11/12/98	12	0 - 6	MK	44,100	248 U	238 U	**246,000 D**	238 U	619 U	4,910
MFAPES182	11/12/98	12	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES183	11/12/98	63	0 - 6	MK	15,800	260 U	250 U	**115,000 D**	250 U	650 U	12,600
MFAPES184	11/12/98	63	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES185	11/12/98	149	0 - 6	MK	21,800	260 U	250 U	**98,700 D**	250 U	650 U	685
MFAPES186	11/12/98	149	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES157	10/27/98	66	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,970,000
MFAPES158	10/27/98	66	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES159	10/27/98	183	0 - 6	MK	238 U	248 U	238 U	238 U	238 U	238 U	238 U	14,200,000
MFAPES160	10/27/98	183	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES161	10/27/98	51	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,430,000
MFAPES162	10/27/98	51	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES163	10/27/98	67	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	9,790,000
MFAPES164	10/27/98	67	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES165	10/29/98	53	0 - 6	MK	250 U	260 U	142 J	130 J	250 U	250 U	250 U	11,100,000 *
MFAPES166	10/29/98	53	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES167	10/29/98	55	0 - 6	MK	238 U	248 U	238 U	238 U	238 U	238 U	238 U	13,800,000 *
MFAPES167FD	10/29/98	55	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,900,000 *
MFAPES168	10/29/98	55	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES169	10/29/98	57	0 - 6	MK	238 U	248 U	238 U	101 J	238 U	238 U	238 U	11,500,000 *
MFAPES170	10/29/98	57	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES171	11/11/98	65	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,550,000
MFAPES172	11/11/98	65	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES173	11/11/98	64	0 - 6	MK	238 U	248 U	664	1,120	238 U	238 U	238 U	7,220,000
MFAPES174	11/11/98	64	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES175	11/11/98	10	0 - 6	MK	250 U	260 U	708	250 U	250 U	250 U	250 U	9,010,000
MFAPES176	11/11/98	10	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES177	11/11/98	11	0 - 6	MK	250 U	260 U	863	1,400	250 U	250 U	250 U	9,670,000
MFAPES178	11/11/98	11	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES179	11/11/98	62	0 - 6	MK	250 U	260 U	250 U	3,120	250 U	250 U	250 U	10,400,000
MFAPES180	11/11/98	62	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES181	11/12/98	12	0 - 6	MK	238 U	248 U	524	4,760 U	238 U	238 U	238 U	13,800,000
MFAPES182	11/12/98	12	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES183	11/12/98	63	0 - 6	MK	250 U	260 U	250 U	2,110 DPJ	744	250 U	250 U	8,820,000
MFAPES184	11/12/98	63	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES185	11/12/98	149	0 - 6	MK	250 U	260 U	250 U	773 DPJ	250 U	250 U	250 U	7,420,000
MFAPES186	11/12/98	149	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES157	10/27/98	66	0 - 6	MK	N/A	67,500	190 B	15,500	15,000 B	30 *B	N/A	N/A
MFAPES158	10/27/98	66	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES159	10/27/98	183	0 - 6	MK	N/A	66,900	170 B	16,400	15,300 B	60 *	N/A	N/A
MFAPES160	10/27/98	183	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES161	10/27/98	51	0 - 6	MK	N/A	67,800	150 B	11,900	10,700 B	20 *B	N/A	N/A
MFAPES162	10/27/98	51	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES163	10/27/98	67	0 - 6	MK	N/A	55,700	220 B	13,800	13,600 B	30 *B	N/A	N/A
MFAPES164	10/27/98	67	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES165	10/29/98	53	0 - 6	MK	N/A	63,100 N*	210 N*B	14,200 N*	11,200 NB	20 U	N/A	N/A
MFAPES166	10/29/98	53	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES167	10/29/98	55	0 - 6	MK	N/A	78,100 N*	240 N*B	17,700 N*	12,400 NB	20 U	N/A	N/A
MFAPES167FD	10/29/98	55	0 - 6	MK	N/A	62,200 N*	240 N*B	18,300 N*	14,000 NB	20 U	N/A	N/A
MFAPES168	10/29/98	55	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES169	10/29/98	57	0 - 6	MK	N/A	65,900 N*	220 N*B	12,900 N*	12,700 NB	20 U	N/A	N/A
MFAPES170	10/29/98	57	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES171	11/11/98	65	0 - 6	MK	N/A	59,600	60 B	12,000 N	10,500 B	60	N/A	N/A
MFAPES172	11/11/98	65	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES173	11/11/98	64	0 - 6	MK	N/A	44,300	150 B	10,100 N	8,700 B	90	N/A	N/A
MFAPES174	11/11/98	64	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES175	11/11/98	10	0 - 6	MK	N/A	49,300	60 B	12,300 N	8,600 B	60	N/A	N/A
MFAPES176	11/11/98	10	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES177	11/11/98	11	0 - 6	MK	N/A	53,700	50 B	13,300 N	10,000 B	60	N/A	N/A
MFAPES178	11/11/98	11	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES179	11/11/98	62	0 - 6	MK	N/A	60,000	40 B	13,400 N	12,600 B	40	N/A	N/A
MFAPES180	11/11/98	62	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES181	11/12/98	12	0 - 6	MK	N/A	105,000 *	230 *B	14,200 N*	15,200 *	1,600	N/A	N/A
MFAPES182	11/12/98	12	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES183	11/12/98	63	0 - 6	MK	N/A	59,500 *	330 *B	15,700 N*	12,900 *	1,000	N/A	N/A
MFAPES184	11/12/98	63	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES185	11/12/98	149	0 - 6	MK	N/A	66,200 *	200 *B	16,500 N*	13,800 *	40	N/A	N/A
MFAPES186	11/12/98	149	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES187	11/12/98	153	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES187FD	11/12/98	153	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES188	11/12/98	153	6 - 6	MK	6 U	6 U	110	6 U	6 U	6 U	N/A
MFAPES189	11/12/98	150	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES190	11/12/98	150	6 - 6	MK	6 U	6 U	26	6 U	6 U	6 U	N/A
MFAPES191	11/13/98	182	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES192	11/16/98	182	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES193	11/13/98	151	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES194	11/16/98	151	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES195	11/13/98	70	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES196	11/16/98	70	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES197	11/13/98	58	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES198	11/16/98	58	6 - 6	MK	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES199	11/13/98	59	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES200	11/16/98	59	6 - 6	MK	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES201	11/19/98	75	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES202	11/19/98	75	6 - 6	MK	6 U	6 U	22	8 B	6 U	6 U	N/A
MFAPES203	11/19/98	76	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES204	11/19/98	76	6 - 6	MK	5 U	5 U	5 U	6 B	5 U	5 U	N/A
MFAPES205	11/19/98	77	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES206	11/19/98	77	6 - 6	MK	5 U	5 U	20	6 B	5 U	5 U	N/A
MFAPES207	11/25/98	88	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES207FD	11/25/98	88	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES208	11/30/98	88	6 - 6	MK	5 U	5 U	18	14	5 U	5 U	N/A
MFAPES209	12/09/98	74	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES210	12/09/98	74	6 - 6	MK	5 U	5 U	15 B	5 U	5 U	5 U	N/A
MFAPES211	12/09/98	73	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES212	12/09/98	73	6 - 6	MK	5 U	5 U	8 B	5 U	5 U	5 U	N/A
MFAPES213	12/09/98	72	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES214	12/09/98	72	6 - 6	MK	5 U	5 U	15 B	5 U	5 U	5 U	N/A
MFAPES215	12/09/98	71	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	250 U

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES187	11/12/98	153	0 - 6	MK	2,660	260 U	250 U	***4,220***	250 U	650 U	250 U
MFAPES187FD	11/12/98	153	0 - 6	MK	2,490	260 U	250 U	***4,480***	250 U	650 U	250 U
MFAPES188	11/12/98	153	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES189	11/12/98	150	0 - 6	MK	42,000	260 U	250 U	**215,000 D**	250 U	650 U	640
MFAPES190	11/12/98	150	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES191	11/13/98	182	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES192	11/16/98	182	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES193	11/13/98	151	0 - 6	MK	2,830	260 U	250 U	***16,100***	250 U	650 U	250 U
MFAPES194	11/16/98	151	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES195	11/13/98	70	0 - 6	MK	364 J	260 U	250 U	3,510	250 U	650 U	250 U
MFAPES196	11/16/98	70	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES197	11/13/98	58	0 - 6	MK	87,900 DJ	260 U	250 U	**752,000 D**	250 U	650 U	**262,000 D**
MFAPES198	11/16/98	58	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES199	11/13/98	59	0 - 6	MK	22,300	260 U	250 U	**144,000 D**	250 U	650 U	2,760
MFAPES200	11/16/98	59	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES201	11/19/98	75	0 - 6	MK	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES202	11/19/98	75	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES203	11/19/98	76	0 - 6	MK	601 J	260 U	250 U	632 J	250 U	650 U	1,220
MFAPES204	11/19/98	76	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES205	11/19/98	77	0 - 6	MK	1,280 J	260 U	250 U	***4,950***	250 U	650 U	250 U
MFAPES206	11/19/98	77	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES207	11/25/98	88	0 - 6	MK	2,620	260 U	250 U	2,620	250 U	650 U	250 U
MFAPES207FD	11/25/98	88	0 - 6	MK	2,300	260 U	250 U	2,500	250 U	650 U	236 J
MFAPES208	11/30/98	88	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES209	12/09/98	74	0 - 6	MK	1,240 J	260 U	250 U	3,380	250 U	650 U	250 U
MFAPES210	12/09/98	74	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES211	12/09/98	73	0 - 6	MK	1,150 J	260 U	250 U	2,640	250 U	650 U	250 U
MFAPES212	12/09/98	73	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES213	12/09/98	72	0 - 6	MK	5,800	260 U	250 U	**40,300 D**	922	650 U	***21,400 D***
MFAPES214	12/09/98	72	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES215	12/09/98	71	0 - 6	MK	4,200	260 U	250 U	***8,380***	250 U	650 U	***19,400 D***

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES187	11/12/98	153	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,400,000
MFAPES187FD	11/12/98	153	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	N/A
MFAPES188	11/12/98	153	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES189	11/12/98	150	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,400,000
MFAPES190	11/12/98	150	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES191	11/13/98	182	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,100,000
MFAPES192	11/16/98	182	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES193	11/13/98	151	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,600,000
MFAPES194	11/16/98	151	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES195	11/13/98	70	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,900,000
MFAPES196	11/16/98	70	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES197	11/13/98	58	0 - 6	MK	242 PJ	1,410	250 U	250 U	939 P	250 U	250 U	14,400,000
MFAPES198	11/16/98	58	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES199	11/13/98	59	0 - 6	MK	250 U	260 U	1,820	1,720	250 U	250 U	250 U	19,200,000
MFAPES200	11/16/98	59	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES201	11/19/98	75	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,200,000
MFAPES202	11/19/98	75	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES203	11/19/98	76	0 - 6	MK	250 U	260 U	368	240 J	250 U	250 U	250 U	14,000,000
MFAPES204	11/19/98	76	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES205	11/19/98	77	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,000,000
MFAPES206	11/19/98	77	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES207	11/25/98	88	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,900,000
MFAPES207FD	11/25/98	88	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	10,400,000
MFAPES208	11/30/98	88	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES209	12/09/98	74	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,900,000
MFAPES210	12/09/98	74	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES211	12/09/98	73	0 - 6	MK	250 U	260 U	250 U	250 U	250 U	250 U	250 U	8,780,000
MFAPES212	12/09/98	73	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES213	12/09/98	72	0 - 6	MK	250 U	260 U	250 U	1,000	250 U	250 U	250 U	10,500,000
MFAPES214	12/09/98	72	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES215	12/09/98	71	0 - 6	MK	250 U	260 U	250 U	871 P	250 U	250 U	250 U	10,500,000

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES187	11/12/98	153	0 - 6	MK	N/A	73,600 *	170 *B	15,900 N*	15,400 *	40	N/A	N/A
MFAPES187FD	11/12/98	153	0 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES188	11/12/98	153	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES189	11/12/98	150	0 - 6	MK	N/A	57,700 *	290 *B	11,800 N*	13,700 *	60	N/A	N/A
MFAPES190	11/12/98	150	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES191	11/13/98	182	0 - 6	MK	N/A	66,800	110 B	13,100	11,500 B	40 U	N/A	N/A
MFAPES192	11/16/98	182	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES193	11/13/98	151	0 - 6	MK	N/A	75,600	130 B	14,700	13,700 B	40 U	N/A	N/A
MFAPES194	11/16/98	151	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES195	11/13/98	70	0 - 6	MK	N/A	88,200	160 B	17,500	11,900 B	40 U	N/A	N/A
MFAPES196	11/16/98	70	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES197	11/13/98	58	0 - 6	MK	N/A	73,300	130 B	18,300	15,200 B	40 U	N/A	N/A
MFAPES198	11/16/98	58	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES199	11/13/98	59	0 - 6	MK	N/A	66,700	110 B	24,300	10,000 B	40 U	N/A	N/A
MFAPES200	11/16/98	59	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES201	11/19/98	75	0 - 6	MK	N/A	77,400	40 U	19,200	17,500 B	50	N/A	N/A
MFAPES202	11/19/98	75	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES203	11/19/98	76	0 - 6	MK	N/A	79,800	30 U	16,400	12,600 B	40	N/A	N/A
MFAPES204	11/19/98	76	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES205	11/19/98	77	0 - 6	MK	N/A	67,900	30 U	14,500	11,700 B	60	N/A	N/A
MFAPES206	11/19/98	77	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES207	11/25/98	88	0 - 6	MK	N/A	69,600	110 B	16,400	16,300 N	60	N/A	N/A
MFAPES207FD	11/25/98	88	0 - 6	MK	N/A	84,800	90 B	13,500	11,800 N	70	N/A	N/A
MFAPES208	11/30/98	88	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES209	12/09/98	74	0 - 6	MK	N/A	82,700	200 B	15,000	16,300 B	90	N/A	N/A
MFAPES210	12/09/98	74	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES211	12/09/98	73	0 - 6	MK	N/A	86,100	160 B	12,000	13,900 B	50	N/A	N/A
MFAPES212	12/09/98	73	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES213	12/09/98	72	0 - 6	MK	N/A	147,000	220 B	14,300	14,200 B	50	N/A	N/A
MFAPES214	12/09/98	72	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES215	12/09/98	71	0 - 6	MK	N/A	102,000	220 B	14,600	15,200 B	40	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES216	12/09/98	71	6 - 6	MK	6 U	6 U	6 U	2 J	6 U	6 U	N/A
MFAPES217	04/08/99	117	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES218	04/08/99	117	6	TOLTEST	6 U	6 U	6 U	9 B	6 U	6 U	N/A
MFAPES219	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES220	04/08/99	117	sidewall	TOLTEST	6 U	6 U	6 U	10 B	6 U	6 U	N/A
MFAPES221	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES222	04/08/99	117	sidewall	TOLTEST	5 U	5 U	5 U	10 B	5 U	5 U	N/A
MFAPES223	04/28/99	106	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES224	04/28/99	106	6	TOLTEST	11 U	11 U	11 U	5 J	5 U	5 U	N/A
MFAPES225	04/28/99	107	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES226	04/28/99	107	6	TOLTEST	9 U	9 U	40	3 J	5 U	5 U	N/A
MFAPES227	04/28/99	108	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	192 U
MFAPES228	04/28/99	108	6	TOLTEST	9 U	9 U	9 U	4 J	5 U	5 U	N/A
MFAPES229	04/28/99	109	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	208 U
MFAPES229FD	04/28/99	109	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES230	04/28/99	109	6	TOLTEST	10 U	10 U	10 U	4 J	5 U	5 U	N/A
MFAPES231	04/29/99	105	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES232	04/29/99	105	6	TOLTEST	9 U	9 U	9 U	4 J	5 U	5 U	N/A
MFAPES233	04/29/99	104	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	227 U
MFAPES234	04/29/99	104	6	TOLTEST	9 U	9 U	9 U	4 J	4 U	4 U	N/A
MFAPES235	04/29/99	103	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	227 U
MFAPES236	04/29/99	103	6	TOLTEST	8 U	8 U	8 U	3 J	4 U	4 U	N/A
MFAPES237	05/21/99	100	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES237-FD	05/21/99	100	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES239	05/21/99	101	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES240	05/21/99	101	6	TOLTEST	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES241	05/21/99	112	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES242	05/21/99	112	6	TOLTEST	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES243	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES244	05/21/99	112	sidewall	TOLTEST	6 U	6 U	6 U	6 U	6 U	6 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES216	12/09/98	71	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES217	04/08/99	117	0-6	TOLTEST	1,030 J	260 U	250 U	1350	250 U	650 U	482
MFAPES218	04/08/99	117	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES219	04/08/99	117	sidewall	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES220	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES221	04/08/99	117	sidewall	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES222	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES223	04/28/99	106	0-6	TOLTEST	3,390	248 U	238 U	**19,200**	804 P	619 U	4,020
MFAPES224	04/28/99	106	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES225	04/28/99	107	0-6	TOLTEST	1,760 U	208 U	200 U	3,260	256 P	520 U	200 U
MFAPES226	04/28/99	107	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES227	04/28/99	108	0-6	TOLTEST	1,690 U	200 U	192 U	3,530	192 U	500 U	267
MFAPES228	04/28/99	108	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES229	04/28/99	109	0-6	TOLTEST	1,830 U	217 U	208 U	***6,320***	208 U	542 U	618
MFAPES229FD	04/28/99	109	0-6	TOLTEST	2,100 U	248 U	238 U	***6,280***	238 U	619 U	296
MFAPES230	04/28/99	109	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES231	04/29/99	105	0-6	TOLTEST	1760 J	248 U	217 U	4,000	642 P	619 U	366
MFAPES232	04/29/99	105	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES233	04/29/99	104	0-6	TOLTEST	2,950	236 U	250 U	***8,950***	227 U	591 U	227 U
MFAPES234	04/29/99	104	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES235	04/29/99	103	0-6	TOLTEST	4,000	236 U	250 U	**19,400**	227 U	591 U	1,680
MFAPES236	04/29/99	103	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES237	05/21/99	100	0-6	TOLTEST	2,100 U	248 U	250 U	952 U	238 U	619 U	238 U
MFAPES237-FD	05/21/99	100	0-6	TOLTEST	2,100 U	248 U	250 U	952 U	238 U	619 U	238 U
MFAPES239	05/21/99	101	0-6	TOLTEST	2,170	248 U	238 U	***8,640***	238 U	619 U	1350
MFAPES240	05/21/99	101	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES241	05/21/99	112	0-6	TOLTEST	2,100 U	248 U	238 U	2,490	238 U	619 U	238 U
MFAPES242	05/21/99	112	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES243	05/21/99	112	sidewall	TOLTEST	2,100 U	248 U	238 U	1,770 P	***5,260***	619 U	***27,800 D***
MFAPES244	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES216	12/09/98	71	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES217	04/08/99	117	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,500,000
MFAPES218	04/08/99	117	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES219	04/08/99	117	sidewall	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,200,000
MFAPES220	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES221	04/08/99	117	sidewall	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	12,600,000
MFAPES222	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES223	04/28/99	106	0-6	TOLTEST	238 U	248 U	1230	707	238 U	238 U	238 U	9,660,000
MFAPES224	04/28/99	106	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES225	04/28/99	107	0-6	TOLTEST	200 U	208 U	200 U	200 U	200 U	200 U	200 U	12,400,000
MFAPES226	04/28/99	107	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES227	04/28/99	108	0-6	TOLTEST	192 U	200 U	192 U	192 U	192 U	192 U	192 U	12,200,000
MFAPES228	04/28/99	108	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES229	04/28/99	109	0-6	TOLTEST	208 U	217 U	460	234	208 U	208 U	208 U	12,100,000
MFAPES229FD	04/28/99	109	0-6	TOLTEST	238 U	248 U	502	246	238 U	238 U	238 U	11,600,000
MFAPES230	04/28/99	109	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES231	04/29/99	105	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	9,560,000
MFAPES232	04/29/99	105	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES233	04/29/99	104	0-6	TOLTEST	227 U	236 U	227 U	227 U	227 U	227 U	227 U	8,890,000
MFAPES234	04/29/99	104	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES235	04/29/99	103	0-6	TOLTEST	227 U	236 U	209 J	383	227 U	227 U	227 U	9,560,000
MFAPES236	04/29/99	103	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES237	05/21/99	100	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	16,400,000
MFAPES237-FD	05/21/99	100	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	14,300,000
MFAPES239	05/21/99	101	0-6	TOLTEST	238 U	248 U	546	1620	238 U	238 U	238 U	14,600,000
MFAPES240	05/21/99	101	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES241	05/21/99	112	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	13,200,000
MFAPES242	05/21/99	112	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES243	05/21/99	112	sidewall	TOLTEST	238 U	248 U	1,280	1,590	238 U	238 U	238 U	5,300,000
MFAPES244	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES216	12/09/98	71	6 - 6	MK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES217	04/08/99	117	0-6	TOLTEST	**8,300**	71,600	100 B	16,000	12,800	20 U	550 U	250 U
MFAPES218	04/08/99	117	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES219	04/08/99	117	sidewall	TOLTEST	**7,400**	66,200	40 U	15,500	12,200	20 U	540 U	240 U
MFAPES220	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES221	04/08/99	117	sidewall	TOLTEST	**9,300**	74,800	40 U	16,200	13,200	20 U	540 U	240 U
MFAPES222	04/08/99	117	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES223	04/28/99	106	0-6	TOLTEST	**8,200**	61,200	40 U	13,100	12,800 B	50	570 B	140 NU
MFAPES224	04/28/99	106	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES225	04/28/99	107	0-6	TOLTEST	**9,700**	63,200	40 U	17,100	13,200 B	60	910	150 NU
MFAPES226	04/28/99	107	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES227	04/28/99	108	0-6	TOLTEST	**10,500**	77,200	40 U	15,500	13,000 B	230	820	140 NU
MFAPES228	04/28/99	108	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES229	04/28/99	109	0-6	TOLTEST	**8,500**	69,600	40 B	14,500	13,900 B	60	940	150 NU
MFAPES229FD	04/28/99	109	0-6	TOLTEST	**10,500**	66,900	40 U	16,000	14,800 B	70	580 U	150 NU
MFAPES230	04/28/99	109	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES231	04/29/99	105	0-6	TOLTEST	**8,600**	60,200	40 U	12,900	12,500 B	30 B	590 U	150 U
MFAPES232	04/29/99	105	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES233	04/29/99	104	0-6	TOLTEST	**8,100**	57,200	950 U	13,100	11,700 B	40	580 U	150 U
MFAPES234	04/29/99	104	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES235	04/29/99	103	0-6	TOLTEST	**8,100**	69,000	950 U	12,100	11,900 B	40	570 U	150 U
MFAPES236	04/29/99	103	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES237	05/21/99	100	0-6	TOLTEST	**13,000**	88,000	90 B	19,000	14,000	30 B	440 U	150 U
MFAPES237-FD	05/21/99	100	0-6	TOLTEST	**8,000**	84,000	120 B	17,000	12,000	30 B	400 U	150 U
MFAPES239	05/21/99	101	0-6	TOLTEST	**9,000**	103,000	110 B	17,000	14,000	20 U	400 U	150 U
MFAPES240	05/21/99	101	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES241	05/21/99	112	0-6	TOLTEST	**7,000**	50,000	100 B	16,000	9,000	20 B	390 U	140 U
MFAPES242	05/21/99	112	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES243	05/21/99	112	sidewall	TOLTEST	**5,000**	27,000	190 B	9,000	7,000	30 B	410 U	150 U
MFAPES244	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES245	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES246	05/21/99	112	sidewall	TOLTEST	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES247	05/21/99	102	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES248	05/21/99	102	6	TOLTEST	6 U	6 U	15	6 U	6 U	6 U	N/A
MFAPES249	05/21/99	114	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES250	05/21/99	114	6	TOLTEST	6 U	6 U	21	6 U	6 U	6 U	N/A
MFAPES251	05/21/99	185	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES252	05/21/99	185	6	TOLTEST	6 U	6 U	6	6 U	6 U	6 U	N/A
MFAPES253	05/26/99	100	6	TOLTEST	6 U	6 U	15	6 U	6 U	6 U	N/A
MFAPES254	05/26/99	99	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	245 U
MFAPES254FD	05/26/99	99	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	232 U
MFAPES255	05/26/99	99	6	TOLTEST	6 U	6 U	13	6 U	6 U	6 U	N/A
MFAPES256	05/26/99	98	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	237 U
MFAPES257	05/26/99	98	6	TOLTEST	5 U	5 U	16	5 U	5 U	5 U	N/A
MFAPES258	05/26/99	97	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES259	05/26/99	97	6	TOLTEST	6 U	6 U	47	6 U	6 U	6 U	N/A
MFAPES260	05/26/99	96	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	239 U
MFAPES261	05/26/99	96	6	TOLTEST	6 U	6 U	69	6 U	6 U	6 U	N/A
MFAPES262	06/03/99	96	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	208 U
MFAPES263	06/03/99	96	6	TOLTEST	6 U	6 U	6 U	35	6 U	6 U	N/A
MFAPES264	06/07/99	96	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES265	06/15/99	90	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES265FD	06/15/99	90	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES266	06/15/99	90	6	TOLTEST	6 U	6 U	6 U	6 U	6 U	6 U	N/A
MFAPES267	06/15/99	90	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES268	06/15/99	90	sidewall	TOLTEST	5 U	5 U	3 J	5 U	5 U	5 U	N/A
MFAPES269	06/17/99	78	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES270	06/21/99	78	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES270FD	06/21/99	78	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES271	06/21/99	78	6	TOLTEST	7 U	7 U	9	4 JB	7 U	7 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES245	05/21/99	112	sidewall	TOLTEST	4,120	248 U	238 U	952 U	238 U	619 U	238 U
MFAPES246	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES247	05/21/99	102	0-6	TOLTEST	1,220 J	248 U	238 U	***5,390***	238 U	619 U	1,180
MFAPES248	05/21/99	102	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES249	05/21/99	114	0-6	TOLTEST	4,170	248 U	250 U	***5,440***	238 U	619 U	5,020
MFAPES250	05/21/99	114	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES251	05/21/99	185	0-6	TOLTEST	6,660	248 U	250 U	3,840	238 U	619 U	4,600
MFAPES252	05/21/99	185	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES253	05/26/99	100	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES254	05/26/99	99	0-6	TOLTEST	2,160 U	255 U	245 U	***6,730***	471 P	637 U	802
MFAPES254FD	05/26/99	99	0-6	TOLTEST	2,050 U	242 U	232 U	***7,060***	579 P	605 U	987
MFAPES255	05/26/99	99	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES256	05/26/99	98	0-6	TOLTEST	2,080 U	246 U	237 U	948 U	237 U	616 U	2,610
MFAPES257	05/26/99	98	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES258	05/26/99	97	0-6	TOLTEST	2,100 U	248 U	238 U	952 U	238 U	619 U	241
MFAPES259	05/26/99	97	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES260	05/26/99	96	0-6	TOLTEST	4,250	249 U	239 U	**53,600 D**	239 U	622 U	***18,300 D***
MFAPES261	05/26/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES262	06/03/99	96	0-6	TOLTEST	1,830 U	217 U	208 U	833 U	208 U	542 U	208 U
MFAPES263	06/03/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES264	06/07/99	96	0-6	TOLTEST	2,270	260 U	250 U	***8,290***	250 U	650 U	250 U
MFAPES265	06/15/99	90	0-6	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES265FD	06/15/99	90	0-6	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES266	06/15/99	90	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES267	06/15/99	90	sidewall	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES268	06/15/99	90	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES269	06/17/99	78	0-6	TOLTEST	2,150	248 U	250 U	***11,000***	238 U	619 U	238 U
MFAPES270	06/21/99	78	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES270FD	06/21/99	78	0-6	TOLTEST	2,200 U	260 U	250 U	827 J	250 U	650 U	250 U
MFAPES271	06/21/99	78	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES245	05/21/99	112	sidewall	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	10,200,000
MFAPES246	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES247	05/21/99	102	0-6	TOLTEST	238 U	248 U	312	400	238 U	238 U	238 U	13,800,000
MFAPES248	05/21/99	102	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES249	05/21/99	114	0-6	TOLTEST	238 U	248 U	331	352	238 U	238 U	238 U	12,200,000
MFAPES250	05/21/99	114	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES251	05/21/99	185	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	15,000,000
MFAPES252	05/21/99	185	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES253	05/26/99	100	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES254	05/26/99	99	0-6	TOLTEST	245 U	255 U	385	526	245 U	245 U	245 U	11,400,000
MFAPES254FD	05/26/99	99	0-6	TOLTEST	232 U	242 U	416	604	232 U	232 U	232 U	13,800,000
MFAPES255	05/26/99	99	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES256	05/26/99	98	0-6	TOLTEST	237 U	246 U	237 U	237 U	237 U	237 U	237 U	12,700,000
MFAPES257	05/26/99	98	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES258	05/26/99	97	0-6	TOLTEST	238 U	248 U	238 U	238 U	238 U	238 U	238 U	13,900,000
MFAPES259	05/26/99	97	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES260	05/26/99	96	0-6	TOLTEST	239 U	249 U	570	628	239 U	239 U	239 U	12,200,000
MFAPES261	05/26/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES262	06/03/99	96	0-6	TOLTEST	208 U	217 U	208 U	208 U	208 U	208 U	208 U	7,250,000
MFAPES263	06/03/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES264	06/07/99	96	0-6	TOLTEST	250 U	260 U	196 J	539	250 U	250 U	250 U	12,400,000
MFAPES265	06/15/99	90	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	18,100,000 *
MFAPES265FD	06/15/99	90	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	17,700,000 *
MFAPES266	06/15/99	90	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES267	06/15/99	90	sidewall	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	13,700,000 *
MFAPES268	06/15/99	90	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES269	06/17/99	78	0-6	TOLTEST	238 U	248 U	238 U	225 J	238 U	238 U	238 U	10,700,000
MFAPES270	06/21/99	78	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15,900,000
MFAPES270FD	06/21/99	78	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,300,000
MFAPES271	06/21/99	78	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES245	05/21/99	112	sidewall	TOLTEST	**7,000**	88,000	170 B	12,000	13,000	20 B	400 U	150 U
MFAPES246	05/21/99	112	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES247	05/21/99	102	0-6	TOLTEST	**8,000**	104,000	100 B	17,000	14,000	30 B	400 U	150 U
MFAPES248	05/21/99	102	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES249	05/21/99	114	0-6	TOLTEST	**8,000**	89,000	120 B	15,000	14,000	20 U	400 U	140 U
MFAPES250	05/21/99	114	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES251	05/21/99	185	0-6	TOLTEST	**10,000**	64,000	100 B	19,000	13,000	40	440 U	150 U
MFAPES252	05/21/99	185	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES253	05/26/99	100	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES254	05/26/99	99	0-6	TOLTEST	**7,900**	78,800	60 B	15,100	13,300	80 N	540 U	240 U
MFAPES254FD	05/26/99	99	0-6	TOLTEST	**8,700**	83,900	70 B	17,000	13,800	70 N	530 U	240 U
MFAPES255	05/26/99	99	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES256	05/26/99	98	0-6	TOLTEST	**7,800**	81,700	40 B	16,700	12,700	200 N	540 U	240 U
MFAPES257	05/26/99	98	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES258	05/26/99	97	0-6	TOLTEST	**7,000**	62,800	40 U	17,500	11,700	90 N	560 U	250 U
MFAPES259	05/26/99	97	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES260	05/26/99	96	0-6	TOLTEST	**10,000**	66,200	50 B	16,400	13,400	70 N	550 U	250 U
MFAPES261	05/26/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES262	06/03/99	96	0-6	TOLTEST	**5,000**	35,000	90 B	10,000	8,000	30 B	420 U	150 U
MFAPES263	06/03/99	96	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES264	06/07/99	96	0-6	TOLTEST	**11,000**	65,000	100 B	17,000	18,000 B	80	380 U	140 U
MFAPES265	06/15/99	90	0-6	TOLTEST	**14,000**	70,000	40 U	22,000 N	20,000	70	1000 B	150 U
MFAPES265FD	06/15/99	90	0-6	TOLTEST	**9,000**	69,000	40 U	22,000 N	13,000	40 B	410 U	150 U
MFAPES266	06/15/99	90	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES267	06/15/99	90	sidewall	TOLTEST	**9,000**	100,000	30 U	18,000 N	14,000	30 B	380 U	140 U
MFAPES268	06/15/99	90	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES269	06/17/99	78	0-6	TOLTEST	**8,000**	105,000	40 U	14,000	16,000	20 U	400 U	140 U
MFAPES270	06/21/99	78	0-6	TOLTEST	**8,000 N***	87,000 N*	40 NU	21,000 N	12,000 N*	30 B	400 N*U	150 U
MFAPES270FD	06/21/99	78	0-6	TOLTEST	**6,000 N***	93,000 N*	40 NU	20,000 N	12,000 N*	30 B	400 N*U	150 U
MFAPES271	06/21/99	78	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES272	06/21/99	78	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES273	06/21/99	78	sidewall	TOLTEST	6 U	6 U	6 U	4 JB	6 U	6 U	N/A
MFAPES274	06/21/99	82	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES275	06/21/99	82	6	TOLTEST	5 U	5 U	10	5 JB	5 U	5 U	N/A
MFAPES276	06/21/99	83	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES277	06/21/99	83	6	TOLTEST	6 U	6 U	6 U	4 JB	6 U	6 U	N/A
MFAPES278	06/21/99	84	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES279	06/21/99	84	6	TOLTEST	6 U	6 U	6 U	5 JB	6 U	6 U	N/A
MFAPES280	06/21/99	92	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES281	06/21/99	92	6	TOLTEST	5 U	5 U	5 U	3 JB	5 U	5 U	N/A
MFAPES282	08/04/99	28	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES282FD	08/04/99	28	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES283	08/04/99	28	6	TOLTEST	5 U	5 U	5 U	5 U	5 U	5 U	N/A
MFAPES284	08/04/99	27	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	238 U
MFAPES285	08/04/99	27	6	TOLTEST	7 U	7 U	7 U	21 B	7 U	7 U	N/A
MFAPES286	08/04/99	31	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES287	08/04/99	31	6	TOLTEST	5 U	5 U	5 U	15 B	5 U	5 U	N/A
MFAPES288	08/09/99	32	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES288FD	08/09/99	32	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES289	08/09/99	32	6	TOLTEST	9 U	4 U	23 B	4 U	4 U	4 U	N/A
MFAPES290	08/10/99	30	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES290FD	08/10/99	30	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES291	08/10/99	30	6	TOLTEST	11 U	6 U	13 J	6 U	6 U	6 U	N/A
MFAPES292	08/11/99	130	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES293	08/11/99	130	6	TOLTEST	12 U	6 U	14 J	6 U	6 U	6 U	N/A
MFAPES294	08/11/99	39	0-6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	250 U
MFAPES295	08/11/99	39	6	TOLTEST	13 U	6 U	21 J	6 U	6 U	6 U	N/A
MFAPES296	08/27/99	60	0-7	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	1,000 U
MFAPES296FD	08/27/99	60	0-7	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	1,000 U
MFAPES297	08/27/99	60	6	TOLTEST	14 U	7 U	42 B	7 U	7 U	7 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES272	06/21/99	78	sidewall	TOLTEST	4,870	260 U	250 U	***12,900***	250 U	650 U	250 U
MFAPES273	06/21/99	78	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES274	06/21/99	82	0-6	TOLTEST	2,200 U	260 U	250 U	1,000 U	250 U	650 U	250 U
MFAPES275	06/21/99	82	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES276	06/21/99	83	0-6	TOLTEST	2,200 U	260 U	250 U	***7,290***	250 U	650 U	250 U
MFAPES277	06/21/99	83	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES278	06/21/99	84	0-6	TOLTEST	2,200 U	260 U	250 U	2,920	250 U	650 U	250 U
MFAPES279	06/21/99	84	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES280	06/21/99	92	0-6	TOLTEST	1,700 J	260 U	250 U	***6,330***	250 U	650 U	2,730
MFAPES281	06/21/99	92	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES282	08/04/99	28	0-6	TOLTEST	24,400	260 U	250 U	**199,000 D**	250 U	650 U	1,140
MFAPES282FD	08/04/99	28	0-6	TOLTEST	55,400	260 U	250 U	**353,000 D**	250 U	650 U	2,200
MFAPES283	08/04/99	28	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES284	08/04/99	27	0-6	TOLTEST	38,500	248 U	250 U	**266,000 D**	238 U	619 U	8,260
MFAPES285	08/04/99	27	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES286	08/04/99	31	0-6	TOLTEST	4,380	260 U	250 U	***13,700***	250 U	650 U	750
MFAPES287	08/04/99	31	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES288	08/09/99	32	0-6	TOLTEST	1,500	250 U	*500 U*	3,100	250 U	250 U	700
MFAPES288FD	08/09/99	32	0-6	TOLTEST	1,300	250 U	*500 U*	2,100	250 U	250 U	790
MFAPES289	08/09/99	32	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES290	08/10/99	30	0-6	TOLTEST	570	250 U	*500 U*	2,700	250 U	250 U	250 U
MFAPES290FD	08/10/99	30	0-6	TOLTEST	500	250 U	*500 U*	2,500	250 U	250 U	250 U
MFAPES291	08/10/99	30	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES292	08/11/99	130	0-6	TOLTEST	1,800	250 U	*500 U*	***5,800***	250 U	250 U	250 U
MFAPES293	08/11/99	130	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES294	08/11/99	39	0-6	TOLTEST	5,100	250 U	*500 U*	***6,700***	250 U	250 U	250 U
MFAPES295	08/11/99	39	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES296	08/27/99	60	0-7	TOLTEST	1,210	1,000 U	*2,500 U*	963 J	1,000 U	1,000 U	1,000 U
MFAPES296FD	08/27/99	60	0-7	TOLTEST	2,720	1,000 U	*2,500 U*	2,020	1,000 U	1,000 U	1,000 U
MFAPES297	08/27/99	60	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES272	06/21/99	78	sidewall	TOLTEST	250 U	260 U	250 U	1,120 P	250 U	250 U	250 U	11,900,000
MFAPES273	06/21/99	78	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES274	06/21/99	82	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,600,000
MFAPES275	06/21/99	82	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES276	06/21/99	83	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	11,400,000
MFAPES277	06/21/99	83	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES278	06/21/99	84	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,900,000
MFAPES279	06/21/99	84	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES280	06/21/99	92	0-6	TOLTEST	250 U	260 U	250 U	250 U	250 U	250 U	250 U	15,500,000
MFAPES281	06/21/99	92	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES282	08/04/99	28	0-6	TOLTEST	250 U	260 U	368	1,340 P	250 U	250 U	250 U	10,800,000
MFAPES282FD	08/04/99	28	0-6	TOLTEST	250 U	260 U	586	1,850 P	250 U	250 U	250 U	11,600,000
MFAPES283	08/04/99	28	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES284	08/04/99	27	0-6	TOLTEST	238 U	248 U	1,390	2,570	238 U	238 U	238 U	9,840,000
MFAPES285	08/04/99	27	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES286	08/04/99	31	0-6	TOLTEST	250 U	260 U	692 P	464	250 U	250 U	250 U	11,500,000
MFAPES287	08/04/99	31	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES288	08/09/99	32	0-6	TOLTEST	250 U	250 U	98 J	180 J	74 J	250 U	250 U	11,600,000
MFAPES288FD	08/09/99	32	0-6	TOLTEST	250 U	250 U	120 J	200 J	61 J	250 U	250 U	12,800,000
MFAPES289	08/09/99	32	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES290	08/10/99	30	0-6	TOLTEST	250 U	250 U	250 U	250 U	250 U	250 U	250 U	10,800,000
MFAPES290FD	08/10/99	30	0-6	TOLTEST	250 U	250 U	250 U	250 U	250 U	250 U	250 U	11,000,000
MFAPES291	08/10/99	30	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES292	08/11/99	130	0-6	TOLTEST	250 U	250 U	250 U	250 U	250 U	250 U	250 U	12,800,000
MFAPES293	08/11/99	130	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES294	08/11/99	39	0-6	TOLTEST	250 U	250 U	400	300	250 U	250 U	250 U	11,100,000
MFAPES295	08/11/99	39	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES296	08/27/99	60	0-7	TOLTEST	1,000 U	1,000 U	1000 U	170 J	1,000 U	1,000 U	1,000 U	16,900,000
MFAPES296FD	08/27/99	60	0-7	TOLTEST	1,000 U	1,000 U	1000 U	158 J	1,000 U	0	1,000 U	13,000,000
MFAPES297	08/27/99	60	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES272	06/21/99	78	sidewall	TOLTEST	**7,000 N***	101,000 N*	40 NU	15,000 N	14,000 N*	40	400 N*U	150 U
MFAPES273	06/21/99	78	sidewall	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES274	06/21/99	82	0-6	TOLTEST	**7,000 N***	110,000 N*	40 NU	18,000 N	15,000 N*	30 B	410 N*U	150 U
MFAPES275	06/21/99	82	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES276	06/21/99	83	0-6	TOLTEST	**9,000 N***	174,000 N*	100 NB	14,000 N	17,000 N*	40	1,000 N*B	150 U
MFAPES277	06/21/99	83	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES278	06/21/99	84	0-6	TOLTEST	**8,000 N***	150,000 N*	40 NU	17,000 N	16,000 N*	40 B	440 N*U	150 U
MFAPES279	06/21/99	84	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES280	06/21/99	92	0-6	TOLTEST	**10,000 N***	54,000 N*	40 NU	21,000 N	13,000 N*	80	390 N*U	140 U
MFAPES281	06/21/99	92	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES282	08/04/99	28	0-6	TOLTEST	**8,000**	76,000	40 U	16,000	19,000	60 N	390 U	140 U
MFAPES282FD	08/04/99	28	0-6	TOLTEST	**8,000**	70,000	30 U	22,000	14,000	40 N	370 U	130 U
MFAPES283	08/04/99	28	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES284	08/04/99	27	0-6	TOLTEST	**8,000**	76,000	170 B	17,000	16,000	80 N	360 U	130 U
MFAPES285	08/04/99	27	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES286	08/04/99	31	0-6	TOLTEST	**7,000**	72,000	30 U	14,000	15,000	60 N	370 U	130 U
MFAPES287	08/04/99	31	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES288	08/09/99	32	0-6	TOLTEST	*11,500 U*	68,500	580 U	16,300	11,600	24 J	23,000 U	1,200 U
MFAPES288FD	08/09/99	32	0-6	TOLTEST	**7,900 J**	52,000	580 U	19,600	11,800	14 J	23,000 U	1,200 U
MFAPES289	08/09/99	32	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES290	08/10/99	30	0-6	TOLTEST	**6,900 J**	238,000	570 U	24,300	14,000	110 U	22,700 U	1,100 U
MFAPES290FD	08/10/99	30	0-6	TOLTEST	*11,300 U*	321,000	560 U	18,700	12,500	110 U	22,500 U	1,100 U
MFAPES291	08/10/99	30	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES292	08/11/99	130	0-6	TOLTEST	**7,400 J**	54,700	540 U	38,100	34,600	110 U	21,400 U	1,100 U
MFAPES293	08/11/99	130	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES294	08/11/99	39	0-6	TOLTEST	**7,000 J**	110,000	620 U	17,900	13,400	20 J	24,600 U	1,200 U
MFAPES295	08/11/99	39	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFAPES296	08/27/99	60	0-7	TOLTEST	**9,020 J**	73,500	634 U	19,600	18,100	58 J	25,400 U	1,270 U
MFAPES296FD	08/27/99	60	0-7	TOLTEST	**6,110 J**	75,500	666 U	15,100	18,100	44 J	26,600 U	1,330 U
MFAPES297	08/27/99	60	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					VOLATILES						EXPLOSIVES
ANALYTE					MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB
IM Industrial Cleanup Goal (Human Health)					27,000,000	2,800,000	8,800,000	18,000	880,000	320,000	68,000
IM Residential Cleanup Goal (Human Health)					7,100,000	770,000	2,000,000	7,800	790,000	320,000	6,500
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY	**4,000,000						
MFAPES298	08/27/99	37	0-8	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	1,000 U
MFAPES299	08/27/99	37	6	TOLTEST	12 U	6 U	24 U	6 U	6 U	6 U	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES						
ANALYTE					HMX	NITROBENZENE	PETN	RDX	TNB	TETRYL	TNT
IM Industrial Cleanup Goal (Human Health)					34,000,000	94,000	250	17,000	34,000	6,800,000	64,000
IM Residential Cleanup Goal (Human Health)					3,300,000	18,000	250	4,000	3,300	650,000	15,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**40,000					
MFAPES298	08/27/99	37	0-8	TOLTEST	44,000 D	1,000 U	*2,500 U*	**272,000 D**	1,000 U	1,000 U	1,000 U
MFAPES299	08/27/99	37	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					EXPLOSIVES							METALS
ANALYTE					2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT	ALUMINUM
IM Industrial Cleanup Goal (Human Health)					1,400,000	680,000	1,400,000	680,000	6,800,000	6,800,000	6,800,000	100,000,000
IM Residential Cleanup Goal (Human Health)					130,000	65,000	130,000	65,000	650,000	650,000	650,000	77,000,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY								
MFAPES298	08/27/99	37	0-8	TOLTEST	1,000 U	1,000 U	124 J	1,000 U	1,000 U	1,000 U	1,000 U	11,700,000
MFAPES299	08/27/99	37	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

					METALS							
ANALYTE					ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
IM Industrial Cleanup Goal (Human Health)					2,400	100,000,000	850,000	450,000	1,000,000	510,000	8,500,000	8,500,000
IM Residential Cleanup Goal (Human Health)					320	5,300,000	38,000	210,000	400,000	23,000	380,000	380,000
Units of Measurement					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SITE ID	SAMPLE DATE	GRID NUMBER	DEPTH (inches)	SAMPLED BY		**2,000,000	**20,000	**100,000	**100,000	**4,000		
MFAPES298	08/27/99	37	0-8	TOLTEST	*12,300 U*	59,400	615 U	17,100	13,800	9 J	24,600 U	1,230 U
MFAPES299	08/27/99	37	6	TOLTEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-1
MINE FILL A POST-EXCAVATION SAMPLE RESULTS
NSWC CRANE

Notes:
* - Duplicate analysis not within control limits.
** - Value to be used for comparison after 4/13/98 (comparable to TCLP value times 20)
B (organics) - Detected in corresponding method blank
B (metals) - Reported value is greater than instrument detection limit but less than reporting limit
D - Secondary dilution required for analysis
E (organics) - Value is greater than highest calibration standard
E (metals) - Serial dilution performed on sample and was outside of acceptable limits
J - Estimated value
MEK - Methyl Ethyl Ketone
MIBK - Methyl Isobutyl Ketone
N - Spike sample recovery not within control limits
N/A - Not Analyzed
P - Greater than 40% difference detected between the two GC columns
U - not detected
UG/KG - micrograms per kilogram
UG/L - micrograms per liter
Values **BOLD** and OUTLINED exceed Industrial Cleanup Goals
Values **BOLD** and ***ITALICS*** exceed Residential Cleanup Goals
Values *ITALICS* not detected, detection limit exceeds Industrial Cleanup Goals

TABLE H-2
MINE FILL A POST-EXCAVATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	SAMPLE COLLECTOR	UNITS	MEK	MIBK	ACETONE	METHYLENE CHLORIDE	TOLUENE	XYLENES	DNB	HMX	NITROBENZENE
MFAFB072298	7/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	LT 4 U	LT 13 U	LT 7 U
MFARB072298	7/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	LT 4 U	LT 13 U	LT 7 U
MFATB072298	7/22/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB080398	8/3/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB090898	9/8/98	MK	UG/L	LT 5 U	LT 5 U	**12**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFARB090998	9/9/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	LT 4 U	LT 13 U	LT 7 U
MFATB090998	9/9/98	MK	UG/L	LT 5 U	LT 5 U	**13**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB091098	9/10/98	MK	UG/L	LT 5 U	LT 5 U	**18**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB091498	9/14/98	MK	UG/L	LT 5 U	LT 5 U	**20**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB093098	9/30/98	MK	UG/L	LT 5 U	LT 5 U	**10**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB100198	10/1/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB101398	10/13/98	MK	UG/L	LT 5 U	LT 5 U	**16**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB101498	10/14/98	MK	UG/L	LT 5 U	LT 5 U	**16**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB101598	10/15/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102098	10/20/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102298	10/22/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102698	10/26/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102798	10/27/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102898	10/28/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB102998	10/29/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB111198	11/11/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB111298	11/12/98	MK	UG/L	LT 5 U	LT 5 U	**72**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB111698	11/16/98	MK	UG/L	LT 5 U	LT 5 U	**44**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFARB111998	11/19/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	LT 4 U	LT 13 U	LT 7 U
MFATB111998	11/19/98	MK	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB113098	11/30/98	MK	UG/L	LT 5 U	LT 5 U	**42**	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFARB062199	6/21/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	LT 4 U	LT 13 U	LT 7 U
MFATB040899	4/8/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB042899	4/28/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	**2 JB**	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB042999	4/29/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 4 J	**1 JB**	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB052199	5/21/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB052699	5/26/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB062199	6/21/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB080499	8/4/99	TOLTEST	UG/L	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	LT 5 U	N/A	N/A	N/A
MFATB080999	8/9/99	TOLTEST	UG/L	LT 2 U	LT 2 U	**12 B**	LT 1 U	LT 1 U	LT 1 U	N/A	N/A	N/A
MFATB081099	8/10/99	TOLTEST	UG/L	LT 2 U	LT 2 U	**26 B**	LT 1 U	LT 1 U	LT 1 U	N/A	N/A	N/A
MFATB081199	8/11/99	TOLTEST	UG/L	LT 4 U	LT 4 U	**26**	LT 2 U	LT 2 U	LT 2 U	N/A	N/A	N/A
MFATB082799	8/27/99	TOLTEST	UG/L	LT 2 U	LT 2 U	**16 B**	LT 1 U	LT 1 U	LT 1 U	N/A	N/A	N/A

TABLE H-2
MINE FILL A POST-EXCAVATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	SAMPLE COLLECTOR	UNITS	PETN	RDX	TNB	TETRYL	TNT	2,4-DNT	2,6-DNT	2-Am DNT	4-Am DNT	2-NT	3-NT	4-NT
MFAFB072298	7/22/98	MK	UG/L	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U	LT 8 U
MFARB072298	7/22/98	MK	UG/L	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U	LT 8 U
MFATB072298	7/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080398	8/3/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB090898	9/8/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB090998	9/9/98	MK	UG/L	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U	LT 8 U
MFATB090998	9/9/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB091098	9/10/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB091498	9/14/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB093098	9/30/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB100198	10/1/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101398	10/13/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101498	10/14/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101598	10/15/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102098	10/20/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102298	10/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102698	10/26/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102798	10/27/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102898	10/28/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102998	10/29/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111198	11/11/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111298	11/12/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111698	11/16/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB111998	11/19/98	MK	UG/L	LT 20 U	LT 14 U	LT 7.3 U	LT 10 U	LT 6.4 U	LT 5.7 U	LT 9.4 U	LT 12 U	LT 7 U	LT 12 U	LT 7.9 U	LT 8 U
MFATB111998	11/19/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB113098	11/30/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB062199	6/21/99	TOLTEST	UG/L	LT 20 U	LT 14 U	LT 7 U	LT 10 U	LT 6 U	LT 6 U	LT 9 U	LT 12 U	LT 7 U	LT 12 U	LT 8 U	LT 8 U
MFATB040899	4/8/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB042899	4/28/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB042999	4/29/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB052199	5/21/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB052699	5/26/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB062199	6/21/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080499	8/4/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080999	8/9/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB081099	8/10/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB081199	8/11/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB082799	8/27/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-2
MINE FILL A POST-EXCAVATION QC SAMPLE RESULTS
NSWC CRANE

SITE ID	SAMPLE DATE	SAMPLE COLLECTOR	UNITS	ALUMINUM	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
MFAFB072298	7/22/98	MK	UG/L	LT 17 U	LT 0.6 U	LT 0.3 U	LT 0.7 U	LT 1.5 U	LT 0.1 U	N/A	N/A
MFARB072298	7/22/98	MK	UG/L	LT 17 U	LT 0.6 U	LT 0.3 U	LT 0.7 U	LT 1.5 U	LT 0.1 U	N/A	N/A
MFATB072298	7/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080398	8/3/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB090898	9/8/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB090998	9/9/98	MK	UG/L	**38.8 B**	**1.5 B**	LT 0.3 U	**1.6 B**	LT 1.5 U	LT 0.2 U	N/A	N/A
MFATB090998	9/9/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB091098	9/10/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB091498	9/14/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB093098	9/30/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB100198	10/1/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101398	10/13/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101498	10/14/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB101598	10/15/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102098	10/20/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102298	10/22/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102698	10/26/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102798	10/27/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102898	10/28/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB102998	10/29/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111198	11/11/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111298	11/12/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB111698	11/16/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB111998	11/19/98	MK	UG/L	LT 17 U	LT 0.6 U	LT 0.3 U	**0.850 B**	LT 1.5 U	**0.190 *B**	N/A	N/A
MFATB111998	11/19/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB113098	11/30/98	MK	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFARB062199	6/21/99	TOLTEST	UG/L	LT 32 U	LT 0 U	LT 0 U	LT 0 U	LT 2 U	LT 0 U	LT 3 U	LT 2 U
MFATB040899	4/8/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB042899	4/28/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB042999	4/29/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB052199	5/21/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB052699	5/26/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB062199	6/21/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080499	8/4/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB080999	8/9/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB081099	8/10/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB081199	8/11/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFATB082799	8/27/99	TOLTEST	UG/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE H-2
MINE FILL A POST-EXCAVATION QC SAMPLE RESULTS
NSWC CRANE

Notes:

* - Duplicate analysis not within control limits.
** - Value to be used for comparison after 4/13/98 (comparable to TCLP value times 20)
B (organics) - Detected in corresponding method blank
B (metals) - Reported value is greater than instrument detection limit but less than reporting limit
D - secondary dilution required for analysis
E (organics) - Value is greater than highest calibration standard
E (metals) - Serial dilution performed on sample and was outside of acceptable limits
J - Estimated value
MEK - Methyl Ethyl Ketone
MIBK - Methyl Isobutyl Ketone
N - Spike sample recovery not within control limits
N/A - Not Analyzed
P - Greater than 40% difference detected between the two GC columns
U - not detected
UG/KG - micrograms per kilogram
UG/L - micrograms per liter
Values **BOLD** are above detection limits

APPENDIX I

WINDROW RECIPES, FIELD MONITORING RESULTS, AND DAY ZERO/DAY LAST SAMPLE RESULTS SUMMARY

(Attached in separate in binder)

APPENDIX J

BACKFILL GRID LOCATION DRAWINGS

FIGURE		PAGES
J1	Backfill Locations, Mine Fill A Buildings 153/154	4 pages
J2	Backfill Locations, Mine Fill A Buildings 158/159	3 pages
J3	Backfill Locations, Mine Fill A Buildings 152	2 pages
J4	Backfill Locations, Mine Fill A Building 157	3 pages
J5	Windrows Permanently Backfilled at Staging Area	1 page

ATTACHMENT 1

APPENDIX A—SW-846 METHOD 5035 FOR VOLATILES

1.0. SCOPE AND APPLICATION

1.1 The analytical method that follows is designed to analyze soil samples from sites for volatile compounds based on a closed-system purge and trap GC/MS method.

1.2 The reporting limits and compounds listed in Table 7 are normal limits and compounds analyzed by this method.

2.0. SUMMARY OF METHOD

2.1 Low-level volatile organic compounds are determined by collecting approximately 5g of sample, weighed in the field at the time of collection, and placing it in a pre-weighed vial with a septum-sealed screw-cap that already contains a stirring bar and 5mL of sodium bisulfate preservative solution. The entire vial is placed, unopened, onto the instrument. Immediately before analysis, organic-free reagent water, surrogates, and internal standards are automatically added without opening the sample vial.

2.2 The sample introduction technique in Appendix Section 2.1 is not applicable to medium-level samples. Medium-level volatile organic compounds are determined by collecting approximately 5g of sample, weighed in the field at the time of collection, and placing it in a pre-weighed vial with a septum-sealed screw cap that already contains a stirring bar and 10mL of methanol preservative. Analysis of the medium level sample proceeds as stated earlier in the SOP in Section 8.

2.3 An alternative procedure to submitting sample vials to the laboratory is the submission of Encore Samplers. Transfer of the sample into the appropriate preservative is then performed at the laboratory.

3.0. HEALTH AND SAFETY

3.1 Some of the reagents solvents, and other chemicals used in this method have been clearly defined as toxic and/or carcinogenic. Most, however, remain in question or are not precisely defined with respect to the hazards of handling. All chemicals and samples, therefore, are treated as potentially hazardous, and exposure to them is minimized. Also, the MSDS for all stock solutions, reagents, and solvents used are kept on file in an easily accessible place in the lab. Any spills that may occur are cleaned up immediately.

4.0. SAMPLE PRESERVAION, CONTAINERS, HANDLING & STORAGE

4.1 All soil samples are to be preserved, whether it is performed in the field or in the laboratory.

4.2 Samples are stored at 4 +/- 2 C. All samples must be allowed to warm to ambient temperature before analysis.

5.0. INTERFERENCES AND POTENTIAL PROBLEMS

5.1 The same sources of contamination stated in Section 5.0 of this SOP apply to Method 5035.

6.0. APPARATUS AND MATERIALS

6.1 Purge and Trap Device---The purge and trap device consists of the sample purger, the trap, and the desorber. The sample purger must be capable of analyzing a soil by means of a closed-system autosampler. It must also have the capability of automatically adding internal standard and surrogate without opening the sample vial. Sample purgers include the Tekmar Precept II and the Varian Archon.

6.2 Magnetic Stirring Bars—PTFE- or glass coated bars of the appropriate size to fit in the sample vials. Stirring bars may be reused, provided they are thoroughly cleaned between uses.

6.3 Encore Sample Extractor---Metal device used to extract soil sample out of Encore Samplers into VOA vials.

7.0 REAGENTS AND STANDARDS

7.1 Reagent water — Produced by filtering tap water through an organic filtration system containing activated charcoal prior to use.

7.2 Methanol — Pesticide quality or equivalent.

7.3 Secondary dilution standards — Using commercially prepared standard solutions, secondary dilution standards that contain the compounds of interest, either singly or mixed together, are prepared in methanol. Secondary dilution standards should be stored with minimal headspace and should be checked frequently for signs of degradation or evaporation especially just prior to preparing calibration standards from them. Secondary dilution standards are used until degradation is verified through daily calibration checks.

7.4 Internal Standard and Surrogate Spiking Solution — The internal standards are Pentafluorobenzene, 1,4-Difluorobenzene, Chlorobenzene-d_5, and 1,4-Dichlorobenzene-d_4. The surrogates are Dibromofluoromethane, Toluene-d_8, 4-Bromofluorobenzene, and 1,2-Dichloroethane d_4. One internal standard and surrogate standard solution is prepared containing the above at a concentration of 250 µg/mL in methanol.

7.5 Sodium Bisulfate—ACS reagent grade or equivalent

8.0 PROCEDURE

8.1 Sample Containers: Clients may submit samples to the laboratory in one of two ways; In preserved 40mL VOA vials or in a device such as the Encore sample.

8.1.1 Preserved 40mL VOA Vials

8.1.1.1 Before sampling, the 40mL VOA vials must be prepared. This preparation may be performed by our laboratory or the client responsible for sampling. The specific preparation procedure depends on the expected concentration range of the sample. If the concentration range is unknown, enough sample should be taken to prepare both low and high concentration vials.

8.1.1.2 Sample vials should be prepared in a controlled environment, sealed, and shipped to the field location. The vials containing preservative for low concentration soil samples should be prepared by the following steps:

- Add a clean magnetic stirring bar to each clean vial.
- Add 1g of NaHSO4 preservative to each vial.
- Add 5mL of organic-free reagent water to each vial.
- Seal the vial with the screw-cap and septum seal.
- Affix a label to each vial.
- Weigh the prepared vial to the nearest 0.01g, record the weight, and write it on the label.

8.1.1.3 The vials containing preservative for high concentration soil samples should be prepared using the following steps:

- Add 10mL of methanol to each vial.
- Seal the vial with the screw-cap and septum seal.
- Affix a label to each vial.
- Weigh the prepared vial to the nearest 0.01g, record the weight, and write it on the label.

8.2 Sample Collection: Samples may be collected in either an Encore sampler or in preserved VOA vials.

8.3 Sample Storage:

8.3.1 If samples arrive at the laboratory in Encore Samplers, they must be analyzed or preserved within 48 hours of sampling. Preservation is performed in the same manner as stated above, depending on the expected sample concentration level.

8.3.2 After the vial containing the preservative is weighed, the sample core is removed from the Encore Sampler and added to the vial.

8.3.3 The vial is weighed again to determine the precise weight of the sample.

8.4 Instrument Requirements: Low level samples requiring Method 5035 must be analyzed on the Tekmar Precept or Varian Archon to accommodate the "closed-system" requirements.

8.5 All other calibration and sample analysis procedures would be performed as stated in Sections 8.0 through Sections 12.0 of the SOP, with specific regards to the Teckmar Precept, Varian Archon, or equivalent.

ATTACHMENT 2

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

COC #54

Project No.: 4324-0009-007-35
Project Name: NSWC Crane Bioreactor Facility
Samplers: (Signature)
Sampler: (Print) Ryan H. Erwin

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 Explosives	Gold Metals	TCLP Metals	8240 VOC	RCRA Metals	Remarks
Soil	Grid 112 comp. 0-12"	3/27/98	1240	CRAIMFA ICS 501		✓	✓	✓	✓			Mine Fill A
	Grid 112 grab 12-18"		1249	CRAIMFA ICS 502		✓				✓		Pre-Excavation
	Grid 112 comp. 24-36"		1257	CRAIMFA ICS 503		✓	✓	✓	✓			Sampling
	Grid 113 comp. 0-12"		1415	CRAIMFA ICS 504		✓	✓	✓	✓			
	Grid 113 grab 12-18"		1420	CRAIMFA ICS 505		✓				✓		
	Grid 113 comp. 24-36"		1445	CRAIMFA ICS 506		✓	✓	✓	✓			
	Grid 101 comp 0-12"	3/30/98	~~1~~0831	CRAIMFA ICS 507		✓	✓	✓	✓			
	Grid 101 grab 12-18"		0848	CRAIMFA ICS 508		✓				✓		
	Grid 101 comp 24-36"		0903	CRAIMFA ICS 509		✓	✓	✓	✓			
liquid	rinse blank		1102	CRAIMFA R0330		✓	✓				✓	
Soil	Grid 102 comp 0-12"	3/31/98	0815	CRAIMFA ICS 510		✓	✓	✓	✓			
	Grid 102 grab 12-18"		0820	CRAIMFA ICS 511		✓				✓		
	Grid 102 comp 24-36"		0840	CRAIMFA ICS 512		✓	✓	✓	✓			
	Grid 114 comp 0-12"		0940	CRAIMFA ICS 513		✓	✓	✓	✓			Southwest
	Grid 114 grab 12-18"		0954	CRAIMFA ICS 514		✓				✓		Labs
	Grid 114 comp 24-36"		1008	CRAIMFA ICS 515		✓	✓	✓	✓			
liquid	trip blank		1530	CRAIMFA ~~ICS~~ 10331		✓				✓		

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Ryan H. Erwin	3/31/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company:	Date/Time	Total No. Samples This Shipping Container: / Company:
				4/1/98 0900	
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

Seal #s: 2119 2120

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 Rev. 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): KIM WILLISON / SARAH HODSON

REC'D DATE: 4-1-98

RECEIVED BY (SIGNATURE): K Willison

TIME REC'D: 0900

LOGGED IN BY (SIGNATURE): K Willison

LOG-IN DATE: 4-1-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC Crane	33393	33393

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.: NA
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   SEALED IN PLASTIC? YES / NO
   TAPED TO LID? YES / NO
   PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: 8008118245 15
6. COOLER CONDITIONS
   ENOUGH ICE? YES / NO
   TYPE OF ICE? wet
   TYPE OF PACKING? bubbles
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   CORRECT PRESERVATIVE ? YES / NO
   SUFFICIENT SAMPLE ? YES / NO
   LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO
   VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
CRA/MFA1CS501	B,M	01	MKF-01 4-1-98-2			3°
502	V	02				
502 MS		03				
502 MSD		04				
503	B,M	05				
504		06				
505	V	07				
506	B,M	08				
507		09				
508	V	10				
509	B,M	11				
509 MS		12				
509 MSD		13				
CRA/MFAR0330		14		✓		
CRA/MFA1CS510		15				
511	V	16				
512	B,M	17				
513		18				
514	V	19				
515	B,M	20				
CRA/MFAT0331	V	21				

Bias +1.5

Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

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SDG NARRATIVE

April 28, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 33393
EPISODE(S): 33393
FRACTION : EXPLOSIVES
SAMPLE(S) : CRA/MFAICS501, CRA/MFAICS503, CRA/MFAICS504, CRA/MFAICS506, CRA/MFAICS507, CRA/MFAICS509, CRA/MFAR0330, CRA/MFAICS510, CRA/MFAICS512, CRA/MFAICS513, CRA/MFAICS515

This SDG consisted of 10 soil and 1 water samples with applicable MS and MSD for explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

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CASE SUMMARY:

SOIL:

Due to retention time shift in the quantitational analysis, all of the samples in the above SDG were re-analyzed. In the original analysis the retention window was enlarged to detect all of the analytes of interest.

In the preliminary data, HMX was reported with a "J" flag in the sample CRA/MFAICS503. The analyte was detected slightly above the PQL in the re-analyzed sample.

HMX was "JP" flagged and RDX was "J" flagged in the preliminary data of the sample CRA/MFAICS506. In the re-analyzed, sample HMX was "J" flagged and RDX was detected slightly above the PQL.

Due to concentration of analytes and possibly coelution of 4ADNT, the analyte was not reported in the preliminary data of the sample CRA/MFAICS507. The analyte was reported in the re-analyzed sample. In the re-analyzed sample, an interfering peak was detected as 2NT. Since the analyte was not detected in the original analysis, 2NT was not confirmed and this analyte was not reported.

The interfering peak was detected as 2NT in the re-analysis of the sample CRA/MFAICS510. Since the peak was not detected in the original sample, the analyte was not confirmed and it was not reported. With the exception of HMX and RDX, all of the analytes were diluted out in the 100X dilution of this sample. The surrogate (3,4DNT) was diluted out in the 100X dilution of this sample. The analyte was "D" flagged on the form 2E (the surrogate recovery form).

The interfering peak was detected as 2NT in the re-analysis of the sample CRA/MFAICS512. Since the peak was not detected in the original sample, the analyte was not confirmed and it was not reported. 4ADNT was not reported in the original sample. The analyte was reported in the re-analyzed sample.

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Due to concentration of analytes and possibly coelution of 4ADNT, the analyte was not reported in the preliminary data of the sample CRA/MFAICS513. The analyte was reported in the re-analyzed sample. 4ADNT was diluted out in the 10X dilution of the confirmational analysis of this sample and the analyte was detected below the PQL in the quantitational analysis. Therefore, the analyte was not reported.

Some of the analytes were out of the QC limits and RPD limits in the matrix spike and the matrix spike duplicate possibly due to non-homogeneity of the samples. These samples were within the QC limits in the laboratory control spike (LCS) and the laboratory control spike duplicate (LCSD).

Any reported 2ADNT might be a false positive hit since the analyte elutes at the same retention time as the surrogate (3,4DNT). Therefore, there is no positive way to confirm this analyte, unless the sample detecting such an analyte in the quantitation column is to be reextracted without a surrogate and analyzed for the confirmation for positive hit.

WATER:

TNT exceeded the QC limits in the matrix spike and matrix spike duplicate. The analyte was within the QC limits in the laboratory control spike (LCS) and the laboratory control spike duplicate (LCSD).

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The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

We use the following flags where appropriate. "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment which is explained in the case narrative.

Shahriar Shahreza
LC Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

	SAMPLE NUMBER	S1 #	OTHER
1	CRA/MFAICS501	103	0
2	CRA/MFAICS501 10X	100D	0
3	CRA/MFAICS503	108	0
4	CRA/MFAICS504	110	0
5	CRA/MFAICS506	110	0
6	CRA/MFAICS507	95.5	0
7	CRA/MFAICS507 10X	108D	0
8	CRA/MFAICS509	96.7	0
9	CRA/MFAICS509 MS	100	0
10	CRA/MFAICS509 MSD	109	0
11	CRA/MFAR0330	107	0
12	CRA/MFAR0330 MS	121	0
13	CRA/MFAR0330 MSD	127	0
14	CRA/MFAICS510	91.4	0
15	CRA/MFAICS510 100X	D	0
16	CRA/MFAICS512	107	0
17	CRA/MFAICS512 5X	102D	0
18	CRA/MFAICS513	100	0
19	CRA/MFAICS513 10X	97.6D	0
20	CRA/MFAICS515	104	0
21	BL0401SD	112	0
22	BL0401WH	99.4	0
23	LC0401SD	111	0
24	LC0401WH	135	0
25	LD0401SD	113	0
26	LD0401WH	131	0
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

page _ 1

FORM II

3F

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: CRA/MFAICS509 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
HMX	9500	3970	11600	80	54-128
RDX	9500	15000	16500	16*	66-109
TNB	9500	838	8750	83	57-130
DNB	9500		9010	95	74-122
TETRYL	9500		8720	92	32-119
NB	9500		8730	92	70-135
TNT	9500	12600	9730	30*	44-124
4ADNT	9500	3040	9460	68	60-140
2ADNT	9500	3800	9260	58*	60-140
26DNT	9500		8810	93	58-125
24DNT	9500	317	8490	86	59-120
2NT	9500		9000	95	79-124
4NT	9500		9000	95	74-128
3NT	9500		8870	93	79-121

No of Analyte recoveries out of QC Advisory Limits = 3

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	13500	100	22	30	54-128
RDX	9500	19700	50*	103*	30	66-109
TNB	9500	9970	96	14	30	57-130
DNB	9500	10400	109	14	45	74-122
TETRYL	9500	10000	105	13	30	32-119
NB	9500	10200	107	15	35	70-135
TNT	9500	9980	28*	9	30	44-124
4ADNT	9500	10600	80	16	40	60-140
2ADNT	9500	10300	68	17	40	60-140
26DNT	9500	9900	104	11	35	58-125
24DNT	9500	9920	101	16	35	59-120
2NT	9500	10300	108	13	35	79-124
4NT	9500	10300	108	13	35	74-128
3NT	9500	10200	107	14	35	79-121

No of Analyte recoveries out of QC Advisory Limits = 3
No of RPD's out of QC Limits 1

WATER EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: CRA/MFAR0330 MSD

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
HMX	400		394	99	44-145
RDX	150		146	97	66-139
TNB	225		204	91	56-129
DNB	125		110	88	76-122
TETRYL	413		393	95	76-120
NB	213		194	91	82-111
TNT	188		286	152*	76-137
4ADNT	313		297	95	60-140
2ADNT	313		284	91	60-140
26DNT	288		266	92	80-118
24DNT	175		161	92	72-123
2NT	363		310	85	74-130
4NT	250		209	84	78-116
3NT	238		286	120	72-126

No of Analyte recoveries out of QC Advisory Limits = 1

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	400	402	100	2	15	44-145
RDX	150	151	101	4	12	66-139
TNB	225	215	96	5	10	56-129
DNB	125	111	89	1	15	76-122
TETRYL	413	367	89	7	14	76-120
NB	213	201	94	4	13	82-111
TNT	188	292	155*	2	15	76-137
4ADNT	313	304	97	2	40	60-140
2ADNT	313	287	92	1	40	60-140
26DNT	288	268	93	1	13	80-118
24DNT	175	165	94	2	14	72-123
2NT	363	326	90	5	15	74-130
4NT	250	221	88	6	14	78-116
3NT	238	305	128*	6	15	72-126

No of Analyte recoveries out of QC Advisory Limits = 1
No of RPD's out of QC Limits 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: LC0401SD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
HMX	9500		11200	118	57-137
RDX	9500		9760	103	77-113
TNB	9500		9710	102	64-125
DNB	9500		10500	110	82-118
TETRYL	9500		7030	74	23-124
NB	9500		10200	107	69-143
TNT	9500		9630	101	75-118
4ADNT	9500		10500	110	60-140
2ADNT	9500		10200	107	60-140
26DNT	9500		9930	104	78-117
24DNT	9500		9970	105	74-126
2NT	9500		10300	108	78-123
4NT	9500		10400	109	79-125
3NT	9500		10200	107	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: LD0401SD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
HMX	9500		10900	115	57-137
RDX	9500		9570	101	77-113
TNB	9500		9240	97	64-125
DNB	9500		10300	108	82-118
TETRYL	9500		6780	71	23-124
NB	9500		10100	106	69-143
TNT	9500		9580	101	75-118
4ADNT	9500		10400	109	60-140
2ADNT	9500		10000	105	60-140
26DNT	9500		9750	103	78-117
24DNT	9500		9760	103	74-126
2NT	9500		10200	107	78-123
4NT	9500		10300	108	79-125
3NT	9500		10200	107	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: LC0401WH

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
HMX	400		404	101	46-151
RDX	150		148	99	72-129
TNB	225		212	94	74-118
DNB	125		109	87	76-132
TETRYL	413		278	67	58-120
NB	213		198	93	68-135
TNT	188		273	145	61-145
4ADNT	313		309	99	60-140
2ADNT	313		275	88	60-140
26DNT	288		263	91	77-125
24DNT	175		158	90	70-134
2NT	363		321	88	73-131
4NT	250		220	88	73-116
3NT	238		294	124	71-127

# of Analyte recoveries out of QC Advisory Limits = 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Client Sample No: LD0401WH

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
HMX	400		389	97	46-151
RDX	150		148	99	72-129
TNB	225		200	89	74-118
DNB	125		103	82	76-132
TETRYL	413		278	67	58-120
NB	213		188	88	68-135
TNT	188		270	144	61-145
4ADNT	313		277	89	60-140
2ADNT	313		253	81	60-140
26DNT	288		247	86	77-125
24DNT	175		150	86	70-134
2NT	363		302	83	73-131
4NT	250		206	82	73-116
3NT	238		280	118	71-127

# of Analyte recoveries out of QC Advisory Limits = 0

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0401SD

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Matrix: (soil/water) Soil

Date Extracted: 04/01/98 Extn. Method: SONC

Date Analyzed (1): 04/11/98 Date Analyzed(2): 04/04/98

Time Analyzed (1): 20:10:31 Time Analyzed(2): 23:05:14

Instrument ID (1): IN12 Instrument ID(2): IN12

LC Column ID (1): CARB-04 LC Column ID (2): LC-CN-09

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0401SD	LC0401SD	04/11/98	
2	LD0401SD	LD0401SD	04/11/98	
3	CRA/MFAICS501	33393.01	04/11/98	04/05/98
4	CRA/MFAICS501 10X	33393.01DL	04/11/98	04/16/98
5	CRA/MFAICS503	33393.05	04/12/98	04/05/98
6	CRA/MFAICS504	33393.06	04/12/98	04/05/98
7	CRA/MFAICS506	33393.08	04/12/98	04/05/98
8	CRA/MFAICS507 10X	33393.09DL	04/12/98	04/16/98
9	CRA/MFAICS509	33393.11	04/12/98	04/05/98
10	CRA/MFAICS509 MS	33393.12MS	04/12/98	
11	CRA/MFAICS509 MSD	33393.13MSD	04/12/98	
12	CRA/MFAICS510	33393.15	04/12/98	04/05/98
13	CRA/MFAICS510 100X	33393.15DL	04/12/98	04/18/98
14	CRA/MFAICS512	33393.17	04/12/98	04/05/98
15	CRA/MFAICS512 5X	33393.17DL	04/12/98	04/18/98
16	CRA/MFAICS513	33393.18	04/12/98	04/05/98
17	CRA/MFAICS513 10X	33393.18DL	04/12/98	04/18/98
18	CRA/MFAICS515	33393.20	04/12/98	04/05/98
19	CRA/MFAICS507	33393.09	04/20/98	04/05/98
20				
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22				
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25				

FORM IV

4C

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0401WH

Lab Code: SWOK Case No: MKF-OH SDG No:33393

Matrix: (soil/water) Water

Date Extracted: Extn. Method: DIRECT

Date Analyzed (1): 04/03/98 Date Analyzed(2): 04/09/98

Time Analyzed (1): 05:29:17 Time Analyzed(2): 10:06:20

Instrument ID (1): IN13 Instrument ID(2): IN10

LC Column ID (1): CARB-06 LC Column ID (2): LC-CN-10

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0401WH	LC0401WH	04/03/98	
2	LD0401WH	LD0401WH	04/03/98	
3	CRA/MFAR0330	33393.14	04/03/98	
4	CRA/MFAR0330 MS	33393.14MS	04/03/98	
	CRA/MFAR0330 MSD	33393.14MSD	04/03/98	
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FORM IV

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

CRA/MFAICS503

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33393

Matrix: (soil/water) SOIL Lab Sample ID: 33393.05

Sample Amt: 2g % Moisture 16.67 Date Received: 04/01/98

Extraction Volume: 10ml Date Extracted: 04/01/98

Extraction Method: SONC Date Analyzed: 04/12/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2220	
121-82-4	RDX	4850	
99-35-4	TNB	277	
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	650	
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

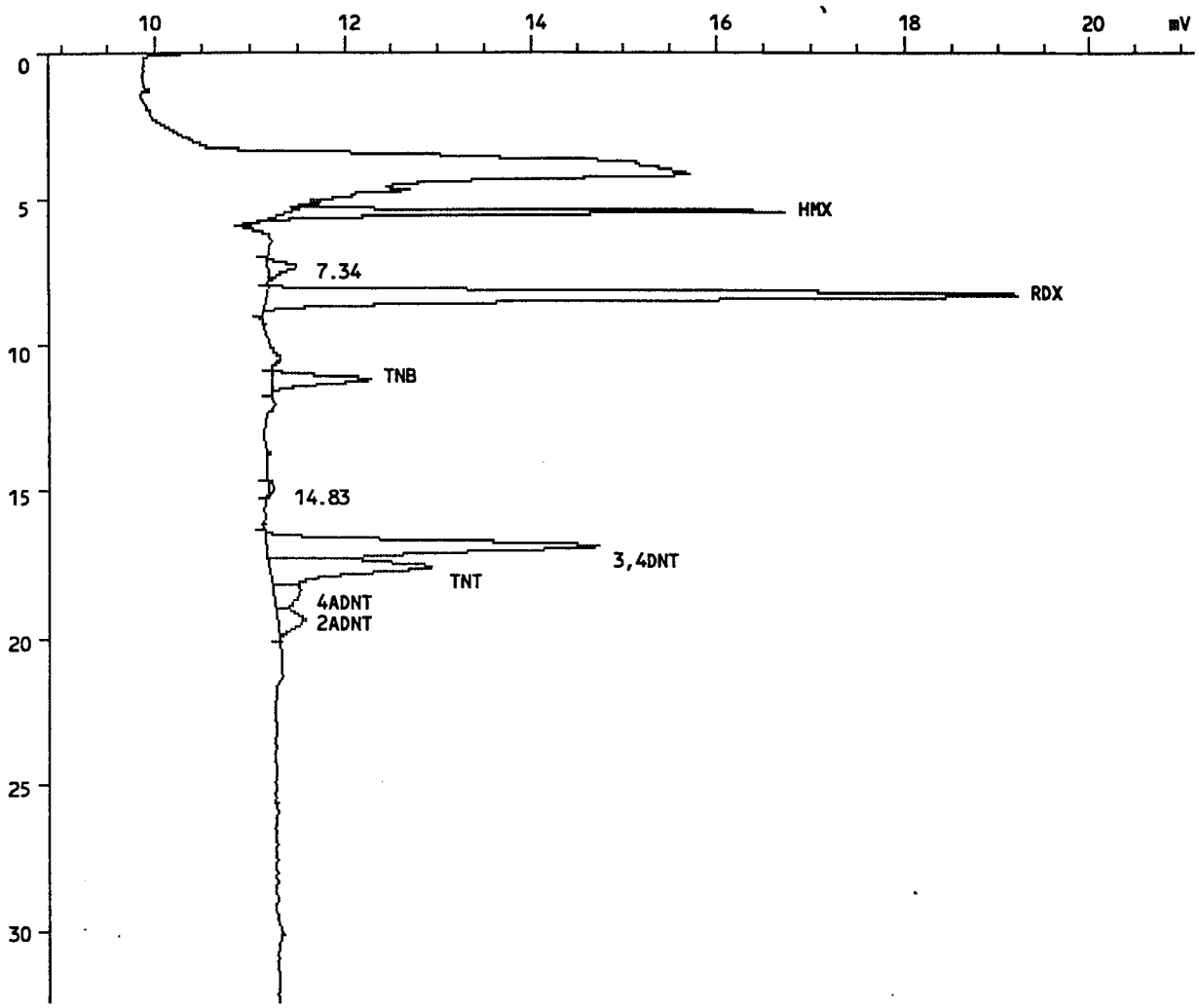
FORM I

LONG PLOT

Injection F: <MC3> 2 2EX0410,39,1

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-04, INJ:200,COL#1

Acquired on 12-Apr-98 at 00:38:17
Reported on 20-Apr-98 at 14:54:24



INJECTION REPORT

Injection F: <MC3> 2 2EX0410,39,1

Acquired on 12-Apr-98 at 00:38:17
Modified on 20-Apr-82 at 11:46:44
Reported on 20-Apr-98 at 11:46:45

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-04,INJ:200,COL#1
Number of samples.: 64
Calibration file..: 2EX0410 Last modified on 14-Apr-82 at 12:07:44
Method file.....: EXPLOS Last modified on 20-Apr-82 at 11:44:02
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

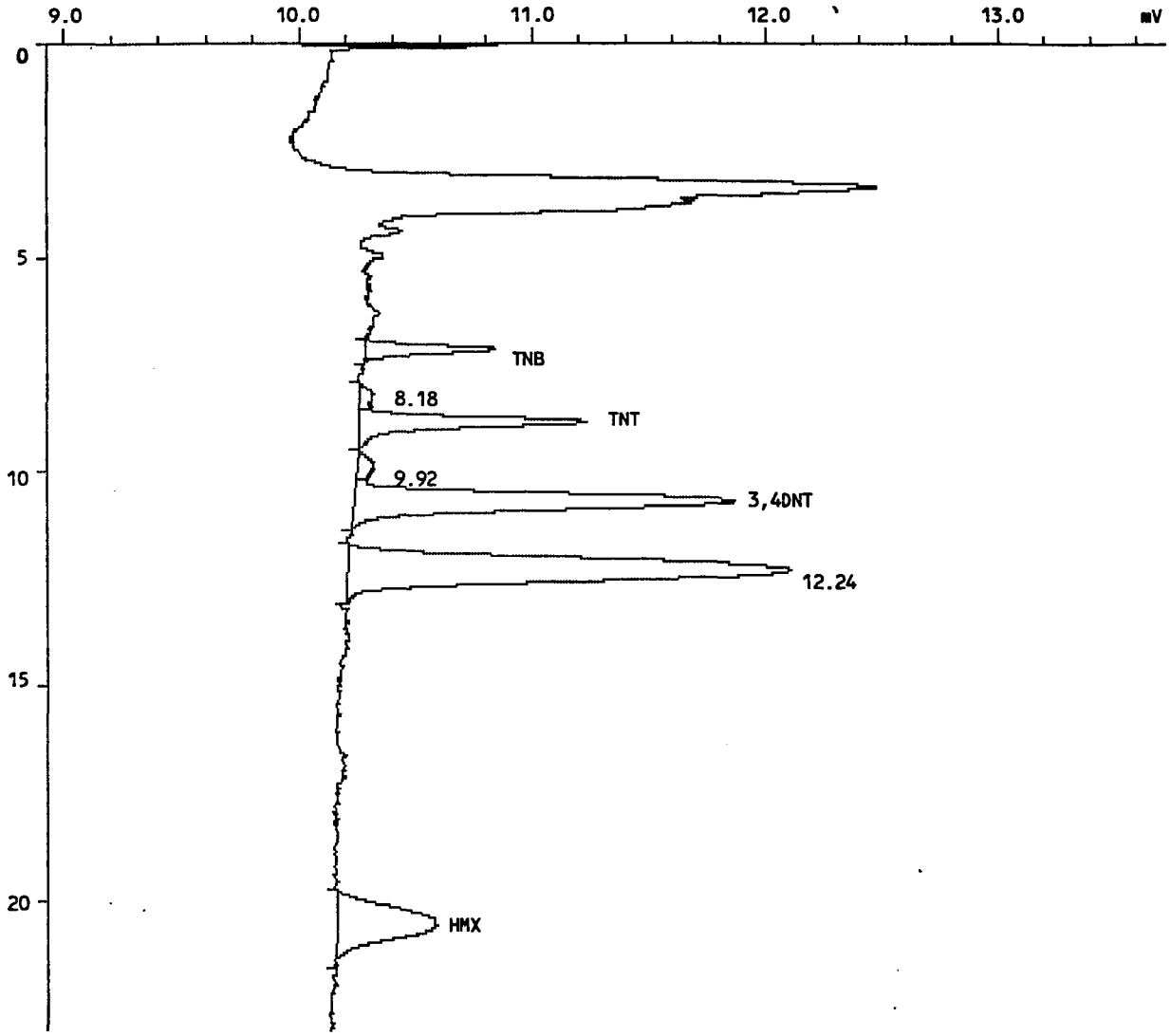
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	5.493	5415	56847	2225.803	HMX *
3	8.320	8053	172826	4854.663	RDX *
4	11.195	1035	21268	277.288	TNB *
6	16.928	3537	97263	2155.652	3,4DNT 108
7	17.643	1710	52881	650.121	TNT *
8	18.400	284	11058	193.799	4ADNT
9	19.424	279	10343	125.034	2ADNT
Total		20312	422486	10482.360	
Residual		376	8646	301.848	

LONG PLOT

Injection F: <MC3> 2 2CN0403A,4,1

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
INST ID: IN12, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100, UV

Acquired on 05-Apr-98 at 00:42:01
Reported on 07-Apr-98 at 14:23:56



INJECTION REPORT

Injection F: <MC3> 2 2CN0403A,4,1

Acquired on 05-Apr-98 at 00:42:01
Modified on 07-Apr-82 at 14:20:14
Reported on 07-Apr-98 at 14:20:16

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN12, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100, UV
Number of samples.: 27
Calibration file..: 2CN0403A Last modified on 06-Apr-82 at 12:09:26
Method file.....: LCCN Last modified on 07-Apr-82 at 14:17:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

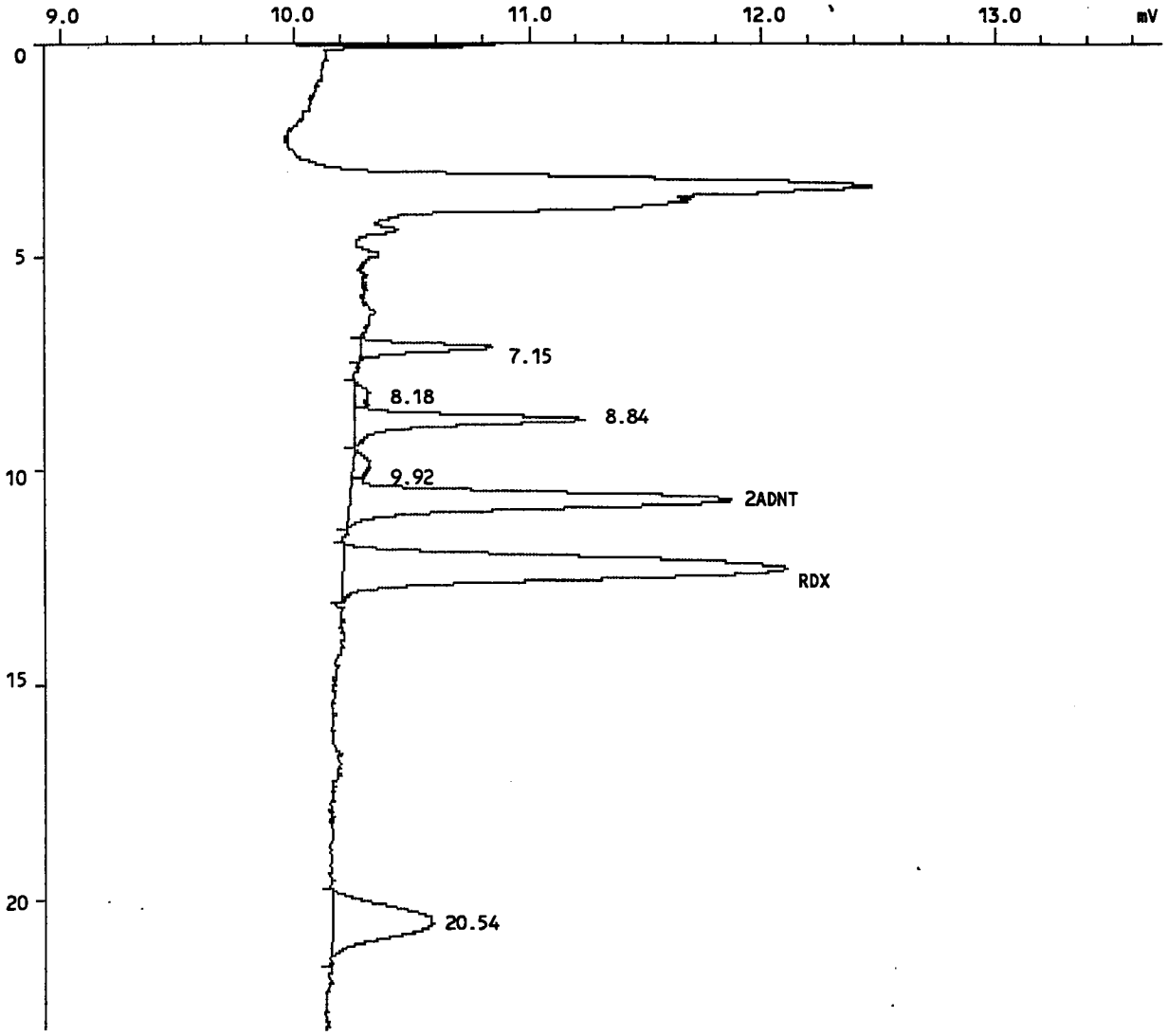
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	7.147	571	8009	277.616	TNB
3	8.837	983	17167	568.270	TNT
5	10.693	1630	40087	2280.263	3,4DNT
7	20.539	427	20986	2079.898	HMX
Total		3611	86250	5206.047	
Residual		2030	68630	0.000	

LONG PLOT

Injection F: <MC3> 2 2CN0403A,4,1

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
INST ID: IN12, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100, UV

Acquired on 05-Apr-98 at 00:42:01
Reported on 07-Apr-98 at 14:31:00



INJECTION REPORT

Injection F: <MC3> 2 2CN0403A,4,1

Acquired on 05-Apr-98 at 00:42:01
Modified on 07-Apr-82 at 14:29:52
Reported on 07-Apr-98 at 14:29:53

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN12, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100, UV
Number of samples.: 27
Calibration file..: 2CN0403B Last modified on 06-Apr-82 at 12:09:56
Method file.....: LCCN Last modified on 07-Apr-82 at 14:17:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS503
Sample ID.....: 33393.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
5	10.693	1630	40087	1210.357	2ADNT
6	12.240	1897	65247	4438.583	RDX
Total		3526	105334	5648.940	
Residual		2114	49546	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

CRA/MFAR0330

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33393

Matrix: (soil/water) WATER Lab Sample ID: 33393.14

Sample Amt: 1ml % Moisture Date Received: 04/01/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 04/03/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	8.00	U
99-08-1	3NT	7.90	U

SURROGATE AMOUNT SPIKED (ug/L) 200
3,4-DNT

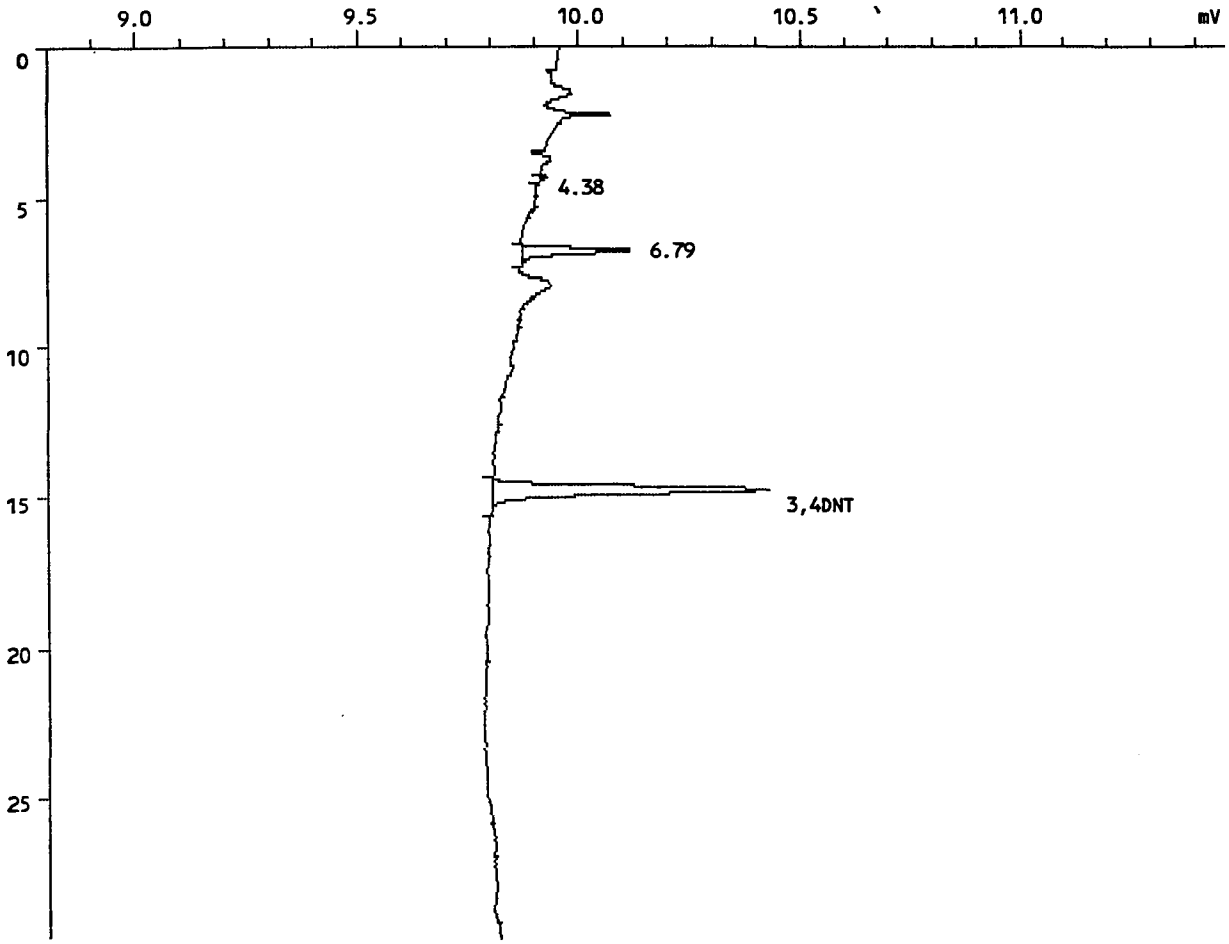
FORM I

LONG PLOT

Injection F: <MC3> 5 5E0402W,12,1

Sample name.....: CRA/MFAR0330
Sample ID.....: 33393.14
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1

Acquired on 03-Apr-98 at 08:28:12
Reported on 07-Apr-98 at 15:41:36



INJECTION REPORT

Injection F: <MC3> 5 5E0402W,12,1

Acquired on 03-Apr-98 at 08:28:12
Modified on 07-Apr-82 at 15:38:22
Reported on 07-Apr-98 at 15:38:24

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1
Number of samples.: 19
Calibration file..: 5E0402W Last modified on 07-Apr-82 at 15:38:22
Method file.....: EXPLOS Last modified on 07-Apr-82 at 15:37:18
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAR0330
Sample ID.....: 33393.14
Sample type.....: Sample
Sample amount.....: 1.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 1.000
Dilution.....: 2.000
Amount (g or mL).....: 1.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/L	Peak name
3	14.784	623	12145	214.962	3,4DNT108
Total		623	12145	214.962	
Residual		259	3396	-5.306	

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-04

Inj 1

Injection File Name Level 1 : 2EX0410,4
Injection File Name Level 2 : 2EX0410,5
Injection File Name Level 3 : 2EX0410,6
Injection File Name Level 4 : 2EX0410,7
Injection File Name Level 5 : 2EX0410,8

Calibration Date : 04/10/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	12016	1185	328296	1293	859300	1302	1292692	1306	1716157	1300
RDX	6911	1638	189214	1792	499956	1811	754713	1832	1006274	1830
TNB	10943	3624	294894	3901	762806	3872	1156633	3908	1526027	3873
DNB	8664	5348	223199	5498	575466	5449	883277	5576	1166988	5505
TETRYL	8971	2412	228072	2452	594332	2456	898118	2467	1180098	2438
NB	13325	4038	355881	4319	913821	4270	1403294	4358	1864342	4336
3,4-DNT	10774	2121	289884	2286	755530	2289	1138660	2296	1509255	2287
TNT	9834	3642	279842	4140	723982	4114	1112732	4215	1487586	4226
4ADNT	6221	2636	173617	2933	445879	2895	673358	2902	893342	2900
2ADNT	8955	3794	248354	4195	644153	4183	985856	4249	1311009	4257
26DNT	9129	2353	236848	2437	618725	2436	920134	2421	1202399	2376
24DNT	12405	5256	347016	5862	894997	5812	1397693	6025	1867320	6063
2NT	7582	2243	215537	2548	559860	2545	850978	2579	1125182	2557
T	6332	1873	196785	2326	519597	2362	795472	2411	1048376	2383
T	8375	2601	235671	2931	600554	2860	906269	2886	1213876	2904

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-04

Inj 1

Injection File Name Level 1 : 2EX0410,4
Injection File Name Level 2 : 2EX0410,5
Injection File Name Level 3 : 2EX0410,6
Injection File Name Level 4 : 2EX0410,7
Injection File Name Level 5 : 2EX0410,8

Calibration Date : 04/10/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	1277	4.05	0.99999	1302	0.000
RDX	1780	4.57	0.99998	1827	0.000
TNB	3835	3.12	0.99998	3884	0.000
DNB	5475	1.54	0.99992	5519	0.000
TETRYL	2445	0.88	0.99996	2450	0.000
NB	4264	3.06	0.99995	4334	0.000
3,4-DNT	2256	3.35	1.00000	2290	0.000
TNT	4067	5.96	0.99991	4206	0.000
2ADNT	2853	4.29	1.00000	2901	0.000
2ADNT	4136	4.68	0.99996	4243	0.000
26DNT	2405	1.58	0.99987	2400	0.000
24DNT	5803	5.58	0.99979	6014	0.000
2NT	2494	5.65	0.99997	2562	0.000
4NT	2271	9.88	0.99993	2387	0.000
3NT	2836	4.73	0.99996	2893	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/10/1998
Continuing Calibration #: 2
Continuing Cal Date : 04/11/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-04
Injection File Name : 2EX0410,31
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	845721	1281	1277	0.34	1302	1.58
RDX	492166	1783	1780	0.15	1827	2.40
TNB	743020	3772	3835	1.66	3884	2.89
DNB	575295	5448	5475	0.50	5519	1.29
TETRYL	562251	2323	2445	4.98	2450	5.16
NB	896082	4187	4264	1.80	4334	3.37
3,4-DNT	752059	2279	2256	1.03	2290	0.47
TNT	711361	4042	4067	0.63	4206	3.91
4ADNT	444414	2886	2853	1.14	2901	0.52
2ADNT	638823	4148	4136	0.30	4243	2.24
26DNT	610545	2404	2405	0.04	2400	0.17
24DNT	884865	5746	5803	0.99	6014	4.46
2NT	539633	2453	2494	1.66	2562	4.26
4NT	496344	2256	2271	0.65	2387	5.50
NT	574143	2734	2836	3.61	2893	5.50

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/10/1998
Continuing Calibration #: 3
Continuing Cal Date : 04/12/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-04
Injection File Name : 2EX0410,43
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	847477	1284	1277	0.55	1302	1.37
RDX	495934	1797	1780	0.92	1827	1.65
TNB	747571	3795	3835	1.06	3884	2.30
DNB	582262	5514	5475	0.71	5519	0.09
TETRYL	535595	2213	2445	9.48	2450	9.66
NB	915626	4279	4264	0.34	4334	1.27
3,4-DNT	752377	2280	2256	1.07	2290	0.43
TNT	724840	4118	4067	1.26	4206	2.08
4ADNT	451340	2931	2853	2.71	2901	1.03
2ADNT	646455	4198	4136	1.50	4243	1.07
26DNT	616842	2429	2405	0.99	2400	1.20
24DNT	898586	5835	5803	0.54	6014	2.98
2NT	553704	2517	2494	0.90	2562	1.76
4NT	513793	2335	2271	2.84	2387	2.17
3NT	594735	2832	2836	0.15	2893	2.11

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/10/1998
Continuing Calibration #: 4
Continuing Cal Date : 04/12/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-04
Injection File Name : 2EX0410,54
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	850714	1289	1277	0.93	1302	1.00
RDX	496133	1798	1780	0.96	1827	1.61
TNB	739942	3756	3835	2.07	3884	3.30
DNB	577232	5466	5475	0.16	5519	0.96
TETRYL	507547	2097	2445	14.22	2450	14.39
NB	911380	4259	4264	0.13	4334	1.72
3,4-DNT	748391	2268	2256	0.53	2290	0.96
TNT	727070	4131	4067	1.57	4206	1.78
4ADNT	455229	2956	2853	3.60	2901	1.90
2ADNT	647710	4206	4136	1.70	4243	0.88
26DNT	607198	2391	2405	0.59	2400	0.38
24DNT	912843	5928	5803	2.14	6014	1.44
2NT	550099	2500	2494	0.25	2562	2.40
4NT	508211	2310	2271	1.72	2387	3.24
3NT	584743	2784	2836	1.83	2893	3.76

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/10/1998
Continuing Calibration #: 5
Continuing Cal Date : 04/12/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-04
Injection File Name : 2EX0410,61
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	847942	1285	1277	0.60	1302	1.32
RDX	490130	1776	1780	0.26	1827	2.80
TNB	734467	3728	3835	2.79	3884	4.01
DNB	571771	5414	5475	1.11	5519	1.90
TETRYL	534586	2209	2445	9.65	2450	9.83
NB	896202	4188	4264	1.79	4334	3.36
3,4-DNT	745796	2260	2256	0.19	2290	1.30
TNT	715089	4063	4067	0.11	4206	3.40
4ADNT	446243	2898	2853	1.55	2901	0.11
2ADNT	638369	4145	4136	0.23	4243	2.31
26DNT	610893	2405	2405	0.02	2400	0.23
24DNT	888043	5767	5803	0.64	6014	4.12
2NT	543043	2468	2494	1.04	2562	3.65
4NT	505765	2299	2271	1.23	2387	3.70
[illegible]NT	583805	2780	2836	1.99	2893	3.91

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	10.140	254.000	660.000	990.000	1320.000
RDX	4.220	105.600	276.000	412.000	550.000
TNB	3.020	75.600	197.000	296.000	394.000
DNB	1.620	40.600	105.600	158.400	212.000
TETRYL	3.720	93.000	242.000	364.000	484.000
NB	3.300	82.400	214.000	322.000	430.000
3,4-DNT	5.080	126.800	330.000	496.000	660.000
TNT	2.700	67.600	176.000	264.000	352.000
4ADNT	2.360	59.200	154.000	232.000	308.000
2ADNT	2.360	59.200	154.000	232.000	308.000
26DNT	3.880	97.200	254.000	380.000	506.000
24DNT	2.360	59.200	154.000	232.000	308.000
2NT	3.380	84.600	220.000	330.000	440.000
4NT	3.380	84.600	220.000	330.000	440.000
3NT	3.220	80.400	210.000	314.000	418.000

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CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : CARB-04
Calibration Date : 04/10/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	5.52	5.52	5.49	5.49	5.46
RDX	8.36	8.35	8.30	8.29	8.25
TNB	11.22	11.23	11.15	11.15	11.10
DNB	13.70	13.72	13.63	13.63	13.57
TETRYL	14.69	14.70	14.59	14.60	14.53
NB	15.54	15.56	15.46	15.46	15.40
3,4-DNT	16.96	16.97	16.84	16.84	16.77
TNT	17.69	17.69	17.56	17.57	17.50
4ADNT	18.50	18.50	18.35	18.35	18.27
2ADNT	19.50	19.49	19.35	19.36	19.29
26DNT	20.68	20.70	20.56	20.56	20.50
24DNT	21.41	21.38	21.23	21.23	21.16
2NT	25.15	25.14	24.96	24.98	24.91
4NT	26.90	26.86	26.67	26.70	26.62
3NT	29.01	28.96	28.76	28.78	28.70

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
HMX	5.48	5.51	5.47	5.50	5.50
RDX	8.29	8.26	8.29	8.32	8.34
TNB	11.14	11.12	11.14	11.18	11.22
DNB	13.62	13.58	13.62	13.68	13.72
TETRYL	14.59	14.54	14.59	14.66	14.72
NB	15.45	15.42	15.45	15.52	15.57
3,4-DNT	16.83	16.78	16.84	16.93	16.98
TNT	17.55	17.52	17.56	17.64	17.69
4ADNT	18.34	18.28	18.36	18.45	18.50
2ADNT	19.34	19.29	19.37	19.47	19.52
26DNT	20.54	20.50	20.56	20.67	20.72
24DNT	21.22	21.17	21.23	21.34	21.39
2NT	24.95	24.91	24.97	25.12	25.16
4NT	26.68	26.61	26.68	26.84	26.89
3NT	28.75	28.70	28.76	28.94	28.99

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	5.49	0.020	0.061	5.43 - 5.56
RDX	8.30	0.037	0.112	8.19 - 8.42
TNB	11.16	0.044	0.133	11.03 - 11.30
DNB	13.65	0.054	0.163	13.48 - 13.81
TETRYL	14.62	0.068	0.203	14.42 - 14.82
NB	15.48	0.059	0.178	15.31 - 15.66
3,4-DNT	16.87	0.077	0.230	16.64 - 17.10
TNT	17.60	0.073	0.218	17.38 - 17.81

2EX041
page 2

4ADNT	18.39	0.090	0.269	18.12 - 18.66
2ADNT	19.40	0.089	0.266	19.13 - 19.66
26DNT	20.60	0.085	0.254	20.34 - 20.85
24DNT	21.28	0.095	0.285	20.99 - 21.56
2NT	25.02	0.104	0.312	24.71 - 25.34
4NT	26.75	0.114	0.341	26.40 - 27.09
NT	28.83	0.124	0.371	28.46 - 29.21

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33393
Instrument ID: IN12 Column ID: CARB-04

Dates of Anlayses: 04/10/98 to 04/12/98

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
	INST. BLK.	INST. BLK.	04/10/98	20:19
calib	EXP L1 SOIL STD	2-156:IA1	04/10/98	22:33
calib	EXP L2 SOIL STD	2-155:IA2	04/10/98	23:17
calib	EXP L3 SOIL STD	2-154:IA3	04/11/98	00:02
calib	EXP L4 SOIL STD	2-153:IA4	04/11/98	00:47
calib	EXP L5 SOIL STD	2-152:IA5	04/11/98	01:31
calib	EXP L3 SOIL STD	2-154:CA2	04/11/98	18:41
	BL0401SD	BL0401SD	04/11/98	20:10
soil LCS/LCSD	LC0401SD	LC0401SD	04/11/98	21:39
soil LCS/LCSD	LD0401SD	LD0401SD	04/11/98	22:24
	CRA/MFAICS501	33393.01	04/11/98	23:09
	CRA/MFAICS501 10X	33393.01DL	04/11/98	23:53
	CRA/MFAICS503	33393.05	04/12/98	00:38
	CRA/MFAICS504	33393.06	04/12/98	01:22
	CRA/MFAICS506	33393.08	04/12/98	02:07
CCV	EXP L3 SOIL STD	2-154:CA3	04/12/98	03:36
	CRA/MFAICS507 10X	33393.09DL	04/12/98	05:06
	CRA/MFAICS509	33393.11	04/12/98	05:50
MS	CRA/MFAICS509 MS	33393.12MS	04/12/98	06:35

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33393
Instrument ID: IN12 Column ID: CARB-04

Dates of Anlayses: 04/10/98 to 04/12/98

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
MSD	CRA/MFAICS509 MSD	33393.13MSD	04/12/98	07:19
	CRA/MFAICS510	33393.15	04/12/98	08:04
	CRA/MFAICS510 100X	33393.15DL	04/12/98	08:49
	CRA/MFAICS512	33393.17	04/12/98	09:33
	CRA/MFAICS512 5X	33393.17DL	04/12/98	10:18
	CRA/MFAICS513	33393.18	04/12/98	11:03
CCV	EXP L3 SOIL STD	2-154:CA4	04/12/98	11:47
	CRA/MFAICS513 10X	33393.18DL	04/12/98	13:16
	CRA/MFAICS515	33393.20	04/12/98	14:01
	EXP L3 SOIL STD	2-154:CA5	04/12/98	17:00

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33393
Instrument ID: IN12 Column ID: LC-CN-09

Confirmation

Dates of Anlayses: 04/03/98 to 04/06/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1A STD	2-102:IA1	04/03/98	18:15
EXP L2A STD	2-101:IA2	04/03/98	18:47
EXP L3A STD	2-100:IA3	04/03/98	19:24
EXP L4A STD	2-99:IA4	04/03/98	19:56
EXP L5A STD	2-98:IA5	04/03/98	20:29
EXP L1B STD	2-107:IB1	04/03/98	21:01
EXP L2B STD	2-106:IB2	04/03/98	21:33
EXP L3B STD	2-105:IB3	04/03/98	22:05
EXP L4B STD	2-104:IB4	04/03/98	22:38
EXP L5B STD	2-103:IB5	04/03/98	23:10
EXP L3A STD	2-100:CA4	04/04/98	22:00
EXP L3B STD	2-105:CB4	04/04/98	22:32
BL0401SD	BL0401SD	04/04/98	23:05
CRA/MFAICS501	33393.01	04/05/98	00:09
CRA/MFAICS503	33393.05	04/05/98	00:42
CRA/MFAICS504	33393.06	04/05/98	01:14
CRA/MFAICS506	33393.08	04/05/98	01:46
CRA/MFAICS507	33393.09	04/05/98	02:18
CRA/MFAICS509	33393.11	04/05/98	02:51

calib

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33393
Instrument ID: IN12 Column ID: LC-CN-09

Dates of Anlayses: 04/03/98 to 04/06/98

CCV

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L3A STD	2-100:CA5	04/05/98	03:23
EXP L3B STD	2-105:CB5	04/05/98	03:55
CRA/MFAICS510	33393.15	04/05/98	04:27
CRA/MFAICS512	33393.17	04/05/98	05:00
CRA/MFAICS513	33393.18	04/05/98	05:32
CRA/MFAICS515	33393.20	04/05/98	06:04
EXP L3A STD	2-100:CA6	04/05/98	08:13
EXP L3B STD	2-105:CB6	04/05/98	08:45

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33393
Instrument ID: IN13 Column ID: CARB-06

Dates of Anlayses: 04/03/98 to 04/03/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	
INST. BLANK	INST.BLK.	04/03/98	00:16	
EXP HIGH WATER L1 ST	2-63:IA1	04/03/98	01:45	Calib.
EXP HIGH WATER L2 ST	2-62:IA2	04/03/98	02:30	Calib.
EXP HIGH WATER L3 ST	2-61:IA3	04/03/98	03:15	Calib.
EXP HIGH WATER L4 ST	2-60:IA4	04/03/98	03:59	Calib.
EXP HIGH WATER L5 ST	2-59:IA5	04/03/98	04:44	Calib.
BL0401WH	BL0401WH	04/03/98	05:29	
LC0401WH	LC0401WH	04/03/98	06:58	LCS/LCSD
LD0401WH	LD0401WH	04/03/98	07:43	LCS/LCSD
CRA/MFAR0330	33393.14	04/03/98	08:28	
CRA/MFAR0330 MS	33393.14MS	04/03/98	09:57	ms/msd
CRA/MFAR0330 MSD	33393.14MSD	04/03/98	10:42	ms/msd
EXP HIGH WATER L3 ST	2-61:CA1	04/03/98	11:27	CCV

FORM VIII

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-06

Inj 1

Injection File Name Level 1 : 5E0402W,3
Injection File Name Level 2 : 5E0402W,4
Injection File Name Level 3 : 5E0402W,5
Injection File Name Level 4 : 5E0402W,6
Injection File Name Level 5 : 5E0402W,7

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	336	263	843	265	56273	354	113675	357	233943	368
RDX	318	306	972	374	56773	437	117795	453	240718	465
TNB	607	843	1533	852	86130	961	176990	989	361403	1010
DNB	568	1495	1066	1110	61576	1294	125847	1325	256396	1349
TETRYL	683	759	1260	558	69547	615	140350	621	284431	632
NB	567	834	1464	861	72737	856	154974	912	316389	931
3,4-DNT	722	564	1699	528	89082	557	186278	582	380097	594
TNT	585	914	1347	842	74965	937	155352	971	317776	993
4ADNT	595	595	1442	572	80003	640	165278	661	341911	684
2ADNT	475	848	1271	908	63716	910	131715	941	274117	979
26DNT	495	516	1493	622	71868	625	147451	641	303614	660
24DNT	641	1145	1695	1211	85169	1217	174965	1250	360540	1288
2NT	557	497	1579	564	78502	541	162412	560	332458	573
4NT	356	445	916	458	44908	449	93823	469	193042	483
	334	418	1118	559	57202	602	119196	627	244278	643

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-06

Inj 1

Injection File Name Level 1 : 5E0402W,3
Injection File Name Level 2 : 5E0402W,4
Injection File Name Level 3 : 5E0402W,5
Injection File Name Level 4 : 5E0402W,6
Injection File Name Level 5 : 5E0402W,7

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	321	16.43	0.99989	365	0.000
RDX	407	16.34	0.99985	461	0.000
TNB	931	8.40	0.99990	1003	0.000
DNB	1315	10.48	0.99992	1342	0.000
TETRYL	637	11.62	0.99995	629	0.000
NB	879	4.63	0.99977	924	0.000
3,4-DNT	565	4.51	0.99985	590	0.000
TNT	931	6.29	0.99987	986	0.000
[illegible]NT	630	7.32	0.99978	678	0.000
[illegible]DNT	917	5.25	0.99971	969	0.000
26DNT	613	9.20	0.99984	655	0.000
24DNT	1222	4.33	0.99983	1277	0.000
2NT	547	5.51	0.99986	569	0.000
4NT	461	3.33	0.99979	479	0.000
3NT	570	15.94	0.99984	638	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 1
Continuing Cal Date : 04/03/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-06
Injection File Name : 5E0402W,16
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	56798	357	321	11.16	365	2.20
RDX	55681	428	407	5.28	461	7.14
TNB	86922	970	931	4.22	1003	3.32
DNB	60982	1281	1315	2.54	1342	4.55
TETRYL	67953	601	637	5.59	629	4.43
NB	72168	849	879	3.36	924	8.08
3,4-DNT	90858	568	565	0.52	590	3.75
TNT	73937	924	931	0.77	986	6.30
4ADNT	80580	645	630	2.25	678	4.87
2ADNT	63678	910	917	0.82	969	6.11
26DNT	71652	623	613	1.68	655	4.86
24DNT	85535	1222	1222	0.00	1277	4.34
2NT	79490	548	547	0.19	569	3.70
4NT	45444	454	461	1.37	479	5.05
3NT	58102	612	570	7.34	638	4.15

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

ıjection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	1.280	3.180	159.000	318.000	636.000
RDX	1.040	2.600	130.000	260.000	518.000
TNB	0.720	1.800	89.600	179.000	358.000
DNB	0.380	0.960	47.600	95.000	190.000
TETRYL	0.900	2.260	113.000	226.000	450.000
NB	0.680	1.700	85.000	170.000	340.000
3,4-DNT	1.280	3.220	160.000	320.000	640.000
TNT	0.640	1.600	80.000	160.000	320.000
4ADNT	1.000	2.520	125.000	250.000	500.000
2ADNT	0.560	1.400	70.000	140.000	280.000
26DNT	0.960	2.400	115.000	230.000	460.000
24DNT	0.560	1.400	70.000	140.000	280.000
2NT	1.120	2.800	145.000	290.000	580.000
4NT	0.800	2.000	100.000	200.000	400.000
3NT	0.800	2.000	95.000	190.000	380.000

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CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN13
Column ID : CARB-06
Calibration Date : 04/03/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.79	4.78	4.76	4.76	4.77
RDX	7.38	7.34	7.33	7.34	7.33
TNB	9.96	9.95	9.92	9.94	9.92
DNB	12.21	12.19	12.17	12.18	12.14
TETRYL	12.82	12.80	12.81	12.81	12.77
NB	13.87	13.80	13.81	13.81	13.78
3,4-DNT	14.89	14.85	14.86	14.86	14.82
TNT	15.58	15.53	15.55	15.56	15.52
4ADNT	16.27	16.25	16.24	16.25	16.19
2ADNT	17.19	17.16	17.12	17.15	17.08
26DNT	18.22	18.18	18.17	18.20	18.13
24DNT	18.90	18.83	18.83	18.87	18.79
2NT	22.19	22.05	22.04	22.11	22.03
4NT	23.55	23.60	23.56	23.62	23.53
3NT	25.45	25.38	25.37	25.42	25.34

COMPONENT NAME	RT Cont CA1
HMX	4.77
RDX	7.30
TNB	9.84
DNB	12.04
TETRYL	12.59
NB	13.66
3,4-DNT	14.64
TNT	15.37
4ADNT	16.00
2ADNT	16.89
26DNT	17.97
24DNT	18.62
2NT	21.77
4NT	23.24
3NT	25.01

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.77	0.012	0.037	4.74 - 4.81
RDX	7.34	0.028	0.083	7.25 - 7.42
TNB	9.92	0.041	0.124	9.80 - 10.05
DNB	12.15	0.062	0.186	11.97 - 12.34
TETRYL	12.77	0.087	0.260	12.51 - 13.03
NB	13.79	0.069	0.207	13.58 - 14.00
3,4-DNT	14.82	0.091	0.274	14.55 - 15.09
TNT	15.52	0.076	0.227	15.29 - 15.75

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4ADNT	16.20	0.100	0.301	15.90 - 16.50
2ADNT	17.10	0.110	0.331	16.77 - 17.43
26DNT	18.15	0.092	0.276	17.87 - 18.42
24DNT	18.80	0.098	0.295	18.51 - 19.10
2NT	22.03	0.140	0.420	21.61 - 22.45
4NT	23.52	0.138	0.415	23.10 - 23.93
NT	25.33	0.161	0.483	24.84 - 25.81

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 2CN0403,3
Injection File Name Level 2 : 2CN0403,4
Injection File Name Level 3 : 2CN0403,5
Injection File Name Level 4 : 2CN0403,6
Injection File Name Level 5 : 2CN0403,7

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
TNB	11665	2536	66556	2894	165647	2881	341874	2973	722432	3141
26DNT	9538	1908	51842	2074	130024	2080	268479	2148	569728	2279
TNT	11998	2608	69071	3003	174731	3039	359530	3126	765170	3327
3,4DNT	9885	1412	59677	1705	151213	1833	307113	1861	653216	1979
TETRYL	14045	1561	82528	1834	202075	1796	426829	1897	879793	1955
HMX	6041	863	36667	1048	89515	1023	177333	1013	383468	1096

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 2CN0403,8
Injection File Name Level 2 : 2CN0403,9
Injection File Name Level 3 : 2CN0403,10
Injection File Name Level 4 : 2CN0403,11
Injection File Name Level 5 : 2CN0403,12

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
NB	17742	3548	79321	3173	193886	3102	413888	3311	837170	3349
DNB	17699	4425	91008	4550	258636	5173	493416	4934	982311	4912
24DNT	19247	3849	105639	4226	303272	4852	582016	4656	1158419	4634
4ADNT	16810	1827	91681	1993	264667	2301	506606	2203	1001308	2177
2ADNT	29499	2950	157638	3153	449191	3594	859302	3437	1713169	3426
RDX	6359	1272	35509	1420	99700	1595	192276	1538	381396	1526

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 2CN0403,3
Injection File Name Level 2 : 2CN0403,4
Injection File Name Level 3 : 2CN0403,5
Injection File Name Level 4 : 2CN0403,6
Injection File Name Level 5 : 2CN0403,7

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
TNB	2885	7.66	0.99959	3097	0.000
26DNT	2098	6.41	0.99952	2245	0.000
TNT	3021	8.69	0.99951	3276	0.000
3,4DNT	1758	12.32	0.99959	1949	0.000
TETRYL	1809	8.37	0.99979	1936	0.000
HMX	1009	8.66	0.99926	1077	0.000

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 2CN0403,8
Injection File Name Level 2 : 2CN0403,9
Injection File Name Level 3 : 2CN0403,10
Injection File Name Level 4 : 2CN0403,11
Injection File Name Level 5 : 2CN0403,12

Calibration Date : 04/03/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
NB	3297	5.24	0.99982	3330	0.000
DNB	4799	6.36	0.99982	4926	0.000
24DNT	4443	9.07	0.99983	4646	0.000
4ADNT	2100	9.00	0.99977	2187	0.000
2ADNT	3312	7.76	0.99983	3435	0.000
RDX	1470	8.68	0.99985	1531	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 4
Continuing Cal Date : 04/04/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403,53
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	153820	2675	2885	7.27	3097	13.63
26DNT	121560	1945	2098	7.28	2245	13.36
TNT	162553	2827	3021	6.41	3276	13.69
3,4DNT	139119	1686	1758	4.09	1949	13.50
TETRYL	187512	1667	1809	7.84	1936	13.92
HMX	81328	929	1009	7.84	1077	13.72

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 4
Continuing Cal Date : 04/04/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403,54
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	195454	3127	3297	5.14	3330	6.08
DNB	225227	4505	4799	6.13	4926	8.56
24DNT	263951	4223	4443	4.96	4646	9.09
4ADNT	230064	2001	2100	4.75	2187	8.51
2ADNT	395005	3160	3312	4.59	3435	7.99
RDX	87139	1394	1470	5.17	1531	8.91

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 5
Continuing Cal Date : 04/05/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403A,9
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	160356	2789	2885	3.33	3097	9.96
26DNT	127195	2035	2098	2.98	2245	9.35
TNT	170153	2959	3021	2.04	3276	9.66
3,4DNT	145705	1766	1758	0.45	1949	9.40
TETRYL	200450	1782	1809	1.48	1936	7.99
HMX	84628	967	1009	4.10	1077	10.22

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 5
Continuing Cal Date : 04/05/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403A,10
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	193045	3089	3297	6.31	3330	7.23
DNB	220330	4407	4799	8.17	4926	10.55
24DNT	259580	4153	4443	6.53	4646	10.60
4ADNT	226185	1967	2100	6.35	2187	10.05
2ADNT	385383	3083	3312	6.91	3435	10.24
RDX	83555	1337	1470	9.07	1531	12.66

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 6
Continuing Cal Date : 04/05/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403A,18
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	157989	2748	2885	4.76	3097	11.28
26DNT	123380	1974	2098	5.89	2245	12.07
TNT	164757	2865	3021	5.14	3276	12.52
3,4DNT	141069	1710	1758	2.74	1949	12.29
TETRYL	197456	1755	1809	2.95	1936	9.36
HMX	85212	974	1009	3.44	1077	9.60

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/03/1998
Continuing Calibration #: 6
Continuing Cal Date : 04/05/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : LC-CN-09
Injection File Name : 2CN0403A,19
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	195727	3132	3297	5.01	3330	5.94
DNB	223609	4472	4799	6.80	4926	9.22
24DNT	263534	4217	4443	5.11	4646	9.24
4ADNT	229913	1999	2100	4.81	2187	8.57
2ADNT	393447	3148	3312	4.96	3435	8.36
RDX	87427	1399	1470	4.86	1531	8.61

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

.njection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
TNB	4.600	23.000	57.500	115.000	230.000
26DNT	5.000	25.000	62.500	125.000	250.000
TNT	4.600	23.000	57.500	115.000	230.000
3,4DNT	7.000	35.000	82.500	165.000	330.000
TETRYL	9.000	45.000	112.500	225.000	450.000
HMX	7.000	35.000	87.500	175.000	350.000

CALIBRATION FACTOR DATA
FORM 9D.

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
NB	5.000	25.000	62.500	125.000	250.000
DNB	4.000	20.000	50.000	100.000	200.000
24DNT	5.000	25.000	62.500	125.000	250.000
4ADNT	9.200	46.000	115.000	230.000	460.000
2ADNT	10.000	50.000	125.000	250.000	500.000
RDX	5.000	25.000	62.500	125.000	250.000

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : LC-CN-09
Calibration Date : 04/03/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
TNB	7.07	7.12	7.09	7.08	7.06
26DNT	8.02	8.06	8.04	8.03	8.00
TNT	8.76	8.82	8.80	8.77	8.75
3,4DNT	10.60	10.67	10.65	10.62	10.59
TETRYL	15.54	15.65	15.62	15.58	15.54
HMX	20.34	20.59	20.50	20.45	20.40

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
TNB	7.14	7.09	7.12	7.12	7.12
26DNT	8.09	8.04	8.08	8.06	8.07
TNT	8.84	8.78	8.82	8.82	8.83
3,4DNT	10.70	10.63	10.66	10.65	10.67
TETRYL	15.69	15.55	15.62	15.61	15.66
	20.63	20.38	20.45	20.48	20.52

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
TNB	7.10	0.024	0.073	7.03 - 7.18
26DNT	8.05	0.026	0.079	7.97 - 8.13
TNT	8.80	0.028	0.084	8.72 - 8.88
3,4DNT	10.64	0.032	0.097	10.55 - 10.74
TETRYL	15.60	0.057	0.172	15.43 - 15.77
HMX	20.45	0.109	0.326	20.12 - 20.77

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : LC-CN-09
Calibration Date : 04/03/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
NB	6.14	6.18	6.21	6.14	6.12
DNB	6.97	7.01	7.05	6.98	6.96
24DNT	8.42	8.45	8.51	8.42	8.40
4ADNT	9.67	9.73	9.80	9.71	9.69
2ADNT	10.56	10.60	10.67	10.57	10.56
RDX	12.16	12.24	12.30	12.19	12.19

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
NB	6.16	6.18	6.19	6.17	6.18
DNB	7.01	7.01	7.03	7.00	7.02
24DNT	8.46	8.46	8.48	8.45	8.47
4ADNT	9.76	9.75	9.78	9.73	9.76
2ADNT	10.63	10.62	10.65	10.60	10.62
RDX	12.26	12.24	12.26	12.22	12.26

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
NB	6.17	0.025	0.074	6.10 - 6.25
DNB	7.01	0.028	0.083	6.92 - 7.09
24DNT	8.45	0.032	0.097	8.36 - 8.55
4ADNT	9.74	0.039	0.116	9.62 - 9.85
2ADNT	10.61	0.038	0.114	10.49 - 10.72
RDX	12.22	0.044	0.131	12.09 - 12.35

2CN0403
A STD

CALIBRATION FACTOR DAT
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

trument ID : IN12
lumn ID : LC-CN-09
Calibration Date : 04/03/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
TNB	7.07	7.12	7.09	7.08	7.06
26DNT	8.02	8.06	8.04	8.03	8.00
TNT	8.76	8.82	8.80	8.77	8.75
3,4DNT	10.60	10.67	10.65	10.62	10.59
TETRYL	15.54	15.65	15.62	15.58	15.54
HMX	20.34	20.59	20.50	20.45	20.40

COMPONENT NAME	RT Cont CA6	RT Cont CA7	RT Cont CA8	RT Cont CA9
TNB	7.12	7.13	7.11	7.09
26DNT	8.07	8.08	8.05	8.03
TNT	8.82	8.83	8.80	8.77
3,4DNT	10.66	10.68	10.64	10.60
TETRYL	15.64	15.64	15.57	15.48
HMX	20.50	20.45	20.41	20.19

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
TNB	7.10	0.024	0.073	7.03 - 7.18
26DNT	8.05	0.026	0.079	7.97 - 8.13
TNT	8.80	0.028	0.084	8.72 - 8.88
3,4DNT	10.64	0.032	0.097	10.55 - 10.74
TETRYL	15.60	0.057	0.172	15.43 - 15.77
HMX	20.45	0.109	0.326	20.12 - 20.77

2CN0403
B STD

CALIBRATION FACTOR DAT
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : LC-CN-09
Calibration Date : 04/03/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
NB	6.14	6.18	6.21	6.14	6.12
DNB	6.97	7.01	7.05	6.98	6.96
24DNT	8.42	8.45	8.51	8.42	8.40
4ADNT	9.67	9.73	9.80	9.71	9.69
2ADNT	10.56	10.60	10.67	10.57	10.56
RDX	12.16	12.24	12.30	12.19	12.19

COMPONENT NAME	RT Cont CA6	RT Cont CA7	RT Cont CA8	RT Cont CA9
NB	6.20	6.19	6.17	6.16
DNB	7.05	7.02	7.00	6.98
24DNT	8.50	8.47	8.45	8.42
4ADNT	9.78	9.76	9.73	9.69
2ADNT	10.65	10.62	10.59	10.55
RDX	12.25	12.24	12.18	12.16

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
NB	6.17	0.025	0.074	6.10 - 6.25
DNB	7.01	0.028	0.083	6.92 - 7.09
24DNT	8.45	0.032	0.097	8.36 - 8.55
4ADNT	9.74	0.039	0.116	9.62 - 9.85
2ADNT	10.61	0.038	0.114	10.49 - 10.72
RDX	12.22	0.044	0.131	12.09 - 12.35

	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980401SD

EXTRACT DATE: 1998-04-01 14:09

000926
Page: 1 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0401SD			S/L				2.0							10.0	N		1000		
BB0401SD			S/L				2.0							10.0	N		1000		
LC0401SD			S/L				2.0							10.0	N	500	1000		
LD0401SD			S/L				2.0							10.0	N	500	1000		
33393.01 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS501	S/L				2.0							10.0	N		1000		
33393.05 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS503	S/L				2.0							10.0	N		1000		
33393.06 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS504	S/L				2.0							10.0	N		1000		
33393.08 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS506	S/L				2.0							10.0	N		1000		
33393.09 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS507	S/L				2.0							10.0	N		1000		
33393.11 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS509	S/L				2.0							10.0	N		1000		
33393.12MS GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS509	S/L				2.0							10.0	N	500	1000		
33393.13MSD GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS509	S/L				2.0							10.0	N	500	1000		
33393.15 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS510	S/L				2.0							10.0	N		1000		
33393.17 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS512	S/L				2.0							10.0	N		1000		
33393.18 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS513	S/L				2.0							10.0	N		1000		

INITIALS

WEIGHING:	MK	EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	PV	VERIFIER:	MK		
MATRIX SPIKER:	PV	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 2-97

MATRIX SPIKE SOLID/CONC #(s): 2-96

SOP - METHOD # : SWL-OP-_____ Rev._____

COMMENTS

CH_3CN lot BR259

METHOD	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH ☐ REEXTRACT ☐ TCLP ☐ DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC

BATCH: 980401SD

EXTRACT DATE: 1998-04-01 14:09

000926
Page: 2 of 2

SAMPLE ID (EPISODE #)	CLIENT / CASE	DATE RECEIVED / CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
33393.20 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAICS515	S/L				2.0						10.0	N		1000			

INITIALS					
WEIGHING:		EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	PV	VERIFIER:	MK		
MATRIX SPIKER:	PV	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS	
FLORISIL CARTRIDGE #:	
GPC COLUMN #:	
SURROGATES ID CONC #:	2-97
MATRIX SPIKE SOLID/CONC #(s):	2-96
SOP - METHOD # : SWL-OP-	

COMMENTS

	SV	OD T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			XXXXX
SONC. (3550)			
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980401WH

EXTRACT DATE: 1998-04-01 15:08

000929
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT / CASE	DATE RECEIVED / CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • (ml)	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0401WH			W/L					5.0						5.0	N		500		
BB0401WH			W/L					5.0						5.0	N		500		
LC0401WH			W/L					5.0						5.0	N	250	500		
LD0401WH			W/L					5.0						5.0	N	250	500		
33393.14 GC200	MKF-OH	04/01/1998 12:39 CRA/MFAR0330	W/L					5.0						5.0	N		500		
33394.01 GC200	MKF-OH	04/01/1998 12:55 CRA/BPSWWB15	W/L					5.0						5.0	N		500		
33393.14MS GC200	MKF-OH	04/01/1998 12:39 CRA/MFAR0330	W/L					5.0						5.0	N	250	500		
33393.14MSD GC200	MKF-OH	04/01/1998 12:39 CRA/MFAR0330	W/L					5.0						5.0	N	250	500		

INITIALS

WEIGHING:		EXTRACTION: MK	FLORISIL:
CLEANUP:		KD:	
BLOWDOWN:		TV:	
SURROG. SPIKER:	PV	VERIFIER: MK	
MATRIX SPIKER:	PV	VERIFIER: MK	
SUBMITTED BY:		REVIEWED BY:	4/3/98

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 2-95A

MATRIX SPIKE SOLID/CONC #(s): 2-85

SOP - METHOD # : SWL-OP-_____ Rev._____

COMMENTS

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

CCIC # 55

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 4324-0009-007-35

Project Name: NSWC Crane BioFacility

Samplers: (Signature)

Sampler: (Print) Ryan H. Erwin

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 EXP	6010 Metals	TCLP Metals	8240 VOC	Remarks
Soil	Grid 115 comp. 0-12"	4/1/98	1303	CRA/MFA ICS 516		✓	✓	✓	✓		Mine Fill A
	Grid 115 grab 12-18"		1331	CRA/MFA ICS 517		✓				✓	Re-Excavation
	Grid 115 comp. 24-36"		1346	CRA/MFA ICS 518		✓	✓	✓	✓		
	Grid 105 comp 0-12"		1445	CRA/MFA ICS 519		✓	✓	✓	✓		
	Grid 105 comp.		1450	CRA/MFA ICS 520		✓	✓	✓	✓		
	Grid 105 grab 12-18"		1500	CRA/MFA ICS 521		✓				✓	
	Grid 105 comp. 24-36"	—	1520	CRA/MFA ICS 522		✓	✓	✓	✓		
	Grid 104 Comp 0-12"	4/2/98	1300	CRA/MFA ICS 523		✓	✓	✓	✓		
	Grid 104 grab 12-18"		1313	CRA/MFA ICS 524		✓				✓	
	Grid 104 Comp 24-36"		1328	CRA/MFA ICS 525		✓	✓	✓	✓		
liquid	Trip Blank	—	1530	CRA/MFA T0401		✓				✓	
											Southwest Labs

Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company	Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company
Ryan H. Erwin	4/2/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company: J. Hodson	Date/Time 4/3/98 9:15	Total No. Samples This Shipping Container: / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 Rev. 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): KIM WILLISON / SARAH HODSON

REC'D DATE: 4-3-98

RECEIVED BY (SIGNATURE): S. Hodson.

TIME REC'D: 0915

LOGGED IN BY (SIGNATURE): K Willison

LOG-IN DATE: 4-3-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC CRANE	33437	33437

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.:
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   SEALED IN PLASTIC? YES / NO
   TAPED TO LID? YES / NO
   PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: B00811824490
6. COOLER CONDITIONS
   ENOUGH ICE? YES / NO
   TYPE OF ICE? Wet
   TYPE OF PACKING? Bubble
7. SAMPLE TAGS PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   CORRECT PRESERVATIVE ? YES / NO
   SUFFICIENT SAMPLE ? YES / NO
   LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO
   VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
CRA/MFA1CS516	B,M	.01	MKE-01 4-3-98-2			3°C
517		.04 ~~.02~~				
518		.07				
519		.08				
520		.09				
521		.10				
522		.11				
523		.12				
524		.13				
525		.14				
CRS/MFAT0401		.15				

Bias +1.5

* Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

SDG NARRATIVE

April 24, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 33437
EPISODE(S): 33437
FRACTION : EXPLOSIVES
SAMPLE(S) : CRA/MFAICS516, CRA/MFAICS518, CRA/MFAICS519, CRA/MFAICS520, CRA/MFAICS522, CRA/MFAICS523, CRA/MFAICS525

This SDG consisted of 7 soil samples with applicable MS and MSD for explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples are air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high level water samples, direct injection method is used. For low level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-7

CASE SUMMARY:

Due to retention time shift in the original quantitational analysis which had exceeded 2% within the calibration standard, all of the above samples were re-analyzed under a new initial calibration standard.

RDX was reported with a "J" flag in the data package of the sample CRA/MFAICS518. The analyte was not reported in the preliminary data.

2ADNT was reported with a "P" flag in the sample CRA/MFAICS520. The analyte was not reported in the preliminary data.

2ADNT was reported with a "P" flag in the sample CRA/MFAICS523. The analyte was not reported in the preliminary data.

2ADNT was reported with a "P" flag in the sample CRA/MFAICS525. The analyte was not reported in the preliminary data.

All of the analytes were within QC limits in the laboratory control spike (LCS) and the laboratory control spike duplicate (LCSD) and matrix spike (MS) and matrix spike duplicate (MSD).

Any reported 2ADNT might be a false positive hit since the analyte elutes at the same retention time as the surrogate (3,4DNT). Therefore, there is no positive way to confirm this analyte, unless the sample detecting such an analyte in the quantitation column is to be reextracted without a surrogate and analyzed for the confirmation for positive hit.

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

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We use the following flags where appropriate. "J" - indicates a quantitated result which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment which is explained in the case narrative.

Shahriar Shahreza
LC Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33437

	SAMPLE NUMBER	S1 #	OTHER
1	CRA/MFAICS516	91.7	0
2	CRA/MFAICS516 MS	114	0
3	CRA/MFAICS516 MSD	121	0
4	CRA/MFAICS518	107	0
5	CRA/MFAICS519	96.8	0
6	CRA/MFAICS520	92.3	0
7	CRA/MFAICS520 10X	81.7D	0
8	CRA/MFAICS522	99.4	0
9	CRA/MFAICS522 10X	90.7D	0
10	CRA/MFAICS523	96.6	0
11	CRA/MFAICS523 10X	109D	0
12	CRA/MFAICS525	108	0
13	BL0406SA	107	0
14	LC0406SA	118	0
15	LD0406SA	120	0
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

page _ 1

FORM II

3F

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Code: SWOK Case No: MKF-OH SDG No:33437

Client Sample No: CRA/MFAICS516 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
HMX	9500		11000	116	54-128
RDX	9500		8990	95	66-109
TNB	9500		9840	104	57-130
DNB	9500		10700	113	74-122
TETRYL	9500		9040	95	32-119
NB	9500		10500	110	70-135
TNT	9500	720	10800	106	44-124
4ADNT	9500	290	9950	102	60-140
2ADNT	9500		10100	106	60-140
26DNT	9500		10000	105	58-125
24DNT	9500		9940	105	59-120
2NT	9500		10400	109	79-124
4NT	9500		10200	107	74-128
3NT	9500		10300	108	79-121

f Analyte recoveries out of QC Advisory Limits = 0

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	10500	110	5	30	54-128
RDX	9500	8600	91	4	30	66-109
TNB	9500	9460	100	4	30	57-130
DNB	9500	10200	107	5	45	74-122
TETRYL	9500	8580	90	5	30	32-119
NB	9500	9870	104	6	35	70-135
TNT	9500	10300	101	5	30	44-124
4ADNT	9500	9640	98	4	40	60-140
2ADNT	9500	9760	103	3	40	60-140
26DNT	9500	9740	102	3	35	58-125
24DNT	9500	9600	101	4	35	59-120
2NT	9500	10100	106	3	35	79-124
4NT	9500	9900	104	3	35	74-128
3NT	9500	9940	105	3	35	79-121

No of Analyte recoveries out of QC Advisory Limits = 0
No of RPD's out of QC Limits 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Code: SWOK Case No: MKF-OH SDG No:33437

Client Sample No: LC0406SA

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
HMX	9500		10600	112	57-137
RDX	9500		9470	100	77-113
TNB	9500		8680	91	64-125
DNB	9500		10000	105	82-118
TETRYL	9500		4050	43	23-124
NB	9500		9640	101	69-143
TNT	9500		9110	96	75-118
4ADNT	9500		10500	110	60-140
2ADNT	9500		9340	98	60-140
26DNT	9500		9290	98	78-117
24DNT	9500		9480	100	74-126
2NT	9500		9660	102	78-123
4NT	9500		9550	100	79-125
3NT	9500		9590	101	78-121

of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Code: SWOK Case No: MKF-OH SDG No:33437

Client Sample No: LD0406SA

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
HMX	9500		10700	113	57-137
RDX	9500		9530	100	77-113
TNB	9500		9030	95	64-125
DNB	9500		10300	108	82-118
TETRYL	9500		4270	45	23-124
NB	9500		10100	106	69-143
TNT	9500		9560	101	75-118
4ADNT	9500		11200	118	60-140
2ADNT	9500		9560	101	60-140
26DNT	9500		9770	103	78-117
24DNT	9500		9640	101	74-126
2NT	9500		10200	107	78-123
4NT	9500		10100	106	79-125
3NT	9500		10100	106	78-121

of Analyte recoveries out of QC Advisory Limits = 0

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0406SA

Code: SWOK Case No: MKF-OH SDG No:33437

Matrix: (soil/water) Soil

Date Extracted: 04/06/98 Extn. Method: SONC

Date Analyzed (1): 04/16/98 Date Analyzed(2): 04/12/98

Time Analyzed (1): 05:24:21 Time Analyzed(2): 01:57:18

Instrument ID (1): IN12 Instrument ID(2): IN10

LC Column ID (1): CARB-05 LC Column ID (2): LC-CN-10

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0406SA	LC0406SA	04/16/98	
2	CRA/MFAICS516	33437.01	04/16/98	04/12/98
3	CRA/MFAICS516 MS	33437.02MS	04/16/98	
4	CRA/MFAICS516 MSD	33437.03MSD	04/16/98	
5	CRA/MFAICS518	33437.07	04/16/98	04/12/98
	CRA/MFAICS519	33437.08	04/16/98	04/12/98
	CRA/MFAICS520	33437.09	04/16/98	04/18/98
8	CRA/MFAICS520 10X	33437.09DL	04/16/98	04/18/98
9	CRA/MFAICS522	33437.11	04/16/98	04/18/98
10	CRA/MFAICS522 10X	33437.11DL	04/16/98	04/18/98
11	CRA/MFAICS523	33437.12	04/16/98	04/18/98
12	CRA/MFAICS523 10X	33437.12DL	04/16/98	04/18/98
13	CRA/MFAICS525	33437.14	04/16/98	04/18/98
14	LD0406SA	LD0406SA	04/22/98	
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

CRA/MFAICS519

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33437

Matrix: (soil/water) SOIL Lab Sample ID: 33437.08

Sample Amt: 2g % Moisture 20.04 Date Received: 04/03/98

Extraction Volume: 10ml Date Extracted: 04/06/98

Extraction Method: SONC Date Analyzed: 04/16/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	6720	
121-82-4	RDX	9120	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	438	
1946-51-0	4ADNT	404	
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

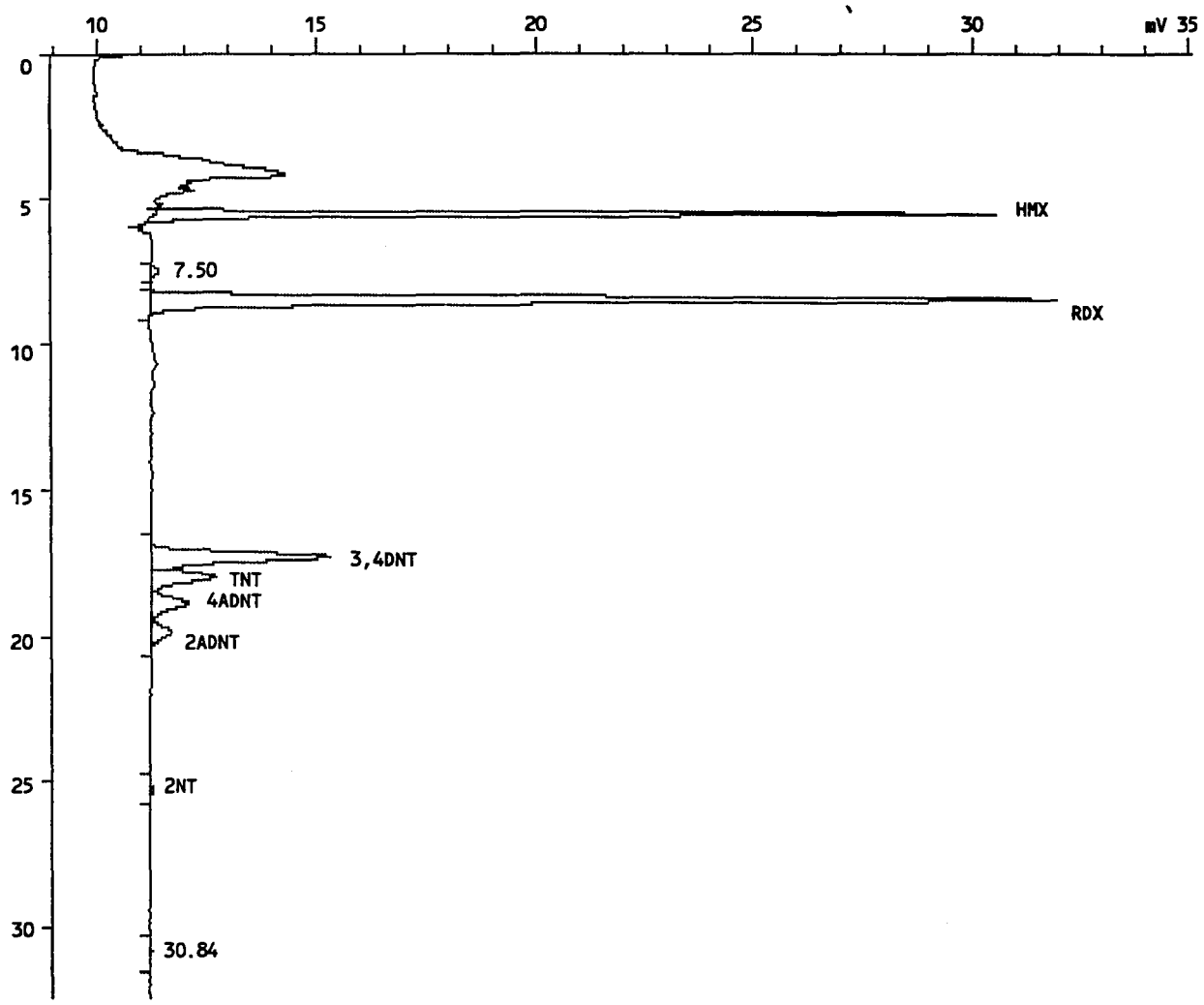
FORM I

LONG PLOT

Injection F: <MC3> 2 2EX0415,35,1

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-05, INJ:200,COL#1

Acquired on 16-Apr-98 at 12:50:37
Reported on 21-Apr-98 at 20:01:24



INJECTION REPORT

Injection F: <MC3> 2 2EX0415,35,1

Acquired on 16-Apr-98 at 12:50:37
Modified on 21-Apr-82 at 19:53:18
Reported on 21-Apr-98 at 19:53:20

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-05,INJ:200,COL#1
Number of samples.: 44
Calibration file..: 2EX0415 Last modified on 20-Apr-82 at 21:20:18
Method file.....: EXPLOS Last modified on 21-Apr-82 at 19:50:22
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

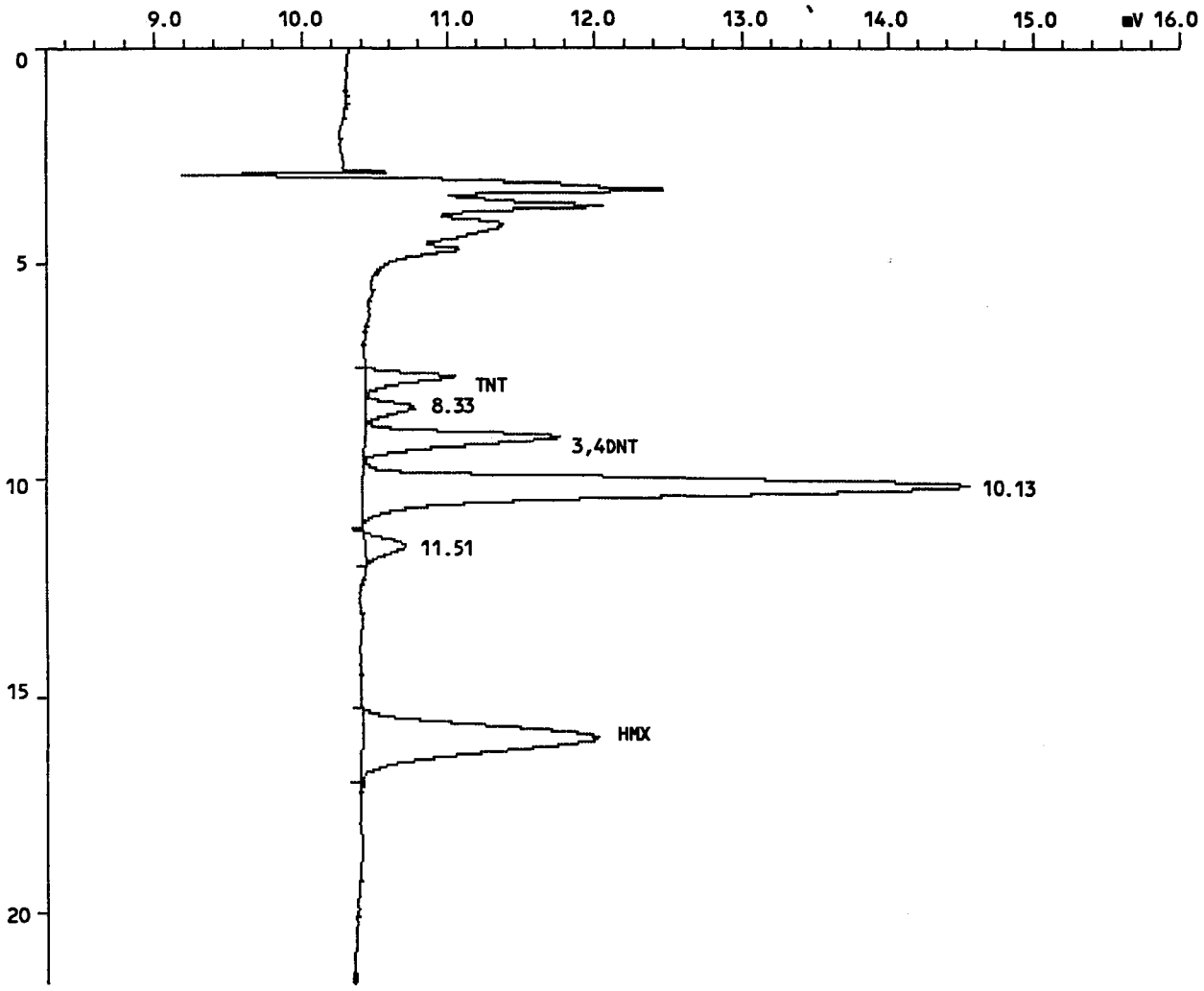
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	5.579	19300	177761	6723.193	HMX *
3	8.485	20674	334968	9117.262	RDX *
4	17.301	4073	93369	1935.504	3,4DNT 97
5	17.984	1500	36524	437.731	TNT *
6	18.869	856	24731	404.226	4ADNT *
7	19.851	495	14539	168.232	2ADNT
8	25.291	66	1746	34.117	2NT
Total		46965	683638	18820.266	
Residual		252	5172	155.614	

LONG PLOT

Injection F: <MC3> 3 3CN0411,18,1

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 12-Apr-98 at 04:54:43
Reported on 13-Apr-98 at 14:54:00



INJECTION REPORT

Injection F: <MC3> 3 3CN0411,18,1

Acquired on 12-Apr-98 at 04:54:43
Modified on 13-Apr-82 at 14:50:38
Reported on 13-Apr-98 at 14:50:38

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV
Number of samples.: 46
Calibration file..: 3CN0411A Last modified on 13-Apr-82 at 14:20:10
Method file.....: LCCN Last modified on 13-Apr-82 at 14:50:26
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

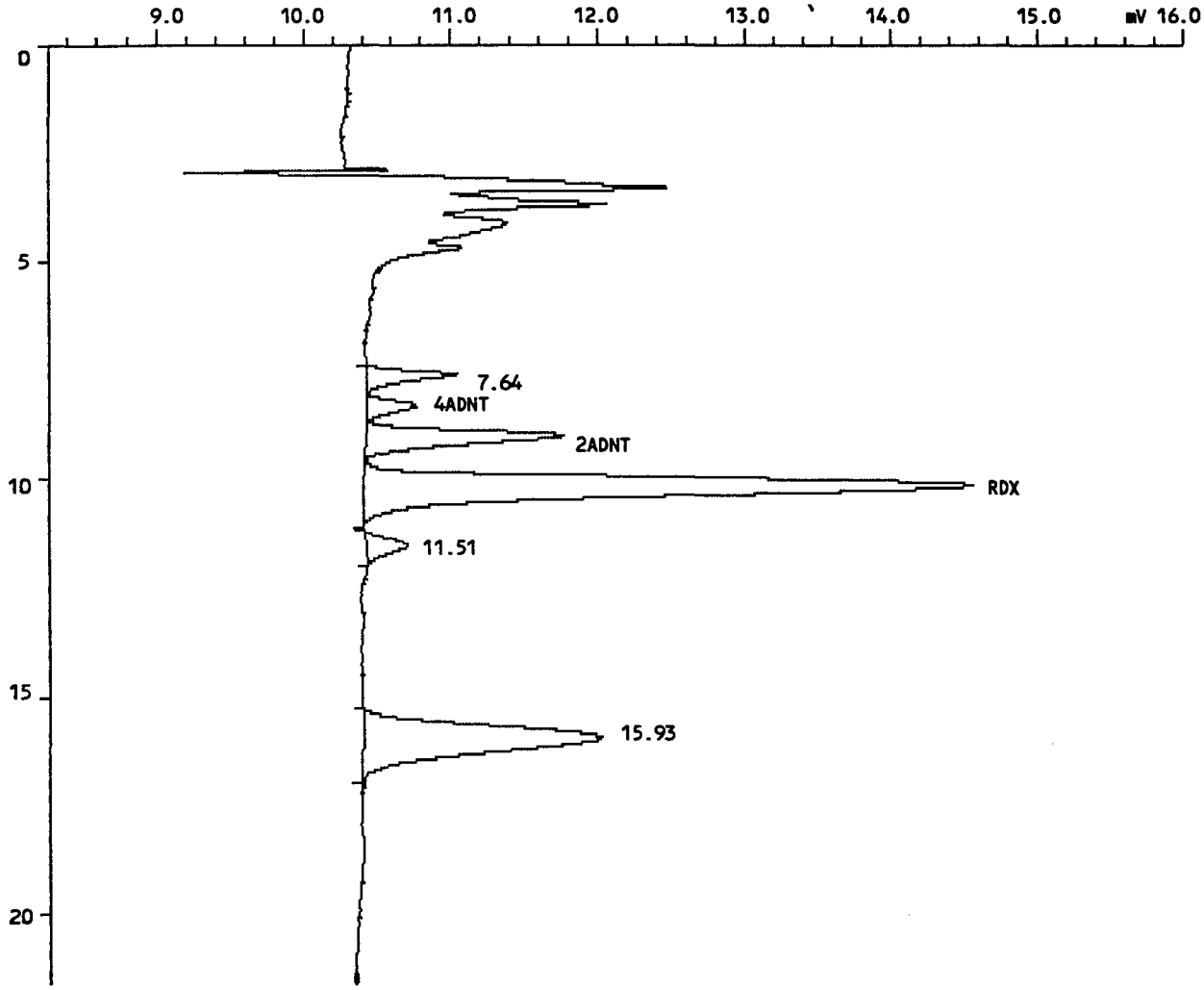
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	7.643	612	9765	375.293	TNT
3	9.040	1342	28453	2106.066	3,4DNT
6	15.925	1608	66392	6233.989	HMX
Total		3562	104610	8715.348	
Residual		4771	130411	0.000	

LONG PLOT

Injection F: <MC3> 3 3CN0411,18,1

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 12-Apr-98 at 04:54:43
Reported on 13-Apr-98 at 14:57:31



INJECTION REPORT

Injection F: <MC3> 3 3CN0411,18,1

Acquired on 12-Apr-98 at 04:54:43
Modified on 13-Apr-82 at 14:54:46
Reported on 13-Apr-98 at 14:54:47

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV
Number of samples.: 46
Calibration file..: 3CN0411B Last modified on 13-Apr-82 at 14:22:18
Method file.....: LCCN Last modified on 13-Apr-82 at 14:50:26
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAICS519
Sample ID.....: 33437.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	8.331	340	6389	366.768	4ADNT
3	9.040	1342	28453	1090.152	2ADNT
4	10.133	4137	117294	8231.188	RDX
Total		5819	152136	9688.106	
Residual		2515	82884	0.000	

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33437
Instrument ID: IN12 Column ID: CARB-05

Dates of Anlayses: 04/15/98 to 04/16/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
INST. BLK.	INST.BLK.	04/15/98	11:33
EXP L1 SOIL STD	2-156:IA1	04/15/98	13:47
EXP L2 SOIL STD	2-155:IA2	04/15/98	14:31
EXP L3 SOIL STD	2-154:IA3	04/15/98	15:16
EXP L4 SOIL STD	2-153:IA4	04/15/98	16:00
EXP L5 SOIL STD	2-152:IA5	04/15/98	16:45
EXP L3 SOIL STD	2-154:CA1	04/16/98	00:56
BL0406SA	BL0406SA	04/16/98	05:24
LC0406SA	LC0406SA	04/16/98	06:53
CRA/MFAICS516	33437.01	04/16/98	08:22
CRA/MFAICS516 MS	33437.02MS	04/16/98	09:07
EXP L3 SOIL STD	2-154:CA2	04/16/98	09:52
CRA/MFAICS516 MSD	33437.03MSD	04/16/98	11:21
CRA/MFAICS518	33437.07	04/16/98	12:06
CRA/MFAICS519	33437.08	04/16/98	12:50
CRA/MFAICS520	33437.09	04/16/98	13:35
CRA/MFAICS520 10X	33437.09DL	04/16/98	14:19
CRA/MFAICS522	33437.11	04/16/98	15:04
CRA/MFAICS522 10X	33437.11DL	04/16/98	15:49

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33437
Instrument ID: IN12 Column ID: CARB-05

Dates of Anlayses: 04/15/98 to 04/16/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
CRA/MFAICS523	33437.12	04/16/98	16:33
CRA/MFAICS523 10X	33437.12DL	04/16/98	17:23
CRA/MFAICS525	33437.14	04/16/98	18:08
EXP L3 SOIL STD	2-154:CA3	04/16/98	19:02

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33437
Instrument ID: IN12 Column ID: CARB-06

Dates of Anlayses: 04/19/98 to 04/22/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1 SOIL STD	2-173:IA1	04/19/98	21:57
EXP L2 SOIL STD	2-172:IA2	04/19/98	22:41
EXP L3 SOIL STD	2-171:IA3	04/19/98	23:26
EXP L4 SOIL STD	2-170:IA4	04/20/98	00:11
EXP L5 SOIL STD	2-169:IA5	04/20/98	00:55
EXP L3 SOIL STD	2-171:CA7	04/22/98	13:43
LD0406SA	LD0406SA	04/22/98	16:42
EXP L3 SOIL STD	2-171:CA8	04/22/98	17:27

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33437
Instrument ID: IN10 Column ID: LC-CN-10

Dates of Anlayses: 04/11/98 to 04/13/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1A STD	2-146:IA1	04/11/98	18:33
EXP L2A STD	2-145:IA2	04/11/98	19:18
EXP L3A STD	2-144:IA3	04/11/98	20:02
EXP L4A STD	2-143:IA4	04/11/98	20:46
EXP L5A STD	2-142:IA5	04/11/98	21:31
EXP L1B STD	1-151:IB1	04/11/98	22:15
EXP L2B STD	2-150:IB2	04/11/98	22:59
EXP L3B STD	2-149:IB3	04/11/98	23:44
EXP L4B STD	2-148:IB4	04/12/98	00:28
EXP L5B STD	2-147:IB5	04/12/98	01:12
BL0406SA	BL0406SA	04/12/98	01:57
CRA/MFAICS516	33437.01	04/12/98	03:26
CRA/MFAICS518	33437.07	04/12/98	04:10
CRA/MFAICS519	33437.08	04/12/98	04:54
EXP L3A STD	2-144:CA1	04/12/98	08:36
EXP L3B STD	2-149:CB1	04/12/98	09:20

FORM VIII

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-05

Inj 1

Injection File Name Level 1 : 2EX0415,4
Injection File Name Level 2 : 2EX0415,5
Injection File Name Level 3 : 2EX0415,6
Injection File Name Level 4 : 2EX0415,7
Injection File Name Level 5 : 2EX0415,8

Calibration Date : 04/15/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	12602	1243	334568	1317	905474	1372	1315657	1329	1784127	1352
RDX	6909	1637	192191	1820	535597	1941	767176	1862	1059003	1925
TNB	10547	3492	289375	3828	807727	4100	1170768	3955	1565461	3973
DNB	8464	5225	224434	5528	618815	5860	885212	5588	1199752	5659
TETRYL	9324	2506	209034	2248	618708	2557	889668	2444	1208917	2498
NB	14206	4305	351078	4261	954637	4461	1376193	4274	1860481	4327
3,4-DNT	12315	2424	298873	2357	818074	2479	1183764	2387	1592996	2414
TNT	10669	3951	277296	4102	764538	4344	1113968	4220	1493340	4242
4ADNT	7652	3242	173933	2938	481123	3124	683154	2945	937399	3044
2ADNT	10166	4308	249158	4209	685508	4451	988379	4260	1348041	4377
26DNT	9997	2577	251105	2583	681439	2683	985756	2594	1317994	2605
24DNT	13331	5649	334285	5647	921088	5981	1337928	5767	1774349	5761
2NT	8038	2378	214622	2537	587554	2671	853679	2587	1153769	2622
T	7707	2280	198775	2350	543663	2471	786782	2384	1062553	2415
T	8999	2795	228442	2841	623382	2968	907885	2891	1227922	2938

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-05

Inj 1

Injection File Name Level 1 : 2EX0415,4
Injection File Name Level 2 : 2EX0415,5
Injection File Name Level 3 : 2EX0415,6
Injection File Name Level 4 : 2EX0415,7
Injection File Name Level 5 : 2EX0415,8

Calibration Date : 04/15/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	1322	3.73	0.99984	1347	0.000
RDX	1837	6.63	0.99962	1907	0.000
TNB	3870	6.00	0.99978	3983	0.000
DNB	5572	4.15	0.99969	5663	0.000
TETRYL	2451	4.91	0.99952	2485	0.000
NB	4325	1.85	0.99976	4328	0.000
3,4-DNT	2412	1.89	0.99980	2413	0.000
[illegible]T	4172	3.60	0.99986	4247	0.000
[illegible]DNT	3059	4.19	0.99946	3023	0.000
2ADNT	4321	2.21	0.99967	4349	0.000
26DNT	2608	1.65	0.99984	2612	0.000
24DNT	5761	2.36	0.99976	5791	0.000
2NT	2559	4.39	0.99984	2617	0.000
4NT	2380	3.00	0.99982	2412	0.000
3NT	2887	2.44	0.99987	2926	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/15/1998
Continuing Calibration #: 1
Continuing Cal Date : 04/16/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-05
Injection File Name : 2EX0415,19
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	859255	1302	1322	1.56	1347	3.34
RDX	503072	1823	1837	0.78	1907	4.41
TNB	757818	3847	3870	0.59	3983	3.41
DNB	590193	5589	5572	0.30	5663	1.32
TETRYL	569675	2354	2451	3.94	2485	5.28
NB	902037	4215	4325	2.55	4328	2.61
3,4-DNT	779180	2361	2412	2.11	2413	2.17
TNT	718206	4081	4172	2.19	4247	3.91
4ADNT	454108	2949	3059	3.59	3023	2.46
2ADNT	645712	4193	4321	2.96	4349	3.59
26DNT	657100	2587	2608	0.82	2612	0.96
24DNT	858626	5575	5761	3.22	5791	3.72
2NT	554738	2522	2559	1.46	2617	3.63
4NT	509020	2314	2380	2.78	2412	4.08
3NT	592872	2823	2887	2.20	2926	3.52

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/15/1998
Continuing Calibration #: 2
Continuing Cal Date : 04/16/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-05
Injection File Name : 2EX0415,31
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	886888	1344	1322	1.61	1347	0.23
RDX	519692	1883	1837	2.50	1907	1.25
TNB	780255	3961	3870	2.35	3983	0.55
DNB	606706	5745	5572	3.11	5663	1.45
TETRYL	574874	2376	2451	3.06	2485	4.42
NB	933267	4361	4325	0.82	4328	0.76
3,4-DNT	804099	2437	2412	1.02	2413	0.96
TNT	748222	4251	4172	1.90	4247	0.10
4ADNT	470759	3057	3059	0.05	3023	1.11
2ADNT	669629	4348	4321	0.63	4349	0.01
26DNT	676684	2664	2608	2.14	2612	1.99
24DNT	892108	5793	5761	0.56	5791	0.03
2NT	573671	2608	2559	1.90	2617	0.34
4NT	530496	2411	2380	1.32	2412	0.03
NT	607231	2892	2887	0.17	2926	1.18

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/15/1998
Continuing Calibration #: 3
Continuing Cal Date : 04/16/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-05
Injection File Name : 2EX0415,43
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	911918	1382	1322	4.48	1347	2.58
RDX	537139	1946	1837	5.94	1907	2.07
TNB	798276	4052	3870	4.71	3983	1.75
DNB	622077	5891	5572	5.72	5663	4.02
TETRYL	542292	2241	2451	8.56	2485	9.84
NB	939671	4391	4325	1.52	4328	1.45
3,4-DNT	830228	2516	2412	4.30	2413	4.24
TNT	765808	4351	4172	4.30	4247	2.46
4ADNT	490423	3185	3059	4.12	3023	5.34
2ADNT	691292	4489	4321	3.89	4349	3.22
26DNT	698308	2749	2608	5.40	2612	5.25
24DNT	923783	5999	5761	4.13	5791	3.58
2NT	575405	2615	2559	2.21	2617	0.04
4NT	536390	2438	2380	2.44	2412	1.08
3NT	610960	2909	2887	0.78	2926	0.57

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	10.140	254.000	660.000	990.000	1320.000
RDX	4.220	105.600	276.000	412.000	550.000
TNB	3.020	75.600	197.000	296.000	394.000
DNB	1.620	40.600	105.600	158.400	212.000
TETRYL	3.720	93.000	242.000	364.000	484.000
NB	3.300	82.400	214.000	322.000	430.000
3,4-DNT	5.080	126.800	330.000	496.000	660.000
TNT	2.700	67.600	176.000	264.000	352.000
4ADNT	2.360	59.200	154.000	232.000	308.000
2ADNT	2.360	59.200	154.000	232.000	308.000
26DNT	3.880	97.200	254.000	380.000	506.000
24DNT	2.360	59.200	154.000	232.000	308.000
2NT	3.380	84.600	220.000	330.000	440.000
4NT	3.380	84.600	220.000	330.000	440.000
3NT	3.220	80.400	210.000	314.000	418.000

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : CARB-05
Calibration Date : 04/15/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	5.57	5.54	5.59	5.54	5.55
RDX	8.48	8.39	8.44	8.39	8.42
TNB	11.36	11.28	11.37	11.29	11.34
DNB	13.88	13.79	13.89	13.80	13.85
TETRYL	14.90	14.77	14.90	14.78	14.84
NB	15.73	15.66	15.77	15.68	15.72
3,4-DNT	17.18	17.10	17.22	17.10	17.16
TNT	17.89	17.80	17.92	17.81	17.87
4ADNT	18.62	18.58	18.70	18.57	18.62
2ADNT	19.63	19.56	19.71	19.57	19.61
26DNT	20.92	20.84	20.97	20.85	20.89
24DNT	21.60	21.53	21.66	21.54	21.58
2NT	25.42	25.34	25.48	25.35	25.40
4NT	27.16	27.08	27.22	27.09	27.14
3NT	29.30	29.20	29.35	29.22	29.27

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4
HMX	5.56	5.57	5.58	5.57
RDX	8.42	8.44	8.38	8.45
TNB	11.33	11.35	11.31	11.37
DNB	13.85	13.89	13.85	13.91
TETRYL	14.84	14.90	14.85	14.92
NB	15.73	15.77	15.74	15.80
3,4-DNT	17.16	17.23	17.20	17.26
TNT	17.87	17.93	17.92	17.96
4ADNT	18.66	18.75	18.73	18.79
2ADNT	19.65	19.75	19.73	19.78
26DNT	20.92	21.00	20.99	21.04
24DNT	21.61	21.70	21.69	21.73
2NT	25.43	25.53	25.54	25.57
4NT	27.17	27.28	27.29	27.32
3NT	29.30	29.42	29.43	29.46

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	5.56	0.018	0.054	5.51 - 5.62
RDX	8.42	0.033	0.099	8.32 - 8.52
NB	11.33	0.033	0.099	11.23 - 11.43
DNB	13.86	0.041	0.124	13.73 - 13.98
TETRYL	14.86	0.054	0.161	14.69 - 15.02
NB	15.73	0.043	0.129	15.60 - 15.86
3,4-DNT	17.18	0.057	0.170	17.01 - 17.35
TNT	17.89	0.053	0.158	17.73 - 18.04

2EX0415
page 2

4ADNT	18.67	0.078	0.233	18.44 - 18.90
2ADNT	19.67	0.081	0.242	19.42 - 19.91
26DNT	20.94	0.069	0.206	20.73 - 21.14
24DNT	21.63	0.072	0.217	21.41 - 21.84
2NT	25.45	0.083	0.248	25.20 - 25.70
4NT	27.19	0.087	0.261	26.93 - 27.45
3NT	29.33	0.094	0.282	29.05 - 29.61

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-10

Inj 1

Injection File Name Level 1 : 3CN0411,4
Injection File Name Level 2 : 3CN0411,5
Injection File Name Level 3 : 3CN0411,6
Injection File Name Level 4 : 3CN0411,7
Injection File Name Level 5 : 3CN0411,8

Calibration Date : 04/11/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
TNB	11959	2600	59876	2603	145873	2537	304432	2647	604348	2628
26DNT	8652	1730	43801	1752	108275	1732	225311	1802	442188	1769
TNT	11864	2579	59998	2609	146647	2550	304752	2650	603007	2622
3,4DNT	8656	1237	43955	1256	114536	1388	238419	1445	472393	1431
TETRYL	12341	1371	57870	1286	153469	1364	328232	1459	683952	1520
HMX	7578	1083	37425	1069	90812	1038	188599	1078	370345	1058

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-10

Inj 1

Injection File Name Level 1 : 3CN0411,9
Injection File Name Level 2 : 3CN0411,10
Injection File Name Level 3 : 3CN0411,11
Injection File Name Level 4 : 3CN0411,12
Injection File Name Level 5 : 3CN0411,13

Calibration Date : 04/11/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
NB	9666	1933	50510	2020	129472	2072	260224	2082	512979	2052
DNB	13993	3498	76836	3842	188238	3765	392394	3924	750274	3751
24DNT	15589	3118	86241	3450	210859	3374	438485	3508	837861	3351
4ADNT	14687	1596	83862	1823	201226	1750	418351	1819	791200	1720
2ADNT	24764	2476	133377	2668	326438	2612	674182	2697	1299687	2599
RDX	7575	1515	37043	1482	87171	1395	173470	1388	336203	1345

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-10

Inj 1

Injection File Name Level 1 : 3CN0411,4
Injection File Name Level 2 : 3CN0411,5
Injection File Name Level 3 : 3CN0411,6
Injection File Name Level 4 : 3CN0411,7
Injection File Name Level 5 : 3CN0411,8

Calibration Date : 04/11/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
TNB	2603	1.60	0.99994	2627	0.000
26DNT	1757	1.69	0.99992	1773	0.000
TNT	2602	1.48	0.99995	2624	0.000
3,4DNT	1351	7.29	0.99990	1431	0.000
TETRYL	1400	6.48	0.99962	1500	0.000
HMX	1065	1.67	0.99992	1061	0.000

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-10

Inj 1

Injection File Name Level 1 : 3CN0411,9
Injection File Name Level 2 : 3CN0411,10
Injection File Name Level 3 : 3CN0411,11
Injection File Name Level 4 : 3CN0411,12
Injection File Name Level 5 : 3CN0411,13

Calibration Date : 04/11/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
NB	2032	2.95	0.99996	2058	0.000
DNB	3756	4.25	0.99969	3786	0.000
24DNT	3360	4.43	0.99968	3384	0.000
4ADNT	1742	5.31	0.99954	1742	0.000
2ADNT	2610	3.25	0.99980	2619	0.000
RDX	1425	4.97	0.99987	1357	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/11/1998
Continuing Calibration #: 1
Continuing Cal Date : 04/12/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-10
Injection File Name : 3CN0411,23
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	153053	2662	2603	2.26	2627	1.32
26DNT	113307	1813	1757	3.17	1773	2.23
TNT	153075	2662	2602	2.31	2624	1.46
3,4DNT	116592	1413	1351	4.57	1431	1.22
TETRYL	150729	1340	1400	4.30	1500	10.70
HMX	102084	1167	1065	9.54	1061	9.96

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 04/11/1998
Continuing Calibration #: 1
Continuing Cal Date : 04/12/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-10
Injection File Name : 3CN0411,24
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	129578	2073	2032	2.04	2058	0.73
DNB	190621	3812	3756	1.50	3786	0.69
24DNT	211252	3380	3360	0.59	3384	0.11
4ADNT	202310	1759	1742	1.01	1742	1.00
2ADNT	325941	2608	2610	0.11	2619	0.45
RDX	101464	1623	1425	13.94	1357	19.66

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
TNB	4.600	23.000	57.500	115.000	230.000
26DNT	5.000	25.000	62.500	125.000	250.000
TNT	4.600	23.000	57.500	115.000	230.000
3,4DNT	7.000	35.000	82.500	165.000	330.000
TETRYL	9.000	45.000	112.500	225.000	450.000
HMX	7.000	35.000	87.500	175.000	350.000

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
NB	5.000	25.000	62.500	125.000	250.000
DNB	4.000	20.000	50.000	100.000	200.000
24DNT	5.000	25.000	62.500	125.000	250.000
4ADNT	9.200	46.000	115.000	230.000	460.000
2ADNT	10.000	50.000	125.000	250.000	500.000
RDX	5.000	25.000	62.500	125.000	250.000

A8TD

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : LC-CN-10
Calibration Date : 04/11/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
TNB	6.23	6.26	6.22	6.23	6.22
26DNT	6.99	7.01	6.98	6.99	6.97
TNT	7.59	7.62	7.58	7.59	7.58
3,4DNT	8.95	9.00	8.95	8.97	8.95
TETRYL	12.69	12.73	12.67	12.68	12.68
HMX	15.89	15.90	15.78	15.86	15.85

COMPONENT NAME	RT Cont CA1
TNB	6.26
26DNT	7.03
TNT	7.63
3,4DNT	9.02
TETRYL	12.77
HMX	15.93

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
TNB	6.24	0.016	0.049	6.19 - 6.29
26DNT	6.99	0.022	0.067	6.93 - 7.06
TNT	7.60	0.021	0.062	7.54 - 7.66
3,4DNT	8.97	0.030	0.090	8.88 - 9.06
TETRYL	12.70	0.040	0.121	12.58 - 12.83
HMX	15.87	0.052	0.155	15.71 - 16.02

BSTD

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : LC-CN-10
Calibration Date : 04/11/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
NB	5.50	5.51	5.50	5.50	5.48
DNB	6.18	6.18	6.17	6.16	6.14
24DNT	7.34	7.35	7.34	7.33	7.31
4ADNT	8.31	8.33	8.31	8.31	8.27
2ADNT	8.97	9.00	8.98	8.98	8.94
RDX	10.13	10.16	10.13	10.13	10.08

COMPONENT NAME	RT Cont CA1
NB	5.52
DNB	6.19
24DNT	7.36
4ADNT	8.34
2ADNT	9.00
RDX	10.15

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
NB	5.50	0.012	0.037	5.47 - 5.54
DNB	6.17	0.015	0.044	6.13 - 6.21
24DNT	7.34	0.018	0.054	7.28 - 7.39
4ADNT	8.31	0.022	0.065	8.25 - 8.38
2ADNT	8.98	0.023	0.068	8.91 - 9.04
RDX	10.13	0.026	0.079	10.05 - 10.21

METHOD	SV	PEST • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)		XXXXX	
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980406SA

EXTRACT DATE: 1998-04-06 09:24

000939
Page: 1 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g * ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
BL0406SA			S/L	N/A			2.0							10.0	N		1000		
BB0406SA			S/L	N/A			2.0							10.0	N		1000		
LC0406SA			S/L	N/A			2.0							10.0	N	500	1000		
LD0406SA			S/L	N/A			2.0							10.0	N	500	1000		
33437.01 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS516	S/L	N/A	20.69	1.6	2.0							10.0	N		1000		
33437.02MS GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS516	S/L	N/A	20.69	1.6	2.0							10.0	N	500	1000		
33437.03MSD GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS516	S/L	N/A	20.69	1.6	2.0							10.0	N	500	1000		
33437.07 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS518	S/L	N/A	17.86	1.6	2.0							10.0	N		1000		
33437.08 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS519	S/L	N/A	20.04	1.6	2.0							10.0	N		1000		
33437.09 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS520	S/L	N/A	21.49	1.6	2.0							10.0	N		1000		
33437.11 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS522	S/L	N/A	19.24	1.6	2.0							10.0	N		1000		
33437.12 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS523	S/L	N/A	20.36	1.6	2.0							10.0	N		1000		
33437.14 GC200	MKF-OH	04/03/1998 13:54 CRA/MFAICS525	S/L	N/A	20.04	1.6	2.0							10.0	N		1000		
33446.01 GC200	XXXXXXXX XXXXXXXX	XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXX	S/L	N/A	43.67	1.1	2.0							10.0	N		1000		
33446.02 GC200	XXXXXXXX XXXXXXXX	XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXX	S/L	N/A	45.08	1.1	2.0							10.0	N		1000		

INITIALS

WEIGHING:	MK	EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	PV	VERIFIER:	MK		
MATRIX SPIKER:	PV	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:	1/21/98		

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 2-97

MATRIX SPIKE SOLID/CONC #(s): 2-96

SOP - METHOD # : SWL-OP-_____ Rev._____

COMMENTS

CH_3Cu lot BR259

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

COC # 59

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 4329-0009-007-35

Project Name: NSWC Crane BioFacility

Samplers: (Signature)

Sampler: (Print) Ryan Erwin

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 Explosive	6010 Metals	TCLP Metals	VOCs	8240 VOC	Remarks
Soil	Grid 103 0-12" Comp	4/3/98	0853	CRA/MFA ICS 526		✓	✓	✓	✓		✓	Mine-Field A
	Grid 103 12-18" Grab		0921	CRA/MFA ICS 527		✓					✓	Pre-Exc.
	Grid 103 24-36" Comp		0941	CRA/MFA ICS 528		✓	✓	✓	✓			
	Grid 181 0-12" Comp		1100	CRA/MFA ICS 529		✓	✓	✓	✓			
	Grid 181 12-18" Grab		1105	CRA/MFA ICS 530		✓					✓	
	Grid 181 24-36" Comp		1300	CRA/MFA ICS 531		✓	✓	✓	✓			
	Grid 182 0-12" Comp	4/6/98	0841	CRA/MFA ICS 532		✓	✓	✓	✓			
	Grid 182 12-18" Grab		0858	CRA/MFA ICS 533		✓					✓	
	Grid 182 24-36" Comp		0921	CRA/MFA ICS 534		✓	✓	✓	✓			
	Grid 174 0-12" Comp		1000	CRA/MFA ICS 535		✓	✓	✓	✓			
	Grid 174 12-18" Grab		1021	CRA/MFA ICS 536		✓					✓	
	Grid 174 24-36" Comp		1042	CRA/MFA ICS 537		✓	✓	✓	✓			
	Grid 174 12-18" Grab		1030	CRA/MFA ICS 538		✓					✓	
liquid	Rinse Blank		0800	CRA/MFA B0406		✓			✓			
	Trip Blank		1530	CRA/MFA T0406		✓	✓				✓	South West Lakes

Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company	Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company
Ryan Erwin	1530 4/6/98				
Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company	Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company
Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company	Received for Laboratory By: (Signature) / Company: Williams	Date/Time 4/7/98 0945	Total No. Samples This Shipping Container: / Company
Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company	Relinquished By: (Signature) / Company	Date/Time	Received By: (Signature) / Company

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 Rev. 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): KIM WILLISON / SARAH HODSON

REC'D DATE: 4-7-98

RECEIVED BY (SIGNATURE): [signature]

TIME REC'D: 0945

LOGGED IN BY (SIGNATURE): [signature]

LOG-IN DATE: 4-7-98

PROJECT: USWC CRANE

EPISODE:

SAMPLE DELIVERY GROUP:

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.:
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   - SEALED IN PLASTIC? YES / NO
   - TAPED TO LID? YES / NO
   - PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: 8008118245 42
6. COOLER CONDITIONS
   - ENOUGH ICE? YES / NO
   - TYPE OF ICE? wet
   - TYPE OF PACKING? Bubble
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   - BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   - CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   - CORRECT PRESERVATIVE ? YES / NO
   - SUFFICIENT SAMPLE ? YES / NO
   - LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO
   - VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
CRA/MFA/RCS526	B, M	.01	MKF-014 7-1-98-1			3°C
527		.02				
527MS		.03				
527MSD		.04				
528		.05				
529		.06				
530		.07				
531		.08				
531MS		.09				
531MSD		.10				
532		.11				
533		.12				
534		.13				
535		.14				
536		.15				
537		.16				
538		.17				
CRA/MFA0406	MI	.18		✓		
CRA/MFA T0406	V	.19				

* Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

WATER EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33479

Client Sample No: CRA/MFAR04068 MSD

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
HMX	400		378	95	44-145
RDX	150		140	93	66-139
TNB	225		204	91	56-129
DNB	125		110	88	76-122
TETRYL	413		295	71*	76-120
NB	213		196	92	82-111
TNT	188		269	143*	76-137
4ADNT	313		304	97	60-140
2ADNT	313		281	90	60-140
26DNT	288		255	89	80-118
24DNT	175		164	94	72-123
2NT	363		330	91	74-130
4NT	250		237	95	78-116
3NT	238		262	110	72-126

No of Analyte recoveries out of QC Advisory Limits = 2

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	400	381	95	1	15	44-145
RDX	150	146	97	4	12	66-139
TNB	225	207	92	1	10	56-129
DNB	125	112	90	2	15	76-122
TETRYL	413	312	76	6	14	76-120
NB	213	198	93	1	13	82-111
TNT	188	267	142*	1	15	76-137
4ADNT	313	304	97	0	40	60-140
2ADNT	313	279	89	1	40	60-140
26DNT	288	252	88	1	13	80-118
24DNT	175	158	90	4	14	72-123
2NT	363	320	88	3	15	74-130
4NT	250	241	96	2	14	78-116
3NT	238	272	114	4	15	72-126

No of Analyte recoveries out of QC Advisory Limits = 2
No of RPD's out of QC Limits 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33479

Client Sample No: LC0408WB

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
HMX	400		388	97	46-151
RDX	150		139	93	72-129
TNB	225		208	92	74-118
DNB	125		112	90	76-132
TETRYL	413		322	78	58-120
NB	213		198	93	68-135
TNT	188		260	138	61-145
4ADNT	313		298	95	60-140
2ADNT	313		276	88	60-140
26DNT	288		252	88	77-125
24DNT	175		160	91	70-134
2NT	363		323	89	73-131
4NT	250		235	94	73-116
3NT	238		268	113	71-127

# of Analyte recoveries out of QC Advisory Limits = 0

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Code: SWOK Case No: MKF-OH SDG No:33479

Client Sample No: LD0408WB

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
HMX	400		397	99	46-151
RDX	150		144	96	72-129
TNB	225		206	92	74-118
DNB	125		114	91	76-132
TETRYL	413		325	79	58-120
NB	213		198	93	68-135
TNT	188		268	142	61-145
4ADNT	313		298	95	60-140
2ADNT	313		279	89	60-140
26DNT	288		260	90	77-125
24DNT	175		158	90	70-134
2NT	363		332	92	73-131
4NT	250		241	96	73-116
3NT	238		269	113	71-127

of Analyte recoveries out of QC Advisory Limits = 0

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

CRA/MFAR04068

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33479

Matrix: (soil/water) WATER Lab Sample ID: 33479.18

Sample Amt: 1ml % Moisture Date Received: 04/07/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 04/09/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	8.00	U
99-08-1	3NT	7.90	U

SURROGATE AMOUNT SPIKED (ug/L) 200
3,4-DNT

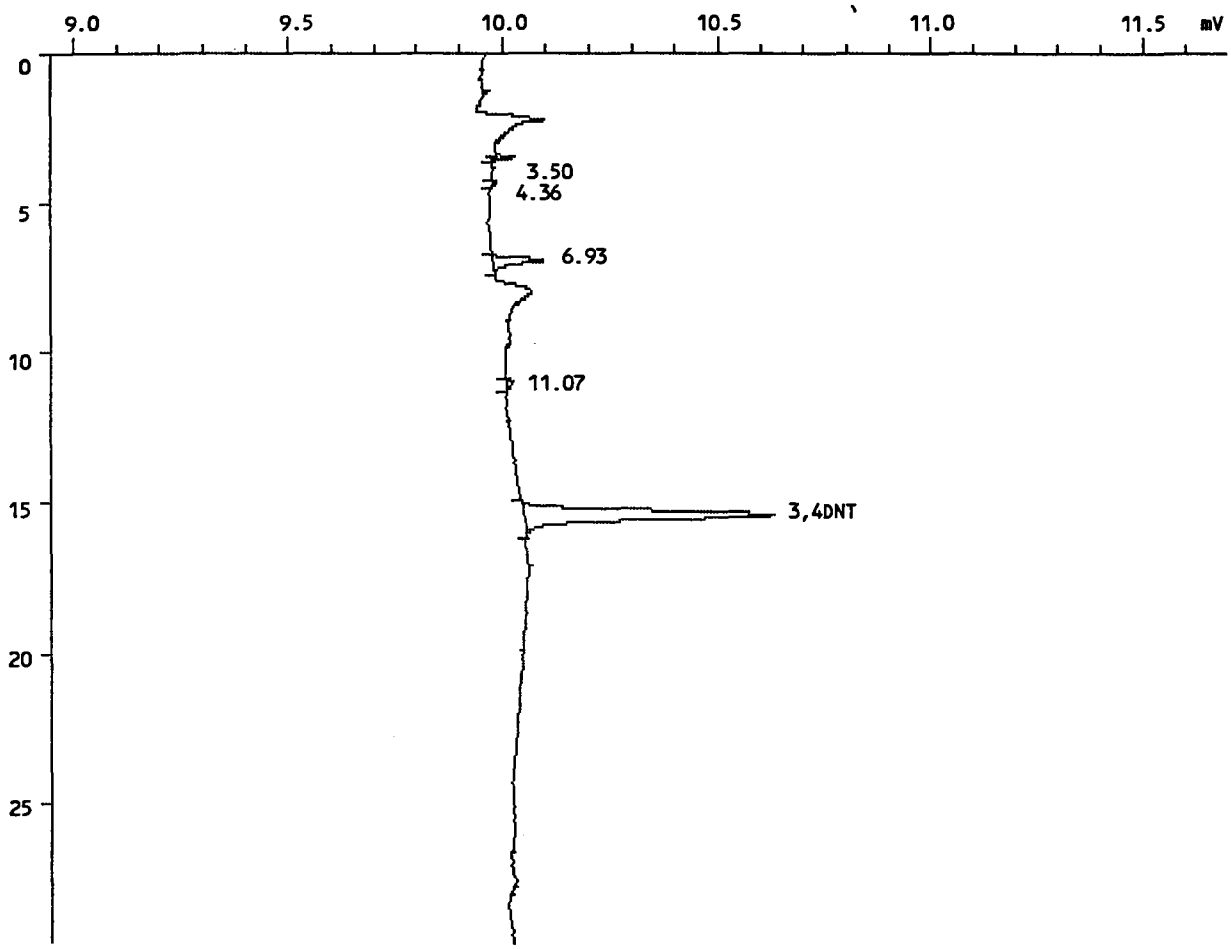
FORM I

LONG PLOT

Injection F: <MC3> 5 5E0408W,25,1

Sample name.....: CRA/MFAR04068
Sample ID.....: 33479.18
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1

Acquired on 09-Apr-98 at 12:49:17
Reported on 15-Apr-98 at 11:28:05



INJECTION REPORT

Injection F: <MC3> 5 5E0408W,25,1

Acquired on 09-Apr-98 at 12:49:17
Modified on 15-Apr-82 at 10:25:56
Reported on 15-Apr-98 at 10:25:57

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1
Number of samples.: 29
Calibration file..: 5E0408W Last modified on 15-Apr-82 at 10:25:56
Method file.....: EXPLOS Last modified on 15-Apr-82 at 10:24:22
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: CRA/MFAR04068
Sample ID.....: 33479.18
Sample type.....: Sample
Sample amount.....: 1.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 1.000
Dilution.....: 2.000
Amount (g or mL).....: 1.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/L	Peak name
5	15.408	585	12095	246.340	3,4DNT
Total		585	12095	246.340	
Residual		188	2214	-3.459	

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

MFA-003

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 1324-0009-07-35

Project Name: NSWC Crane

Samplers: (Signature)

Sampler: (Print) Peter J Chevalier

Analysis Required: 8330 Explosives; 6010/7471 Metals; 8260 VOC; RCRA Metals

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 Explosives	6010/7471 Metals	8260 VOC	RCRA Metals	Remarks
Soil	Grid 176 grab 12"	4/24/98	1000	MFA-ICS 550		✓			✓		Mine Fill A Pre-Excavation
	Grid 180 grab 12"		1015	MFA-ICS 553		✓			✓		
	Grid 178 comp 0-12"		0930	MFA-ICS 555		✓	✓	✓			
	Grid 178 grab 12"		0938	MFA-ICS 556		✓			✓		
	Grid 178 grab 30"		1000	MFA-ICS 557		✓			✓		
	Grid 178 comp 0-12"		0930	MFA-ICS 555-FD		✓	✓	✓			
	Grid 179 comp 0-12"		1020	MFA-ICS 558		✓	✓	✓			
	Grid 179 grab 12"		1033	MFA-ICS 559		✓			✓		
	Grid 179 comp 24-36"		1045	MFA-ICS 560		✓	✓	✓			
liquid	rinse blank		0830	MFA-ICS RB042498		✓	✓			✓	
liquid	trip blank		1530	MFA-ICS TB042498		✓			✓		
											Southwest Labs

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
	4/24/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company: C. Miller	Date/Time 4-25-98 8:30	Total No. Samples This Shipping Container / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2 WB1) / SWL-GA-115 Rev. 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): KIM WILLISON / SARAH HODSON

REC'D DATE: 4-25-98

RECEIVED BY (SIGNATURE): C. Miller

TIME REC'D: 8:30

LOGGED IN BY (SIGNATURE):

LOG-IN DATE: 4-25-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC CRANE	33748	33748

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.:
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   - SEALED IN PLASTIC? YES / NO
   - TAPED TO LID? YES / NO
   - PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: 8009118246 18
6. COOLER CONDITIONS
   - ENOUGH ICE? YES / NO
   - TYPE OF ICE? WET
   - TYPE OF PACKING? Bubble
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   - BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   - CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   - CORRECT PRESERVATIVE ? YES / NO
   - SUFFICIENT SAMPLE ? YES / NO
   - LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO
   - VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
MFA-ICS-550	V	01	MKE-04 4-25-98-1			10°C
553	↓	02				
555	B,M	03				
556	V	04				
557	V	05				
555FD	B,M	06				
558	↓	07				
559	V	08				
560	B,M	09				
MFA-ICS RB042498	↓	10				
TB042498	V	11				

B1 +1

* Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

SDG NARRATIVE

May 23, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 33748
EPISODE(S) : 33748
FRACTION : EXPLOSIVES
SAMPLE(S) : MFA-ICS-555, MFA-ICS-555FD, MFA-ICS-558, MFA-ICS-560, MFA-ICS-RB042498

This SDG consisted of 4 soil and 1 water samples for explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA, INC
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2

CASE SUMMARY:

Soil:

All of the analytes were within QC limits in the laboratory control spike (LCS) an he laboratory control spike duplicate (LCSD).

WATER:

An interfering peak eluted in the L1 and L2 standards at the approximate retention time as RDX. The interfering peak was not eluted in the other low level standard injected prior to this standard. Possibly due to autosampler vial contamination, the interfering peak was detected in these standards. Since correlation coefficient was greater than 0.99 for the analyte, slope was utilized to calculate the concentration for RDX. RDX was not detected in the sample.

ICV slightly exceeded 15% deviation when compared to the initial calibration standard. Since PETN was not detected in the associated sample, the sample was not re-analyzed.

The surrogate (3,4DNT) exceeded the QC limits in the samples MFA-ICS-RB042498MS and MFA-ICS-RB042498MSD and LC0425WC.

Tetryl was out of the QC limits in the samples MFA-ICS-RB042498MS and MFA-ICS-RB042498MSD. The analyte was within the QC limits in the LCS an LCSD.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

To analyze PETN, LC ChemStation software was utilized. Unlike the VG software, the Response Factor in the ChemStation is calculated by dividing the concentration by the area.

Multiplier = amount extracted/ final volume

The following is an example of the calculation for the LC0425WC:

Mean response factor * area of the sample * dilution * Multiplier = the concentration

3.22 * 205.52 * 1 * 2 = 1323 ug/L

Form 9s were included for the %RSD and correlation coefficient calculation of the calibration standard. However, the samples were calculated based on the mean response factor generated by the software which due to a number of decimal places, the mean response factor generated by the software might not be exactly the same as the form 9s.

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

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1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-

We use the following flags where appropriate. "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment which is explained in the case narrative.

Shahriar Shahreza

C Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

	SAMPLE NUMBER	S1 #	OTHER
1	MFA-ICS-555	97.0	0
2	MFA-ICS-555-FD	105	0
3	MFA-ICS-558	105	0
4	MFA-ICS-560	100	0
5	MFA-ICS-RB042498	112	0
6	MFA-ICS-RB042498 MS	152*	0
7	MFA-ICS-RB042498 MSD	145*	0
8	BL0425SC	107	0
9	BL0425WC	108	0
10	LC0425SC	140	0
11	LC0425WC	144*	0
12	LD0425SC	86.2	0
13	LD0425WC	127	0
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

FORM II

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LC0425SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
HMX	9500		10900	115	57-137
RDX	9500		9690	102	77-113
TNB	9500		9410	99	64-125
DNB	9500		10500	110	82-118
TETRYL	9500		11100	117	23-124
NB	9500		10900	115	69-143
TNT	9500		9690	102	75-118
4ADNT	9500		10700	113	60-140
2ADNT	9500		10400	109	60-140
26DNT	9500		10100	106	78-117
24DNT	9500		10000	105	74-126
2NT	9500		10200	107	78-123
4NT	9500		10200	107	79-125
3NT	9500		10400	109	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LC0425SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
PETN	3000		3000	100	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LD0425SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
HMX	9500		9000	95	57-137
RDX	9500		7940	84	77-113
TNB	9500		6900	73	64-125
DNB	9500		8490	89	82-118
TETRYL	9500		6170	65	23-124
NB	9500		8160	86	69-143
TNT	9500		7550	80	75-118
4ADNT	9500		7970	84	60-140
2ADNT	9500		7790	82	60-140
26DNT	9500		7710	81	78-117
24DNT	9500		7830	82	74-126
2NT	9500		8140	86	78-123
4NT	9500		8230	87	79-125
3NT	9500		8400	88	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LD0425SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
PETN	3000		2820	94	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

4C

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0425SC

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Matrix: (soil/water) Soil

Date Extracted: 04/25/98 Extn. Method: SONC

Date Analyzed (1): 04/29/98 Date Analyzed(2): 04/29/98

Time Analyzed (1): 19:06:25 Time Analyzed(2): 02:27:20

Instrument ID (1): IN13 Instrument ID(2): IN10

LC Column ID (1): CARB-06 LC Column ID (2): LC-CN-10

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0425SC	LC0425SC	04/29/98	
2	LD0425SC	LD0425SC	04/29/98	
3	MFA-ICS-555	33748.03	04/29/98	04/29/98
4	MFA-ICS-555-FD	33748.06	04/29/98	04/29/98
	MFA-ICS-558	33748.07	04/29/98	04/29/98
	MFA-ICS-560	33748.09	04/30/98	04/29/98
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0425SC

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Matrix: (soil/water) Soil

Date Extracted: 04/25/98 Extn. Method: SONC

Date Analyzed (1): 04/29/98 Date Analyzed(2):

Time Analyzed (1): 00:57:29 Time Analyzed(2):

Instrument ID (1): LC4 Instrument ID(2):

LC Column ID (1): LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0425SC	LC0425SC	04/29/98	
2	LD0425SC	LD0425SC	04/29/98	
3	MFA-ICS-555	33748.03	04/29/98	
4	MFA-ICS-555-FD	33748.06	04/29/98	
	MFA-ICS-558	33748.07	04/29/98	
	MFA-ICS-560	33748.09	04/30/98	
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-555

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) SOIL Lab Sample ID: 33748.03

Sample Amt: 2g % Moisture 23.22 Date Received: 04/25/98

Extraction Volume: 10ml Date Extracted: 04/25/98

Extraction Method: SONC Date Analyzed: 04/29/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	4360	
121-82-4	RDX	90.2	J
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	186	J
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

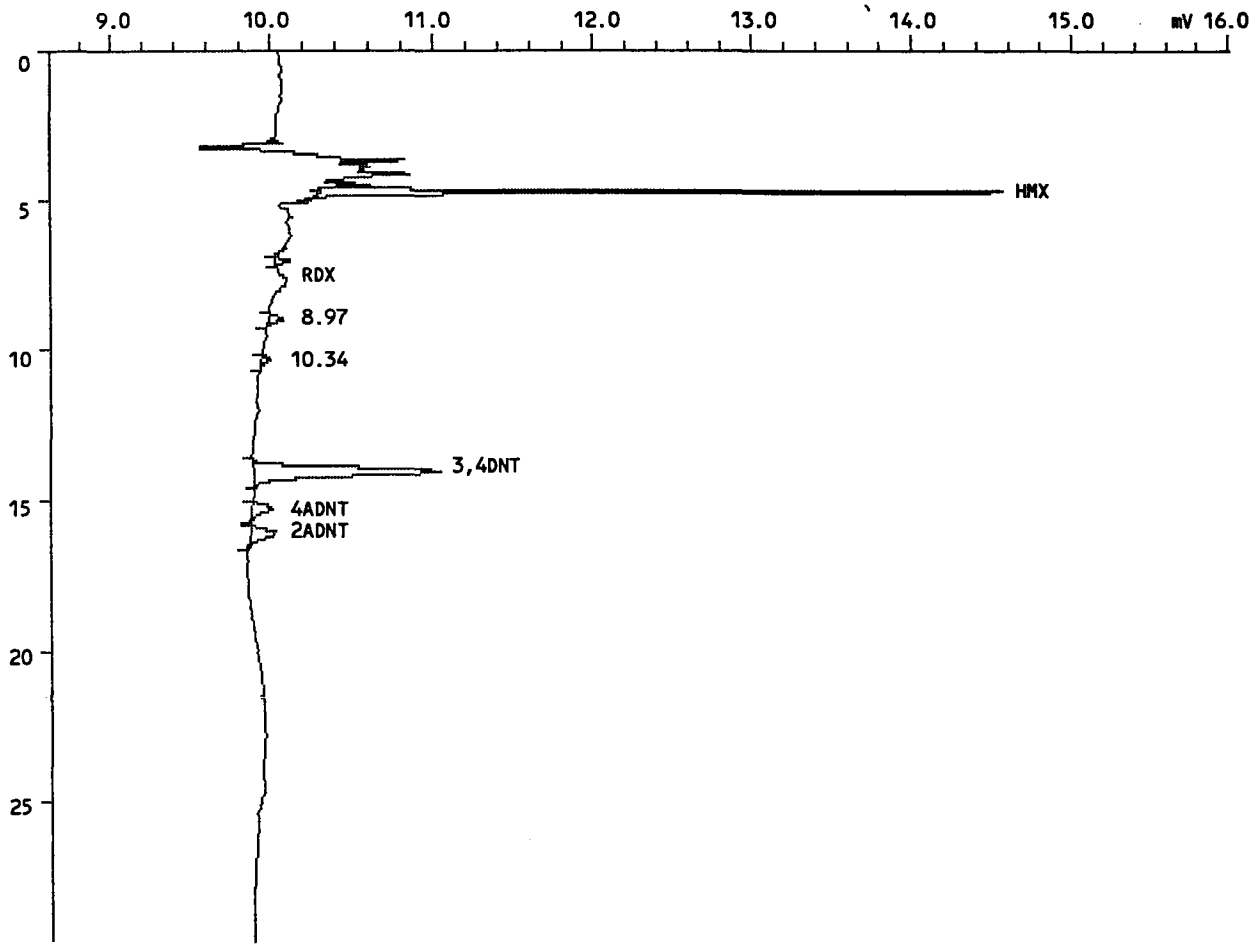
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0429A,6,1

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1

Acquired on 29-Apr-98 at 22:05:05
Reported on 30-Apr-98 at 12:07:34



INJECTION REPORT

Injection F: <MC3> 5 5EX0429A,6,1

Acquired on 29-Apr-98 at 22:05:05
Modified on 30-Apr-82 at 12:07:12
Reported on 30-Apr-98 at 12:07:18

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06,INJ:200,COL#1
Number of samples.: 33
Calibration file..: 5EX0429 Last modified on 30-Apr-82 at 12:07:08
Method file.....: EXPLOS Last modified on 30-Apr-82 at 11:46:20
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

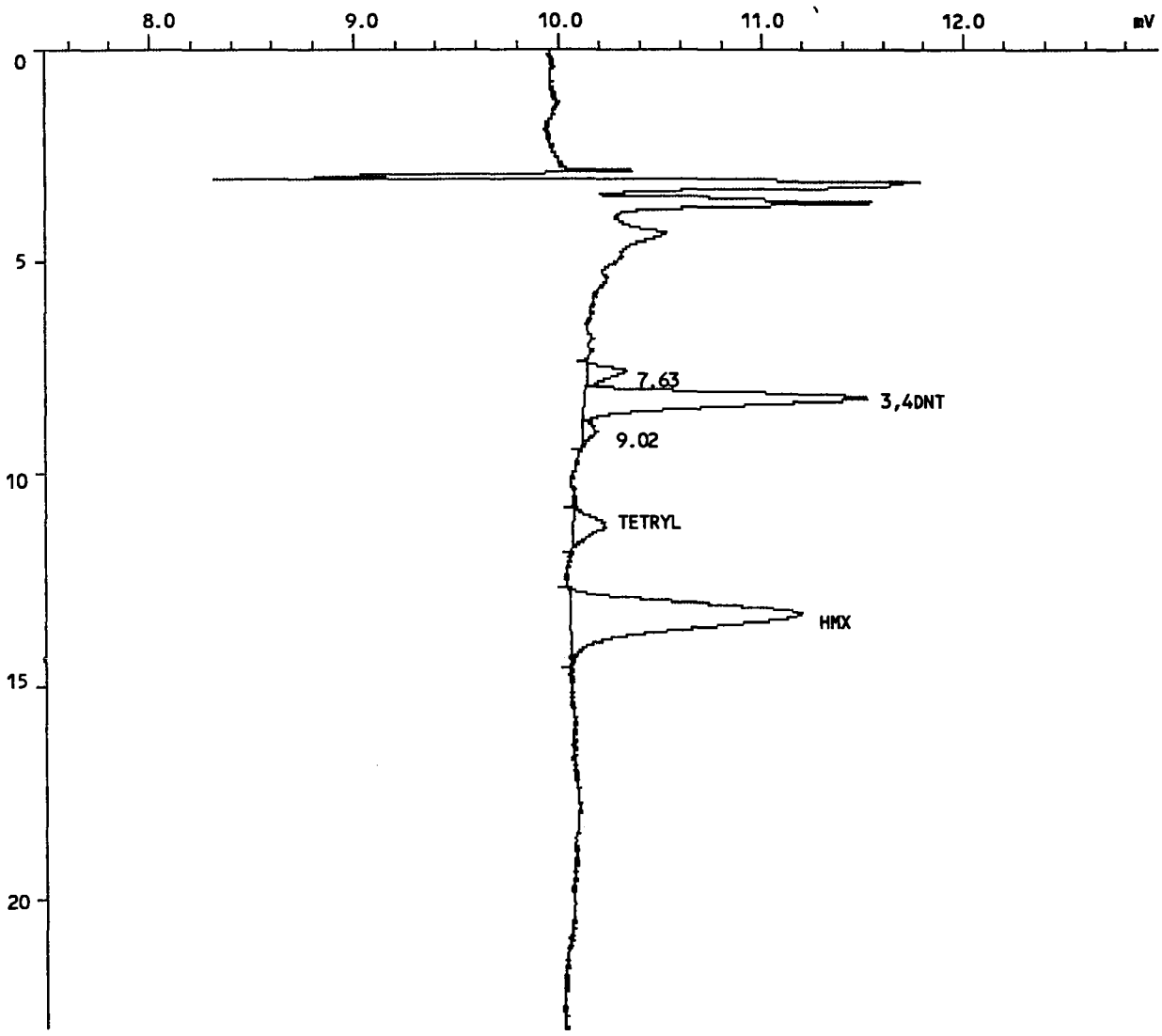
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.747	4282	29930	4362.932	HMX
2	7.056	85	774	90.239	RDX
5	14.053	1147	20794	1939.722	3,4DNT
6	15.259	134	2532	185.598	4ADNT
7	16.059	165	3359	179.815	2ADNT
Total		5813	57388	6758.306	
Residual		143	2093	243.914	

LONG PLOT

Injection F: <MC3> 3 3CN0428A,4,1

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 29-Apr-98 at 03:56:02
Reported on 30-Apr-98 at 12:33:11



INJECTION REPORT

Injection F: <MC3> 3 3CN0428A,4,1

Acquired on 29-Apr-98 at 03:56:02
Modified on 30-Apr-82 at 12:30:32
Reported on 30-Apr-98 at 12:30:34

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10,INJ:100, UV
Number of samples.: 29
Calibration file..: 3CN0428A Last modified on 30-Apr-82 at 12:25:50
Method file.....: LCCN Last modified on 30-Apr-82 at 12:29:52
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

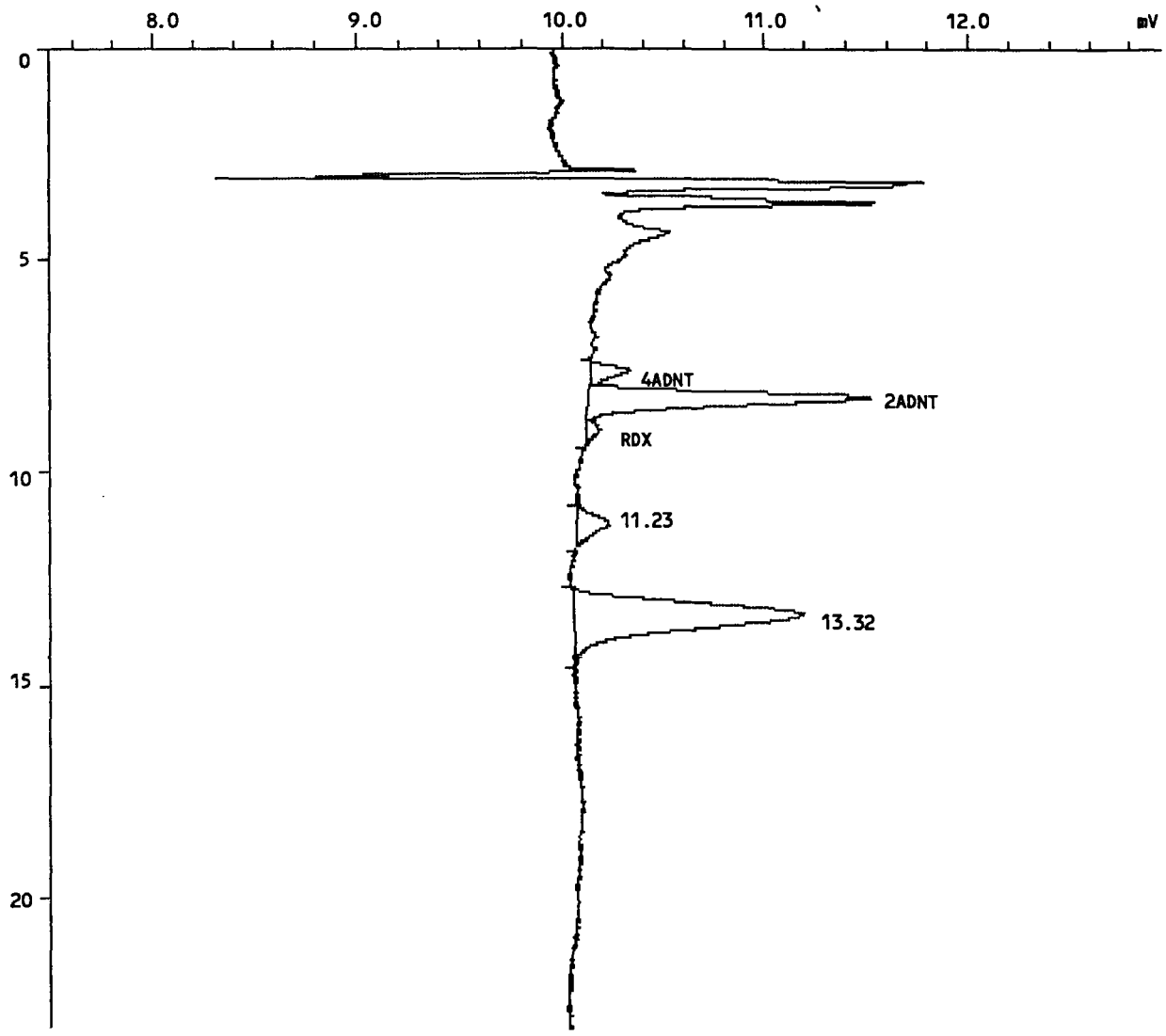
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	8.219	1394	31053	2315.642	3,4DNT
4	11.227	155	4479	307.430	TETRYL
5	13.323	1145	46545	4411.820	HMX
Total		2694	82077	7034.891	
Residual		272	5007	0.000	

LONG PLOT

Injection F: <MC3> 3 3CN0428A,4,1

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 29-Apr-98 at 03:56:02
Reported on 30-Apr-98 at 12:45:27



INJECTION REPORT

Injection F: <MC3> 3 3CN0428A,4,1

Acquired on 29-Apr-98 at 03:56:02
Modified on 30-Apr-82 at 12:41:16
Reported on 30-Apr-98 at 12:41:17

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10,INJ:100, UV
Number of samples.: 29
Calibration file..: 3CN0428B Last modified on 30-Apr-82 at 12:27:10
Method file.....: LCCN Last modified on 30-Apr-82 at 12:29:52
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555
Sample ID.....: 33748.03
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	7.627	198	3494	225.416	4ADNT
2	8.219	1394	31053	1220.627	2ADNT
3	9.024	74	1513	114.729	RDX
Total		1666	36060	1560.772	
Residual		1300	51024	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-555

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) SOIL Lab Sample ID: 33748.03

Sample Amt: 2g % Moisture 23.22 Date Received: 04/25/98

Extraction Volume: 10ml Date Extracted: 04/27/98

Extraction Method: SONC Date Analyzed: 04/29/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

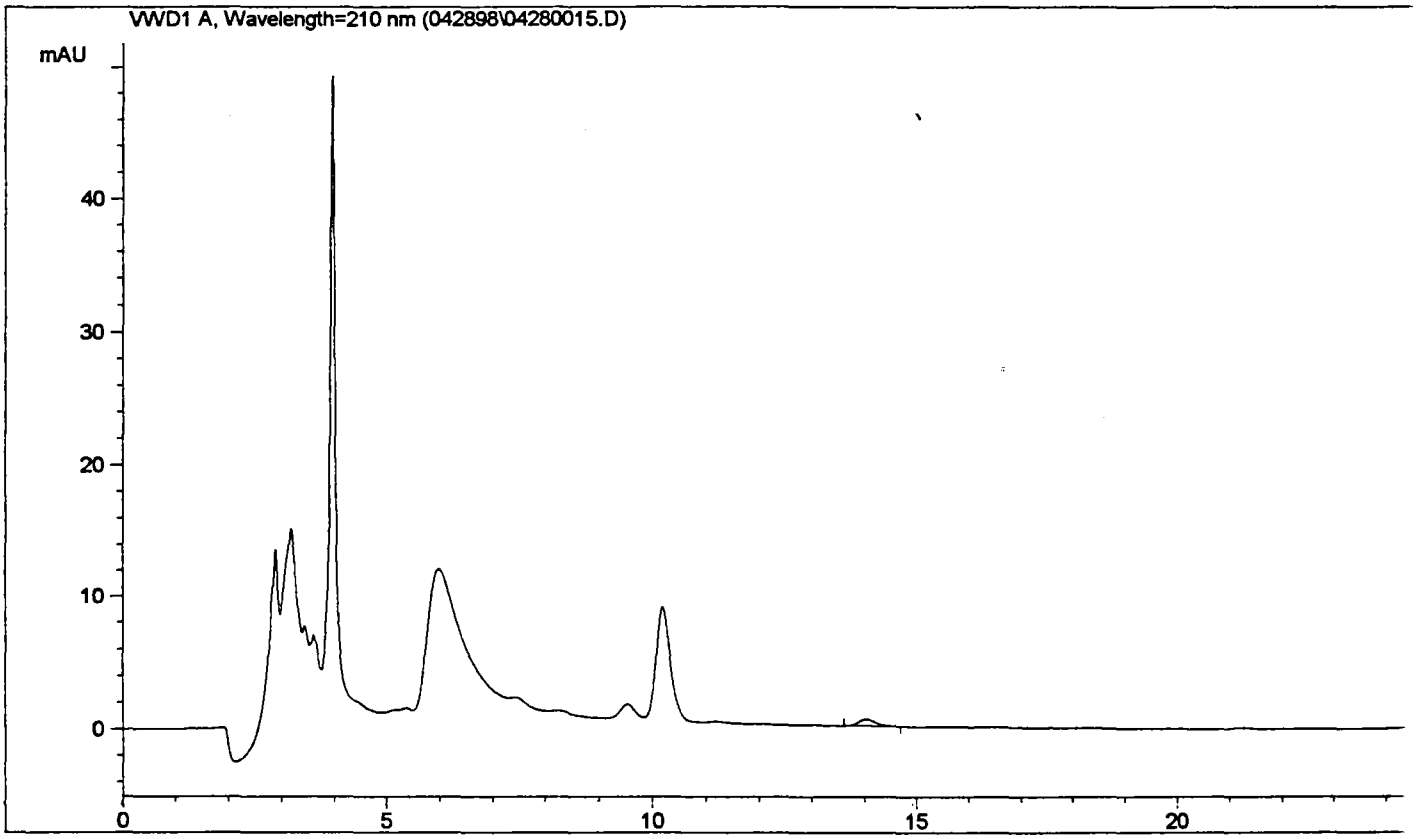
FORM I

Injection Date : Wed, 29. Apr. 1998
Sample Name : 33748.03
Acq Operator : SS

Seq Line : 15
Vial No. : 15
Inj. No. : 1
Inj. Vol. : 200 µl

Acq. Method : 042898.M
Analysis Method : C:\HPCHEM\1\METHODS\042898.M
Last Changed : Thu, 30. Apr. 1998, 01:13:53 pm

PETN



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Customized Report: extstd.frp

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Sorted By Signal
Calib. Data Modified : Thu, 30. Apr. 1998,01:13:44 pm
Multiplier : 10.000000
Dilution : 1.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
14.023	PB	12.23936	0.00000	0.00000	
Totals:				0.00000	

25

1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-555-FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) SOIL Lab Sample ID: 33748.06

Sample Amt: 2g % Moisture 22.09 Date Received: 04/25/98

Extraction Volume: 10ml Date Extracted: 04/25/98

Extraction Method: SONC Date Analyzed: 04/29/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	RPD of FD
2691-41-0	HMX	5520		23.5
121-82-4	RDX	1000	U	—
99-35-4	TNB	250	U	0
99-65-0	DNB	250	U	0
479-45-8	TETRYL	650	U	0
98-95-3	NB	260	U	0
118-96-7	TNT	250	U	0
1946-51-0	4ADNT	167	J	10.7
35572-78-2	2ADNT	250	U	0
606-20-2	26DNT	260	U	0
121-14-2	24DNT	250	U	0
88-72-2	2NT	250	U	0
99-99-0	4NT	250	U	0
99-08-1	3NT	250	U	0

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

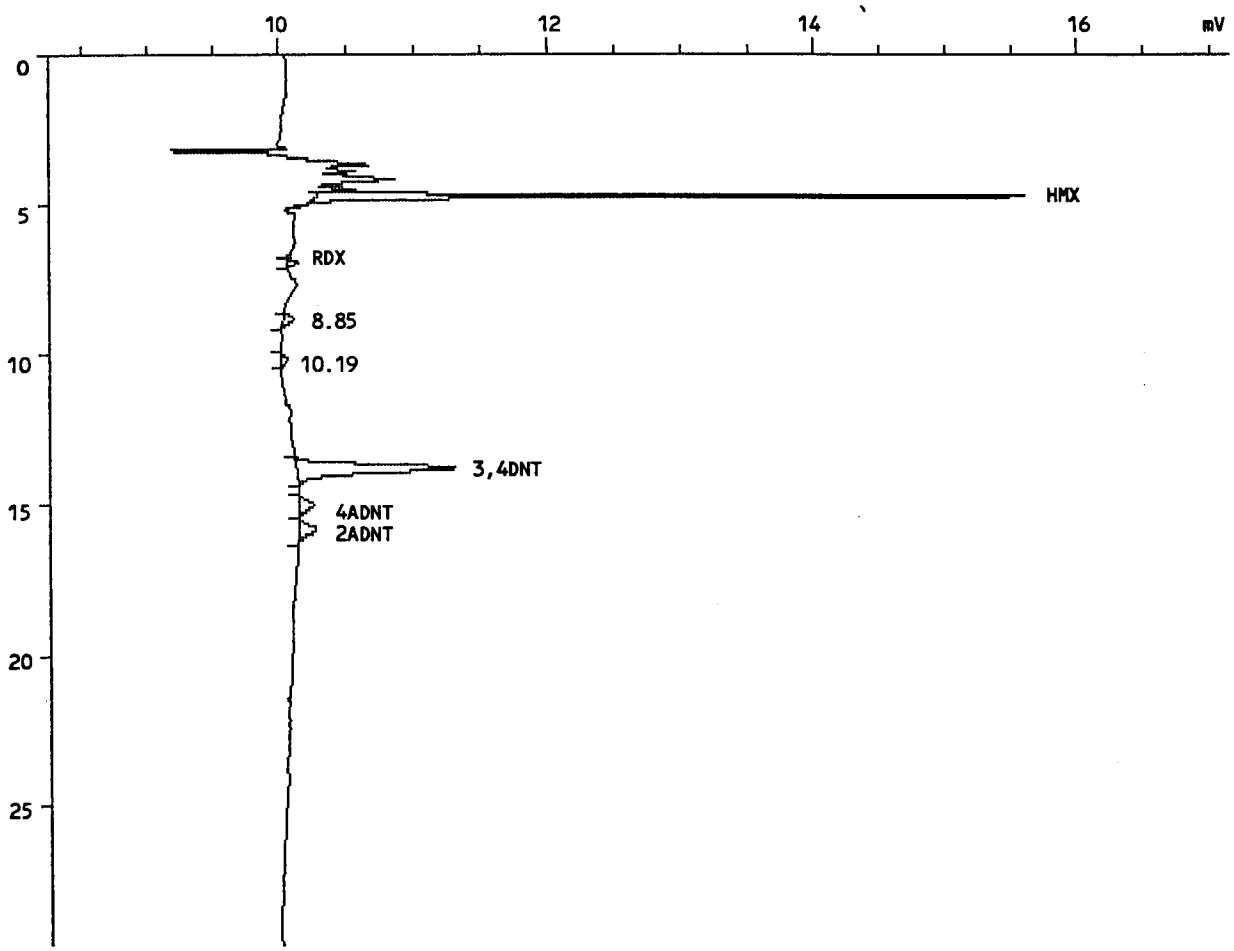
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0429A,7,1

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06, INJ:200,COL#1

Acquired on 29-Apr-98 at 22:49:45
Reported on 30-Apr-98 at 11:52:11



INJECTION REPORT

Injection F: <MC3> 5 5EX0429A,7,1

Acquired on 29-Apr-98 at 22:49:45
Modified on 30-Apr-82 at 11:47:06
Reported on 30-Apr-98 at 11:47:08

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-06,INJ:200,COL#1
Number of samples.: 33
Calibration file..: 5EX0429 Last modified on 30-Apr-82 at 11:19:58
Method file.....: EXPLOS Last modified on 30-Apr-82 at 11:46:20
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

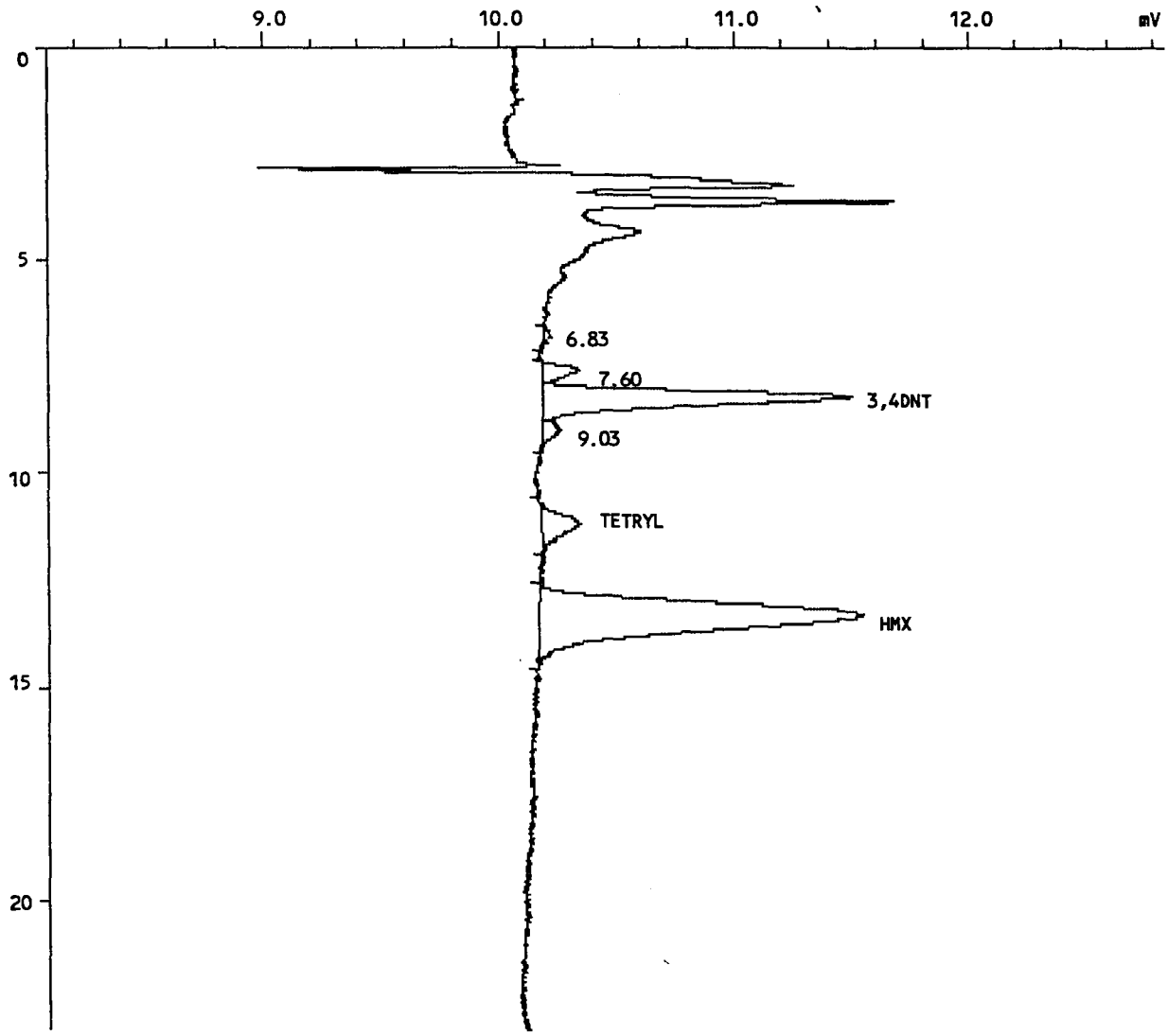
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.747	5337	37902	5525.021	HMX
2	6.981	88	808	94.191	RDX
5	13.829	1187	22513	2100.080	3,4DNT
6	15.019	109	2278	166.996	4ADNT
7	15.840	133	2898	155.154	2ADNT
Total		6855	66399	8041.442	
Residual		136	2009	234.171	

LONG PLOT

Injection F: <MC3> 3 3CN0428A,5,1

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 29-Apr-98 at 04:40:24
Reported on 30-Apr-98 at 12:32:42



INJECTION REPORT

Injection F: <MC3> 3 3CN0428A,5,1

Acquired on 29-Apr-98 at 04:40:24
Modified on 30-Apr-82 at 12:30:48
Reported on 30-Apr-98 at 12:30:48

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10,INJ:100, UV
Number of samples.: 29
Calibration file..: 3CN0428A Last modified on 30-Apr-82 at 12:25:50
Method file.....: LCCN Last modified on 30-Apr-82 at 12:29:52
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

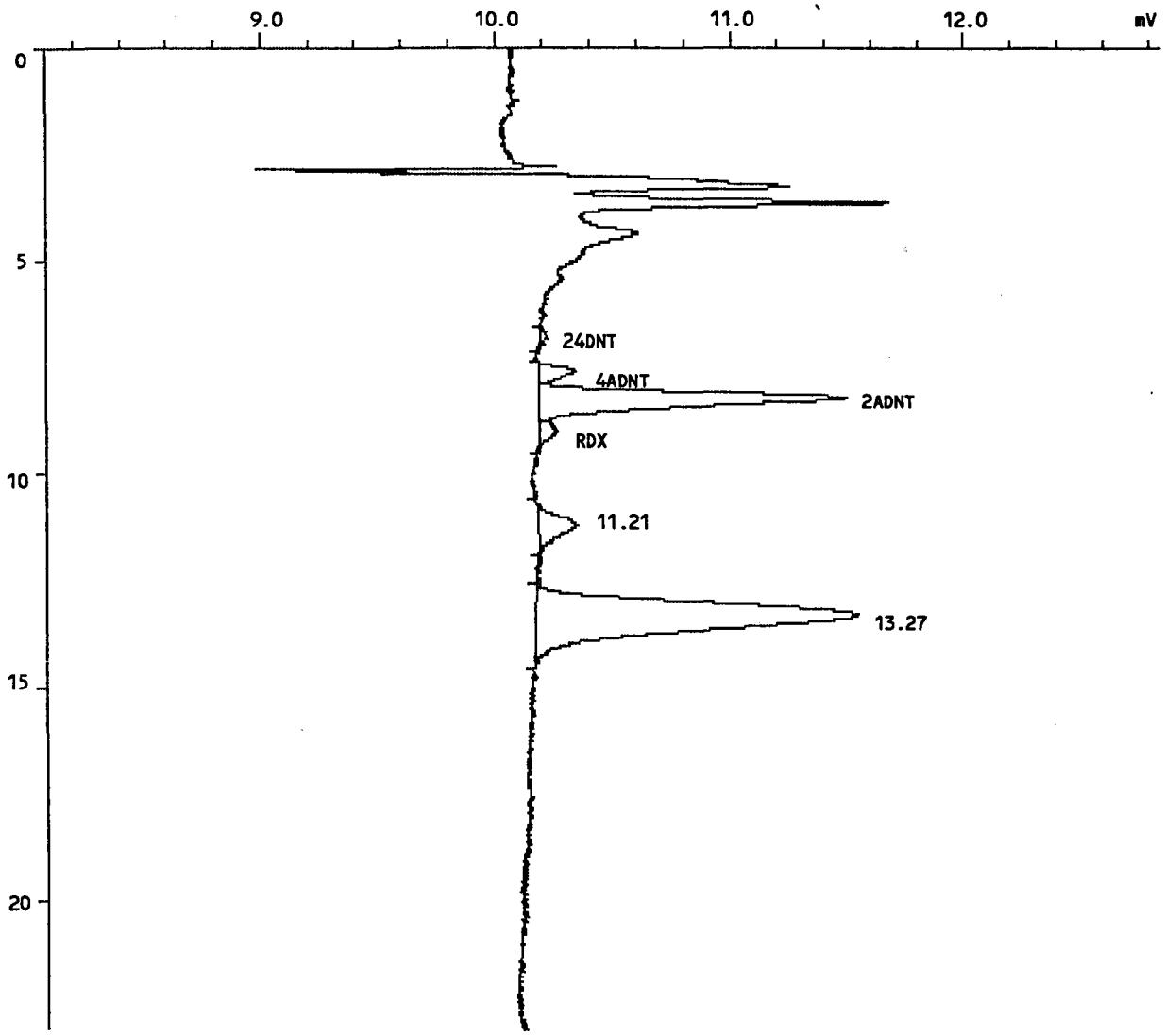
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
3	8.208	1318	30860	2301.294	3,4DNT
5	11.205	171	5308	364.301	TETRYL
6	13.275	1376	59212	5612.480	HMX
Total		2865	95380	8278.074	
Residual		275	5132	0.000	

LONG PLOT

Injection F: <MC3> 3 3CN0428A,5,1

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10, INJ:100, UV

Acquired on 29-Apr-98 at 04:40:24
Reported on 30-Apr-98 at 12:44:56



INJECTION REPORT

Injection F: <MC3> 3 3CN0428A,5,1

Acquired on 29-Apr-98 at 04:40:24
Modified on 30-Apr-82 at 12:41:30
Reported on 30-Apr-98 at 12:41:30

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-10,INJ:100, UV
Number of samples.: 29
Calibration file..: 3CN0428B Last modified on 30-Apr-82 at 12:27:10
Method file.....: LCCN Last modified on 30-Apr-82 at 12:29:52
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-555-FD
Sample ID.....: 33748.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	6.827	37	528	16.760	24DNT
2	7.600	157	2852	183.984	4ADNT
3	8.208	1318	30860	1213.064	2ADNT
4	9.035	81	1752	132.861	RDX
Total		1593	35993	1546.669	
Residual		1547	64520	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-555-FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) SOIL Lab Sample ID: 33748.06

Sample Amt: 2g % Moisture 22.09 Date Received: 04/25/98

Extraction Volume: 10ml Date Extracted: 04/27/98

Extraction Method: SONC Date Analyzed: 04/29/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	RPD of FD
75-11-5	PETN----------	250	U	0

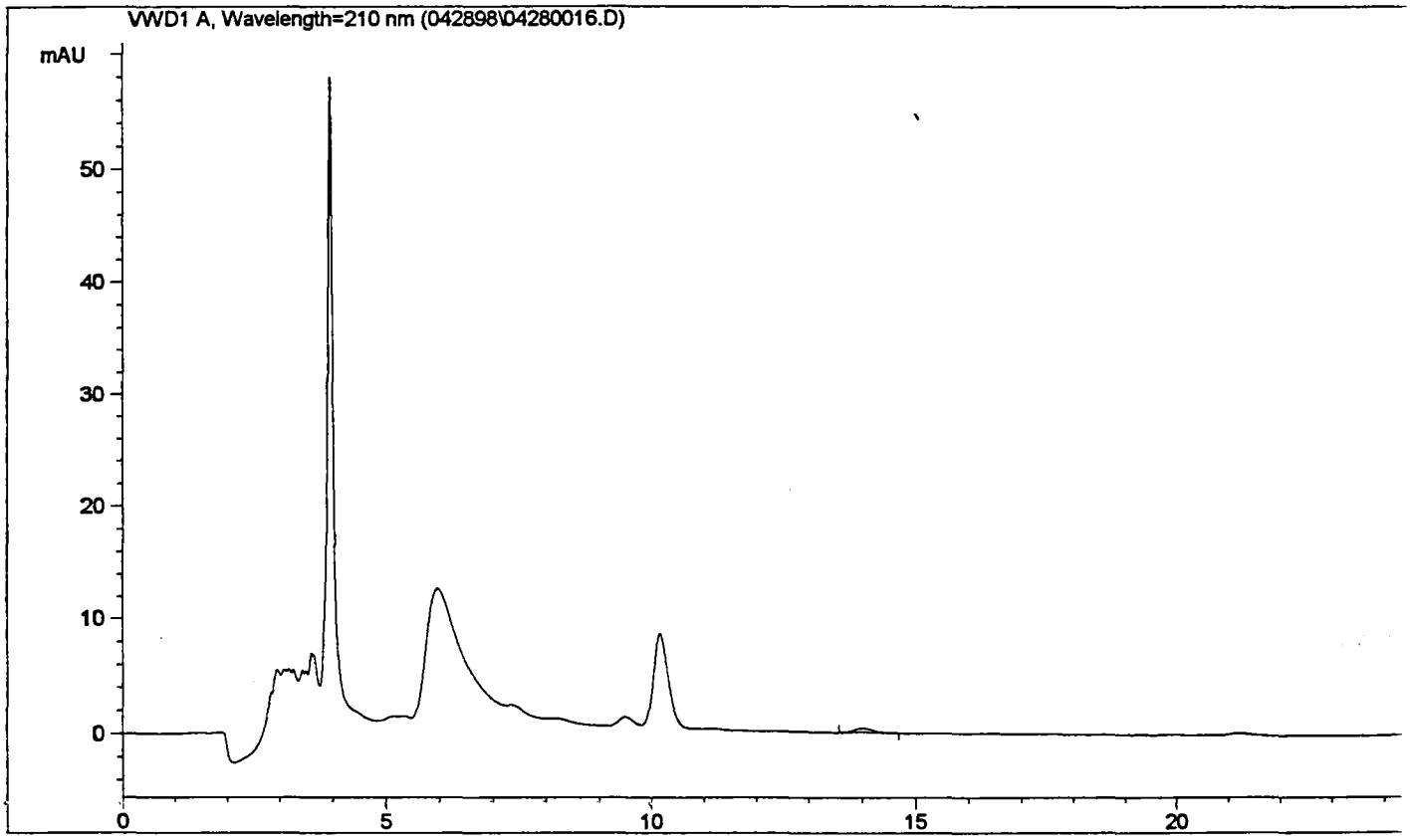
FORM I

Injection Date : Wed, 29. Apr. 1998
Sample Name : 33748.06
Acq Operator : SS

Seq Line : 16
Vial No. : 16
Inj. No. : 1
Inj. Vol. : 200 µl

Acq. Method : 042898.M
Analysis Method : C:\HPCHEM\1\METHODS\042898.M
Last Changed : Thu, 30. Apr. 1998, 01:13:53 pm

PETN



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Customized Report: extstd.frp

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Sorted By Signal
Calib. Data Modified : Thu, 30. Apr. 1998,01:13:44 pm
Multiplier : 10.000000
Dilution : 1.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
14.006	PB	10.13148	0.00000	0.00000	
Totals:				0.00000	

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

MFA-005

Project No.: 4324-0009-007-34

Project Name: ~~4329~~ NSWC Crane Bio facility

Samplers: (Signature) [signature]

Sampler: (Print) Ryan Erwin

Split Samples

Analysis Required

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 Expl.	6010, 7470	8260	Remarks
Soil	Grid 184 0-12" Comp	5/14/98	850	MFA ICS 565		✓	✓	✓		MS/MSD on
	Grid 184 12-18" ~~Comp~~ Grab		855	MFA ICS 566		✓			✓	Grid 185 was
	Grid 184 24-36" Comp		915	MFA ICS 567		✓	✓	✓		at ICS 571
	Grid 185 0-12" Comp		1028	MFA ICS 568		✓	✓	✓		Additional
	Grid 185 12-18" Grab		1032	MFA ICS 569		✓			✓	VOC taken
	Grid 185 24-36" Comp		1345	MFA ICS 570		✓	✓	✓		at Corners.
	Grid 185 12-18" Grab		1245	MFA ICS 571		✓			✓	571 — 573
	Grid 185 12-18" Grab		1300	MFA ICS 572		✓			✓	
	Grid 185 12-18" Grab		1315	MFA ICS 573		✓			✓	
	Grid 185 24-36" Comp		1345	MFA ICS 574 FD		✓	✓	✓		
liquid				MFA ICS T0514		✓			✓	

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
[signature]	5/14/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company: C. Miller	Date/Time 5-15-98 9:40	Total No. Samples This Shipping Container: / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

6°C

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-

SDG NARRATIVE

June 10, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 33971
EPISODE(S): 33971
FRACTION : EXPLOSIVES
SAMPLE(S) : MFA-ICS-565, MFA-ICS-567, MFA-ICS-568, MFA-ICS-570, MFA-ICS-574FD

This SDG consisted of 5 soil samples with applicable MS and MSD for explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

TM

Standard Operating Procedure

Determination of PETN in Soil and Water by HPLC

Document No.: SWL-OL-206

Rev No. / Date: Rev. 1.0 — 04/01/98

OFFICIAL COPY RED STAMP INDICATES ORIGINAL

APPROVALS	DATES
Procedure Prepared By	Date 04/01/98
Organic Program Manager	Date 4-1-98
Laboratory Safety Officer	Date 4/1/98
Laboratory QA/QC Officer	Date 4/1/98

(Effective Date is 10 calendar days after the last signature above - QA/QC Officer)

Document Status

[✓] Controlled DC No. 2062 Issued to: ALAN FOSDICK Date: 4/1/98 QA: ll

[ ] Official Copy OC No.:_____ Issued to:_____ Date:_____ QA:_____

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1.0 Scope and Application

1.1 Method SW846-8330, Rev 0, published September 1994 is intended for the analysis of explosives residues by High Pressure Liquid Chromatography (HPLC). This Standard Operating Procedure (SOP) is used to determine the concentration of the following compound in a water, soil or sediment matrix:

COMPOUND NAME	ABBREVIATION	CAS NUMBER
Pentaerythritol tetranitrate	PETN	75-11-5

1.2 The subject analyte is used as an initiating agent and it is extremely sensitive to initiation. When weighing, homogenizing, or making stock solution for calibration standards, caution should be taken. This method is restricted to use by or under the supervision of analysts experienced in the use of HPLC, skilled in the interpretation of chromatograms, and experienced in handling explosive materials. Each analyst must demonstrate the ability to generate acceptable results with this method.

1.3 The practical quantitation limits (PQL) of the target analyte is presented in Table 1.

2.0 Summary of Method

2.1 One extraction is performed for the nitroaromatics and nitramines (reference SOP SWL-OL-200) and PETN. All extracts are spiked with the surrogate 3,4 DNT. Extracts are first analyzed at a wavelength of 254nm for the nitroaromatics and nitramines, then the wavelength is adjusted to 220nm and the extracts are reanalyzed for PETN.

2.2 Aqueous samples are diluted 2X (v/v) with the appropriate solvent, filtered, separated on a spherisorb ODS-II reverse phase column (or equivalent) determined at 220 nm, and confirmed on a LC-CN column.

2.3 Soil and sediment samples are extracted using acetonitrile in an ultrasonic bath. The extracts are filtered and diluted 2X (v/v) with 0.5 % calcium chloride/water. Refer to Section 7.0 for extraction procedure.

3.0 Interferences

3.1 Any material which are extracted from soil with acetonitrile, coeluted with the explosives through the HPLC column, which absorb UV radiation at 220 nm may cause interferences.

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3.2 Carryover from analysis of a highly contaminated sample can result in an apparent contamination of the succeeding samples. This interference is minimized by re-analyzing heavily contaminated sample following dilution.

4.0 Apparatus and Materials

4.1 Primary HPLC System

- Pump — HP Model 1050 quaternary system (or equivalent.)
- Column – Spherisorb ODS-II column (or equivalent)
- Detector — HP Model 1050 Variable UV (or equivalent.)
- Autosampler — HP Model 1050 autosampler (or equivalent.)
- Data System — VG Minichrom data system or equivalent.

4.2 Confirmation HPLC System

- Pump – Waters model 510 high pressure pump capable of 6000 psi at 10 ml/min. or equivalent.
- Column – Supelco LC-CN, 5 µm, 25cm x 4.6mm ID (or equivalent).
- Detector Waters model 486 variable wavelength detector (or equivalent).
- Autosampler – Waters model 715 WISP or equivalent.
- Data System – VG Minichrom or equivalent.

4.3 Other Equipment

- NEY-300 Ultrasonic Bath equipped with drainage, that can hold water at room temperature to 35°C (or equivalent). The sonicator is kept covered during sonication to keep the samples in the dark.
- BLUE M Convection Heating Oven with the temperature range of 0-300°C or equivalent.
- Balance ± 0.0001 g.

4.4 Materials

- Filters – Gelman Accuspec CR 0.45 µm filters for filtering extracts, or equivalent
- Filters – Supelco Nylon 66 0.2 µm x 47 mm membranes for filtering chromatographic solvents or equivalent.
- Glass Pipettes – Class A, glass, 50 mL, 10 mL, 5 mL, 4 mL, 2 mL, 1 mL

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- Vials – 15 mL, 20 mL, 40 ml, glass, Teflon lined screw cap or crimp top.
- Syringes – 5 mL, 10 mL, glass or polypropylene.
- Volumetric flasks – Class A - 10 mL, 20 mL, 50 mL, 100 mL, 200 mL, 250 mL.
- Mortar and pestle.
- SMI pipetter – 50-250 µL, and 10-60 µL.

5.0 Reagents

5.1 HPLC grade chemicals shall be used in all tests. It is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lowering the accuracy of the determination.

- Acetonitrile, CH3CN – HPLC grade.
- Methanol, CH3OH – HPLC grade.
- Water, H2O – HPLC grade.

5.2 Stock Standard Solutions. Analyte Standards obtained from AccuStandard (equivalent vendor) at 1000 µg/mL.

- PETN – Standard Analytical Reference Material

5.3 These immediate stock standard solutions are kept at 4°C in the dark for up to one year or shorter according to manufacturer expiration date.

5.4 Intermediate stock standard solution is prepared from the immediate stock standard solution in methanol and the intermediate stock standard is refrigerated at 4±2°C and kept in the dark upon preparation for six months.

5.5 Working Calibration Standards for soil matrices.

5.5.1 Prepare 5 point working calibration standards fresh, if CCV response is ≥15% by diluting the intermediate stock standards by 50:50 (v/v) with a 5 g/L (0.5%) Calcium Chloride/water and acetonitrile. Analyst judgement should determine if new calibration standards are required.

5.5.2 Five-level calibration standards are prepared from the intermediate stock standard in the manner that the low level standard is at or near the MDL , and the upper extent of the high level standard is at the detector linear range. Each level is injected one time.

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CASE SUMMARY:

The surrogate (3,4DNT) was not detected in the sample MFA-ICS-568 and its MS and MSD due to the concentration of the TNT peak. Therefore, no recovery was reported for the surrogate on the form 2E (the surrogate recovery form). The surrogate was diluted out in the 50X dilution of these samples.

Since some of the analytes were out of the QC limits in the freshly prepared initial calibration standard, another initial calibration standard was prepared and these sample were re-analyzed. All of the analytes were within the QC limits under the new initial calibration standard.

Due to non-homogeneity of the samples MFA-ICS-568MS and MFA-ICS-568MSD, some of the analytes were out of the QC limits and %RPD limits in these samples.

All of the analytes were within the QC limits in the laboratory control spike (LCS) and the laboratory control spike duplicate (LCSD).

To analyze PETN, LC ChemStation software was utilized. Unlike the VG software, the Response Factor in the ChemStation is calculated by dividing the concentration by the area.

Multiplier = amount extracted/ final volume. Multiplier does not have any units.

The following is an example of the calculation for the LC0516SD:

Mean response factor * area of the sample * dilution * Multiplier = the concentration

2.94 * 94.46 * 2 * 5 = 2777 ug/Kg

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The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

We use the following flags where appropriate. "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment which is explained in the case narrative.

Shahriar Shahreza

LC Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

	SAMPLE NUMBER	S1 #	OTHER
1	MFA-ICS-565	105	0
2	MFA-ICS-567	107	0
3	MFA-ICS-568		0
4	MFA-ICS-568 50X	D	0
5	MFA-ICS-568 MS		0
6	MFA-ICS-568 MS 50X	D	0
7	MFA-ICS-568 MSD 50X	D	0
8	MFA-ICS-568 MSD		0
9	MFA-ICS-570	95.6	0
10	MFA-ICS-574FD	91.5	0
11	BL0516SC	103	0
12	LC0516SC	102	0
13	LD0516SC	87.5	0
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

FORM II

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: MFA-ICS-568 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
HMX	9500	101000	135000	358*	54-128
RDX	9500	650000	979000	3460*	66-109
TNB	9500	1050	10200	96	57-130
DNB	9500		8670	91	74-122
TETRYL	9500		8440	89	32-119
NB	9500		9040	95	70-135
TNT	9500	661000	660000	11*	44-124
4ADNT	9500		20300	214*	60-140
2ADNT	9500		13300	140	60-140
26DNT	9500		9080	96	58-125
24DNT	9500		10600	112	59-120
2NT	9500		9890	104	79-124
4NT	9500		9040	95	74-128
3NT	9500		8110	85	79-121

No of Analyte recoveries out of QC Advisory Limits = 4

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	157000	589*	49*	30	54-128
RDX	9500	1030000	4000*	14	30	66-109
TNB	9500	10000	94	2	30	57-130
DNB	9500	8660	91	0	45	74-122
TETRYL	9500	7980	84	6	30	32-119
NB	9500	9090	96	1	35	70-135
TNT	9500	468000	2030*	198*	30	44-124
4ADNT	9500	19700	207*	3	40	60-140
2ADNT	9500	13000	137	2	40	60-140
26DNT	9500	8940	94	2	35	58-125
24DNT	9500	10100	106	6	35	59-120
2NT	9500	9870	104	0	35	79-124
4NT	9500	8840	93	2	35	74-128
3NT	9500	8100	85	0	35	79-121

No of Analyte recoveries out of QC Advisory Limits = 4
No of RPD's out of QC Limits 2

3F

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: MFA-ICS-568 MSD 50X

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
HMX	9500	107000	139000	337*	54-128
RDX	9500	693000	1060000	3860*	66-109
TNB	9500		9710	102	57-130
DNB	9500		9690	102	74-122
TETRYL	9500		7380	78	32-119
NB	9500		9290	98	70-135
TNT	9500	690000	685000	53	44-124
4ADNT	9500		20600	217*	60-140
2ADNT	9500		13800	145*	60-140
26DNT	9500		8900	94	58-125
24DNT	9500		8990	95	59-120
2NT	9500		8440	89	79-124
4NT	9500		8500	90	74-128
3NT	9500		7020	74*	79-121

of Analyte recoveries out of QC Advisory Limits = 5

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	159000	547*	48*	30	54-128
RDX	9500	1080000	4070*	5	30	66-109
TNB	9500	9020	95	7	30	57-130
DNB	9500	8540	90	13	45	74-122
TETRYL	9500	5970	63	21	30	32-119
NB	9500	8840	93	5	35	70-135
TNT	9500	473000	2280*	191*	30	44-124
4ADNT	9500	17500	184*	16	40	60-140
2ADNT	9500	10500	110	27	40	60-140
26DNT	9500	7000	74	24	35	58-125
24DNT	9500	8630	91	4	35	59-120
2NT	9500	8210	86	3	35	79-124
4NT	9500	9100	96	.7	35	74-128
3NT	9500	9100	96	26	35	79-121

No of Analyte recoveries out of QC Advisory Limits = 5
No of RPD's out of QC Limits 2

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: MFA-ICS-568

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
PETN	3000		2800	93	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
PETN	3000	2670	89	5	30	70-130

No of Analyte recoveries out of QC Advisory Limits = 0
No of RPD's out of QC Limits 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: LC0516SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
HMX	9500		9560	101	57-137
RDX	9500		9230	97	77-113
TNB	9500		8950	94	64-125
DNB	9500		9270	98	82-118
TETRYL	9500		4700	50	23-124
NB	9500		9830	103	69-143
TNT	9500		7300	77	75-118
4ADNT	9500		10500	110	60-140
2ADNT	9500		9460	100	60-140
26DNT	9500		9010	95	78-117
24DNT	9500		10100	106	74-126
2NT	9500		9690	102	78-123
4NT	9500		9400	99	79-125
3NT	9500		8700	92	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: LC0516SD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
PETN	3000		2780	93	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: LD0516SC

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
HMX	9500		9470	100	57-137
RDX	9500		9140	96	77-113
TNB	9500		8990	95	64-125
DNB	9500		9190	97	82-118
TETRYL	9500		5650	60	23-124
NB	9500		9440	99	69-143
TNT	9500		7460	79	75-118
4ADNT	9500		9970	105	60-140
2ADNT	9500		9380	99	60-140
26DNT	9500		8960	94	78-117
24DNT	9500		10100	106	74-126
2NT	9500		9600	101	78-123
4NT	9500		9360	99	79-125
3NT	9500		8550	90	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Client Sample No: LD0516SD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
PETN	3000		2740	91	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

4C

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0516SC

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Matrix: (soil/water) Soil

Date Extracted: 05/16/98 Extn. Method: SONC

Date Analyzed (1): 06/06/98 Date Analyzed(2): 05/24/98

Time Analyzed (1): 09:06:55 Time Analyzed(2): 04:57:33

Instrument ID (1): IN13 Instrument ID(2): IN10

LC Column ID (1): CARB-08 LC Column ID (2): LC-CN-09

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0516SC	LC0516SC	06/06/98	
2	LD0516SC	LD0516SC	06/06/98	
3	MFA-ICS-565	33971.01	06/06/98	05/24/98
4	MFA-ICS-567	33971.03	06/06/98	05/24/98
5	MFA-ICS-568	33971.04	06/06/98	05/24/98
6	MFA-ICS-568 50X	33971.04DL	06/06/98	05/25/98
7	MFA-ICS-568 MS	33971.05MS	06/06/98	
8	MFA-ICS-568 MS 50X	33971.05MSDL	06/06/98	
9	MFA-ICS-568 MSD	33971.06MSD	06/06/98	
10	MFA-ICS-568 MSD 50X	33971.06MDDL	06/06/98	
11	MFA-ICS-570	33971.08	06/06/98	05/24/98
12	MFA-ICS-574FD	33971.14	06/06/98	05/24/98
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

4C

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0516SD

Lab Code: SWOK Case No: MKF-OH SDG No:33971

Matrix: (soil/water) Soil

Date Extracted: 05/16/98 Extn. Method: SONC

Date Analyzed (1): 05/22/98 Date Analyzed(2):

Time Analyzed (1): 01:03:31 Time Analyzed(2):

Instrument ID (1): LC4 Instrument ID(2):

LC Column ID (1): LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0516SD	LC0516SD	05/22/98	
2	LD0516SD	LD0516SD	05/22/98	
3	MFA-ICS-565	33971.01	05/22/98	
4	MFA-ICS-567	33971.03	05/22/98	
5	MFA-ICS-568	33971.04	05/22/98	
6	MFA-ICS-568	33971.05MS	05/22/98	
7	MFA-ICS-568	33971.06MSD	05/22/98	
8	MFA-ICS-570	33971.08	05/22/98	
9	MFA-ICS-574FD	33971.14	05/22/98	
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-570

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33971

Matrix: (soil/water) SOIL Lab Sample ID: 33971.08

Sample Amt: 2g % Moisture 15.80 Date Received: 05/15/98

Extraction Volume: 10ml Date Extracted: 05/16/98

Extraction Method: SONC Date Analyzed: 06/06/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2030	J
121-82-4	RDX	6800	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	1060	
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

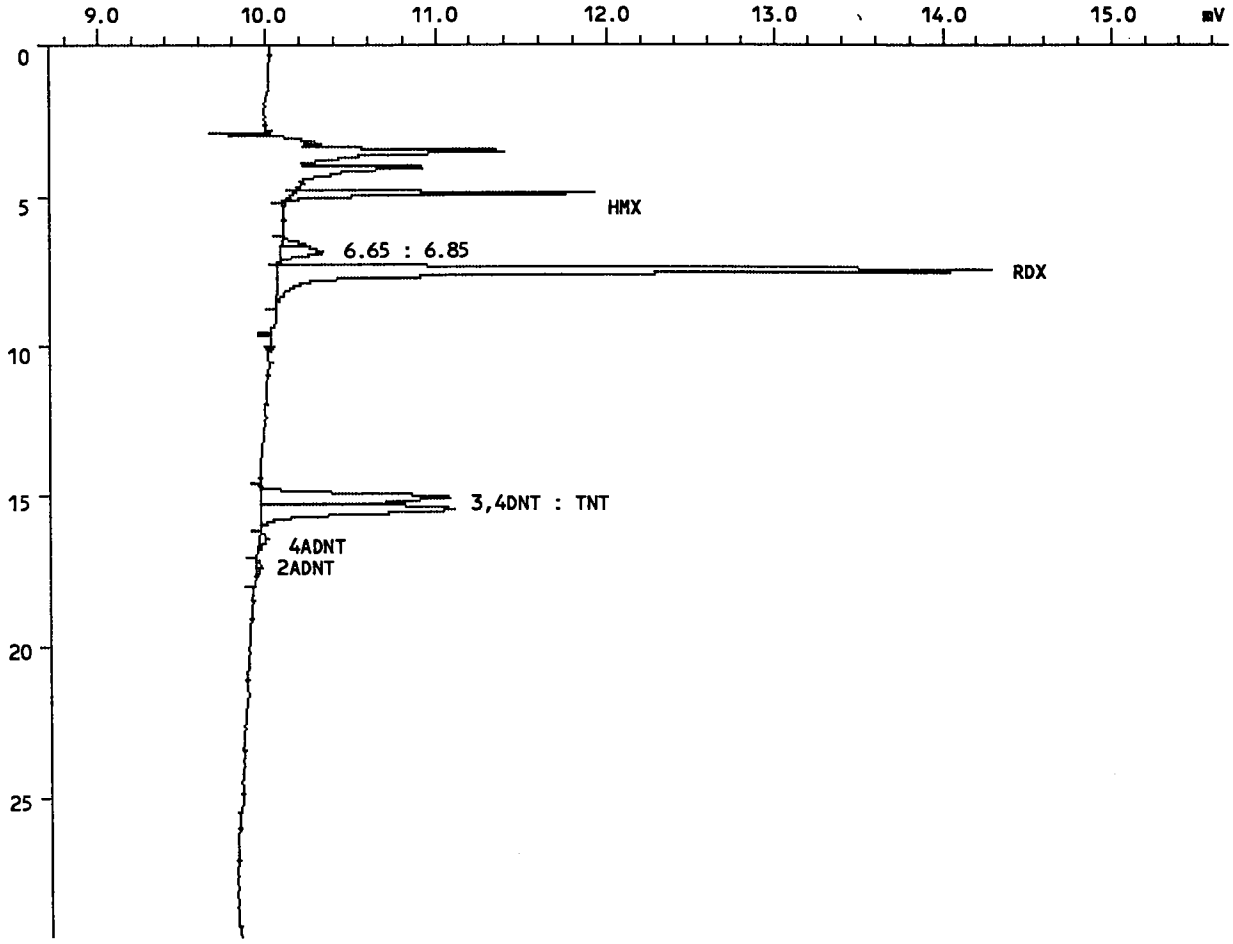
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0605B,15,1

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-08, INJ:200,COL#1

Acquired on 06-Jun-98 at 20:28:17
Reported on 08-Jun-98 at 12:31:44



INJECTION REPORT

Injection F: <MC3> 5 5EX0605B,15,1

Acquired on 06-Jun-98 at 20:28:17
Modified on 08-Jun-82 at 12:04:48
Reported on 08-Jun-98 at 12:04:45

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-08,INJ:200,COL#1
Number of samples.: 18
Calibration file..: 5EX0605 Last modified on 08-Jun-82 at 12:01:06
Method file.....: EXPLOS Last modified on 08-Jun-82 at 12:04:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

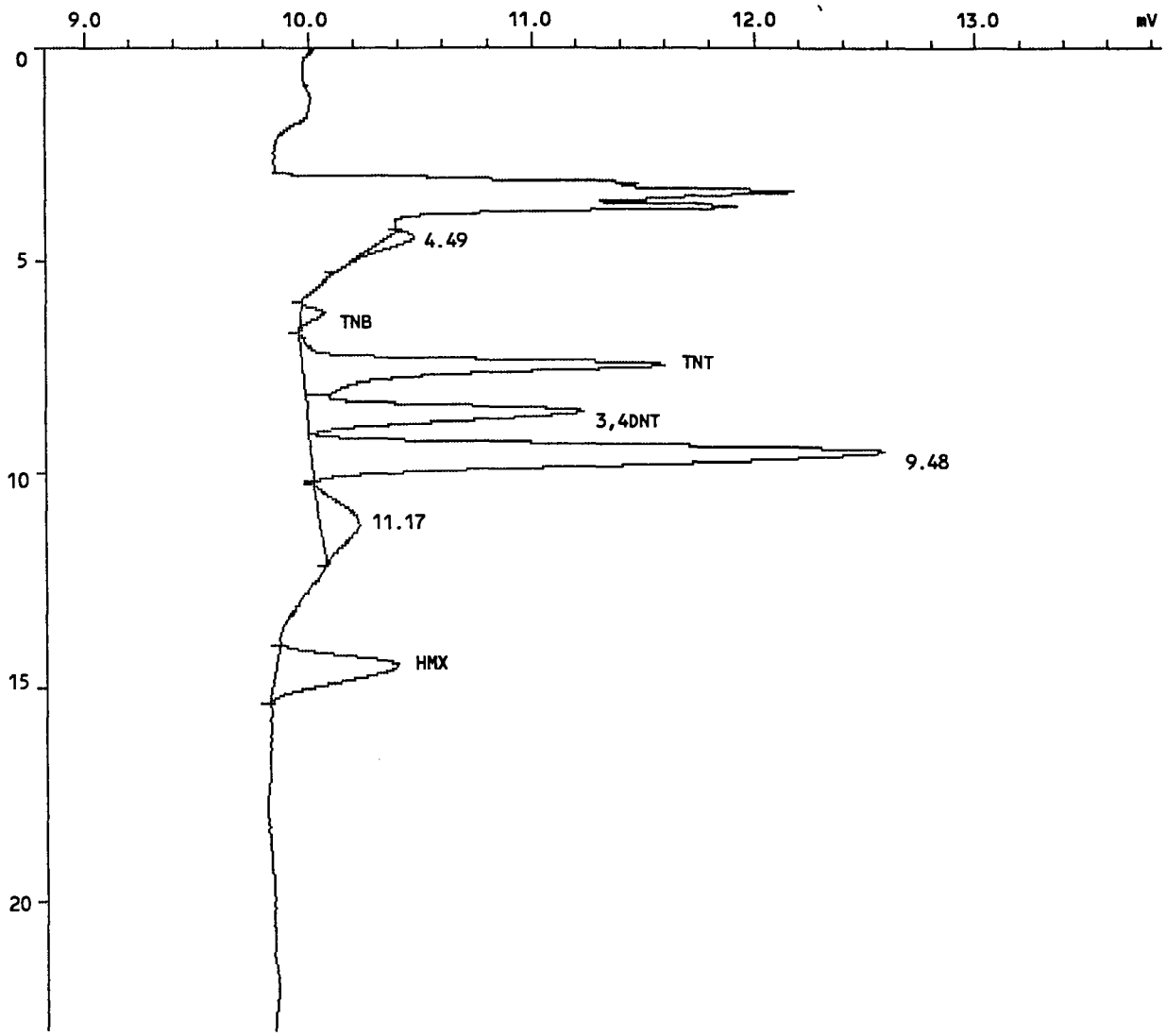
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.912	1783	14893	2029.044	HMX *J
4	7.461	4209	65308	6802.938	RDX *
5	15.072	1105	21042	1912.874	3,4DNT
6	15.467	1136	24718	1056.307	TNT *
7	16.437	56	1201	88.576	4ADNT
8	17.355	37	920	49.893	2ADNT
Total		8326	128082	11939.632	
Residual		401	6126	834.658	

LONG PLOT

Injection F: <MC3> 3 3CN0523A,6,1

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100,UV

Acquired on 24-May-98 at 08:39:18
Reported on 04-Jun-98 at 14:41:04



INJECTION REPORT

Injection F: <MC3> 3 3CN0523A,6,1

Acquired on 24-May-98 at 08:39:18
Modified on 04-Jun-82 at 14:27:30
Reported on 04-Jun-98 at 14:27:29

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09,INJ:100, UV
Number of samples.: 31
Calibration file..: 3CN0523A Last modified on 04-Jun-82 at 14:23:36
Method file.....: LCCN Last modified on 04-Jun-82 at 13:16:44
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

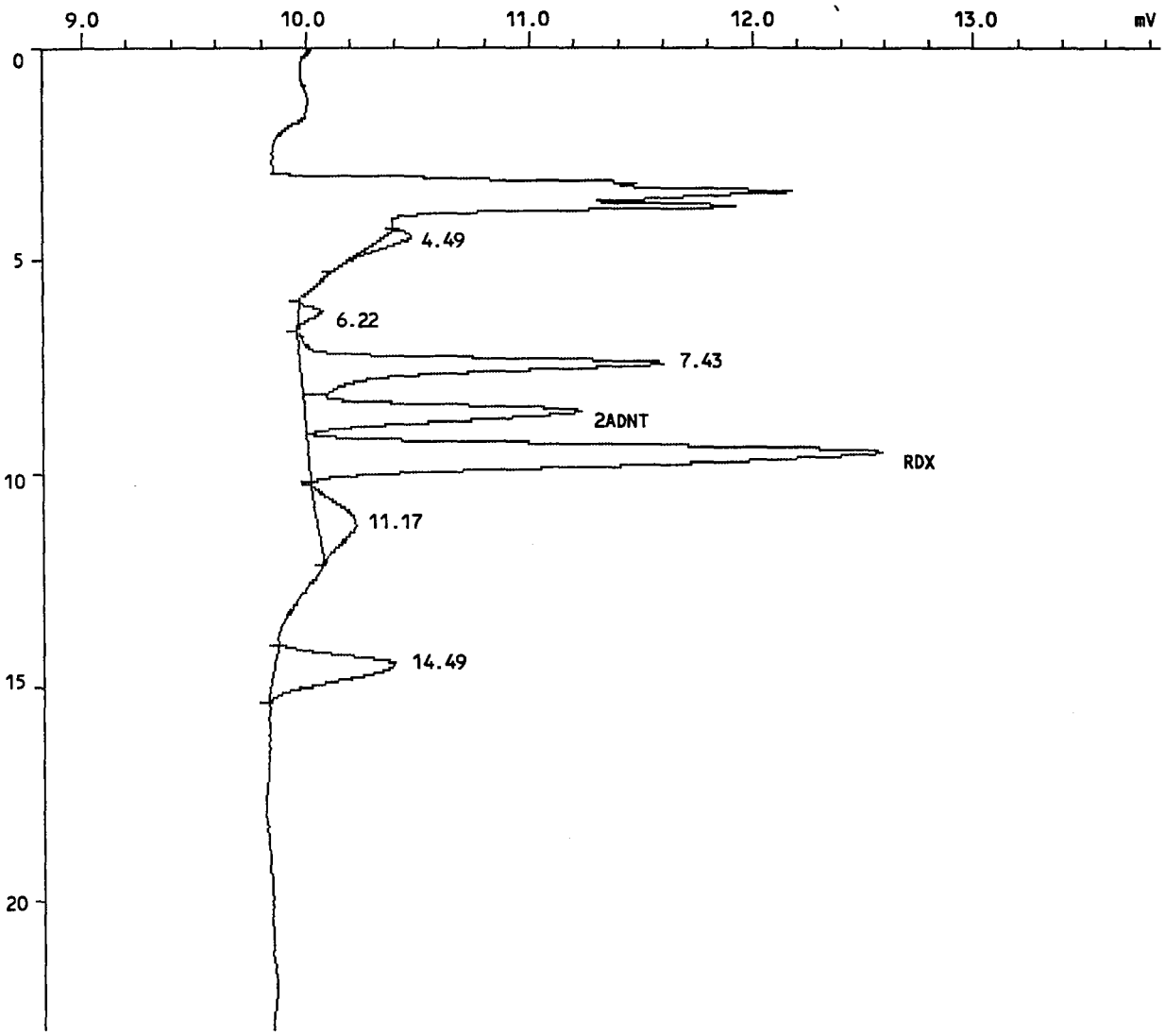
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	6.219	106	1916	75.930	TNB
3	7.429	1631	38936	1483.288	TNT
4	8.549	1239	31874	2186.162	3,4DNT
7	14.491	538	21516	2109.425	HMX
Total		3514	94242	5854.805	
Residual		2907	94956	0.000	

LONG PLOT

Injection F: <MC3> 3 3CN0523A,6,1

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100,UV

Acquired on 24-May-98 at 08:39:18
Reported on 04-Jun-98 at 15:13:20



INJECTION REPORT

Injection F: <MC3> 3 3CN0523A,6,1

Acquired on 24-May-98 at 08:39:18
Modified on 04-Jun-82 at 14:48:36
Reported on 04-Jun-98 at 14:48:35

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09,INJ:100, UV
Number of samples.: 31
Calibration file..: 3CN0523B Last modified on 04-Jun-82 at 14:45:44
Method file.....: LCCN Last modified on 04-Jun-82 at 14:45:54
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-570
Sample ID.....: 33971.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
4	8.549	1239	31874	1174.005	2ADNT
5	9.483	2584	80131	5399.636	RDX
Total		3823	112005	6573.641	
Residual		2598	77194	0.000	

1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-570

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33971

Matrix: (soil/water) SOIL Lab Sample ID: 33971.08

Sample Amt: 2g % Moisture 15.80 Date Received: 05/15/98

Extraction Volume: 10ml Date Extracted: 05/16/98

Extraction Method: SONC Date Analyzed: 05/22/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

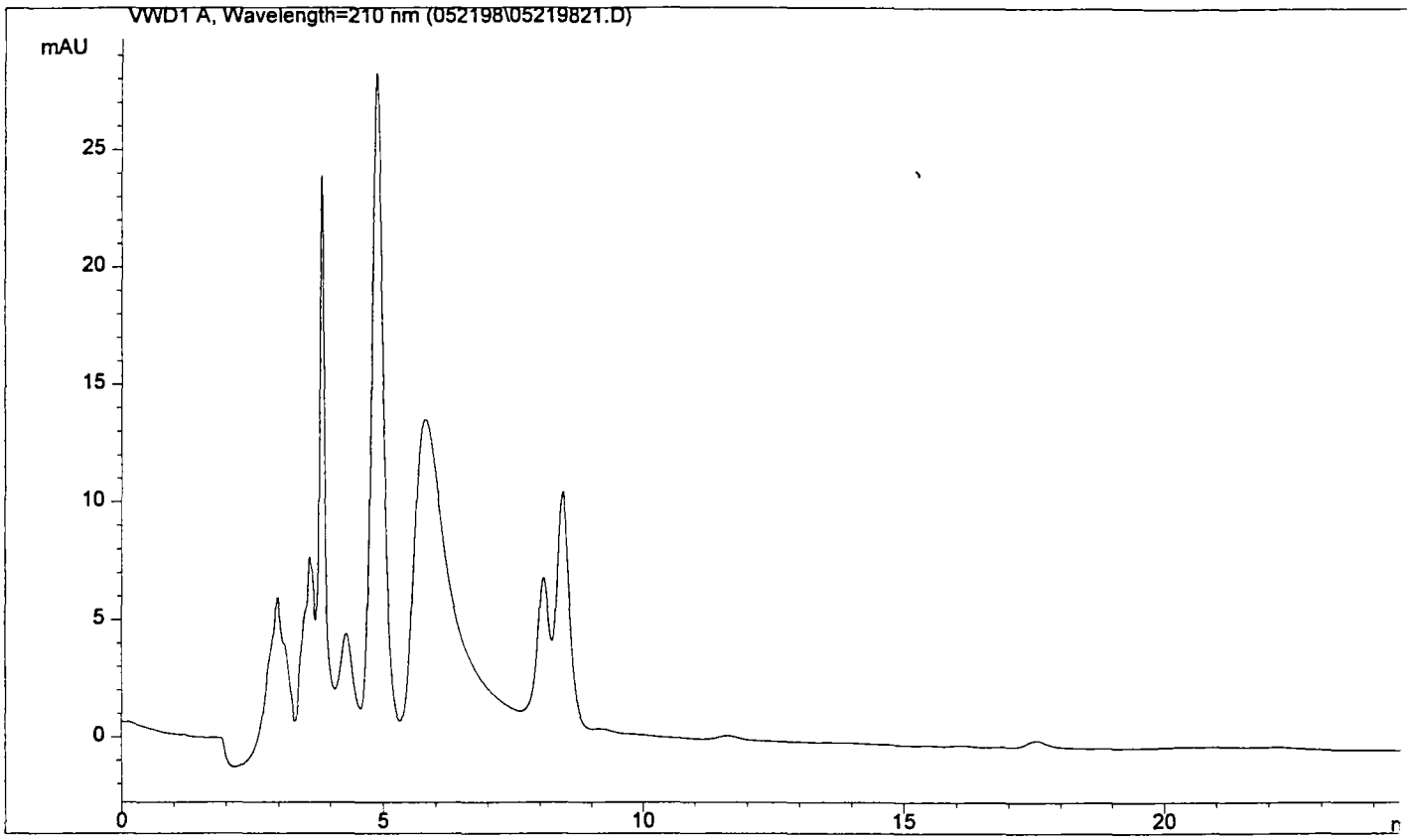
FORM I

Sample Name : 33971.08
Acq Operator : SS

Vial No. : 21
Inj. No. : 1
Inj. Vol. : 200 µl

Acq. Method : 052198.M
Analysis Method : C:\HPCHEM\1\METHODS\052198.M
Last Changed : Sat, 6. Jun. 1998, 05:35:59 pm

PETN SOIL



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Customized Report: extstd.frp

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Sorted By Signal
Calib. Data Modified : Sat, 6. Jun. 1998, 05:30:47 pm
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

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*** End of Report ***

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1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-574FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33971

Matrix: (soil/water) SOIL Lab Sample ID: 33971.14

Sample Amt: 2g % Moisture 16.58 Date Received: 05/15/98

Extraction Volume: 10ml Date Extracted: 05/16/98

Extraction Method: SONC Date Analyzed: 06/06/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	RPD of FD
2691-41-0	HMX	1890	J	7.1
121-82-4	RDX	18900		94.2
99-35-4	TNB	250	U	0
99-65-0	DNB	250	U	0
479-45-8	TETRYL	650	U	0
98-95-3	NB	260	U	0
118-96-7	TNT	1390		26.9
1946-51-0	4ADNT	250	U	0
35572-78-2	2ADNT	250	U	0
606-20-2	26DNT	260	U	0
121-14-2	24DNT	250	U	0
88-72-2	2NT	250	U	0
99-99-0	4NT	250	U	0
99-08-1	3NT	250	U	0

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

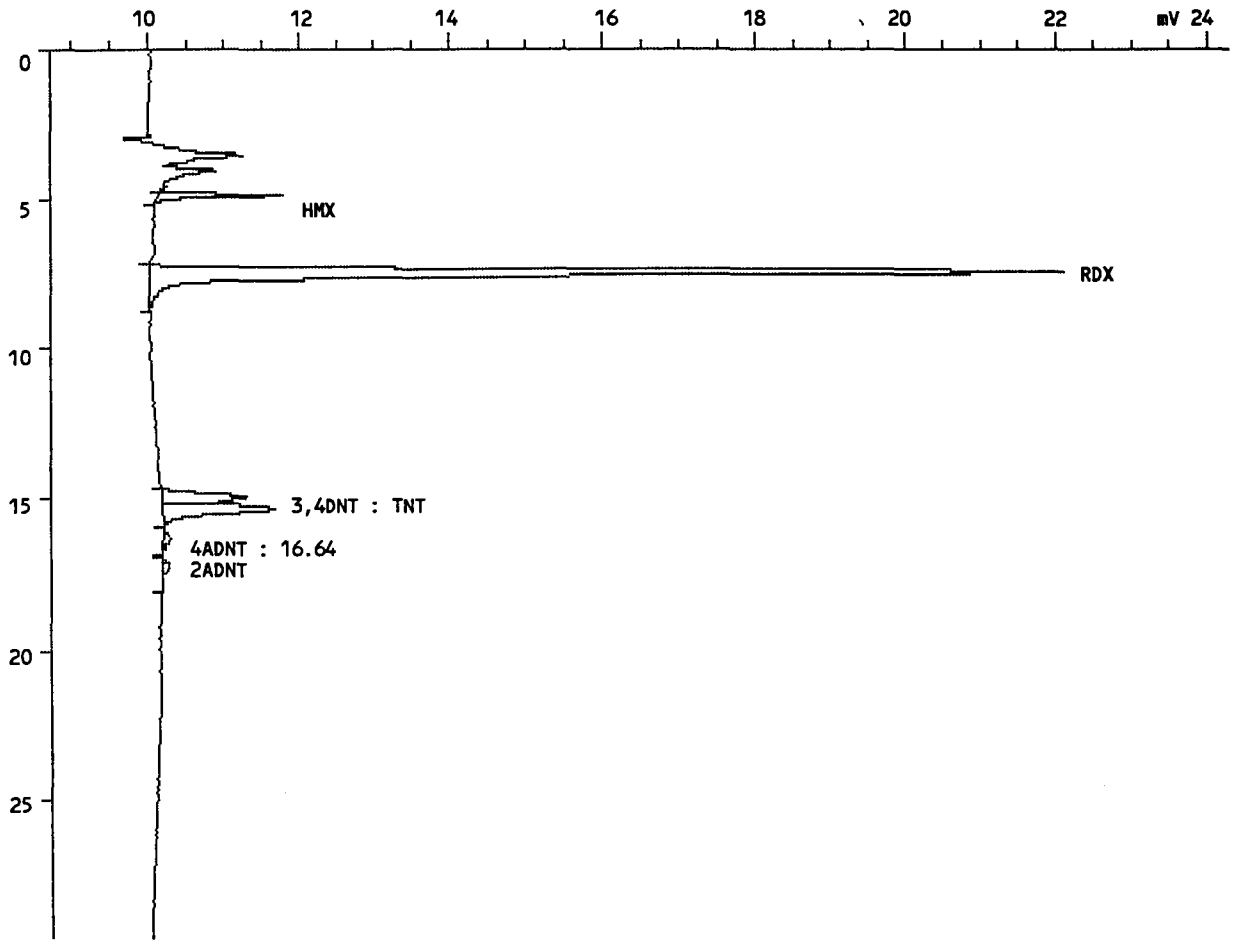
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0605B,16,1

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-08, INJ:200,COL#1

Acquired on 06-Jun-98 at 21:12:57
Reported on 08-Jun-98 at 12:32:07



INJECTION REPORT

Injection F: <MC3> 5 5EX0605B,16,1

Acquired on 06-Jun-98 at 21:12:57
Modified on 08-Jun-82 at 12:05:06
Reported on 08-Jun-98 at 12:05:04

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-08,INJ:200,COL#1
Number of samples.: 18
Calibration file..: 5EX0605 Last modified on 08-Jun-82 at 12:01:06
Method file.....: EXPLOS Last modified on 08-Jun-82 at 12:04:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

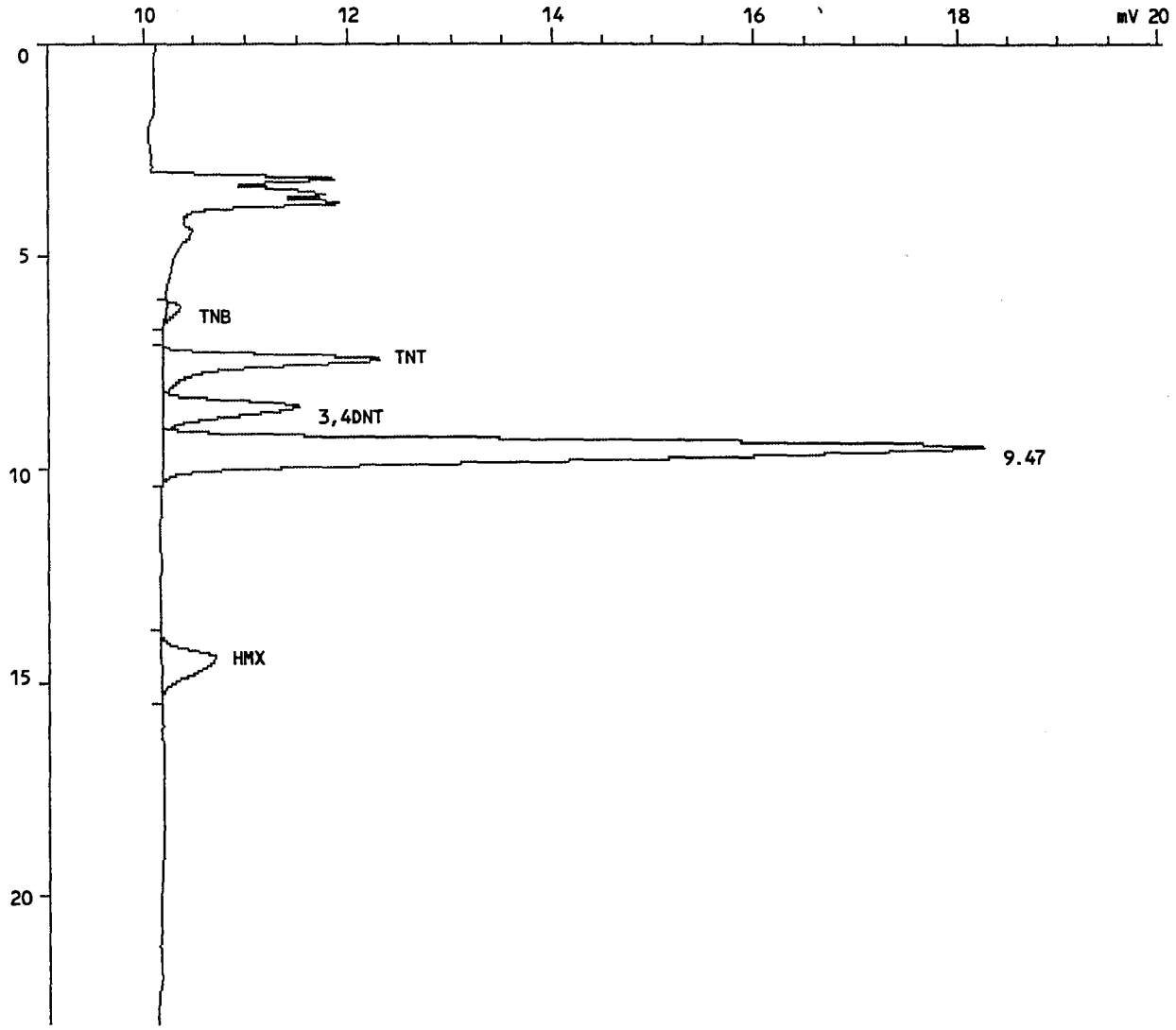
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.907	1662	13860	1888.317	HMX *J
2	7.456	12070	181276	18882.887	RDX *
3	14.987	1103	20129	1829.917	3,4DNT 92
4	15.397	1477	32433	1386.043	TNT *
5	16.363	108	2250	165.925	4ADNT
7	17.312	92	2233	121.104	2ADNT
Total		16512	252182	24274.191	
Residual		41	251	18.514	

LONG PLOT

Injection F: <MC3> 3 3CN0523A,7,1

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100,UV

Acquired on 24-May-98 at 09:23:40
Reported on 04-Jun-98 at 14:41:28



INJECTION REPORT

Injection F: <MC3> 3 3CN0523A,7,1

Acquired on 24-May-98 at 09:23:40
Modified on 04-Jun-82 at 14:27:44
Reported on 04-Jun-98 at 14:27:44

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09,INJ:100, UV
Number of samples.: 31
Calibration file..: 3CN0523A Last modified on 04-Jun-82 at 14:23:36
Method file.....: LCCN Last modified on 04-Jun-82 at 13:16:44
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

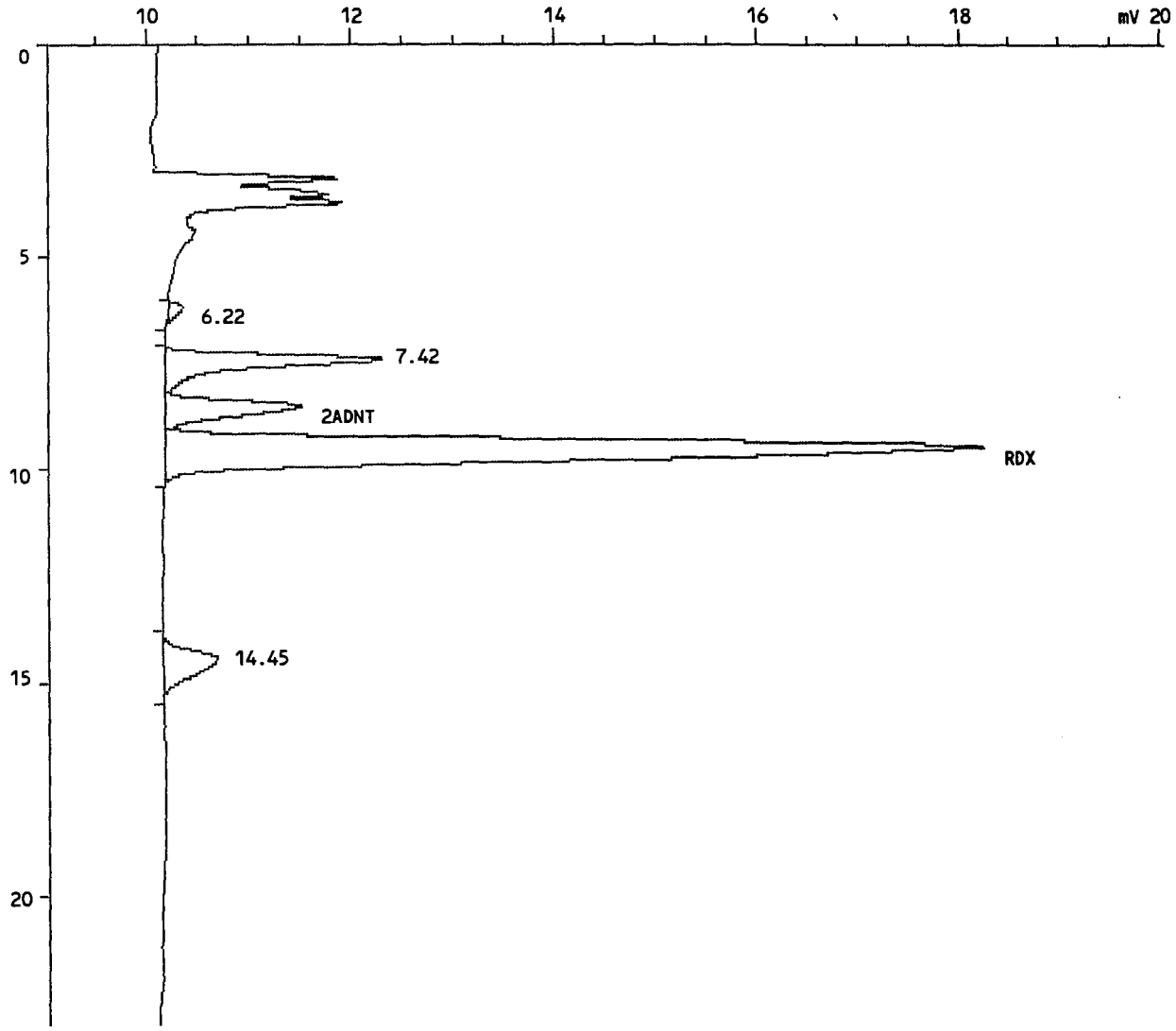
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	6.224	159	3032	120.160	TNB
2	7.419	2127	45095	1717.902	TNT
3	8.539	1341	33318	2285.151	3,4DNT
5	14.453	542	21312	2089.417	HMX
Total		4169	102756	6212.631	
Residual		8061	245945	0.000	

LONG PLOT

Injection F: <MC3> 3 3CN0523A,7,1

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09, INJ:100,UV

Acquired on 24-May-98 at 09:23:40
Reported on 04-Jun-98 at 15:13:44



INJECTION REPORT

Injection F: <MC3> 3 3CN0523A,7,1

Acquired on 24-May-98 at 09:23:40
Modified on 04-Jun-82 at 14:48:48
Reported on 04-Jun-98 at 14:48:48

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: LC-CN, ID: LC-CN-09,INJ:100, UV
Number of samples.: 31
Calibration file..: 3CN0523B Last modified on 04-Jun-82 at 14:45:44
Method file.....: LCCN Last modified on 04-Jun-82 at 14:45:54
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-574FD
Sample ID.....: 33971.14
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
3	8.539	1341	33318	1227.164	2ADNT
4	9.467	8061	245945	16573.102	RDX
Total		9402	279262	17800.266	
Residual		2828	69439	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-574FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33971

Matrix: (soil/water) SOIL Lab Sample ID: 33971.14

Sample Amt: 2g % Moisture 16.58 Date Received: 05/15/98

Extraction Volume: 10ml Date Extracted: 05/16/98

Extraction Method: SONC Date Analyzed: 05/22/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

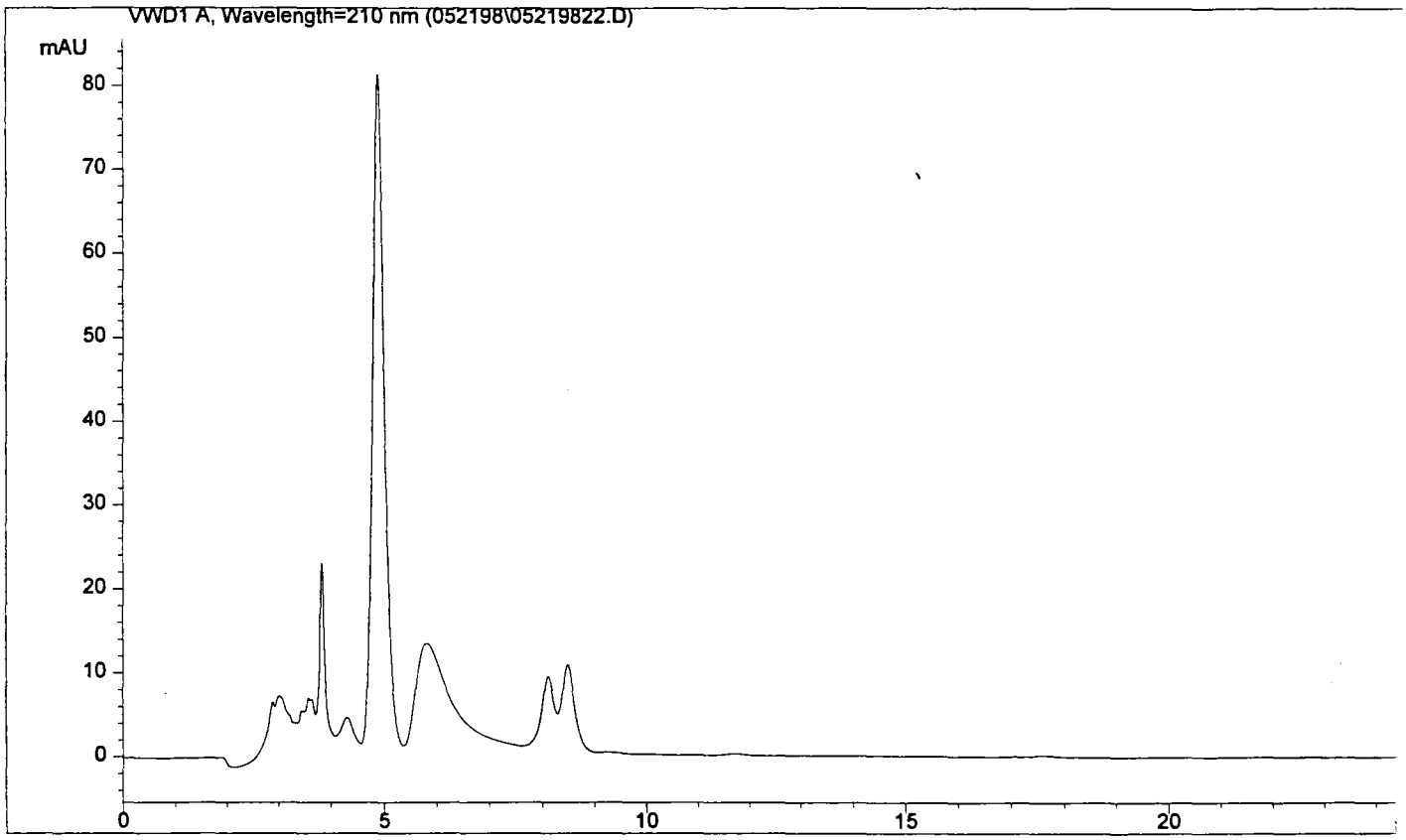
FORM I

Sample Name : 33971.14
Acq Operator : SS

Vial No. : 22
Inj. No. : 1
Inj. Vol. : 200 µl

Acq. Method : 052198.M
Analysis Method : C:\HPCHEM\1\METHODS\052198.M
Last Changed : Sat, 6. Jun. 1998, 05:35:59 pm

PETN SOIL



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Customized Report: extstd.frp

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Sorted By Signal
Calib. Data Modified : Sat, 6. Jun. 1998, 05:30:47 pm
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

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*** End of Report ***

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ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33971
Instrument ID: IN13 Column ID: CARB-08

Dates of Anlayses: 06/05/98 to 06/06/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
INST. BLK.	INST.BLK.	06/05/98	18:12
EXP L1 SOIL STD	2-296:IA1	06/05/98	20:26
EXP L2 SOIL STD	2-295:IA2	06/05/98	21:11
EXP L3 SOIL STD	2-294:IA3	06/05/98	21:56
EXP L4 SOIL STD	2-293:IA4	06/05/98	22:40
EXP L5 SOIL STD	2-292:IA5	06/05/98	23:25
EXP L3 SOIL STD	2-294:CA1	06/06/98	07:37
BL0516SC	BL0516SC	06/06/98	09:06
LC0516SC	LC0516SC	06/06/98	11:26
LD0516SC	LD0516SC	06/06/98	12:10
EXP L3 SOIL STD	2-294:CA2	06/06/98	12:55
MFA-ICS-565	33971.01	06/06/98	14:24
MFA-ICS-567	33971.03	06/06/98	15:09
MFA-ICS-568	33971.04	06/06/98	15:54
MFA-ICS-568 50X	33971.04DL	06/06/98	16:38
MFA-ICS-568 MS	33971.05MS	06/06/98	17:23
MFA-ICS-568 MS 50X	33971.05MSDL	06/06/98	18:08
MFA-ICS-568 MSD	33971.06MSD	06/06/98	18:53
MFA-ICS-568 MSD 50X	33971.06MDDL	06/06/98	19:37

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33971
Instrument ID: IN13 Column ID: CARB-08

Dates of Anlayses: 06/05/98 to 06/06/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
MFA-ICS-570	33971.08	06/06/98	20:28
MFA-ICS-574FD	33971.14	06/06/98	21:12
EXP L3 STD	2-294:CA3	06/06/98	22:42

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33971
Instrument ID: LC4 Column ID:

Dates of Anlayses: 05/21/98 to 05/22/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
instrument blank	instrument bla	05/21/98	20:50
L1 2-214:IA1	L1 2-214:IA1	05/21/98	22:14
L2 2-213:IA2	L2 2-213:IA2	05/21/98	22:42
L3 2-224:IA3	L3 2-224:IA3	05/21/98	23:10
L4 2-211:IA4	L4 2-211:IA4	05/21/98	23:39
L5 2-185:IA5	L5 2-185:IA5	05/22/98	00:07
ICV 2-223:CA1	ICV 2-223:CA1	05/22/98	00:35
BL0516SD	BL0516SD	05/22/98	01:03
LC0516SD	LC0516SD	05/22/98	01:59
LD0516SD	LD0516SD	05/22/98	02:27
MFA-ICS-565	33971.01	05/22/98	02:56
MFA-ICS-567	33971.03	05/22/98	03:24
MFA-ICS-568	33971.04	05/22/98	03:52
MFA-ICS-568	33971.05MS	05/22/98	04:20
MFA-ICS-568	33971.06MSD	05/22/98	04:48
L3 2-224:CA2	L3 2-224:CA2	05/22/98	05:16
MFA-ICS-570	33971.08	05/22/98	06:13
MFA-ICS-574FD	33971.14	05/22/98	06:41
L3 2-224:CA3	L3 2-224:CA3	05/22/98	09:30

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33971
Instrument ID: IN10 Column ID: LC-CN-09

Dates of Anlayses: 05/23/98 to 05/25/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
INST. BLK.	INST. BLK.	05/23/98	19:20
EXP L1A STD	2-231:IA1	05/23/98	21:34
EXP L2A STD	2-230:IA2	05/23/98	22:18
EXP L3A STD	2-229:IA3	05/23/98	23:02
EXP L4A STD	2-228:IA4	05/23/98	23:47
EXP L5A STD	2-227:IA5	05/24/98	00:31
EXP L1B STD	1-236:IB1	05/24/98	01:15
EXP L2B STD	2-235:IB2	05/24/98	02:00
EXP L3B STD	2-234:IB3	05/24/98	02:44
EXP L4B STD	2-233:IB4	05/24/98	03:28
EXP L5B STD	2-232:IB5	05/24/98	04:13
BL0516SC	BL0516SC	05/24/98	04:57
MFA-ICS-565	33971.01	05/24/98	06:26
MFA-ICS-567	33971.03	05/24/98	07:10
MFA-ICS-568	33971.04	05/24/98	07:54
MFA-ICS-570	33971.08	05/24/98	08:39
MFA-ICS-574FD	33971.14	05/24/98	09:23
EXP L3A STD	2-229:CA1	05/24/98	11:36
EXP L3B STD	2-234:CB1	05/24/98	12:21

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 33971
Instrument ID: IN10 Column ID: LC-CN-09

Dates of Anlayses: 05/23/98 to 05/25/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L3A STD	2-229:CA3	05/25/98	02:24
EXP L3B STD	2-234:CB3	05/25/98	03:08
MFA-ICS-568 50X	33971.04DL	05/25/98	06:50
EXP L3A STD	2-229:CA4	05/25/98	07:34
EXP L3B STD	2-234:CB4	05/25/98	08:19

FORM VIII

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-08

Inj 1

Injection File Name Level 1 : 5EX0605,4
Injection File Name Level 2 : 5EX0605,5
Injection File Name Level 3 : 5EX0605,6
Injection File Name Level 4 : 5EX0605,7
Injection File Name Level 5 : 5EX0605,8

Calibration Date : 06/05/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTO Level 5
HMX	3700	365	89797	354	243808	369	360861	365	506592	38
RDX	2057	487	50198	475	131179	475	193824	470	270410	49
TNB	2742	908	72890	964	197250	1001	293748	992	409346	103
DNB	1968	1215	55458	1366	148832	1409	219646	1387	306965	144
TETRYL	2239	602	64967	699	154294	638	256963	706	346867	73
NB	2592	785	74251	901	196573	919	292141	907	394051	91
3,4-DNT	2614	515	68198	538	187996	570	272586	550	381609	57
TNT	2706	1002	79824	1181	212496	1207	317829	1204	442547	125
4ADNT	1316	558	40494	684	110370	717	161020	694	226447	73
2ADNT	1947	825	54469	920	145369	944	215977	931	304244	98
26DNT	2549	657	65723	676	175923	693	261260	688	369194	73
24DNT	2585	1095	67593	1142	182906	1188	269838	1163	385375	125
2NT	1678	496	45111	533	117180	533	177593	538	245673	55
[illegible]	1385	410	39413	466	103837	472	156437	474	219751	49
[illegible]	1788	555	51500	641	137683	656	207780	662	286504	68

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-08

Inj 1

Injection File Name Level 1 : 5EX0605,4
Injection File Name Level 2 : 5EX0605,5
Injection File Name Level 3 : 5EX0605,6
Injection File Name Level 4 : 5EX0605,7
Injection File Name Level 5 : 5EX0605,8

Calibration Date : 06/05/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	367	2.98	0.99930	376	0.000
RDX	480	1.88	0.99949	483	0.000
TNB	981	4.97	0.99944	1019	0.000
DNB	1365	6.54	0.99954	1423	0.000
TETRYL	672	7.42	0.99841	703	0.000
NB	886	6.38	0.99997	914	0.000
3,4-DNT	550	4.62	0.99934	568	0.000
TNT	1170	8.37	0.99949	1233	0.000
[illegible]NT	678	10.32	0.99919	720	0.000
[illegible]DNT	922	6.49	0.99910	964	0.000
26DNT	689	3.88	0.99905	711	0.000
24DNT	1168	4.94	0.99865	1215	0.000
2NT	532	4.20	0.99955	548	0.000
4NT	464	7.12	0.99920	488	0.000
3NT	640	7.80	0.99959	674	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 06/05/1998
Continuing Calibration #: 1
Continuing Cal Date : 06/06/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-08
Injection File Name : 5EX0605A,11
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	238720	362	367	1.50	376	3.70
RDX	128594	466	480	2.94	483	3.51
TNB	191398	972	981	0.96	1019	4.63
DNB	144343	1367	1365	0.14	1423	3.95
TETRYL	139890	578	672	14.00	703	17.81
NB	194555	909	886	2.64	914	0.49
3,4-DNT	184934	560	550	1.90	568	1.31
TNT	209175	1188	1170	1.55	1233	3.63
4ADNT	109853	713	678	5.29	720	0.87
2ADNT	142122	923	922	0.14	964	4.26
26DNT	174143	686	689	0.43	711	3.61
24DNT	179051	1163	1168	0.44	1215	4.30
2NT	118673	539	532	1.44	548	1.65
4NT	104697	476	464	2.51	488	2.42
3NT	135330	644	640	0.74	674	4.32

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 06/05/1998
Continuing Calibration #: 2
Continuing Cal Date : 06/06/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-08
Injection File Name : 5EX0605B,5
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	239401	363	367	1.22	376	3.43
RDX	127718	463	480	3.60	483	4.17
TNB	191797	974	981	0.75	1019	4.43
DNB	146307	1385	1365	1.50	1423	2.65
TETRYL	147589	610	672	9.26	703	13.29
NB	195840	915	886	3.32	914	0.17
3,4-DNT	183502	556	550	1.11	568	2.07
TNT	210576	1196	1170	2.23	1233	2.99
4ADNT	109180	709	678	4.64	720	1.48
2ADNT	142658	926	922	0.52	964	3.90
26DNT	174088	685	689	0.46	711	3.64
24DNT	179271	1164	1168	0.32	1215	4.18
2NT	118762	540	532	1.52	548	1.57
4NT	105203	478	464	3.01	488	1.95
[illegible]NT	136734	651	640	1.78	674	3.33

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 06/05/1998
Continuing Calibration #: 3
Continuing Cal Date : 06/06/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-08
Injection File Name : 5EX0605B,18
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	268355	407	367	10.72	376	8.25
RDX	143761	521	480	8.51	483	7.87
TNB	212653	1079	981	10.04	1019	5.96
DNB	163140	1545	1365	13.18	1423	8.56
TETRYL	151090	624	672	7.11	703	11.23
NB	212445	993	886	12.08	914	8.66
3,4-DNT	207577	629	550	14.37	568	10.78
TNT	234663	1333	1170	13.93	1233	8.11
4ADNT	125821	817	678	20.59	720	13.54
2ADNT	163210	1060	922	15.00	964	9.95
26DNT	194975	768	689	11.48	711	7.92
24DNT	201441	1308	1168	12.01	1215	7.66
2NT	125841	572	532	7.57	548	4.29
4NT	111198	505	464	8.88	488	3.64
1NT	144497	688	640	7.56	674	2.16

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	10.140	254.000	660.000	990.000	1320.000
RDX	4.220	105.600	276.000	412.000	550.000
TNB	3.020	75.600	197.000	296.000	394.000
DNB	1.620	40.600	105.600	158.400	212.000
TETRYL	3.720	93.000	242.000	364.000	484.000
NB	3.300	82.400	214.000	322.000	430.000
3,4-DNT	5.080	126.800	330.000	496.000	660.000
TNT	2.700	67.600	176.000	264.000	352.000
4ADNT	2.360	59.200	154.000	232.000	308.000
2ADNT	2.360	59.200	154.000	232.000	308.000
26DNT	3.880	97.200	254.000	380.000	506.000
24DNT	2.360	59.200	154.000	232.000	308.000
2NT	3.380	84.600	220.000	330.000	440.000
4NT	3.380	84.600	220.000	330.000	440.000
3NT	3.220	80.400	210.000	314.000	418.000

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN13
Column ID : CARB-08
Calibration Date : 06/05/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.90	4.91	4.90	4.89	4.88
RDX	7.46	7.46	7.45	7.42	7.42
TNB	9.91	9.93	9.90	9.86	9.87
DNB	12.16	12.18	12.16	12.09	12.12
TETRYL	12.96	12.98	12.94	12.85	12.91
NB	13.77	13.78	13.76	13.68	13.72
3,4-DNT	15.07	15.07	15.04	14.92	15.00
TNT	15.44	15.47	15.44	15.33	15.41
4ADNT	16.43	16.44	16.41	16.28	16.37
2ADNT	17.36	17.39	17.36	17.22	17.33
26DNT	18.11	18.10	18.06	17.93	18.03
24DNT	18.80	18.80	18.76	18.62	18.73
2NT	21.83	21.89	21.84	21.65	21.78
4NT	23.42	23.43	23.36	23.15	23.29
3NT	25.13	25.21	25.13	24.90	25.05

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3
HMX	4.91	4.89	4.92
RDX	7.46	7.42	7.49
TNB	9.91	9.88	9.95
DNB	12.17	12.13	12.21
TETRYL	12.97	12.92	13.01
NB	13.76	13.72	13.82
3,4-DNT	15.04	14.99	15.10
TNT	15.45	15.40	15.49
4ADNT	16.43	16.37	16.48
2ADNT	17.38	17.31	17.43
26DNT	18.06	18.01	18.13
24DNT	18.75	18.70	18.83
2NT	21.79	21.73	21.91
4NT	23.31	23.25	23.45
3NT	25.09	25.00	25.23

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.90	0.014	0.043	4.86 - 4.94
RDX	7.45	0.026	0.078	7.37 - 7.52
TNB	9.90	0.030	0.091	9.81 - 9.99
DNB	12.15	0.037	0.112	12.04 - 12.26
TETRYL	12.94	0.048	0.145	12.80 - 13.09
NB	13.75	0.044	0.131	13.62 - 13.88
3,4-DNT	15.03	0.058	0.173	14.85 - 15.20
TNT	15.43	0.049	0.148	15.28 - 15.58

4ADNT	16.40	0.061	0.183	16.22 - 16.58
2ADNT	17.35	0.062	0.187	17.16 - 17.53
26DNT	18.05	0.066	0.199	17.85 - 18.25
24DNT	18.75	0.067	0.200	18.55 - 18.95
2NT	21.80	0.085	0.255	21.55 - 22.06
4NT	23.33	0.101	0.304	23.03 - 23.64
T	25.09	0.111	0.332	24.76 - 25.42

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: LC4
Column ID :

Inj 1

Injection File Name Level 1 : 052198,4
Injection File Name Level 2 : 052198,5
Injection File Name Level 3 : 052198,6
Injection File Name Level 4 : 052198,7
Injection File Name Level 5 : 052198,8

Calibration Date : 05/21/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	RESP. FACT Level 1	Area Level 2	RESP. FACT Level 2	Area Level 3	RESP. FACT Level 3	Area Level 4	RESP. FACT Level 4	Area Level 5	RESP. FACT Level 5
PETN	6.40853	3.12E0	54.8288	2.92E0	110.463	2.90E0	446.909	2.86E0	878.416	2.91E0

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: LC4
Column ID :

Inj 1

Injection File Name Level 1 : 052198,4
Injection File Name Level 2 : 052198,5
Injection File Name Level 3 : 052198,6
Injection File Name Level 4 : 052198,7
Injection File Name Level 5 : 052198,8

Calibration Date : 05/21/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Resp Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
PETN	2.942873393	3.46	0.99996	2.90E0	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/21/98
Continuing Calibration #: 1
Continuing Cal Date : 05/22/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 052198,9
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	101.582	3.15E0	2.94E0	7.04	2.90E0	8.47

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/21/98
Continuing Calibration #: 2
Continuing Cal Date : 05/22/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 052198,19
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	108.98	2.94E0	2.94E0	0.22	2.90E0	1.11

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/21/98
Continuing Calibration #: 3
Continuing Cal Date : 05/22/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 052198,28
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	111.567	2.87E0	2.94E0	2.54	2.90E0	1.24

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200ul

Amount Units = ug/L

COMPONENT NAME	SPIKE AMT Level 1	SPIKE AMT Level 2	SPIKE AMT Level 3	SPIKE AMT Level 4	SPIKE AMT Level 5
PETN	20	160	320	1280	2560

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : LC4
Column ID :
Calibration Date : 05/21/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
PETN	10.67	10.66	10.72	10.71	10.69

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3
PETN	10.78	10.72	10.75

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
PETN	10.71	0.038	0.113	10.60 - 10.83

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 3CN0523,4
Injection File Name Level 2 : 3CN0523,5
Injection File Name Level 3 : 3CN0523,6
Injection File Name Level 4 : 3CN0523,7
Injection File Name Level 5 : 3CN0523,8

Calibration Date : 05/23/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
TNB	12102	2631	57881	2517	143472	2495	284570	2475	574221	2497
26DNT	9745	1949	45223	1809	112852	1806	225599	1805	454776	1819
TNT	12712	2763	58866	2559	147924	2573	299235	2602	604259	2627
3,4DNT	10658	1523	47638	1361	119186	1445	243222	1474	490633	1487
TETRYL	13450	1494	64447	1432	157849	1403	306097	1360	628457	1397
HMX	7305	1044	35002	1000	88878	1016	178277	1019	357530	1022

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 3CN0523,9
Injection File Name Level 2 : 3CN0523,10
Injection File Name Level 3 : 3CN0523,11
Injection File Name Level 4 : 3CN0523,12
Injection File Name Level 5 : 3CN0523,13

Calibration Date : 05/23/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
NB	9750	1950	52638	2106	130256	2084	269502	2156	553370	2213
DNB	14454	3614	74492	3725	188012	3760	384273	3843	801207	4006
24DNT	17073	3415	83775	3351	209272	3348	424821	3399	884243	3537
4ADNT	15711	1708	79303	1724	197928	1721	396844	1725	820580	1784
2ADNT	27063	2706	136420	2728	333111	2665	667500	2670	1403484	2807
RDX	8940	1788	38193	1528	88242	1412	164755	1318	343291	1373

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 3CN0523,4
Injection File Name Level 2 : 3CN0523,5
Injection File Name Level 3 : 3CN0523,6
Injection File Name Level 4 : 3CN0523,7
Injection File Name Level 5 : 3CN0523,8

Calibration Date : 05/23/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
TNB	2523	2.47	0.99999	2493	0.000
26DNT	1837	3.41	0.99999	1816	0.000
TNT	2625	3.12	0.99998	2619	0.000
3,4DNT	1458	4.18	0.99995	1481	0.000
TETRYL	1417	3.53	0.99988	1391	0.000
HMX	1020	1.53	1.00000	1021	0.000

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : LC-CN-09

Inj 1

Injection File Name Level 1 : 3CN0523,9
Injection File Name Level 2 : 3CN0523,10
Injection File Name Level 3 : 3CN0523,11
Injection File Name Level 4 : 3CN0523,12
Injection File Name Level 5 : 3CN0523,13

Calibration Date : 05/23/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
NB	2102	4.68	0.99987	2196	0.000
DNB	3789	3.86	0.99976	3963	0.000
24DNT	3410	2.25	0.99977	3502	0.000
4ADNT	1732	1.71	0.99985	1770	0.000
2ADNT	2715	2.12	0.99966	2775	0.000
RDX	1484	12.58	0.99960	1366	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 1
Continuing Cal Date : 05/24/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523A,10
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	145078	2523	2523	0.01	2493	1.22
26DNT	114461	1831	1837	0.33	1816	0.86
TNT	151045	2627	2625	0.07	2619	0.28
3,4DNT	122708	1487	1458	2.03	1481	0.40
TETRYL	139282	1238	1417	12.65	1391	10.96
HMX	91441	1045	1020	2.46	1021	2.40

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 1
Continuing Cal Date : 05/24/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523A,11
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	132263	2116	2102	0.68	2196	3.64
DNB	191710	3834	3789	1.18	3963	3.25
24DNT	212689	3403	3410	0.20	3502	2.82
4ADNT	201876	1755	1732	1.33	1770	0.81
2ADNT	334898	2679	2715	1.33	2775	3.45
RDX	86566	1385	1484	6.65	1366	1.36

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 3
Continuing Cal Date : 05/25/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523A,30
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	149087	2593	2523	2.78	2493	4.02
26DNT	120586	1929	1837	5.00	1816	6.26
TNT	159347	2771	2625	5.57	2619	5.79
3,4DNT	129258	1567	1458	7.47	1481	5.76
TETRYL	119869	1066	1417	24.82	1391	23.37
HMX	92657	1059	1020	3.83	1021	3.76

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 3
Continuing Cal Date : 05/25/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523A,31
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	131572	2105	2102	0.16	2196	4.14
DNB	194259	3885	3789	2.53	3963	1.96
24DNT	215138	3442	3410	0.95	3502	1.70
4ADNT	201317	1751	1732	1.05	1770	1.08
2ADNT	340119	2721	2715	0.21	2775	1.95
RDX	84894	1358	1484	8.46	1366	0.60

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 4
Continuing Cal Date : 05/25/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523B,6
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
TNB	149021	2592	2523	2.73	2493	3.97
26DNT	116960	1871	1837	1.84	1816	3.06
TNT	154534	2688	2625	2.38	2619	2.60
3,4DNT	124328	1507	1458	3.37	1481	1.72
TETRYL	138016	1227	1417	13.44	1391	11.77
HMX	94416	1079	1020	5.80	1021	5.73

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 05/23/1998
Continuing Calibration #: 4
Continuing Cal Date : 05/25/1998
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : LC-CN-09
Injection File Name : 3CN0523B,7
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
NB	131715	2107	2102	0.27	2196	4.04
DNB	195097	3902	3789	2.97	3963	1.54
24DNT	215094	3442	3410	0.93	3502	1.72
4ADNT	198932	1730	1732	0.15	1770	2.25
2ADNT	340676	2725	2715	0.37	2775	1.79
RDX	86081	1377	1484	7.18	1366	0.79

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
TNB	4.600	23.000	57.500	115.000	230.000
26DNT	5.000	25.000	62.500	125.000	250.000
TNT	4.600	23.000	57.500	115.000	230.000
3,4DNT	7.000	35.000	82.500	165.000	330.000
TETRYL	9.000	45.000	112.500	225.000	450.000
HMX	7.000	35.000	87.500	175.000	350.000

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
NB	5.000	25.000	62.500	125.000	250.000
DNB	4.000	20.000	50.000	100.000	200.000
24DNT	5.000	25.000	62.500	125.000	250.000
4ADNT	9.200	46.000	115.000	230.000	460.000
2ADNT	10.000	50.000	125.000	250.000	500.000
RDX	5.000	25.000	62.500	125.000	250.000

A-STD

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : LC-CN-09
Calibration Date : 05/23/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
TNB	6.19	6.20	6.19	6.18	6.16
26DNT	6.76	6.77	6.75	6.76	6.73
TNT	7.41	7.42	7.41	7.41	7.39
3,4DNT	8.53	8.53	8.52	8.53	8.50
TETRYL	11.96	11.97	11.96	11.97	11.94
HMX	14.53	14.56	14.54	14.56	14.54

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4
TNB	6.19	6.18	6.18	6.17
26DNT	6.77	6.76	6.78	6.77
TNT	7.41	7.40	7.42	7.40
3,4DNT	8.52	8.50	8.53	8.50
TETRYL	11.91	11.87	11.93	11.86
HMX	14.38	14.32	14.37	14.22

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
TNB	6.18	0.011	0.032	6.15 - 6.21
26DNT	6.76	0.014	0.041	6.72 - 6.80
TNT	7.41	0.010	0.031	7.38 - 7.44
3,4DNT	8.52	0.017	0.051	8.47 - 8.57
TETRYL	11.93	0.043	0.129	11.80 - 12.06
HMX	14.45	0.126	0.377	14.07 - 14.82

B STD

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : LC-CN-09
Calibration Date : 05/23/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
NB	5.39	5.39	5.40	5.41	5.38
DNB	6.05	6.03	6.04	6.05	6.02
24DNT	7.07	7.07	7.08	7.09	7.06
4ADNT	7.86	7.84	7.86	7.87	7.83
2ADNT	8.47	8.47	8.48	8.49	8.45
RDX	9.49	9.50	9.52	9.52	9.48

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4
NB	5.38	5.39	5.42	5.42
DNB	6.02	6.02	6.05	6.05
24DNT	7.06	7.05	7.09	7.10
4ADNT	7.83	7.82	7.87	7.89
2ADNT	8.44	8.42	8.46	8.49
RDX	9.44	9.40	9.44	9.44

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
NB	5.40	0.016	0.047	5.35 - 5.44
DNB	6.04	0.014	0.043	5.99 - 6.08
24DNT	7.07	0.018	0.053	7.02 - 7.13
4ADNT	7.85	0.024	0.072	7.78 - 7.93
2ADNT	8.46	0.025	0.075	8.39 - 8.54
RDX	9.47	0.042	0.126	9.34 - 9.59

	SV	OD ST • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980516SC

EXTRACT DATE: 1998-05-16 12:28

001127
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0516SC			S/L				2.0							10.0	N		1000		
BB0516SC			S/L				2.0							10.0	N		1000		
LC0516SC			S/L				2.0							10.0	N	500	1000		
LD0516SC			S/L				2.0							10.0	N	500	1000		
33971.01 GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-565	S/L		20.11	1.6	2.0							10.0	N		1000		
33971.03 GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-567	S/L		19.71	1.6	2.0							10.0	N		1000		
33971.04 GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L		18.89	1.6	2.0							10.0	N		1000		
33971.05MS GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L				2.0							10.0	N	500	1000		
33971.06MSD GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L				2.0							10.0	N	500	1000		
33971.08 GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-570	S/L		15.80	1.7	2.0							10.0	N		1000		
33971.14 GC200	MKF-OH	05/15/1998 10:46 MFA-ICS-574FD	S/L		16.58	1.7	2.0							10.0	N		1000		

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INITIALS

WEIGHING:	MK	EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	PV	VERIFIER:	MK		
MATRIX SPIKER:	PV	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 2-204

MATRIX SPIKE SOLID/CONC #(s): 2-243

SOP - METHOD # : SWL-OP-_____ Rev. _____

COMMENTS

CH_3CN BR361

	SV	ST • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980516SD

EXTRACT DATE: 1998-05-16 12:42

001128
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0516SD			S/L				2.0							10.0	N				
BB0516SD			S/L				2.0							10.0	N				
LC0516SD			S/L				2.0							10.0	N	120			
LD0516SD			S/L				2.0							10.0	N	120			
33971.01 GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-565	S/L		20.11	1.6	2.0							10.0	N				
33971.03 GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-567	S/L		19.71	1.6	2.0							10.0	N				
33971.04 GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L		18.89	1.6	2.0							10.0	N				
33971.05MS GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L				2.0							10.0	N	120			
33971.06MSD GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-568	S/L				2.0							10.0	N	120			
33971.08 GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-570	S/L		15.80	1.7	2.0							10.0	N				
33971.14 GC201	MKF-OH	05/15/1998 10:46 MFA-ICS-574FD	S/L		16.58	1.7	2.0							10.0	N				

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INITIALS

WEIGHING:	MK	EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:		VERIFIER:			
MATRIX SPIKER:	PV	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #:

MATRIX SPIKE SOLID/CONC #(s): 2-244

SOP - METHOD # : SWL-OP-_____

COMMENTS

CH_3CN BR36

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

MFA-003

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 4321-0009-07-35

Project Name: NSWC Crane

Samplers: (Signature)

Sampler: (Print) Peter J Chevalier

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	6330 Explosives	6010 7471 Metals	8260 VOC	RCRA Metals	Remarks
Soil	Grid 176 grab 12"	4/24/98	1000	MFA-ICS 550		✓			✓		Mine Fill A Pre-Excavation
	Grid 180 grab 12"		1015	MFA-ICS 553		✓			✓		
	Grid 178 comp 0-12"		0930	MFA-ICS 555		✓	✓	✓			
	Grid 178 grab 12"		0938	MFA-ICS 556		✓			✓		
	Grid 178 grab 30"		1000	MFA-ICS 557		✓			✓		
	Grid 178 comp 0-12"		0930	MFA-ICS 555-FD		✓	✓	✓			
	Grid 179 comp 0-12"		1020	MFA-ICS 558		✓	✓	✓			
	Grid 179 grab 12"		1033	MFA-ICS 559		✓			✓		
	Grid 179 comp 24-36"		1045	MFA-ICS 560		✓	✓	✓			
liquid	rinse blank		0830	MFA-ICS RB042498		✓	✓			✓	
liquid	trip blank		1530	MFA-ICS TB042498		✓			✓		
											Southwest Labs

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
[signature]	4/24/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company: C. Miller	Date/Time 4-25-98 8:30	Total No. Samples This Shipping Container: / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 Rev. 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): KIM WILLISON / SARAH HODSON

RECEIVED BY (SIGNATURE): C. Miller

LOGGED IN BY (SIGNATURE):

REC'D DATE: 4-25-98

TIME REC'D: 8:30

LOG-IN DATE: 4-25-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC CRANE	33748	33748

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.:
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   - SEALED IN PLASTIC? YES / NO
   - TAPED TO LID? YES / NO
   - PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL STICKER PRESENT / ABSENT
5. AIRBILL NO: 8008118246 18
6. COOLER CONDITIONS
   - ENOUGH ICE? YES / NO
   - TYPE OF ICE? WET
   - TYPE OF PACKING? Bubble
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   - BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   - CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   - CORRECT PRESERVATIVE ? YES / NO
   - SUFFICIENT SAMPLE ? YES / NO
   - LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO
   - VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
MFA-ICS-550	V	01	MKF-014 4-25-98-1			10°C Bi.
553	↓	02				
555	B M	03				
556	V	04				
557	V	05				
555FD	B M	06				
558	↓	07				
559	V	08				
560	B M	09				
MFA-ICSRB042498	↓	10				
TB042498	V	11				

* Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

SDG NARRATIVE

May 23, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 33748
EPISODE(S) : 33748
FRACTION : EXPLOSIVES
SAMPLE(S) : MFA-ICS-555, MFA-ICS-555FD, MFA-ICS-558, MFA-ICS-560, MFA-ICS-RB042498

This SDG consisted of 4 soil and 1 water samples for explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-

CASE SUMMARY:

Soil:

All of the analytes were within QC limits in the laboratory control spike (LCS) an he laboratory control spike duplicate (LCSD).

WATER:

An interfering peak eluted in the L1 and L2 standards at the approximate retention time as RDX. The interfering peak was not eluted in the other low level standard injected prior to this standard. Possibly due to autosampler vial contamination, the interfering peak was detected in these standards. Since correlation coefficient was greater than 0.99 for the analyte, slope was utilized to calculate the concentration for RDX. RDX was not detected in the sample.

ICV slightly exceeded 15% deviation when compared to the initial calibration standard. Since PETN was not detected in the associated sample, the sample was not re-analyzed.

The surrogate (3,4DNT) exceeded the QC limits in the samples MFA-ICS-RB042498MS and MFA-ICS-RB042498MSD and LC0425WC.

Tetryl was out of the QC limits in the samples MFA-ICS-RB042498MS and MFA-ICS-RB042498MSD. The analyte was within the QC limits in the LCS an LCSD.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

To analyze PETN, LC ChemStation software was utilized. Unlike the VG software, the Response Factor in the ChemStation is calculated by dividing the concentration by the area.

Multiplier = amount extracted/ final volume

The following is an example of the calculation for the LC0425WC:

Mean response factor * area of the sample * dilution * Multiplier = the concentration

3.22 * 205.52 * 1 * 2 = 1323 ug/L

Form 9s were included for the %RSD and correlation coefficient calculation of the calibration standard. However, the samples were calculated based on the mean response factor generated by the software which due to a number of decimal places, the mean response factor generated by the software might not be exactly the same as the form 9s.

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2

We use the following flags where appropriate. "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment which is explained in the case narrative.

Shahriar Shahreza

-C Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

T- Code: SWOK Case No: MKF-OH SDG No:33748

	SAMPLE NUMBER	S1 #	OTHER
1	MFA-ICS-555	97.0	0
2	MFA-ICS-555-FD	105	0
3	MFA-ICS-558	105	0
4	MFA-ICS-560	100	0
5	MFA-ICS-RB042498	112	0
6	MFA-ICS-RB042498 MS	152*	0
7	MFA-ICS-RB042498 MSD	145*	0
8	BL0425SC	107	0
9	BL0425WC	108	0
10	LC0425SC	140	0
11	LC0425WC	144*	0
12	LD0425SC	86.2	0
13	LD0425WC	127	0
14			
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23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

FORM II

WATER EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: MFA-ICS-RB042498 MSD

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
HMX	400		369	92	44-154
RDX	150		155	103	66-139
TNB	225		202	90	56-129
DNB	125		112	90	76-122
TETRYL	413		178	43*	76-120
NB	213		228	107	82-111
TNT	188		239	127	76-137
4ADNT	313		297	95	60-140
2ADNT	313		285	91	60-140
26DNT	288		273	95	80-118
24DNT	175		154	88	72-123
2NT	363		318	88	74-130
4NT	250		218	87	78-116
3NT	238		275	116	72-126

No of Analyte recoveries out of QC Advisory Limits = 1

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	400	369	92	0	15	44-154
RDX	150	160	107	4	12	66-139
TNB	225	204	91	1	10	56-129
DNB	125	112	90	0	15	76-122
TETRYL	413	217	53*	20*	14	76-120
NB	213	211	99	8	13	82-111
TNT	188	239	127	0	15	76-137
4ADNT	313	291	93	2	40	60-140
2ADNT	313	284	91	0	40	60-140
26DNT	288	274	95	0	13	80-118
24DNT	175	153	87	1	14	72-123
2NT	363	333	92	5	15	74-130
4NT	250	213	85	2	14	78-116
3NT	238	275	116	0	15	72-126

No of Analyte recoveries out of QC Advisory Limits = 1
No of RPD's out of QC Limits 1

WATER EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: MFA-ICS-RB042498

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
PETN	1200		1240	103	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
PETN	1200	1310	109	6	30	70-130

No of Analyte recoveries out of QC Advisory Limits = 0
No of RPD's out of QC Limits 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LC0425WC

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
HMX	400		380	95	46-151
RDX	150		168	112	72-129
TNB	225		211	94	74-118
DNB	125		120	96	79-132
TETRYL	413		284	69	58-120
NB	213		226	106	68-135
TNT	188		248	132	61-145
4ADNT	313		306	98	60-140
2ADNT	313		299	96	60-140
26DNT	288		284	99	77-125
24DNT	175		160	91	70-134
2NT	363		342	94	73-131
4NT	250		222	89	73-116
3NT	238		286	120	71- 127

# of Analyte recoveries out of QC Advisory Limits = 0

3G

WATER EXPLOSIVES CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LC0427WB

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
PETN	1200		1320	110	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LD0425WC

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
HMX	400		361	90	46-151
RDX	150		157	105	72-129
TNB	225		198	88	74-118
DNB	125		112	90	79-132
TETRYL	413		300	73	58-120
NB	213		199	93	68-135
TNT	188		236	126	61-145
4ADNT	313		276	88	60-140
2ADNT	313		280	89	60-140
26DNT	288		255	89	77-125
24DNT	175		156	89	70-134
2NT	363		328	90	73-131
4NT	250		211	84	73-116
3NT	238		274	115	71- 127

# of Analyte recoveries out of QC Advisory Limits = 0

WATER EXPLOSIVES CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Client Sample No: LD0427WD

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
PETN	1200		1270	106	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0425WC

Lab Code: SWOK Case No: MKF-OH SDG No:33748

Matrix: (soil/water) Water

Date Extracted: Extn. Method: DIRECT

Date Analyzed (1): 04/26/98 Date Analyzed(2):

Time Analyzed (1): 01:39:41 Time Analyzed(2):

Instrument ID (1): IN13 Instrument ID(2):

LC Column ID (1): CARB-07 LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0425WC	LC0425WC	04/26/98	
2	LD0425WC	LD0425WC	04/26/98	
3	MFA-ICS-RB042498	33748.10	04/26/98	
4	MFA-ICS-RB042498 MS	33748.10MS	04/26/98	
	MFA-ICS-RB042498 MSD	33748.10MSD	04/26/98	
7				
8				
9				
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23				
24				
25				

FORM IV

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0427WB

Code: SWOK Case No: MKF-OH SDG No:33748

Matrix: (soil/water) Water

Date Extracted: Extn. Method: DIRECT

Date Analyzed (1): 04/29/98 Date Analyzed(2):

Time Analyzed (1): 23:33:05 Time Analyzed(2):

Instrument ID (1): LC4 Instrument ID(2):

LC Column ID (1): LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0427WB	LC0427WB	04/30/98	
2	LD0427WD	LD0427WD	04/30/98	
3	MFA-ICS-RB042498	33748.10	04/30/98	
4	MFA-ICS-RB042498	33748.10MS	04/30/98	
	MFA-ICS-RB042498	33748.10MSD	04/30/98	
7				
8				
9				
10				
11				
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24				
25				

FORM IV

1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-RB04249
8

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) WATER Lab Sample ID: 33748.10

Sample Amt: 1ml % Moisture Date Received: 04/25/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 04/26/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	8.00	U
99-08-1	3NT	7.90	U

SURROGATE AMOUNT SPIKED (ug/L) 200
3,4-DNT

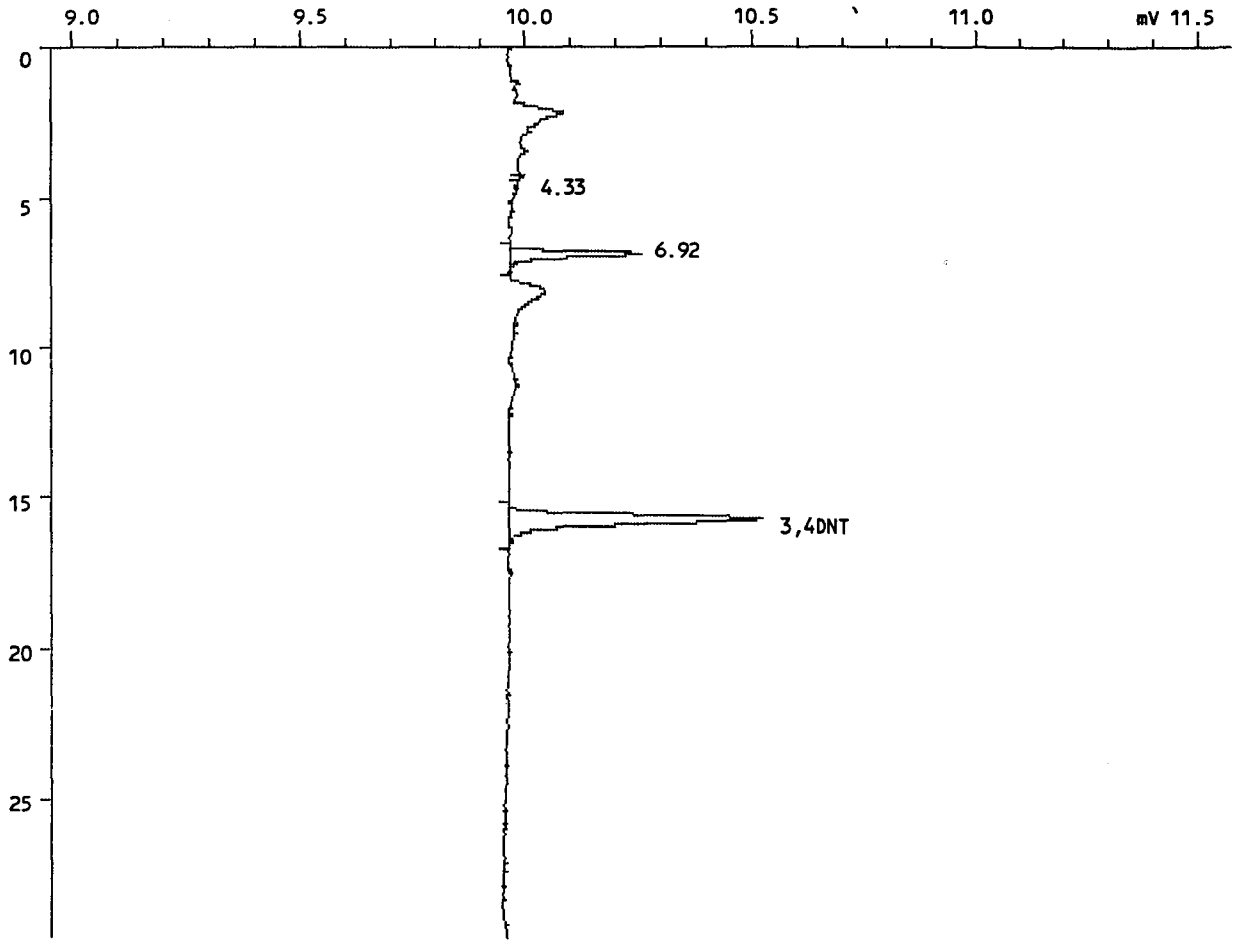
FORM I

LONG PLOT

Injection F: <MC3> 5 5E0425W,13,1

Sample name.....: MFA-ICS-RB042498
Sample ID.....: 33748.10
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-07, INJ:200,COL#1

Acquired on 26-Apr-98 at 04:38:30
Reported on 13-May-98 at 09:54:32



INJECTION REPORT

Injection F: <MC3> 5 5E0425W,13,1

Acquired on 26-Apr-98 at 04:38:30
Modified on 13-May-82 at 09:54:06
Reported on 13-May-98 at 09:54:12

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-07,INJ:200,COL#1
Number of samples.: 18
Calibration file..: 5E0425W Last modified on 13-May-82 at 09:54:06
Method file.....: EXPLOS Last modified on 12-May-82 at 16:57:52
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: MFA-ICS-RB042498
Sample ID.....: 33748.10
Sample type.....: Sample
Sample amount.....: 1.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 1.000
Dilution.....: 2.000
Amount (g or mL).....: 1.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/L	Peak name
3	15.771	556	12003	225.192	3,4DNT 112%
Total		556	12003	225.192	
Residual		302	4291	-6.705	

1D

EXPLOSIVES ANALYSIS DATA SHEET

EPA SAMPLE NO:

MFA-ICS-RB04249
8

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 33748

Matrix: (soil/water) WATER Lab Sample ID: 33748.10

Sample Amt: 1ml % Moisture Date Received: 04/25/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 04/30/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-11-5	PETN----------	20.0	U

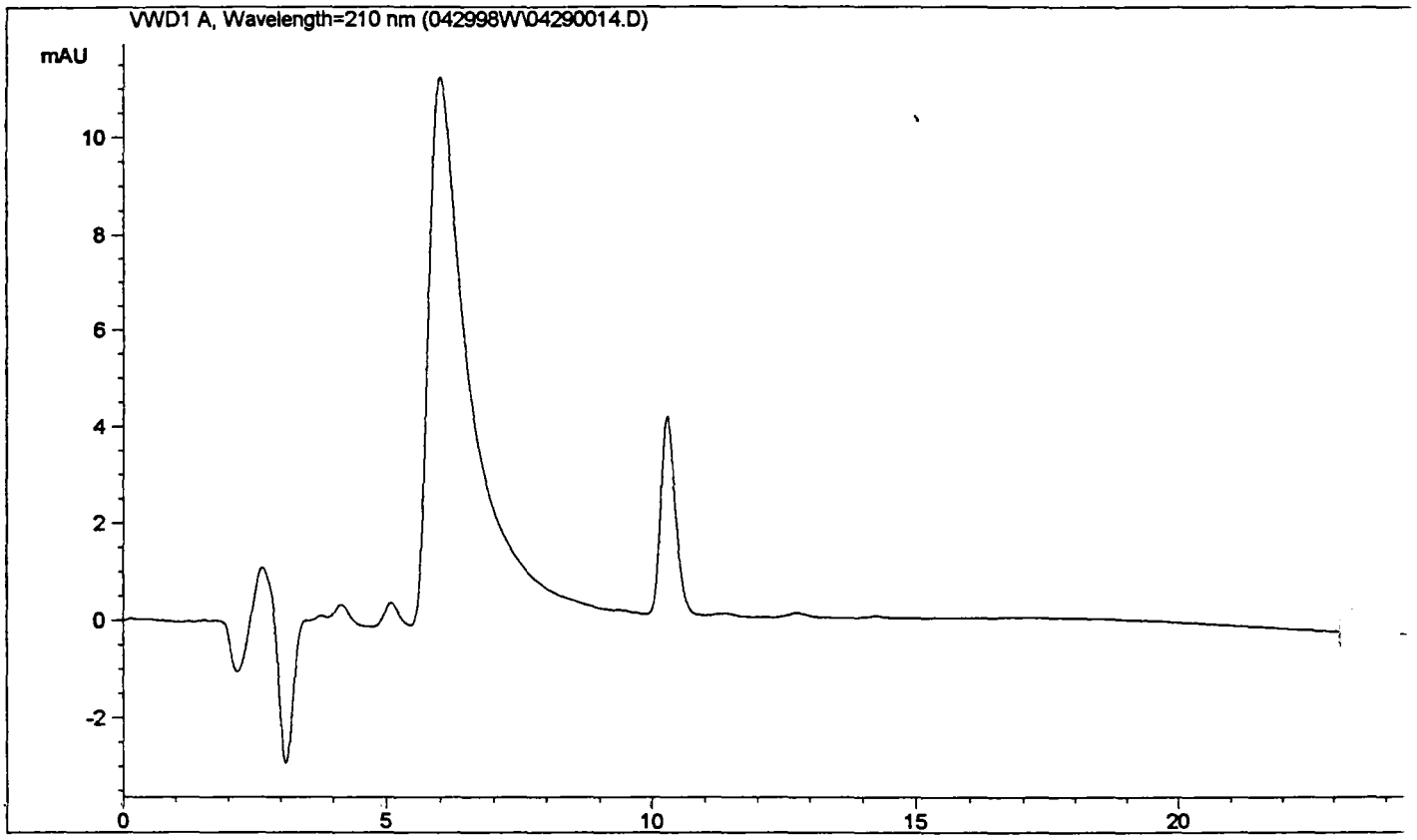
FORM I

Injection Date : Thu, 30. Apr. 1998
Sample Name : 33748.10
Acq Operator : SS

Seq Line : 14
Vial No. : 64
Inj. No. : 1
Inj. Vol. : 200 µl

Acq. Method : 042998W.M
Analysis Method : C:\HPCHEM\1\METHODS\042998W.M
Last Changed : Thu, 30. Apr. 1998, 01:28:48 pm

PETN



==========

Customized Report: extstd.frp

==========

Sorted By Signal
Calib. Data Modified : Thu, 30. Apr. 1998,01:28:49 pm
Multiplier : 2.000000
Dilution : 1.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/L]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

==========

*** End of Report ***

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

MFA-009

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 4329-0009-07-35

Project Name: NSWC Crane Biofacility

Samplers: (Signature)

Sampler: (Print) Ryan Erwin

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Samples Yes	Split Samples No	8330 Explos.	6010/7470 Jet	8260	Remarks
Soil	Grid 192 0-12" Comp	5/28/98	950	MFA ICS 582		✓	✓	✓		
	Grid 192 0-12" Comp		950	MFA ICS 582FD		✓	✓	✓		
	Grid 192 12" Grab		930	MFA ICS 583		✓			✓	
	Grid 192 24-36" Comp		1010	MFA ICS 584		✓	✓	✓		
	Grid 191 0-12" Comp		1040	MFA ICS 585		✓	✓	✓		
	Grid 191 12" Grab		1056	MFA ICS 586		✓			✓	
	Grid 191 24-36" Comp		1100	MFA ICS 587		✓	✓	✓		
	Grid 186 0-12" Comp		1325	MFA ICS 588		✓	✓	✓		
	Grid 186 12" Grab		1332	MFA ICS 589		✓			✓	
	Grid 186 24-36" Comp		1345	MFA ICS 590		✓	✓	✓		
	Grid 187 0-12" Comp		1415	MFA ICS 591		✓	✓	✓		MS/MSD
	Grid 187 12" Grab		1405	MFA ICS 592		✓			✓	
	Grid 187 24-36" Comp		1445	MFA ICS 593		✓	✓	✓		
	Grid 187 24-36" Comp		1445	MFA ICS 593FD		✓	✓	✓		
liquid	Rinse Blank		1500	MFA RC528		✓	✓	✓		
	Trip Blank		1510	MFA T 0528		✓			✓	
										South West Labs

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Ryan Erwin	5/28/98 1600				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company: S. Hodson	Date/Time 5/29/98 9:30	Total No. Samples This Shipping Container: / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 Rev 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH. SRVS.

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): Sarah Hodson/ Charlene Miller

RECEIVED BY (SIGNATURE): S. Hodson

LOGGED IN BY (SIGNATURE): C. Miller

REC'D DATE: 5-29-98

TIME REC'D: 9:30

LOG-IN DATE: 5-29-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC CRANE	34162	34162

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEALS NOS.: 2343; 2344
3. CHAIN - OF- CUSTODY, PRESENT / ABSENT
   SEALED IN PLASTIC? YES / NO
   TAPED TO LID? YES / NO
   PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: 8008118248 13
6. COOLER CONDITIONS
   ENOUGH ICE? YES / NO
   TYPE OF ICE? WET
   TYPE OF PACKING? Bubble
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   CORRECT CONTAINERS USED FOR FOR TESTS INDICATED ? YES / NO
   CORRECT PRESERVATIVE ? YES / NO
   SUFFICIENT SAMPLE ? YES / NO
   LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE ? YES / NO — CM 5/29
   VOA SAMPLES WITHOUT BUBBLES ? YES / NO~
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED ? YES* / NO

CLIENT SAMPLE #	SAMPLE FRACTION@	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #:	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
MFA-TCS-582	B,M	01	MKF-OH 5-29-98-1			3.7°C B.
582FD	B,M	02				
583	V	03				
584	B,M	04				
585	B,M	05				
586	V	06				
587	B,M	07				
588	B,M	08				
589	V	09				Voa not labeled
590	B,M	10				
591		11				
591MS		12				
591MSD	V	13				
592	V	14				
593	B,M	15				
593FD	B,M	16				
MFAR0528	B,M	17				
MFAT0528	V	18				

* Contact PO and attach record of resolution

@ Sample Fractions: B= SV GC/MS, V= VOA GC/MS or GC , P=Pesticide,H=Herbicide, D= Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: MKF-OH **DATE: 06/11/98**
CASE: 34162 **SOW NO.: SW846**
SDG: 34162 **EPISODE NO.: 34162**

INORGANIC METAL FRACTION:

Ten soil samples plus one MS/MSD were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. The samples' analyses were completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A & 3050A
SWL-IN-209	SW846 6010A
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Al, Cd, Pb, Ag, As, Se. No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following element: Al. No action required.

Preparation Blanks: The following element showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Pb. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): The following elements were outside the control limits of 75-125% recovery: MFA-ICS-591S/Cr, Pb, Se; MFA-ICS-591M/Ba, Cr, Pb. All associated samples were flagged with a "N" on Form I's. No action required.

Duplicates (LCSD and MSD): The following elements were outside the control limits of 0-20% RPD: LCSSD/no problems; MFA-ICS-591M/Cr, Pb. All associated samples were flagged with a "*" on Form I's. No action required.

Serial Dilution (ICP): MFA-ICS-591L/no problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman for...
Jason D. Ruckman
Inorganic Program Manager

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

INORGANICS CLP QUALIFIER FLAGS

B	The reported values was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL), if the analyte was analyzed for but not detected. a "U" must be entered.
E	The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the Cover Page (if the problem applies to all samples) or on the specific FORM I - IN (if it is an isolated problem).
M	Duplicate injection precision not met.
N	Spike sample recovery not within control limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance. (See Exhibit E.)
*	Duplicate analysis not within control limits.
+	Correlation coefficient for the MSA is less than 0.995.

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

002

Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.:34162A

SOW No.: SW846__

Client Sample ID	Lab Sample ID
MFAICS582	34162.01
MFAICS582FD	34162.02
MFAICS584	34162.04
MFAICS585	34162.05
MFAICS587	34162.07
MFAICS588	34162.08
MFAICS590	34162.10
MFAICS591	34162.11
MFAICS593	34162.15
MFAICS593FD	34162.16
MFAICS591S	34162.12S
MFAICS591M	34162.13SD

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
BATCH_#'S: ICP=980601I3
AV=980601HG3

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Deborah J. Inman for... Name: Jason D. Ruckman

Date: June 11, 1998 Title: Inorganic Program Manager

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS582

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.01
Level (low/med): LOW Date Received: 05/29/98
% Solids: 82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15500			P
7440-38-2	Arsenic	8.0			P
7440-39-3	Barium	92.2		N	P
7440-43-9	Cadmium	0.04	U		P
7440-47-3	Chromium	19.5		N*	P
7439-92-1	Lead	29.3		N*	P
7439-97-6	Mercury	0.04	U		AV
7782-49-2	Selenium	0.47	U	N	P
7440-22-4	Silver	0.14	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-582

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS582FD

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.02
Level (low/med): LOW Date Received: 05/29/98
% Solids: 75.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	RPD for FD
7429-90-5	Aluminum	16800			P	8.05
7440-38-2	Arsenic	8.0			P	0
7440-39-3	Barium	100		N	P	8.12
7440-43-9	Cadmium	0.04	U		P	0
7440-47-3	Chromium	19.7		N*	P	1.02
7439-92-1	Lead	18.3		N*	P	46.2
7439-97-6	Mercury	0.04	U		AV	0
7782-49-2	Selenium	0.53	U	N	P	—
7440-22-4	Silver	0.16	U		P	—

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-582FD

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS584

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.04
Level (low/med): LOW Date Received: 05/29/98
% Solids: 78.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16500			P
7440-38-2	Arsenic	8.4			P
7440-39-3	Barium	73.7		N	P
7440-43-9	Cadmium	0.04	U		P
7440-47-3	Chromium	20.2		N*	P
7439-92-1	Lead	14.2		N*	P
7439-97-6	Mercury	0.04	U		AV
7782-49-2	Selenium	0.50	U	N	P
7440-22-4	Silver	0.15	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-584

1
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS585

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix (soil/water): SOIL_ Lab Sample ID: 34162.05
Level (low/med): LOW__ Date Received: 05/29/98
% Solids: _79.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	17800			P
7440-38-2	Arsenic__	6.1			P
7440-39-3	Barium___	65.3		N	P
7440-43-9	Cadmium__	0.04	U		P
7440-47-3	Chromium_	21.3		N*	P
7439-92-1	Lead_____	36.1		N*	P
7439-97-6	Mercury__	0.04	U		AV
7782-49-2	Selenium_	0.49	U	N	P
7440-22-4	Silver___	0.15	U		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID_=_MFA-ICS-585

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS587

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.07
Level (low/med): LOW Date Received: 05/29/98
% Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13200			P
7440-38-2	Arsenic	3.8			P
7440-39-3	Barium	57.3		N	P
7440-43-9	Cadmium	0.04	U		P
7440-47-3	Chromium	14.2		N*	P
7439-92-1	Lead	11.6		N*	P
7439-97-6	Mercury	0.04	U		AV
7782-49-2	Selenium	0.47	U	N	P
7440-22-4	Silver	0.14	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-587

1
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS588

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix (soil/water): SOIL_ Lab Sample ID: 34162.08
Level (low/med): LOW__ Date Received: 05/29/98
% Solids: _84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	11800			P
7440-38-2	Arsenic__	3.2			P
7440-39-3	Barium___	78.5		N	P
7440-43-9	Cadmium__	0.12	B		P
7440-47-3	Chromium_	20.4		N*	P
7439-92-1	Lead____	17.7		N*	P
7439-97-6	Mercury__	0.04	U		AV
7782-49-2	Selenium_	0.47	U	N	P
7440-22-4	Silver___	0.14	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID_=_MFA-ICS-588

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS590

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.10
Level (low/med): LOW Date Received: 05/29/98
% Solids: 76.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11900			P
7440-38-2	Arsenic	6.8			P
7440-39-3	Barium	101		N	P
7440-43-9	Cadmium	0.47			P
7440-47-3	Chromium	21.1		N*	P
7439-92-1	Lead	35.3		N*	P
7439-97-6	Mercury	0.04	U		AV
7782-49-2	Selenium	0.51	U	N	P
7440-22-4	Silver	0.15	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-590

1
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS591

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
Matrix (soil/water): SOIL Lab Sample ID: 34162.11
Level (low/med): LOW Date Received: 05/29/98
% Solids: 76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14900			P
7440-38-2	Arsenic	4.2			P
7440-39-3	Barium	89.5		N	P
7440-43-9	Cadmium	0.04	U		P
7440-47-3	Chromium	26.2		N*	P
7439-92-1	Lead	27.1		N*	P
7439-97-6	Mercury	0.04	U		AV
7782-49-2	Selenium	0.52	U	N	P
7440-22-4	Silver	0.16	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: Artifacts:

Comments:
CLIENT_ID = MFA-ICS-591

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS593

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix (soil/water): SOIL_ Lab Sample ID: 34162.15
Level (low/med): LOW__ Date Received: 05/29/98
% Solids: _81.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	15400			P
7440-38-2	Arsenic__	2.9			P
7440-39-3	Barium___	114		N	P
7440-43-9	Cadmium__	0.04	U		P
7440-47-3	Chromium_	25.7		N*	P
7439-92-1	Lead____	15.9		N*	P
7439-97-6	Mercury__	0.04	U		AV
7782-49-2	Selenium_	0.47	U	N	P
7440-22-4	Silver___	0.14	U		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID_=_MFA-ICS-593

1
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAICS593FD

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix (soil/water): SOIL_ Lab Sample ID: 34162.16
Level (low/med): LOW__ Date Received: 05/29/98
% Solids: _82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	RPD for FD
7429-90-5	Aluminum_	13800			P_	11.6
7440-38-2	Arsenic__	2.3			P_	23.1
7440-39-3	Barium___	117		N	P_	2.6
7440-43-9	Cadmium__	0.04	U		P_	0
7440-47-3	Chromium_	23.7		N*	P_	8.1
7439-92-1	Lead____	14.7		N*	P_	7.8
7439-97-6	Mercury__	0.04	U		AV	0
7782-49-2	Selenium_	0.47	U	N	P_	0
7440-22-4	Silver___	0.14	U		P_	0

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID_=_MFA-ICS-593FD

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	1000.0	1007.74	100.8	5000.0	5082.01	101.6	4933.06	98.7	P
Arsenic	250.0	254.11	101.6	500.0	494.49	98.9	492.72	98.5	P
Barium	1000.0	1006.56	100.7	500.0	492.12	98.4	492.27	98.5	P
Cadmium	125.0	121.64	97.3	500.0	487.38	97.5	482.59	96.5	P
Chromium	100.0	98.58	98.6	500.0	486.99	97.4	484.37	96.9	P
Lead	250.0	244.89	98.0	500.0	496.59	99.3	487.11	97.4	P
Mercury	4.1	3.91	95.4	5.0	5.50	110.0	5.29	105.8	AV
Selenium	250.0	243.30	97.3	500.0	496.60	99.3	486.73	97.3	P
Silver	125.0	124.69	99.8	500.0	486.86	97.4	485.92	97.2	P

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				5000.0	4932.80	98.7	5099.85	102.0	P
Arsenic				500.0	488.32	97.7	500.95	100.2	P
Barium				500.0	492.14	98.4	498.59	99.7	P
Cadmium				500.0	480.38	96.1	494.44	98.9	P
Chromium				500.0	483.26	96.7	494.71	98.9	P
Lead				500.0	488.02	97.6	502.15	100.4	P
Mercury				5.0	5.41	108.2	5.35	107.0	AV
Selenium				500.0	487.55	97.5	503.40	100.7	P
Silver				500.0	486.26	97.3	495.87	99.2	P

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium	100.0	98.31	98.3	500.0	503.01	100.6	505.20	101.0	P
Lead	250.0	241.66	96.7	500.0	503.45	100.7	503.57	100.7	P
Mercury				5.0	5.37	107.4	5.29	105.8	AV
Selenium	250.0	244.17	97.7	500.0	509.61	101.9	503.72	100.7	P
Silver									NR

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium				500.0	506.20	101.2			P
Lead				500.0	504.46	100.9			P
Mercury									NR
Selenium				500.0	510.67	102.1			P
Silver									NR

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

AA CRDL Standard Source: PLASMACHEM__

ICP CRDL Standard Source: IN.VEN._____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum				100.0	168.69	168.7	149.85	149.8
Arsenic				20.0	23.66	118.3	22.48	112.4
Barium				4.0	6.07	151.7	6.10	152.5
Cadmium				6.0	5.89	98.2	5.98	99.7
Chromium				10.0	9.86	98.6	10.30	103.0
Lead				6.0	6.08	101.3	5.81	96.8
Mercury	0.2	0.17	85.0					
Selenium				10.0	8.85	88.5	7.24	72.4
Silver				10.0	12.80	128.0	13.09	130.9

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

AA CRDL Standard Source: PLASMACHEM__

ICP CRDL Standard Source: IN.VEN._____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Arsenic								
Barium								
Cadmium								
Chromium				10.0	11.33	113.3	11.85	118.5
Lead				6.0	6.14	102.3	6.19	103.2
Mercury								
Selenium				10.0	11.44	114.4	11.50	115.0
Silver								

3
BLANKS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	16.0	U	73.5	B	16.0	U	16.0	U	1.60	U	P
Arsenic	1.8	U	1.8	U	1.8	U	2.3	B	0.18	U	P
Barium	1.3	U	1.3	U	1.3	U	1.3	U	0.13	U	P
Cadmium	0.3	U	0.5	B	0.4	B	0.3	U	0.03	U	P
Chromium	0.8	U	0.8	U	0.8	U	0.8	U	0.08	U	P
Lead	1.4	U	1.4	B	1.4	U	1.4	U	0.14	B	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.03	U	AV
Selenium	4.0	U	4.0	U	4.0	U	4.0	U	0.40	U	P
Silver	1.2	U	1.2	U	1.2	B	1.2	U	0.12	U	P

3
BLANKS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			53.7	B							P
Arsenic			1.8	U							P
Barium			1.3	U							P
Cadmium			0.3	U							P
Chromium			0.8	U							P
Lead			1.4	U							P
Mercury			0.2	U	0.2	U	0.2	U			AV
Selenium			4.0	U							P
Silver			1.2	U							P

3
BLANKS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Arsenic											NR
Barium											NR
Cadmium											NR
Chromium	0.8	U	0.8	U	0.8	U	0.8	U			P
Lead	1.4	U	1.4	U	1.4	U	1.4	U			P
Mercury											NR
Selenium	4.4	B	4.0	U	4.1	B	4.0	U			P
Silver											NR

ICP INTERFERENCE CHECK SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ ICS Source: EPA-LV91____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum								
Arsenic								
Barium								
Cadmium								
Chromium	0	500	1	432.8	86.6	0	439.0	87.8
Lead	0	50	2	47.2	94.4	2	45.3	90.6
Mercury								
Selenium	0	50	5	49.2	98.4	4	49.1	98.2
Silver								

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No: _____ SDG No.: 34162A

ICP ID Number: TJA ET2_____ ICS Source: EPA-LV91____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum	500000	500000	465329	465204.3	93.0	463699	466979.8	93.4
Arsenic	0	100	2	91.9	91.9	-3	91.4	91.4
Barium	0	500	5	460.7	92.1	5	459.7	91.9
Cadmium	0	1000	-3	860.8	86.1	-3	851.6	85.2
Chromium	0	500	0	434.8	87.0	1	432.7	86.5
Lead	0	50	1	43.4	86.8	3	41.8	83.6
Mercury								
Selenium	0	50	-7	43.0	86.0	-6	43.0	86.0
Silver	0	200	0	186.0	93.0	0	185.7	92.8

5A
SPIKE SAMPLE RECOVERY

Client SAMPLE ID

MFAICS591M

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix: __SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		16888.2370		14869.5108		249.31	809.7		P
Arsenic	75-125	13.6501		4.2274		9.97	94.5		P
Barium	75-125	411.5637		89.4519		249.31	129.2	N	P
Cadmium	75-125	5.7037		0.0389	U	6.23	91.6		P
Chromium	75-125	57.7686		26.2429		24.93	126.5	N	P
Lead	75-125	60.6654		27.0643		9.97	337.0	N	P
Mercury	75-125	0.2223		0.0416	U	0.21	105.9		AV
Selenium	75-125	7.7579		0.5184	U	9.97	77.8		P
Silver	75-125	6.2273		0.1555	U	6.23	100.0		P

Comments:
CLIENT_ID_=_MFA-ICS-591

5A
SPIKE SAMPLE RECOVERY

Client SAMPLE ID

MFAICS591S

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
Matrix: __SOIL_____ Level (low/med): _LOW____
% Solids for Sample: _76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		14535.2574		14869.5108		249.31	-134.1		P
Arsenic	75-125	13.5997		4.2274		9.97	94.0		P
Barium	75-125	353.6801		89.4519		249.31	106.0		P
Cadmium	75-125	5.4772		0.0389	U	6.23	87.9		P
Chromium	75-125	88.1329		26.2429		24.93	248.3	N	P
Lead	75-125	167.5838		27.0643		9.97	1409.4	N	P
Mercury	75-125	0.2202		0.0416	U	0.21	104.9		AV
Selenium	75-125	7.2182		0.5184	U	9.97	72.4	N	P
Silver	75-125	5.6451		0.1555	U	6.23	90.6		P

Comments:
CLIENT_ID_=_MFA-ICS-591

5B
POST DIGEST SPIKE SAMPLE RECOVERY

Client SAMPLE ID

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____ MFAICS591A

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Matrix: ____SOIL_____ Level (low/med): LOW_____

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
Aluminum									NR
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium		620.65		202.50		400.0	104.5		P
Lead		669.11		208.84		420.0	109.6		P
Mercury									NR
Selenium		17.51		4.00	U	10.0	175.1		P
Silver									NR

Comments:
CLIENT_ID_=_MFA-ICS-591

6
DUPLICATES

CLIENT SAMPLE ID

LCSSD

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Matrix (soil/water): SOIL_ Level (low/med): _LOW__

% Solids for Sample: 100.0 % Solids for Duplicate: _100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		175.0945		183.4358		4.7		P
Arsenic		7.2482		7.5972		4.7		P
Barium		24.1959		25.1647		3.9		P
Cadmium		4.4720		4.6585		4.1		P
Chromium		18.4023		19.2018		4.3		P
Lead		7.3340		7.5904		3.4		P
Mercury	0.0333	0.1667		0.1517		9.4		AV
Selenium		6.6327		6.8411		3.1		P
Silver	1.0000	4.4922		4.7666		5.9		P

6
DUPLICATES

CLIENT SAMPLE ID

MFAICS591M

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Matrix (soil/water): SOIL_ Level (low/med): _LOW__

% Solids for Sample: _76.4 % Solids for Duplicate: __76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		14535.2574		16888.2370		15.0		P
Arsenic		13.5997		13.6501		0.4		P
Barium		353.6801		411.5637		15.1		P
Cadmium		5.4772		5.7037		4.1		P
Chromium		88.1329		57.7686		41.6	*	P
Lead		167.5838		60.6654		93.7	*	P
Mercury		0.2202		0.2223		0.9		AV
Selenium		7.2182		7.7579		7.2		P
Silver	1.2466	5.6451		6.2273		9.8		P

7

LABORATORY CONTROL SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Solid LCS Source: EPA0287_____

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				200.00	175.09		160.00	240.00	87.5
Arsenic				8.00	7.25		6.40	9.60	90.6
Barium				25.00	24.20		20.00	30.00	96.8
Cadmium				5.00	4.47		4.00	6.00	89.4
Chromium				20.00	18.40		16.00	24.00	92.0
Lead				8.00	7.33		6.40	9.60	91.6
Mercury				0.17	0.17		0.13	0.20	100.0
Selenium				8.00	6.63		6.40	9.60	82.9
Silver				5.00	4.49		4.00	6.00	89.8

7

LABORATORY CONTROL SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Solid LCS Source: EPA0287_____

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				200.00	183.44		160.00	240.00	91.7
Arsenic				8.00	7.60		6.40	9.60	95.0
Barium				25.00	25.16		20.00	30.00	100.6
Cadmium				5.00	4.66		4.00	6.00	93.2
Chromium				20.00	19.20		16.00	24.00	96.0
Lead				8.00	7.59		6.40	9.60	94.9
Mercury				0.17	0.15		0.13	0.20	91.0
Selenium				8.00	6.84		6.40	9.60	85.5
Silver				5.00	4.77		4.00	6.00	95.4

8

STANDARD ADDITION RESULTS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.:_____ SDG No.:34162A

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

FORM VIII - IN

9

ICP SERIAL DILUTION

Client SAMPLE ID

MFAICS591L

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

Matrix (soil/water): SOIL_ Level (low/med): LOW__

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	114739.09		121110.81		5.6		P
Arsenic	32.62		33.74	B	3.4		P
Barium	690.25		730.26		5.8		P
Cadmium	0.30	U	1.50	U			P
Chromium	202.50		213.73		5.5		P
Lead	208.84		230.46		10.4		P
Mercury							NR
Selenium	4.00	U	20.00	U			P
Silver	1.20	U	6.00	U			P

10

Instrument Detection Limits (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162A
ICP ID Number: TJA_ET1 Date: 03/20/98
Flame AA ID Number :
Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			150		NR
Arsenic			10		NR
Barium			10		NR
Cadmium			3		NR
Chromium	267.72		5	0.8	P
Lead	220.35		3	1.4	P
Mercury			0.2		NR
Selenium	196.02		5	4.0	P
Silver			10		NR

Comments:

10

Instrument Detection Limits (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A
ICP ID Number: TJA_ET2_____ Date: 03/20/98
Flame AA ID Number : _____
Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22		150	16.0	P
Arsenic	189.04		10	1.8	P
Barium	493.41		10	1.3	P
Cadmium	267.72		3	0.3	P
Chromium	267.72		5	0.8	P
Lead	220.35		3	1.4	P
Mercury			0.2		NR
Selenium	196.03		5	4.0	P
Silver	328.07		10	1.2	P

Comments:

10

Instrument Detection Limits (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK
Lab Code: SWOK Case No.: 34162
ICP ID Number:
Flame AA ID Number : PS200B
Furnace AA ID Number :

Contract: MKF-OH
SAS No.:
SDG No.: 34162A
Date: 12/18/96

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			150		NR
Arsenic			10		NR
Barium			10		NR
Cadmium			3		NR
Chromium			5		NR
Lead			3		NR
Mercury	254.00		0.2	0.2	AV
Selenium			5		NR
Silver			10		NR

Comments:

11A
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ Date: 01/13/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	BI_
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	-0.0000230	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000440	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0001140	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0004460	0.0000000	0.0001000	0.0000000	-0.0011430
Mercury						
Selenium	196.02	0.0000000	0.0000000	-0.0001000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

11B
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ Date: 01/13/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : CO_	CR_	CU_	MN_	MO_
Aluminum_	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic__	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0007340
Barium___	493.41	-0.0007300	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium__	226.50	-0.0001430	0.0000000	0.0000000	0.0000000	0.0000000
Chromium_	267.72	0.0000000	0.0000000	0.0000000	0.0002250	0.0000000
Lead_____	220.35	-0.0016270	0.0000000	0.0000000	0.0000000	-0.0006490
Mercury__						
Selenium_	196.02	0.0000000	0.0000000	0.0000000	0.0004530	0.0000000
Silver___	328.07	0.0000000	0.0005060	0.0003560	0.0000000	-0.0005680

Comments:

11B

ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ Date: 01/13/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : NI_	SB_	SC_	SN_	TI_
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0002660	0.0000000	0.0000000	0.0000000	-0.0004910
Mercury						
Selenium	196.02	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0007790	0.0000000	0.0000000

Comments:

11B
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ Date: 01/13/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : TL_	U__	V__	W__	ZN_
Aluminum_	308.21	0.0000000	0.0000000	0.0221230	0.0000000	0.0000000
Arsenic__	189.04	0.0000000	0.0000000	0.0000000	-0.0017530	0.0000000
Barium___	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium__	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium_	267.72	0.0000000	0.0004820	0.0000000	0.0005590	0.0000000
Lead_____	220.35	0.0000000	0.0006940	-0.0005550	-0.0007320	0.0000000
Mercury__						
Selenium_	196.02	0.0000000	0.0000000	0.0000000	0.0091790	0.0000000
Silver___	328.07	0.0000000	0.0025270	-0.0000960	0.0000000	0.0000000

Comments:

11A
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	BA_
Aluminum_	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic__	189.04	0.0000000	0.0000000	-0.0000310	0.0000000	0.0000000
Barium___	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium__	267.72	0.0000000	0.0000000	0.0000770	0.0000000	0.0000000
Chromium_	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead_____	220.35	0.0006490	0.0000000	0.0000530	0.0000000	0.0000000
Mercury__						
Selenium_	196.03	0.0000000	0.0000000	-0.0000310	0.0000000	0.0000000
Silver___	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

11B
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : CO_	CR_	CU_	MN_	NI_
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	267.72	-0.0000800	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0003370	0.0000000
Lead	220.35	-0.0006220	0.0000000	0.0000000	0.0000000	0.0002760
Mercury						
Selenium	196.03	0.0004010	0.0000000	0.0000000	0.0008230	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

11B
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : SC_	SN_	TI_	TL_	V__
Aluminum_	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0159360
Arsenic__	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium___	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium__	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium_	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead_____	220.35	0.0000000	0.0000000	0.0000000	0.0000000	-0.0002030
Mercury__						
Selenium_	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0002840
Silver___	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

12

ICP Linear Ranges (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET1_____ Date: 04/10/98

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Aluminum	15.00	600000.0	P
Arsenic	15.00	30000.0	P
Barium	15.00	20000.0	P
Cadmium	15.00	30000.0	P
Chromium	15.00	60000.0	P
Lead	15.00	60000.0	P
Mercury			NR
Selenium	15.00	30000.0	P
Silver	15.00	30000.0	P

Comments:

12

ICP Linear Ranges (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162A

ICP ID Number: TJA ET2_____ Date: 04/17/98

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Aluminum	15.00	600000.0	P
Arsenic	15.00	30000.0	P
Barium	15.00	40000.0	P
Cadmium	15.00	10000.0	P
Chromium	15.00	10000.0	P
Lead	15.00	60000.0	P
Mercury			NR
Selenium	15.00	60000.0	P
Silver	15.00	60000.0	P

Comments:

13

PREPARATION LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.:_34162 SAS No.: _____ SDG No.:34162A

Method: P_

Client Sample No.	Prep Date	Weight (gram)	Volume (mL)
LCSS	06/01/98	1.00	100
LCSSD	06/01/98	1.00	100
MFAICS582	06/01/98	1.04	100
MFAICS582FD	06/01/98	1.01	100
MFAICS584	06/01/98	1.01	100
MFAICS585	06/01/98	1.04	100
MFAICS587	06/01/98	1.03	100
MFAICS588	06/01/98	1.00	100
MFAICS590	06/01/98	1.02	100
MFAICS591	06/01/98	1.01	100
MFAICS591M	06/01/98	1.05	100
MFAICS591S	06/01/98	1.05	100
MFAICS593	06/01/98	1.03	100
MFAICS593FD	06/01/98	1.03	100
PBS	06/01/98	1.00	100

13
PREPARATION LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.:_34162 SAS No.: _____ SDG No.:34162A

Method: AV

Client Sample No.	Prep Date	Weight (gram)	Volume (mL)
LCSS	06/01/98	0.60	100
LCSSD	06/01/98	0.60	100
MFAICS582	06/01/98	0.64	100
MFAICS582FD	06/01/98	0.64	100
MFAICS584	06/01/98	0.62	100
MFAICS585	06/01/98	0.61	100
MFAICS587	06/01/98	0.60	100
MFAICS588	06/01/98	0.60	100
MFAICS590	06/01/98	0.63	100
MFAICS591	06/01/98	0.63	100
MFAICS591M	06/01/98	0.63	100
MFAICS591S	06/01/98	0.63	100
MFAICS593	06/01/98	0.61	100
MFAICS593FD	06/01/98	0.60	100
PBS	06/01/98	0.60	100

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: TJA ET2_____ Method: P_

Start Date: 06/01/98 End Date: 06/02/98

Client Sample No.	D/F	Time	% R	Analytes																						
				AL	AS	BA	CD	CR	PB	HG	SE	AG														
S0	1	2215		X	X	X	X	X	X		X	X														
S	1	2221		X	X	X	X	X	X		X	X														
ICV	1	2227		X	X	X	X	X	X		X	X														
ICB	1	2233		X	X	X	X	X	X		X	X														
CRI	1	2238		X	X	X	X	X	X		X	X														
ICSA	1	2244		X	X	X	X	X	X		X	X														
ICSAB	1	2250		X	X	X	X	X	X		X	X														
CCV	1	2255		X	X	X	X	X	X		X	X														
CCB	1	2301		X	X	X	X	X	X		X	X														
PBS	1	2307		X	X	X	X	X	X		X	X														
LCSS	1	2312		X	X	X	X	X	X		X	X														
LCSSD	1	2318		X	X	X	X	X	X		X	X														
MFAICS582	1	2324		X	X	X	X	X	X		X	X														
MFAICS582FD	1	2330		X	X	X	X	X	X		X	X														
MFAICS584	1	2335		X	X	X	X	X	X		X	X														
MFAICS585	1	2341		X	X	X	X	X	X		X	X														
MFAICS587	1	2347		X	X	X	X	X	X		X	X														
MFAICS588	1	2352		X	X	X	X	X	X		X	X														
ZZZZZZ	1	2358																								
CCV	1	0004		X	X	X	X	X	X		X	X														
CCB	1	0009		X	X	X	X	X	X		X	X														
MFAICS590	1	0015		X	X	X	X	X	X		X	X														
MFAICS591	1	0021		X	X	X	X	X	X		X	X														
MFAICS591S	1	0027		X	X	X	X	X	X		X	X														
MFAICS591M	1	0032		X	X	X	X	X	X		X	X														
MFAICS591L	5	0040		X	X	X	X	X	X		X	X														
MFAICS593	1	0046		X	X	X	X	X	X		X	X														
MFAICS593FD	1	0052		X	X	X	X	X	X		X	X														
ZZZZZZ	1	0057																								
ZZZZZZ	1	0103																								
ZZZZZZ	1	0109																								
CCV	1	0114		X	X	X	X	X	X		X	X														

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: TJA ET2_____ Method: P_

Start Date: 06/01/98 End Date: 06/02/98

Client Sample No.	D/F	Time	% R	Analytes																						
				AL	AS	BA	CD	CR	PB	HG	SE	AG														
CCB	1	0120		X	X	X	X	X	X		X	X														
ZZZZZZ	1	0126																								
ZZZZZZ	1	0132																								
ZZZZZZ	1	0137																								
ZZZZZZ	1	0145																								
CRI	1	0151		X	X	X	X	X	X		X	X														
ICSA	1	0157		X	X	X	X	X	X		X	X														
ICSAB	1	0202		X	X	X	X	X	X		X	X														
CCV	1	0208		X	X	X	X	X	X		X	X														
CCB	1	0214		X	X	X	X	X	X		X	X														

FORM XIV - IN

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: TJA ET1_____ Method: P_

Start Date: 06/08/98 End Date: 06/08/98

Client Sample No.	D/F	Time	% R	Analytes																							
				AL	AS	BA	CD	CR	PB	HG	SE	AG															
S0	1	1708						X	X		X																
S	1	1713						X	X		X																
ICV	1	1719						X	X		X																
ICB	1	1724						X	X		X																
CRI	1	1729						X	X		X																
ICSA	1	1735						X	X		X																
ICSAB	1	1740						X	X		X																
CCV	1	1746						X	X		X																
CCB	1	1751						X	X		X																
MFAICS591A	1	1756						X	X		X																
ZZZZZ	1	1803																									
ZZZZ	1	1808																									
ZZZZZ	1	1814																									
ZZZZZZ	1	1819																									
ZZZZZZ	1	1824																									
ZZZZZZ	1	1830																									
ZZZZZZ	1	1835																									
ZZZZZZ	1	1841																									
ZZZZZZ	1	1846																									
CCV	1	1851						X	X		X																
CCB	1	1857						X	X		X																
ZZZZZZ	1	1902																									
ZZZZZZ	1	1907																									
ZZZZZZ	1	1913																									
CRI	1	1921						X	X		X																
ICSA	1	1926						X	X		X																
ICSAB	1	1932						X	X		X																
CCV	1	1937						X	X		X																
CCB	1	1942						X	X		X																

FORM XIV - IN

14

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: PS200B_____ Method: AV

Start Date: 06/01/98 End Date: 06/01/98

Client Sample No.	D/F	Time	% R	Analytes																							
				AL	AS	BA	CD	CR	PB	HG	SE	AG															
S0	1	1046								X																	
S0.2	1	1048								X																	
S0.5	1	1051								X																	
S1	1	1054								X																	
S5	1	1057								X																	
S10	1	1059								X																	
ICV	1	1103								X																	
ICB	1	1106								X																	
CRA	1	1109								X																	
CCV	1	1111								X																	
CB	1	1114								X																	
ZZZZZ	1	1128																									
ZZZZZ	1	1131																									
ZZZZZ	1	1133																									
ZZZZZ	1	1136																									
ZZZZZ	1	1139																									
ZZZZZ	1	1141																									
ZZZZZ	1	1144																									
ZZZZZ	1	1146																									
ZZZZZ	1	1149																									
ZZZZZ	1	1152																									
CCV	1	1154								X																	
CCB	1	1157								X																	
ZZZZZ	1	1200																									
ZZZZZ	1	1202																									
ZZZZZ	1	1205																									
ZZZZZ	1	1208																									
ZZZZZ	1	1210																									
ZZZZZ	1	1213																									
ZZZZZ	1	1216																									
ZZZZZ	1	1218																									
ZZZZZ	1	1221																									

FORM XIV - IN

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: PS200B_____ Method: AV

Start Date: 06/01/98 End Date: 06/01/98

Client Sample No.	D/F	Time	% R	Analytes																							
				AL	AS	BA	CD	CR	PB	HG	SE	AG															
ZZZZZZ	1	1224																									
CCV	1	1226								X																	
CCB	1	1229								X																	
ZZZZZZ	1	1232																									
ZZZZZZ	1	1234																									
ZZZZZZ	1	1237																									
ZZZZZZ	1	1240																									
PBS	1	1242								X																	
LCSS	1	1245								X																	
LCSSD	1	1247								X																	
ZZZZZ	1	1250																									
ZZZZZ	1	1253																									
ZZZZZZ	1	1255																									
CCV	1	1258								X																	
CCB	1	1301								X																	
ZZZZZZ	1	1303																									
MFAICS582	1	1306								X																	
MFAICS582FD	1	1309								X																	
MFAICS584	1	1311								X																	
MFAICS585	1	1314								X																	
MFAICS587	1	1317								X																	
MFAICS588	1	1319								X																	
MFAICS590	1	1322								X																	
MFAICS591	1	1325								X																	
MFAICS591S	1	1328								X																	
CCV	1	1330								X																	
CCB	1	1333								X																	
MFAICS591M	1	1336								X																	
MFAICS593	1	1338								X																	
MFAICS593FD	1	1341								X																	
ZZZZZZ	1	1344																									
CCV	1	1346								X																	

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ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162A

Instrument ID Number: PS200B_____ Method: AV

Start Date: 06/01/98 End Date: 06/01/98

Client Sample No.	D/F	Time	% R	Analytes																						
				AL	AS	BA	CD	CR	PB	HG	SE	AG														
CCB	1	1349								X																

FORM XIV - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: MKF-OH **DATE: 06/09/98**
CASE: 34162 **SOW NO.: SW846**
SDG: 34162B **EPISODE NO.: 34162**

Rinse Blank

INORGANIC METAL FRACTION:

One water sample was submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of this sample. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A & 3050A
SWL-IN-209	SW846 6010A
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following element showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Al. No action required.

Linearity near the CRDL (CRA & CRI): No problems.

Preparation Blanks: The following element showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Al. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): Hg only/no problems.

Duplicate (LCSD and MSD): Hg only/no problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman for...
Jason D. Ruckman
Inorganic Program Manager

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
770 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

INORGANICS CLP QUALIFIER FLAGS

B	The reported values was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL), if the analyte was analyzed for but not detected, a "U" must be entered.
E	The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the Cover Page (if the problem applies to all samples) or on the specific FORM I - IN (if it is an isolated problem).
M	Duplicate injection precision not met.
N	Spike sample recovery not within control limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance. (See Exhibit E.)
*	Duplicate analysis not within control limits.
+	Correlation coefficient for the MSA is less than 0.995.

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.:34162B

SOW No.: 3/90___

Client Sample ID	Lab Sample ID
_MFAR0528_____	_34162.17_____
_MFAR0528S____	_34162.17S_____
_MFAR0528M____	_34162.17SD_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____BATCH_#:__ICP=980601I1
_____AV=980601HG1

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Deborah J. Inman for... Jason D. Ruckman

Date: June 9, 1998 Title: Inorganic Program Manager

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INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MFAR0528

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B
Matrix (soil/water): WATER Lab Sample ID: 34162.17
Level (low/med): LOW__ Date Received: 05/29/98
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	65.5	B		P_
7440-38-2	Arsenic__	2.9	U		P_
7440-39-3	Barium___	3.3	B		P_
7440-43-9	Cadmium__	0.30	U		P_
7440-47-3	Chromium_	0.70	U		P_
7439-92-1	Lead_____	2.1	B		P_
7439-97-6	Mercury__	0.10	U		AV
7782-49-2	Selenium_	3.1	U		P_
7440-22-4	Silver___	1.4	U		P_

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	1000.0	971.94	97.2	5000.0	5083.93	101.7	5019.75	100.4	P
Arsenic	250.0	242.95	97.2	500.0	501.41	100.3	509.85	102.0	P
Barium	1000.0	971.77	97.2	500.0	500.98	100.2	505.87	101.2	P
Cadmium	125.0	117.69	94.2	500.0	497.36	99.5	502.77	100.6	P
Chromium	100.0	95.47	95.5	500.0	495.22	99.0	499.01	99.8	P
Lead	250.0	238.35	95.3	500.0	498.04	99.6	504.43	100.9	P
Mercury	4.1	3.91	95.4	5.0	5.50	110.0	5.29	105.8	AV
Selenium	250.0	240.03	96.0	500.0	499.29	99.9	502.90	100.6	P
Silver	125.0	120.71	96.6	500.0	494.17	98.8	496.61	99.3	P

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Initial Calibration Source: EPA-LV_____

Continuing Calibration Source: IN.VEN._____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				5000.0	4950.81	99.0	4992.42	99.8	P
Arsenic				500.0	500.59	100.1	494.34	98.9	P
Barium				500.0	500.86	100.2	493.59	98.7	P
Cadmium				500.0	498.14	99.6	491.54	98.3	P
Chromium				500.0	492.47	98.5	486.63	97.3	P
Lead				500.0	503.86	100.8	497.97	99.6	P
Mercury									NR
Selenium				500.0	499.61	99.9	493.95	98.8	P
Silver				500.0	492.80	98.6	487.57	97.5	P

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

AA CRDL Standard Source: PLASMACHEM__

ICP CRDL Standard Source: IN.VEN._____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum				160.0	158.32	98.9	160.14	100.1
Arsenic				20.0	17.29	86.4	21.87	109.3
Barium				6.0	5.93	98.8	6.02	100.3
Cadmium				6.0	5.77	96.2	6.00	100.0
Chromium				10.0	8.97	89.7	10.19	101.9
Lead				6.0	5.89	98.2	5.24	87.3
Mercury	0.2	0.17	85.0					
Selenium				10.0	10.90	109.0	8.63	86.3
Silver				14.0	12.66	90.4	13.49	96.4

3
BLANKS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	17.0	U	17.0	U	17.0	U	17.0	U	39.57	B	P
Arsenic	2.9	U	2.9	U	2.9	U	2.9	U	2.90	U	P
Barium	0.6	U	0.6	U	0.6	U	0.6	U	0.60	U	P
Cadmium	0.3	U	0.3	U	0.3	U	0.3	U	0.30	U	P
Chromium	0.7	U	0.7	U	0.7	U	0.7	U	0.70	U	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U	1.50	U	P
Mercury	0.1	U	0.1	U	0.1	U			0.10	U	AV
Selenium	3.1	U	3.1	U	3.1	U	3.1	U	3.10	U	P
Silver	1.4	U	1.4	U	1.4	U	1.4	U	1.40	U	P

3
BLANKS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			20.1	B							P
Arsenic			2.9	U							P
Barium			0.6	U							P
Cadmium			0.3	U							P
Chromium			0.7	U							P
Lead			1.5	U							P
Mercury											NR
Selenium			3.1	U							P
Silver			1.4	U							P

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No: _____ SDG No.: 34162B

ICP ID Number: TJA ET2_____ ICS Source: EPA-LV91____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum	500000	500000	474484	476098.5	95.2	477613	478295.5	95.7
Arsenic	0	100	4	95.5	95.5	4	95.2	95.2
Barium	0	500	5	465.8	93.2	5	470.5	94.1
Cadmium	0	1000	-4	871.9	87.2	-4	878.9	87.9
Chromium	0	500	0	440.3	88.1	0	441.9	88.4
Lead	0	50	2	44.3	88.6	3	47.1	94.2
Mercury								
Selenium	0	50	-2	48.4	96.8	-1	48.3	96.6
Silver	0	200	-1	187.2	93.6	0	187.9	93.9

5A
SPIKE SAMPLE RECOVERY

Client SAMPLE ID

MFAR0528M

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B
Matrix: __WATER_____ Level (low/med): _LOW____
% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	75-125	0.7870		0.1000	U	1.00	78.7		AV
Selenium									NR
Silver									NR

Comments:

5A
SPIKE SAMPLE RECOVERY

Client SAMPLE ID

MFAR0528S

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B
Matrix: __WATER_____ Level (low/med): _LOW____
% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Arsenic									NR
Barium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	75-125	0.8030		0.1000	U	1.00	80.3		AV
Selenium									NR
Silver									NR

Comments:

6
DUPLICATES

CLIENT SAMPLE ID

LCSWD

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		2021.7010		1951.9070		3.5		P
Arsenic	60.0	81.0120		77.2890		4.7		P
Barium		250.2390		244.8320		2.2		P
Cadmium		48.9480		47.6690		2.6		P
Chromium		197.8470		193.5900		2.2		P
Lead		79.2650	B	77.4560	B	2.3		P
Mercury	0.2	0.9080		0.8290		9.1		AV
Selenium		75.6800	B	75.2190	B	0.6		P
Silver	10.0	49.7090		48.2960		2.9		P

FORM VI - IN

6
DUPLICATES

CLIENT SAMPLE ID

MFAR0528M

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Arsenic								NR
Barium								NR
Cadmium								NR
Chromium								NR
Lead								NR
Mercury	0.2	0.8030		0.7870		2.0		AV
Selenium								NR
Silver								NR

LABORATORY CONTROL SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Solid LCS Source: _____

Aqueous LCS Source: EPA0392_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	2000.0	2021.7	101.1						
Arsenic	80.0	81.0	101.3						
Barium	250.0	250.2	100.1						
Cadmium	50.0	48.9	97.9						
Chromium	200.0	197.8	98.9						
Lead	80.0	79.3	99.1						
Mercury	1.0	0.9	91.0						
Selenium	80.0	75.7	94.6						
Silver	50.0	49.7	99.4						

LABORATORY CONTROL SAMPLE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

Solid LCS Source: _____

Aqueous LCS Source: EPA0392_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	2000.0	1951.9	97.6						
Arsenic	80.0	77.3	96.6						
Barium	250.0	244.8	97.9						
Cadmium	50.0	47.7	95.3						
Chromium	200.0	193.6	96.8						
Lead	80.0	77.5	96.8						
Mercury	1.0	0.8	83.0						
Selenium	80.0	75.2	94.0						
Silver	50.0	48.3	96.6						

8

STANDARD ADDITION RESULTS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract:MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.:_____ SDG No.:34162B

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

Instrument Detection Limits (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK Contract: MKF-OH
Lab Code: SWOK Case No.: 34162 SAS No.: SDG No.: 34162B
ICP ID Number: TJA_ET2 Date: 03/20/98
Flame AA ID Number :
Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22		100	17.0	P
Arsenic	189.04		60	2.9	P
Barium	445.40		10	0.6	P
Cadmium	226.50		5	0.3	P
Chromium	267.72		10	0.7	P
Lead	220.35		100	1.5	P
Mercury			0.2		NR
Selenium	196.03		250	3.1	P
Silver	328.07		10	1.4	P

Comments:

FORM X - IN

10

Instrument Detection Limits (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____
Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B
ICP ID Number: _____ Date: 12/18/96
Flame AA ID Number : PS200B_____
Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			100		NR
Arsenic			60		NR
Barium			10		NR
Cadmium			5		NR
Chromium			10		NR
Lead			100		NR
Mercury	254.00		0.2	0.1	AV
Selenium			250		NR
Silver			10		NR

Comments:

FORM X - IN

11A

ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	BA_
Aluminum_	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic__	189.04	0.0000000	0.0000000	-0.0000310	0.0000000	0.0000000
Barium___	445.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium__	226.50	0.0000000	0.0000000	0.0000770	0.0000000	0.0000000
Chromium_	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead_____	220.35	0.0006490	0.0000000	0.0000530	0.0000000	0.0000000
Mercury__						
Selenium_	196.03	0.0000000	0.0000000	-0.0000310	0.0000000	0.0000000
Silver___	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

11B

ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : CO_	CR_	CU_	MN_	NI_
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	445.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0000800	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0003370	0.0000000
Lead	220.35	-0.0006220	0.0000000	0.0000000	0.0000000	0.0002760
Mercury						
Selenium	196.03	0.0004010	0.0000000	0.0000000	0.0008230	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

11B
ICP Interelement Correction Factors (Annually)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

ICP ID Number: TJA ET2_____ Date: 01/09/98

Analyte	Wave-length (nm)	Interelement Correction Factors for : SC_	SN_	TI_	TL_	V__
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0159360
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	445.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	-0.0002030
Mercury						
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0002840
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

ICP Linear Ranges (Quarterly)

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162 SAS No.: _____ SDG No.: 34162B

ICP ID Number: TJA ET2_____ Date: 04/17/98

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Aluminum	15.00	600000.0	P
Arsenic	15.00	30000.0	P
Barium	15.00	40000.0	P
Cadmium	15.00	10000.0	P
Chromium	15.00	10000.0	P
Lead	15.00	60000.0	P
Mercury			NR
Selenium	15.00	60000.0	P
Silver	15.00	60000.0	P

Comments:

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PREPARATION LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.:_34162 SAS No.: _____ SDG No.:34162B

Method: P_

Client Sample No.	Prep Date	Weight (gram)	Volume (mL)
LCSW	06/01/98		100
LCSWD	06/01/98		100
MFAR0528	06/01/98		100
PBW	06/01/98		100

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PREPARATION LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.:_34162 SAS No.: _____ SDG No.:34162B

Method: AV

Client Sample No.	Prep Date	Weight (gram)	Volume (mL)
LCSW	06/01/98		100
LCSWD	06/01/98		100
MFAR0528	06/01/98		100
MFAR0528M	06/01/98		100
MFAR0528S	06/01/98		100
PBW	06/01/98		100

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ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162B

Instrument ID Number: TJA ET2_____ Method: P_

Start Date: 06/05/98 End Date: 06/05/98

Client Sample No.	D/F	Time	% R	Analytes																						
				AL	AS	BA	CD	CR	PB	HG	SE	AG														
S0	1	1455		X	X	X	X	X	X		X	X														
S	1	1500		X	X	X	X	X	X		X	X														
ICV	1	1506		X	X	X	X	X	X		X	X														
ICB	1	1511		X	X	X	X	X	X		X	X														
CRI	1	1516		X	X	X	X	X	X		X	X														
ICSA	1	1521		X	X	X	X	X	X		X	X														
ICSAB	1	1526		X	X	X	X	X	X		X	X														
CCV	1	1531		X	X	X	X	X	X		X	X														
CCB	1	1537		X	X	X	X	X	X		X	X														
PBW	1	1542		X	X	X	X	X	X		X	X														
SW	1	1550		X	X	X	X	X	X		X	X														
SWD	1	1556		X	X	X	X	X	X		X	X														
ZZZZZZ	1	1601																								
MFAR0528	1	1606		X	X	X	X	X	X		X	X														
ZZZZZZ	1	1611																								
ZZZZZZ	1	1616																								
ZZZZZZ	1	1621																								
ZZZZZZ	1	1626																								
ZZZZZZ	1	1632																								
CCV	1	1637		X	X	X	X	X	X		X	X														
CCB	1	1642		X	X	X	X	X	X		X	X														
ZZZZZZ	1	1647																								
ZZZZZZ	1	1652																								
ZZZZZZ	1	1657																								
ZZZZZZ	1	1703																								
ZZZZZZ	1	1708																								
ZZZZZZ	1	1713																								
ZZZZZZ	1	1718																								
ZZZZZZ	1	1723																								
ZZZZZZ	1	1728																								
ZZZZZZ	1	1733																								
CCV	1	1739		X	X	X	X	X	X		X	X														

FORM XIV - IN

ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162B

Instrument ID Number: TJA ET2_____ Method: P_

Start Date: 06/05/98 End Date: 06/05/98

Client Sample No.	D/F	Time	% R	Analytes																						
				AL	AS	BA	CD	CR	PB	HG	SE	AG														
CCB	1	1744		X	X	X	X	X	X		X	X														
ZZZZZZ	1	1749																								
ZZZZZZ	1	1754																								
ZZZZZZ	1	1759																								
ZZZZZZ	1	1804																								
ZZZZZZ	1	1810																								
ZZZZZZ	1	1815																								
ZZZZZZ	1	1820																								
CRI	1	1825		X	X	X	X	X	X		X	X														
ICSA	1	1830		X	X	X	X	X	X		X	X														
ICSAB	1	1835		X	X	X	X	X	X		X	X														
[illegible]	1	1840		X	X	X	X	X	X		X	X														
CCB	1	1846		X	X	X	X	X	X		X	X														

FORM XIV - IN

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ANALYSIS RUN LOG

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: MKF-OH____

Lab Code: SWOK__ Case No.: 34162_ SAS No.: _____ SDG No.:34162B

Instrument ID Number: PS200B_____ Method: AV

Start Date: 06/01/98 End Date: 06/01/98

Client Sample No.	D/F	Time	% R	Analytes																							
				AL	AS	BA	CD	CR	PB	HG	SE	AG															
S0	1	1046								X																	
S0.2	1	1048								X																	
S0.4	1	1051								X																	
S1	1	1054								X																	
S5	1	1057								X																	
S10	1	1059								X																	
ICV	1	1103								X																	
ICB	1	1106								X																	
CRA	1	1109								X																	
CCV	1	1111								X																	
[illegible]	1	1114								X																	
[illegible]N	1	1128								X																	
LCSW	1	1131								X																	
LCSWD	1	1133								X																	
ZZZZZZ	1	1136																									
MFAR0528	1	1139								X																	
MFAR0528S	1	1141								X																	
MFAR0528M	1	1144								X																	
ZZZZZZ	1	1146																									
ZZZZZZ	1	1149																									
ZZZZZZ	1	1152																									
CCV	1	1154								X																	
CCB	1	1157								X																	

FORM XIV - IN

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 REV 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA

RECEIVED BY (PRINT NAME): SARAH HODSON

RECEIVED BY (SIGNATURE): S. Hodson

LOGGED IN BY (SIGNATURE): S. Hodson.

REC'D DATE 06/22/99

TIME REC'D 09:50

LOG-IN DATE 1999-06-22 10:55

PROJECT: NSWC CRANE

EPISODE: 39088

SAMPLE DELIVERY GROUP: 39088

Remarks

1. CUSTODY SEAL(S): Present/Absent
   Intact/ Broken
2. CUSTODY SEALS NOS.:
   NA
3. CHAIN-OF CUSTODY. Present/Absent
   Sealed In Plastic? Yes/ No
   Taped To Lid? Yes/ No
   Properly Filled Out (Ink, Signed, ETC.)? Yes/ No
4. AIRBILL AirBill/ Sticker
   Present/Absent
5. AIRBILL NO:
   8116740174173
6. COOLER CONDITIONS
   Enough Ice? Yes/ No
   Type of Ice? WET
   Type of Packing? BUB
7. SAMPLE TAGS Present/Absent
8. SAMPLE CONDITION: Intact/ Broken*/ Leaking
   Bottles Sealed In Separate Plastic Bags? Yes/ No
   Correct Containers Used For Tests Indicated? Yes/ No
   Correct Preservative? Yes/ No
   Sufficient Sample? Yes/ No
   Labels Complete (I.D., Date, Time, Signature, Preservative? Yes/ No
   VOA Samples Without Bubbles? Yes/ No~
9. Does Information on Custody Records, Labels, Tags Agree? Yes/ No*
10. RAD SCREEN WITH GIEGER COUNTER? Yes/ No
11. P.O. Called? Yes/ No

Client Sample #	Sample Fraction @	Assigned LAB#	Cooler I.D.	pH Check	ACID/ BASE LOT#	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
MFAPES270	gc,m	39088.01	06/22/99-1	N		4.0 C
MFAPES270FD	↓	39088.02		N		
MFAPES271	v	39088.03		N		
MFAPES271 ms	↓	39088.04		N		
MFAPES271 msd	↓	39088.05		N		
MFAPES272	gc,m	39088.06		N		
MFAPES273	v	39088.07		N		
MFAPES274	gc,m	39088.08		N		
MFAPES275	v	39088.09		N		
MFAPES276	gc,m	39088.10		N		
MFAPES277	v	39088.11		N		
MFAPES278	gc,m	39088.12		N		
MFAPES279	v	39088.13		N		
MFAPES280	gc,m	39088.14		N		
MFAPES281	v	39088.15		N		
MFATB062199	↓	39088.16		N		
MFARB062199	gc,m	39088.17	↓	Y		↓

* Contact PO and attach record of resolution

@ Sample Fractions: B=SV GC/MS, V= VOA GC/MS or GC, P=Pesticide, H=Herbicide, D=Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

TOLTEST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259

Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808

Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

MFA-050

Chain of Custody Record

25791

Page 1 of 1

Project No.: 37324

Client:

P.O. No.:

Project/Location: NSWC Crane Mine Fill A

Project Mgr.:

Sampler's Name: Peter J. Chevalier

Phone No.

Sampler's Signature: [signature]

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	RETN	6010	7471	8260				Preserved Yes/No	LAB USE ONLY Lab #
1	MFA PES 270	6/21/99	0910	C	Soil	Grid 78 0-6"	1	✓	✓	✓	✓						
2	MFA PES 270 FD		0910	C		Grid 78 0-6"	1	✓	✓	✓	✓						
3	MFA PES 271		0913	G		Grid 78 6"	5					✓	MS	MSD			
4	MFA PES 272		0918	G		Grid 78 Sidewall 0-6"	1	✓	✓	✓	✓						
5	MFA PES 273		0922	G		Grid 78 Sidewall 6"	3					✓					
6	MFA PES 274		1407	C		Grid 82 0-6"	1	✓	✓	✓	✓						
7	MFA PES 275		1409	G		Grid 82 6"	3					✓					
8	MFA PES 276		1416	C		Grid 83 0-6"	1	✓	✓	✓	✓						
9	MFA PES 277		1416	G		Grid 83 6"	3					✓					
10	MFA PES 278		1423	C		Grid 84 0-6"	1	✓	✓	✓	✓						

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
	[signature]	6/21/99 1530	[signature]	1750
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier

Were samples preserved ☐ in field ☐ in lab ☐ N/A

Temp of samples 4 °C

Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A

Were proper containers used? ☐ yes ☐ no

Was container labeled properly for contents? ☐ yes ☐ no

Were samples packaged properly for type of material? ☐ yes ☐ no

Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no

Comments: _____

TAT

TODESI INC.

1915 N. 12th St., P.O. Box 2156, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Seal From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

MFA-050

Chain of Custody Record

5792

Page 2 of 2

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Project No.: 37324
Client:
P.O. No:
Project/Location: NSWC Crane Mine Fill A
Project Mgr.:
Sampler's Name: Peter J. Chevalier
Phone No.:
Sampler's Signature: [signature]

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	PETN	6010	7471	8260			Preserved Yes/No	LAB USE ONLY Lab #
1	MFA PES 279	6/2/99	1424	G	soil	Grid 84 6"	3					✓				
2	MFA PES 280		1432	C		Grid 92 0-6"	1	✓	✓	✓	✓					
3	MFA PES 281		1431	G		Grid 92 6"	3					✓				
4	MFA TB 060299		1500	G	liquid	trip blank	2					✓				
5	MFA RS 060299		1500	G	liquid	rinse blank	3	✓	✓	✓	✓					
6																
7																
8																
9																
10																

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
	[signature]	6/2/99 1530		
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples _____ °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled proper for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label complete properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no

Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 7/9

WEST LABORATORY OF OKLAHOMA
West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE
August 6, 1999

: TOLTEST

ECT : NSWC CRANE

SDG NO : 39088

EPISODE(S) : 39088

EXPLOSIVE FRACTION

This SDG consisted of 7 soil samples and 1 water sample for the explosive analysis. The samples, blanks and spikes were extracted and nalyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

CASE SUMMARY:

Blanks: No problems.

Surrogate(s): The surrogate was out of the laboratory QC limits in the LD0618SD.

Matrix Spikes: Tetryl and 26DNT were out of the laboratory QC limits in the samples MFARB062199MS and MFARB062199MSD. All of the other analytes were within the laboratory QC samples for these samples.

Laboratory Control Spikes: Tetryl was out of the laboratory QC limits in the LC0623WH. All of the analytes were within the laboratory QC limits in the LD0623WH. 2NT was out of the laboratory QC limits in the LC0622SF. All of the analytes were within the laboratory QC limits in the LD0622SF.

2ADNT exceeded 15% D in the CCAL 1-062527. This analyte was not detected in any of the associated samples. 2ADNT and 4NT exceeded 15% D in the CCAL 1-062537. These two analytes were not detected in any of the associated samples.

Enviroquant software was utilized to process the above samples. The Response Factor in the standard is calculated by dividing the area of each analyte by the concentration of the respective analyte.

Multiplier = (final volume / extracted amount) * dilution.

The following is an example of the calculations for RDX in the quantitation and confirmation columns of the undiluted sample MFAPES270:

[Sample's response (area) / mean calibration factor] * Multiplier = the concentration

(72947307/ 261600) * 10 = 2789 ug/Kg

(37270038 / 109500) * 10 = 3404 ug/Kg

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

The laboratory utilizes the following flags where appropriate: "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Phuong Vo
LC Analyst

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0622SF	86	0
02	LC0622SF	91	0
03	LD0622SF	91	0
04	MFAPES270	88	0
05	MFAPES270MS	81	0
06	MFAPES270MSD	84	0
07	MFAPES270FD	81	0
08	MFAPES272	89	0
09	MFAPES274	84	0
10	MFAPES276	87	0
11	MFAPES278	90	0
12	MFAPES280	70	0
13			
14			
15			
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27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix Spike - Client Sample NO.: MFAPES270

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
HMX	9500	0	9970	105	54-128
RDX	9500	2790	10900	86	66-109
TNB	9500	0	9080	96	57-130
DNB	9500	0	9680	102	74-122
TETRYL	9500	0	9680	102	32-119
NB	9500	0	10100	106	70-135
TNT	9500	531	10900	109	44-124
4ADNT	9500	0	9230	97	60-140
2ADNT	9500	0	9280	98	60-140
26DNT	9500	0	9150	96	58-125
24DNT	9500	0	9230	97	59-120
2NT	9500	0	7980	84	79-124
4NT	9500	0	8930	94	74-128
3NT	9500	0	9280	98	79-121

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix Spike - Client Sample NO.: MFAPES270

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	10200	108	3	30	54-128
RDX	9500	9870	74	10	30	66-109
TNB	9500	9350	98	3	30	57-130
DNB	9500	9860	104	2	45	74-122
TETRYL	9500	9910	104	2	30	32-119
NB	9500	10200	107	1	35	70-135
TNT	9500	10900	109	0	30	44-124
4ADNT	9500	9270	98	0	40	60-140
2ADNT	9500	9380	99	1	40	60-140
26DNT	9500	9440	99	3	35	58-125
24DNT	9500	9500	100	3	35	59-120
2NT	9500	8230	87	3	35	79-124
4NT	9500	9210	97	3	35	74-128
3NT	9500	9570	101	3	35	79-121

Column to be used to flag recovery values

Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

Comments: _____

3F

SOIL PETN MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix Spike - Client Sample NO.: MFAPES270

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PETN	3000	0	3100	103	70-130

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PETN	3000	3130	104	1	50	70-130

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Comments:

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

ıb Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LC0622SF

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	8840	93	57-137
RDX	9500	8150	86	77-113
TNB	9500	8280	87	64-125
DNB	9500	8920	94	82-118
TETRYL	9500	8690	91	23-124
NB	9500	9280	98	69-143
TNT	9500	8920	94	75-118
4ADNT	9500	8440	89	60-140
2ADNT	9500	8410	88	60-140
26DNT	9500	8510	90	78-117
24DNT	9500	8530	90	74-126
2NT	9500	7330	77 *	78-123
4NT	9500	8180	86	79-125
3NT	9500	8670	91	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 1 out of 14 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LD0622SF

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	9860	104	57-137
RDX	9500	9060	95	77-113
TNB	9500	9270	98	64-125
DNB	9500	9890	104	82-118
TETRYL	9500	9960	105	23-124
NB	9500	10300	109	69-143
TNT	9500	9880	104	75-118
4ADNT	9500	9370	99	60-140
2ADNT	9500	9650	102	60-140
26DNT	9500	9260	97	78-117
24DNT	9500	9440	99	74-126
2NT	9500	8230	87	78-123
4NT	9500	9180	97	79-125
3NT	9500	9560	101	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3H
SOIL PETN LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LC0622SG

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PETN	3000	3210	107	70-130

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

Comments:

3H

SOIL PETN LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LD0622SG

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PETN	3000	3310	110	70-130

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

Comments:

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0622SF

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Lab Sample ID : BL0622SF Lab File ID : 3_062408

Matrix: (soil/water) SOIL

Date Extracted : 06/22/99 Extraction Method : SONC

Date Analyzed (1): 06/25/99 Date Analyzed (2): 06/25/99

Time Analyzed (1): 0034 Time Analyzed (2): 0432

Instrument ID (1): LC3 Instrument ID (2): LC5

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	LC0622SF	LC0622SF	06/25/99	
02	LD0622SF	LD0622SF	06/25/99	
03	MFAPES270	39088.01	06/25/99	06/25/99
04	MFAPES270MS	39088.01MS	06/25/99	
05	MFAPES270MSD	39088.01MSD	06/25/99	
06	MFAPES270FD	39088.02	06/25/99	07/27/99
07	MFAPES272	39088.06	06/25/99	07/27/99
08	MFAPES274	39088.08	06/25/99	06/25/99
09	MFAPES276	39088.10	06/25/99	06/25/99
10	MFAPES278	39088.12	06/25/99	06/25/99
11	MFAPES280	39088.14	06/25/99	06/25/99
12				
13				
14				
15				
16				
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24				
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26				

Comments:

FORM IV

4C
PETN METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0622SG

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Lab Sample ID : BL0622SG Lab File ID : 4_063040

Matrix: (soil/water) SOIL

Date Extracted : 06/22/99 Extraction Method : SONC

Date Analyzed : 07/01/99 Time Analyzed : 1102

Instrument ID : LC4 LC Column ID : ODS II

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	LC0622SG	LC0622SG	07/01/99
02	LD0622SG	LD0622SG	07/01/99
03	MFAPES270	39088.01	07/01/99
04	MFAPES270MS	39088.01MS	07/01/99
05	MFAPES270MSD	39088.01MSD	07/01/99
06	MFAPES270FD	39088.02	07/01/99
07	MFAPES272	39088.06	07/01/99
08	MFAPES274	39088.08	07/01/99
09	MFAPES276	39088.10	07/01/99
10	MFAPES278	39088.12	07/01/99
11	MFAPES280	39088.14	07/01/99
12			
13			
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22			
23			
24			
25			
26			

Comments:

FORM IV

2E
WATER EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0623WH	88	0
02	LC0623WH	107	0
03	LD0623WH	103	0
04	MFARB062199	90	0
05	MFARB062199MS	108	0
06	MFARB062199MSD	112	0
07			
08			
09			
10			
11			
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29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3E

WATER EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix Spike - Client Sample NO.: MFARB062199

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
HMX	200	0	195	97	44-154
RDX	200	0	168	84	66-139
TNB	200	0	196	98	56-129
DNB	200	0	186	93	76-122
TETRYL	200	0	113	56*	76-120
NB	200	0	171	85	82-111
TNT	200	0	183	92	76-137
4ADNT	200	0	166	83	60-140
2ADNT	200	0	159	79	60-140
26DNT	200	0	165	82*	86-118
24DNT	200	0	176	88	72-123
2NT	200	0	151	76	74-130
4NT	200	0	176	88	78-116
3NT	200	0	182	91	72-126

FORM III

3E

WATER EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix Spike - Client Sample NO.: MFARB062199

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	200	204	102	5	15	44-154
RDX	200	172	86	2	12	66-139
TNB	200	200	100	2	10	56-129
DNB	200	190	95	2	15	76-122
TETRYL	200	110	55 *	2	14	76-120
NB	200	180	90	5	13	82-111
TNT	200	182	91	1	15	76-137
4ADNT	200	169	84	1	40	60-140
2ADNT	200	158	79	0	40	60-140
26DNT	200	164	82 *	1	13	86-118
24DNT	200	177	88	1	14	72-123
2NT	200	158	79	4	15	74-130
4NT	200	191	96	8	14	78-116
3NT	200	193	96	6	15	72-126

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 4 out of 28 outside limits

Comments: _____

3G

WATER EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LC0623WH

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
HMX	200	182	91	46-151
RDX	200	162	81	72-129
TNB	200	184	92	74-118
DNB	200	179	89	79-132
TETRYL	200	105	52 *	58-120
NB	200	167	83	68-135
TNT	200	181	91	61-145
4ADNT	200	155	78	60-140
2ADNT	200	158	79	60-140
26DNT	200	168	84	77-125
24DNT	200	166	83	70-134
2NT	200	147	73	73-131
4NT	200	170	85	73-116
3NT	200	172	86	71-127

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 1 out of 14 outside limits

Comments: _____

3G

WATER EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

ıb Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LD0623WH

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
HMX	200	197	98	46-151
RDX	200	169	84	72-129
TNB	200	193	96	74-118
DNB	200	185	92	79-132
TETRYL	200	120	60	58-120
NB	200	169	85	68-135
TNT	200	182	91	61-145
4ADNT	200	162	81	60-140
2ADNT	200	157	78	60-140
26DNT	200	169	84	77-125
24DNT	200	168	84	70-134
2NT	200	153	76	73-131
4NT	200	178	89	73-116
3NT	200	184	92	71-127

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

FORM III

3G

WATER PETN LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LC0625WH

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PETN	1200	1090	91	70-130

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

Comments:

3G

WATER PETN LABORATORY CONTROL SPIKE RECOVERY

ıb Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

LCS Sample NO.: LD0625WH

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PETN	1200	976	81	70-130

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

Comments: _____

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0623WH

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Lab Sample ID : BL0623WH Lab File ID : 1_062531

Matrix: (soil/water) WATER

Date Extracted : 06/23/99 Extraction Method : SEPF

Date Analyzed : 06/26/99 Time Analyzed : 1119

Instrument ID : LC1 LC Column ID : CARBOSORB

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	LC0623WH	LC0623WH	06/26/99
02	LD0623WH	LD0623WH	06/26/99
03	MFARB062199	39088.17	06/26/99
04	MFARB062199MS	39088.17MS	06/26/99
05	MFARB062199MSD	39088.17MSD	06/26/99
06			
07			
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26			

Comments:

FORM IV

4C

PETN METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0625WH

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Lab Sample ID : BL0625WH Lab File ID : 4_063009

Matrix: (soil/water) WATER

Date Extracted : 06/25/99 Extraction Method : SEPF

Date Analyzed : 06/30/99 Time Analyzed : 1755

Instrument ID : LC4 LC Column ID : ODS II

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT CLIENT SAMPLE NO.	LAB LAB SAMPLE ID	DATE DATE ANALYZED
01	LC0625WH	LC0625WH	06/30/99
02	LD0625WH	LD0625WH	06/30/99
03	MFARB062199	39088.17	06/30/99
04			
05			
06			
07			
08			
09			
10			
11			
12			
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Comments:

FORM IV

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES270

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.01

Sample Amt: 2.0 G % Moisture: 17.6 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 06/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	2790	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	531	
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062411.D Vial: 11
Acq On : 25 Jun 1999 02:48 Operator: BW
Sample : 39088.01 Inst : LC3
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 11:59 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Initial Calibration

07/31/99 D

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.54	46437859	1753.4	m	A
Target Compounds:					
1) HMX	5.13	6711307	299.4	mJ	A
2) RDX	7.65	72947307	2788.9*	m	A
3) TNB	10.23	2306624	40.5	mJ	A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	16.01	26021970	530.9*	m	A
9) 4ADNT	17.22	1480647	37.3	mJ	A
10) 2ADNT	18.09	1961710	43.0	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

JM 6-25-99

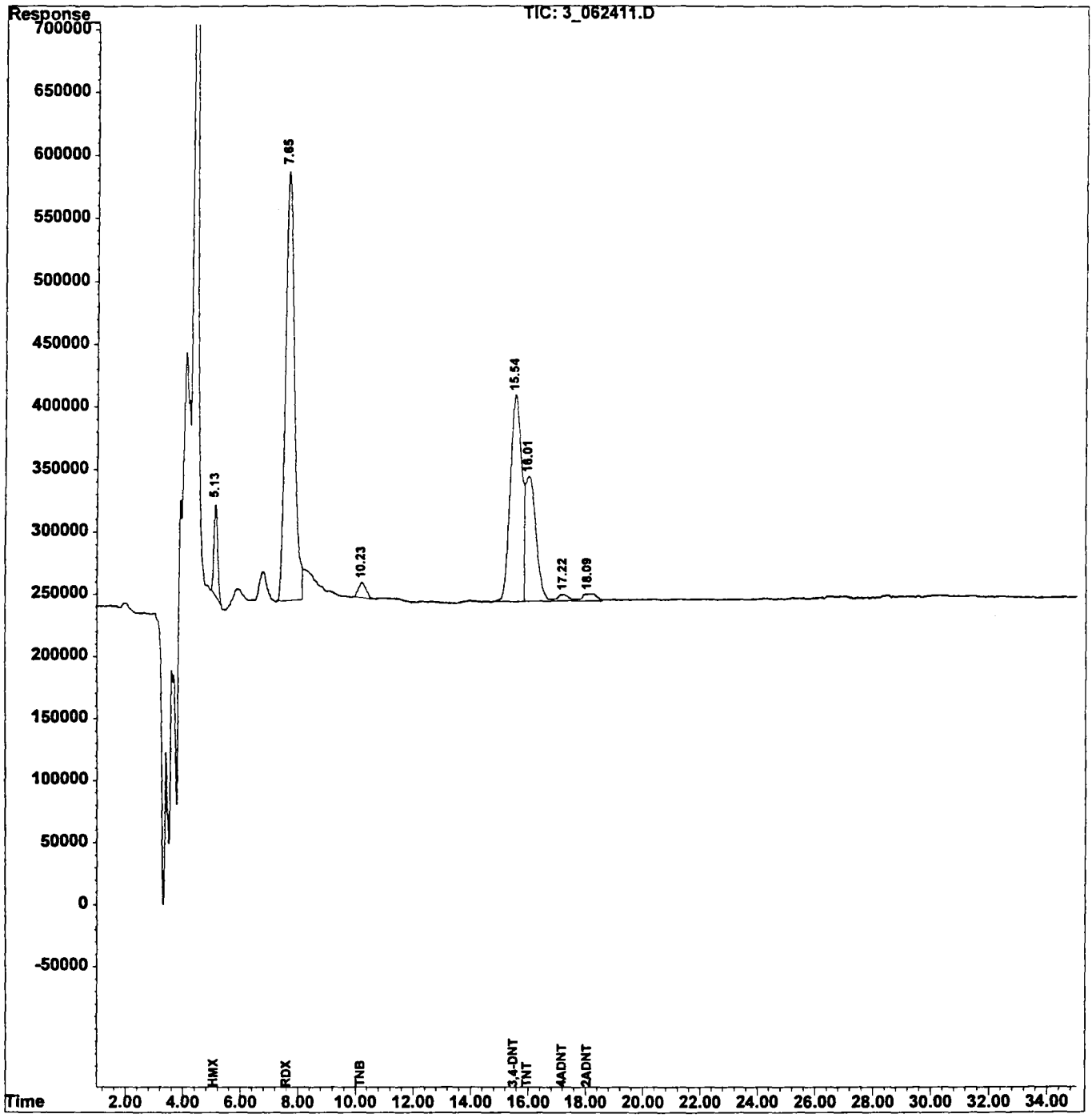
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062411.D Vial: 11
Acq On : 25 Jun 1999 02:48 Operator: BW
Sample : 39088.01 Inst : LC3
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 11:59 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062438.D Vial: 27
Acq On : 25 Jun 1999 06:10 Operator: SM
Sample : 39088.01 Inst : LC5
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 26 14:12 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 17:26:04 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.11	25895915	2187.9	m	A
Target Compounds:					
1) A HMX	4.51	2039954	194.7	mJ	A
2) B RDX	6.88W	37270038	3403.5	m	A
3) A TNB	0.00	0	N.D.	d	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.	d	A
8) A TNT	9.94W	14185558	610.4	m	A
9) B 4ADNT	13.58	980111	85.6	mJ	A
10) B 2ADNT	13.68	1503382	56.8	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

JM
6-26-99

2 verified
06/26/99
M

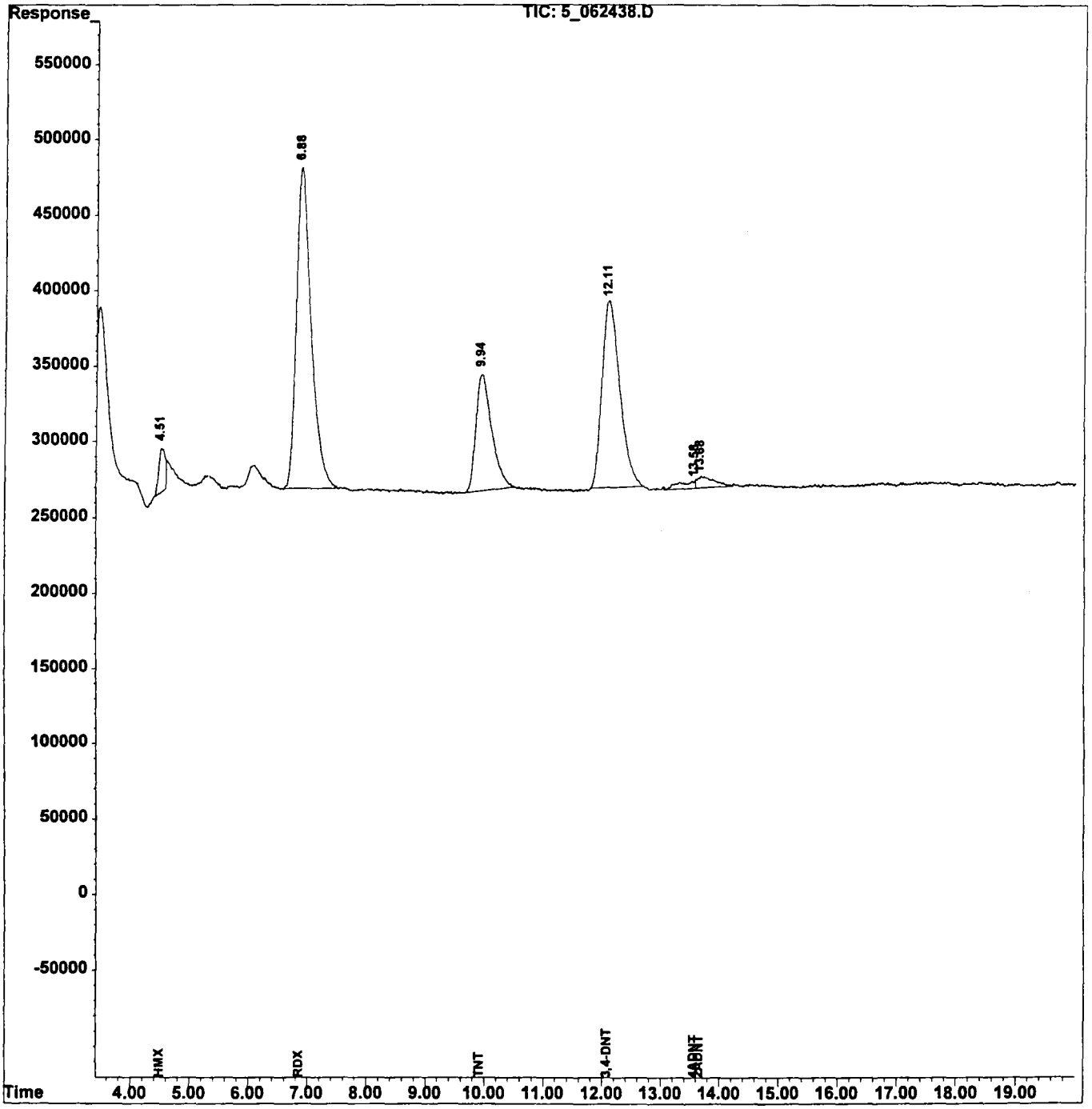
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062438.D Vial: 27
Acq On : 25 Jun 1999 06:10 Operator: SM
Sample : 39088.01 Inst : LC5
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 26 14:12 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 17:26:04 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES270

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.01

Sample Amt: 2.0 G % Moisture: 17.6 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
75-11-5	PETN	250	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063043.D Vial: 43
Acq On : 01-Jul-1999, 12:41 Operator: JF
Sample : 39088.01 Inst : LC4
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

07/05/99

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Initial Calibration

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/Kg	Curve
Target Compounds:				
1) PETN	0.00	0	N.D.	A

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

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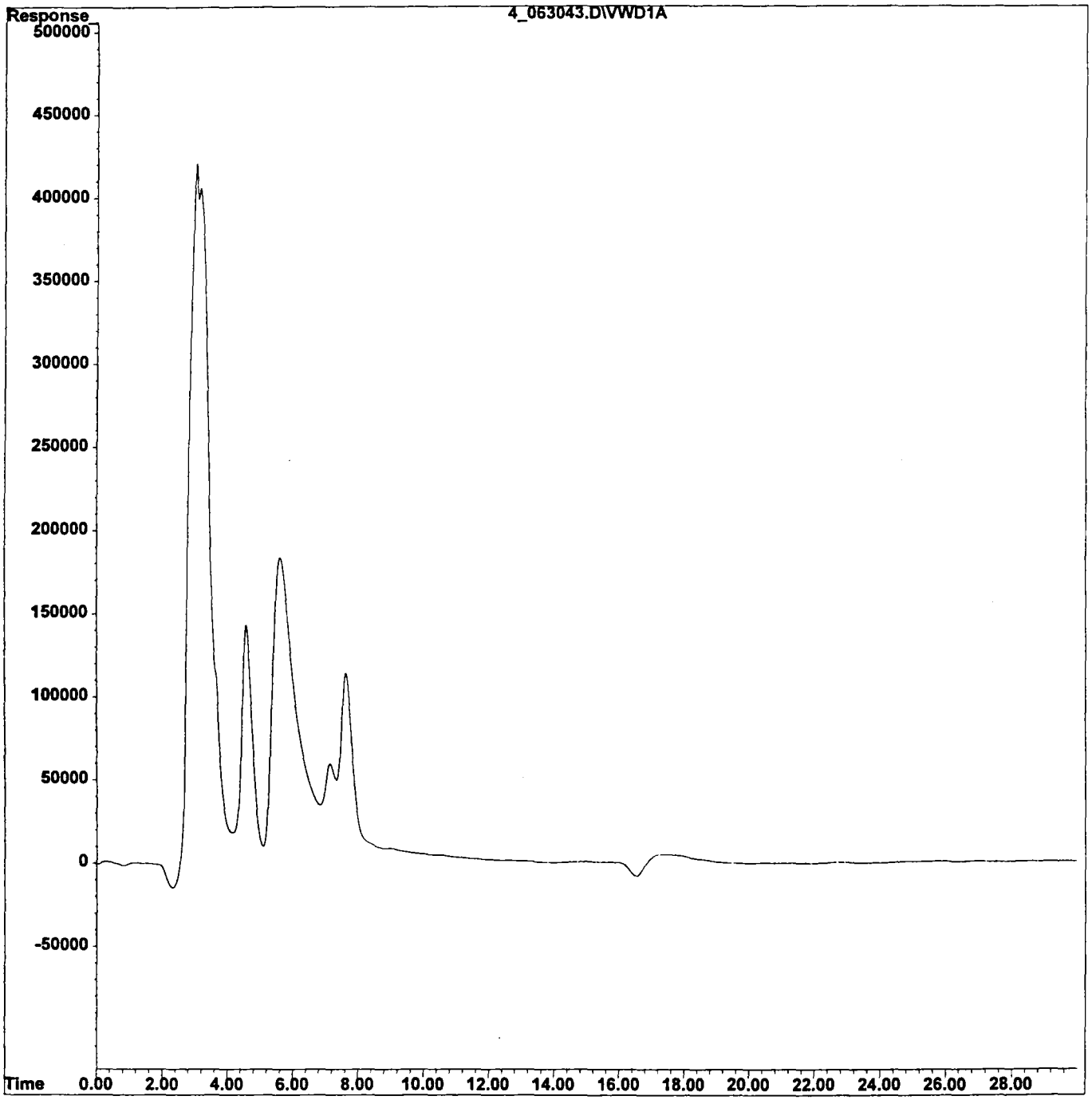
Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063043.D Vial: 43
Acq On : 01-Jul-1999, 12:41 Operator: JF
Sample : 39088.01 Inst : LC4
Misc : MFAPES270 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES270FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.02

Sample Amt: 2.0 G % Moisture: 17.8 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 06/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	827	J
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062414.D Vial: 14
Acq On : 25 Jun 1999 05:02 Operator: BW
Sample : 39088.02 Inst : LC3
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:15 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.68	42882436	1619.1	m	A
Target Compounds:					
1) HMX	5.15	5820512	259.7	mJ	A
2) RDX	7.70	21637627	827.2	m	A
3) TNB	10.34	2003228	35.2	mJ	A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	16.13	30522764	622.8	m	A
9) 4ADNT	17.27	1377770	34.7	mJ	A
10) 2ADNT	18.38	1659200	36.4	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

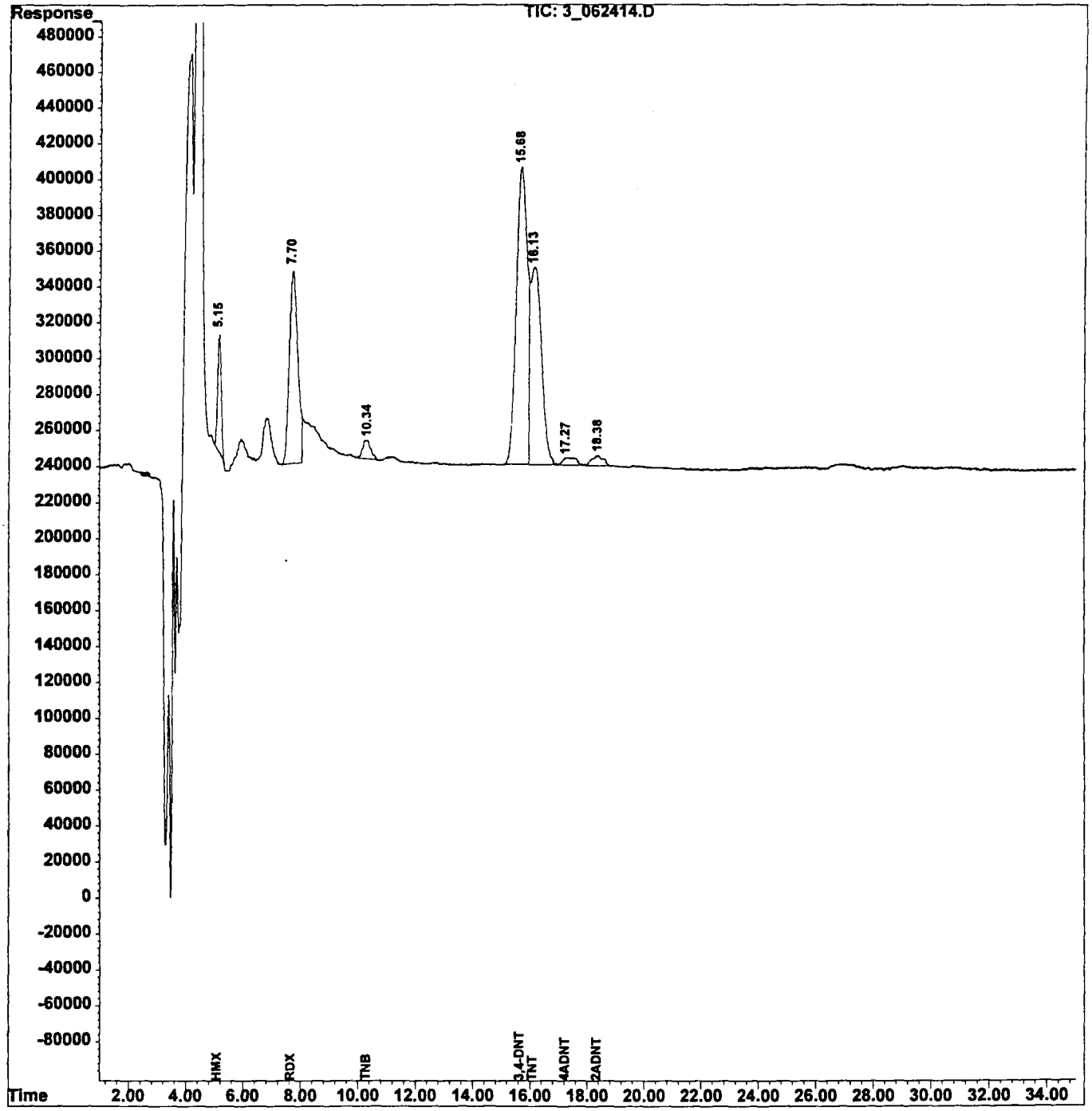
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062414.D Vial: 14
Acq On : 25 Jun 1999 05:02 Operator: BW
Sample : 39088.02 Inst : LC3
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:15 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0727\2_072722.D Vial: 22
Acq On : 27 Jul 1999 23:19 Operator: SM
Sample : 39088.02 Inst : LC2
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 28 16:14 1999 Quant Results File: 200sg27c.RES

Method : f:\hpchem\lc2\data\2_0727\200sg27c.m
Title-Path : - F:\HPCHEM\LC2\DATA\2_0727\
Last Update : Wed Jul 28 13:34:18 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.86	34437840	1671.0	m	A
Target Compounds:					
1) A HMX	5.22	3209967	368.9	m	A
2) B RDX	8.20	11409928	1070.7	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.86	18916701	644.1	m	A
9) B 4ADNT	16.32	835454	77.9	m	A
10) B 2ADNT	17.54	2737851	78.8	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

07/28/99

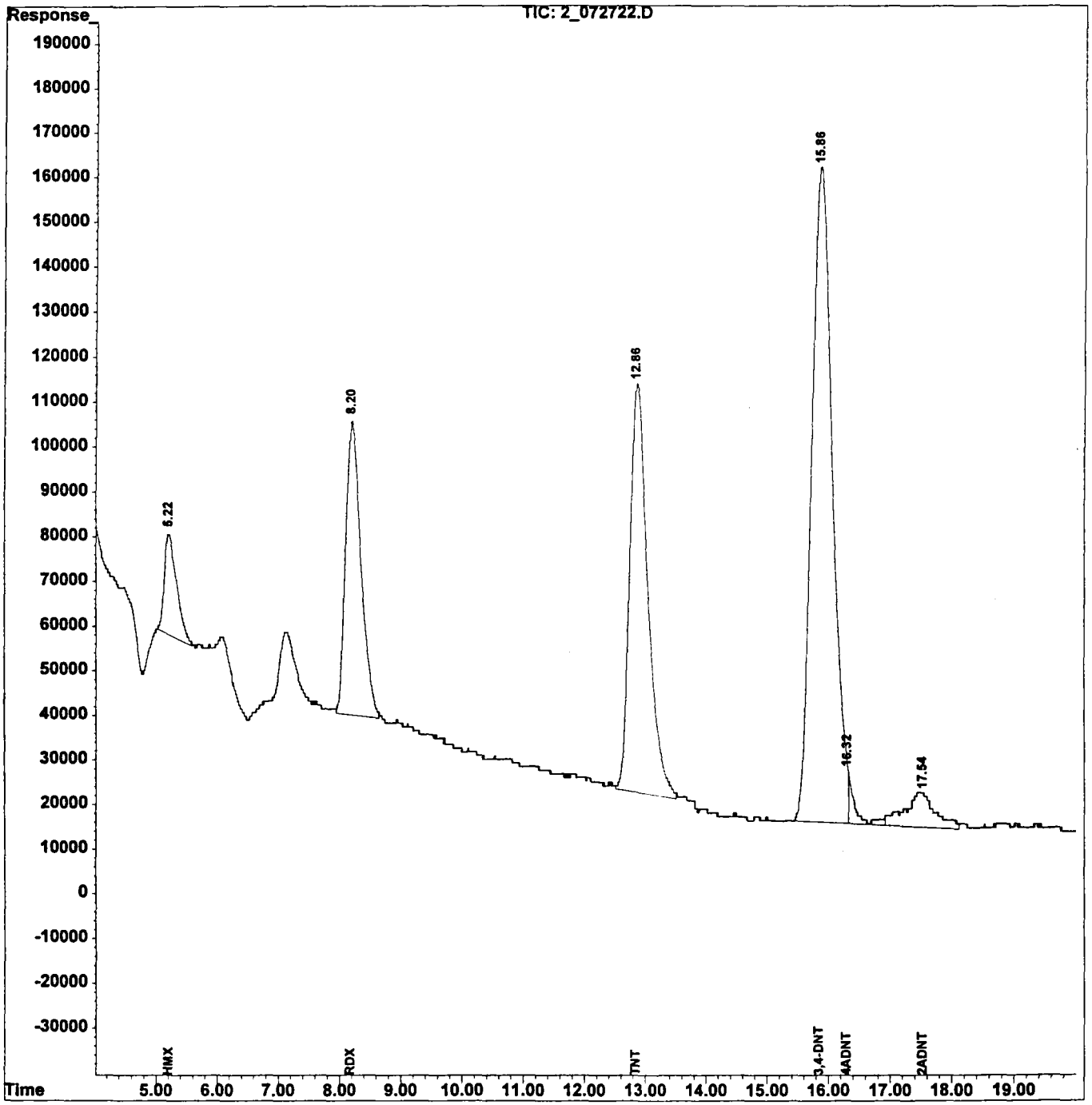
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0727\2_072722.D Vial: 22
Acq On : 27 Jul 1999 23:19 Operator: SM
Sample : 39088.02 Inst : LC2
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 28 16:14 1999 Quant Results File: 200sg27c.RES

Method : f:\hpchem\lc2\data\2_0727\200sg27c.m
Title-Path : - F:\HPCHEM\LC2\DATA\2_0727\
Last Update : Wed Jul 28 13:34:18 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES270FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.02

Sample Amt: 2.0 G % Moisture: 17.8 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
75-11-5	PETN	250	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063046.D Vial: 46
Acq On : 01-Jul-1999, 14:21 Operator: JF
Sample : 39088.02 Inst : LC4
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

07/03/99

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Initial Calibration

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/Kg	Curve
Target Compounds:				
1) PETN	0.00	0	N.D.	A

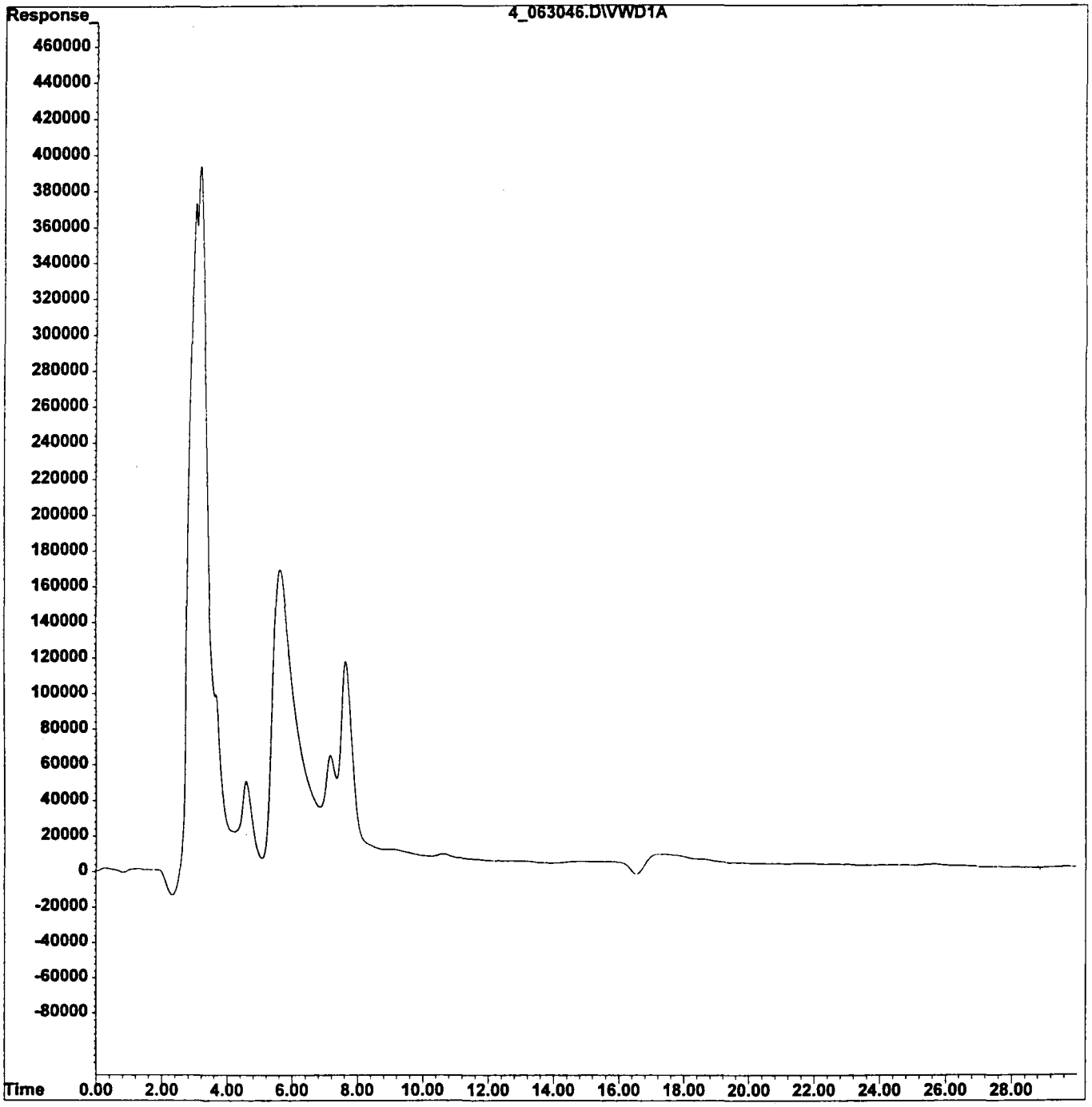
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063046.D Vial: 46
Acq On : 01-Jul-1999, 14:21 Operator: JF
Sample : 39088.02 Inst : LC4
Misc : MFAPES270FD Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES274

Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.08

Sample Amt: 2.0 G % Moisture: 18.6 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 06/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062416.D Vial: 16
Acq On : 25 Jun 1999 06:31 Operator: BW
Sample : 39088.08 Inst : LC3
Misc : MFAPES274 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:25 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.71	44539176	1681.7	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	0.00	0	N.D.		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.	d	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

JM
6-25-99

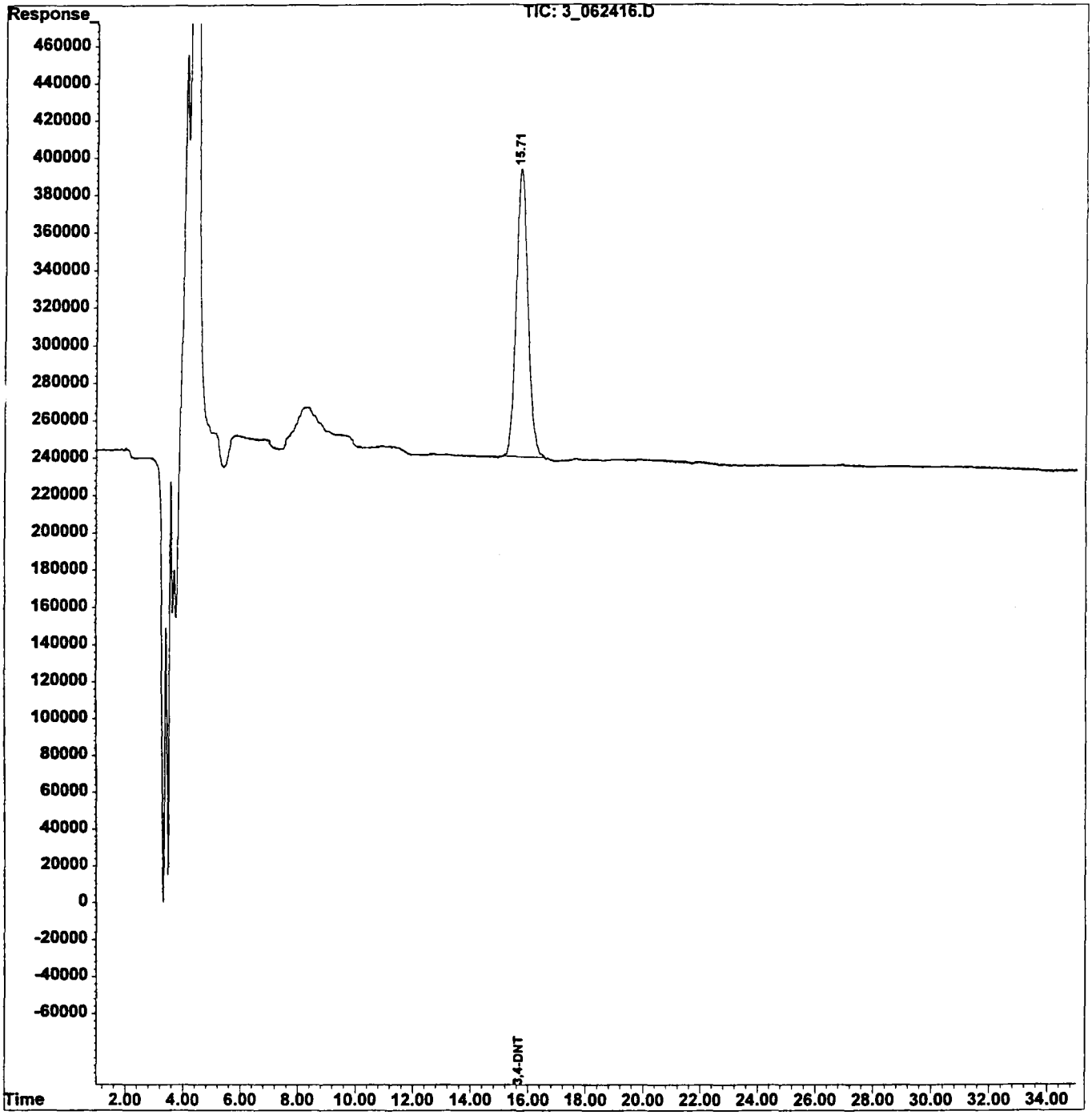
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062416.D Vial: 16
Acq On : 25 Jun 1999 06:31 Operator: BW
Sample : 39088.08 Inst : LC3
Misc : MFAPES274 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:25 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES274

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.08

Sample Amt: 2.0 G % Moisture: 18.6 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
75-11-5	PETN	250	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063050.D Vial: 50
Acq On : 01-Jul-1999, 16:33 Operator: JF
Sample : 39088.08 Inst : LC4
Misc : MFAPES274 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:46 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Initial Calibration

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/Kg		Curve
Target Compounds:					
1) PETN	9.32W	484147	92.5	m	A

07/05/99

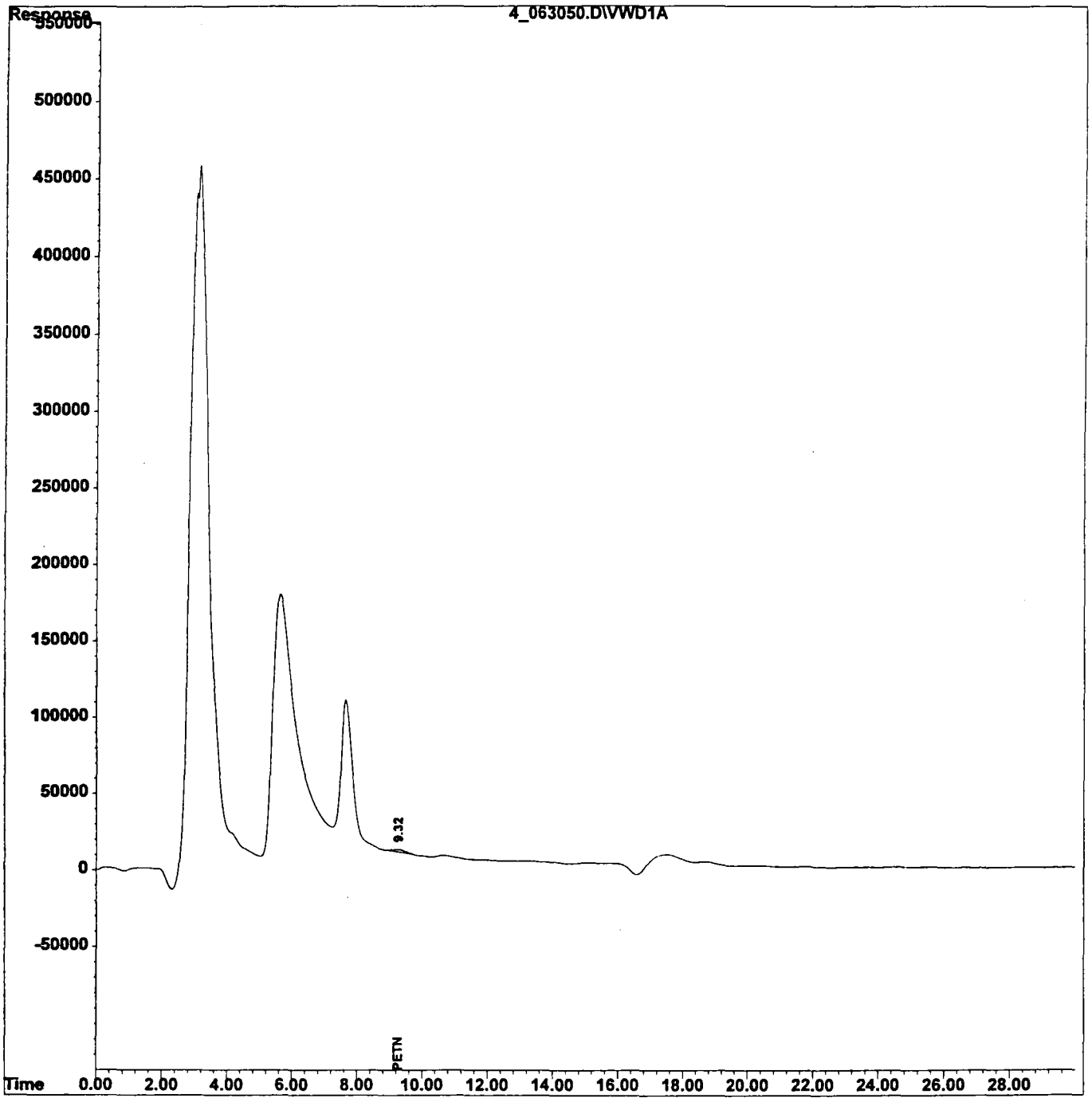
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063050.D Vial: 50
Acq On : 01-Jul-1999, 16:33 Operator: JF
Sample : 39088.08 Inst : LC4
Misc : MFAPES274 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:46 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES276

Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.10

Sample Amt: 2.0 G % Moisture: 17.7 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 06/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	7290	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062417.D Vial: 17
Acq On : 25 Jun 1999 07:16 Operator: BW
Sample : 39088.10 Inst : LC3
Misc : MFAPES276 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:28 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.75	46141211	1742.2	m	A
Target Compounds:					
1) HMX	5.15	14915460	665.4	*	A
2) RDX	7.73	190641445	7288.5	m*	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.	d	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	18.50	2855022	62.6	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

JM
6-25-99
Reanalysis
06/26/99
JO

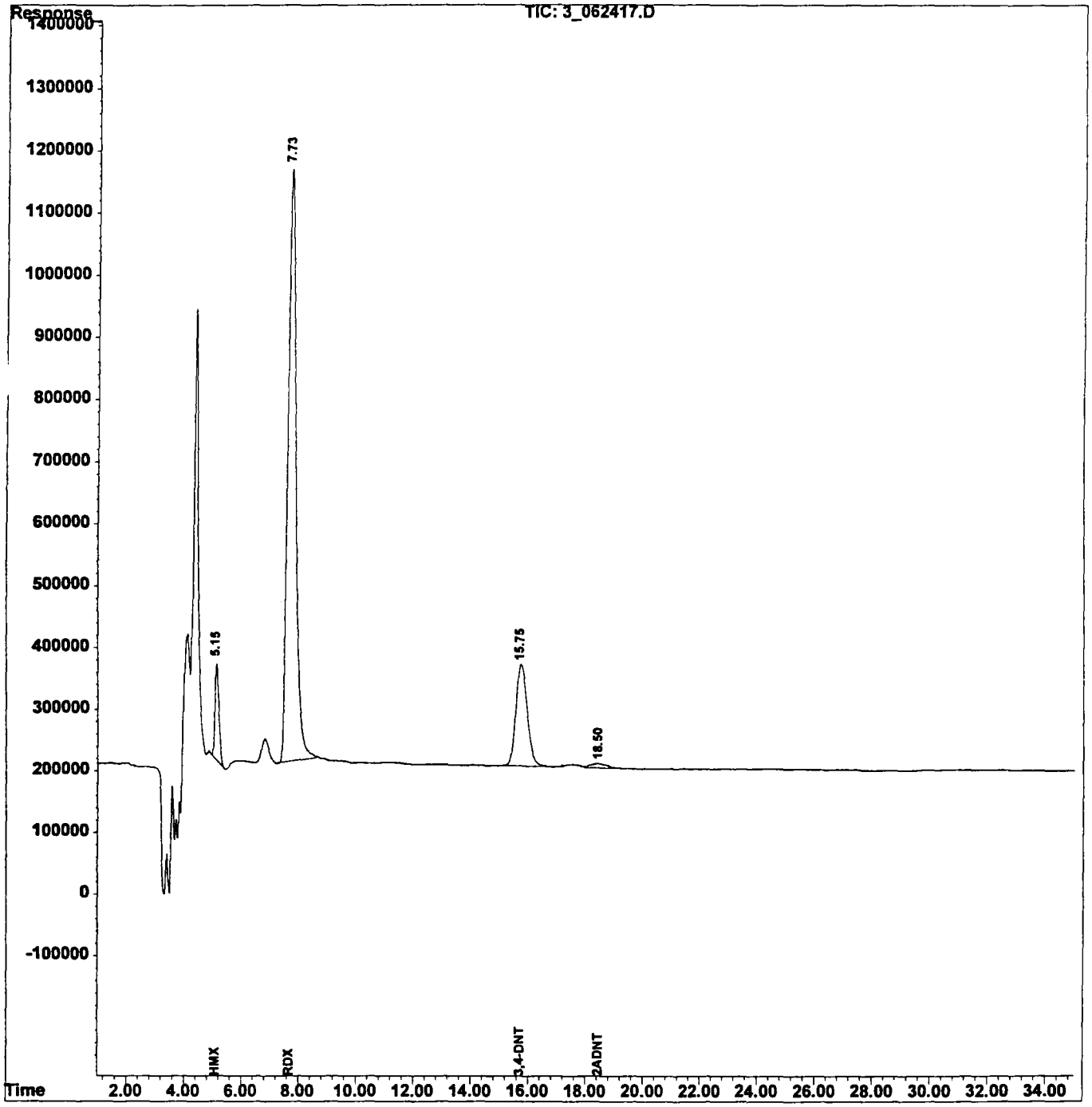
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062417.D Vial: 17
Acq On : 25 Jun 1999 07:16 Operator: BW
Sample : 39088.10 Inst : LC3
Misc : MFAPES276 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 25 12:28 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Fri Jun 25 11:28:10 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062449.D Vial: 38
Acq On : 25 Jun 1999 15:33 Operator: SM
Sample : 39088.10 Inst : LC5
Misc : MFAPES276 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 25 17:30 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 17:26:04 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

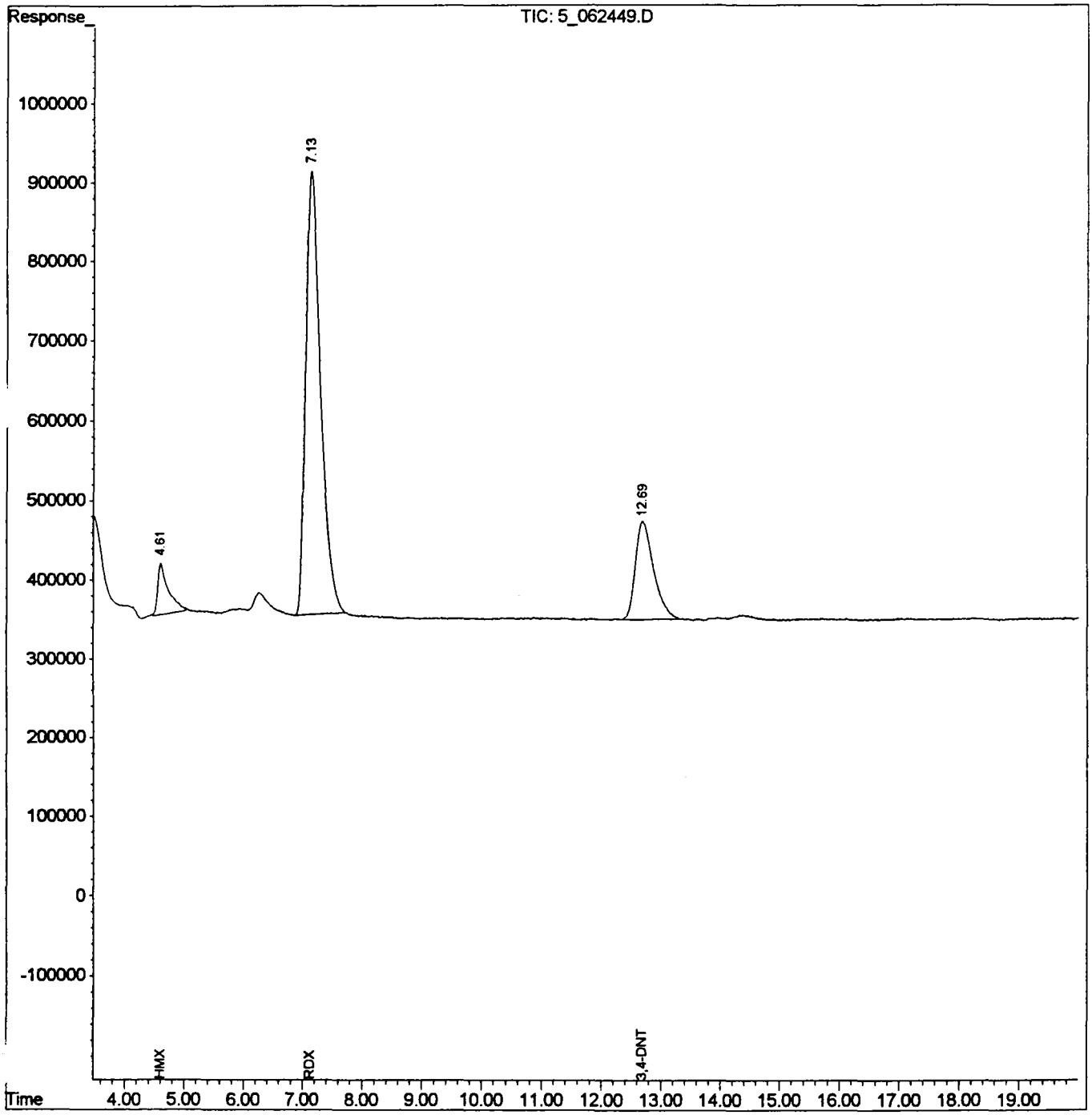
Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.69	26640842	2250.8	m	A
Target Compounds:					
1) A HMX	4.61W	8279942	790.2	m	A
2) B RDX	7.13	96197083	8784.8		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	0.00	0	N.D.		A
9) B 4ADNT	0.00	0	N.D.		A
10) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.	d	A
12) B 24DNT	0.00	0	N.D.	d	A

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062449.D Vial: 38
Acq On : 25 Jun 1999 15:33 Operator: SM
Sample : 39088.10 Inst : LC5
Misc : MFAPES276 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 25 17:30 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 17:26:04 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES276

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.10

Sample Amt: 2.0 G % Moisture: 17.7 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
75-11-5	PETN	250	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063051.D Vial: 51
Acq On : 01-Jul-1999, 17:07 Operator: JF
Sample : 39088.10 Inst : LC4
Misc : MFAPES276 Multiplr: 10.0000
ntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Initial Calibration

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/Kg	Curve
Target Compounds:				
1) PETN	0.00	0	N.D.	A

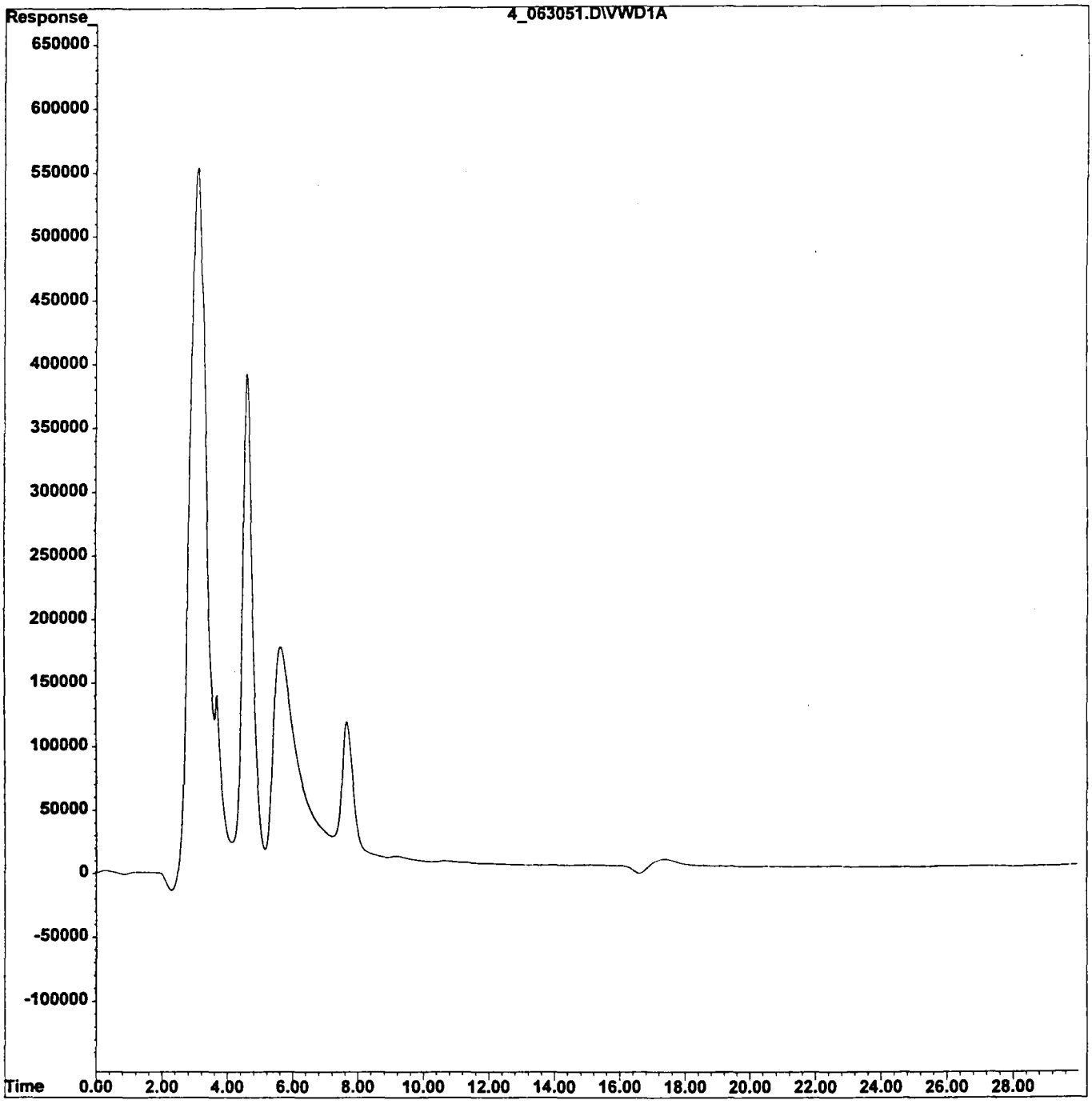
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063051.D Vial: 51
Acq On : 01-Jul-1999, 17:07 Operator: JF
Sample : 39088.10 Inst : LC4
Misc : MFAPES276 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:38 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES278

Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.12

Sample Amt: 2.0 G % Moisture: 17.7 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 06/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	2920	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062420.D Vial: 20
Acq On : 25 Jun 1999 09:29 Operator: BW
Sample : 39088.12 Inst : LC3
Misc : MFAPES278 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 26 10:39 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Sat Jun 26 10:29:16 1999
Response via : Initial Calibration

07/31/99

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.72	47430497	1790.9	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	7.71	76342019	2918.7	m*	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.	d	A
9) 4ADNT	17.61	412419	10.4	mJ	A
10) 2ADNT	0.00	0	N.D.	d	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

6-26-99

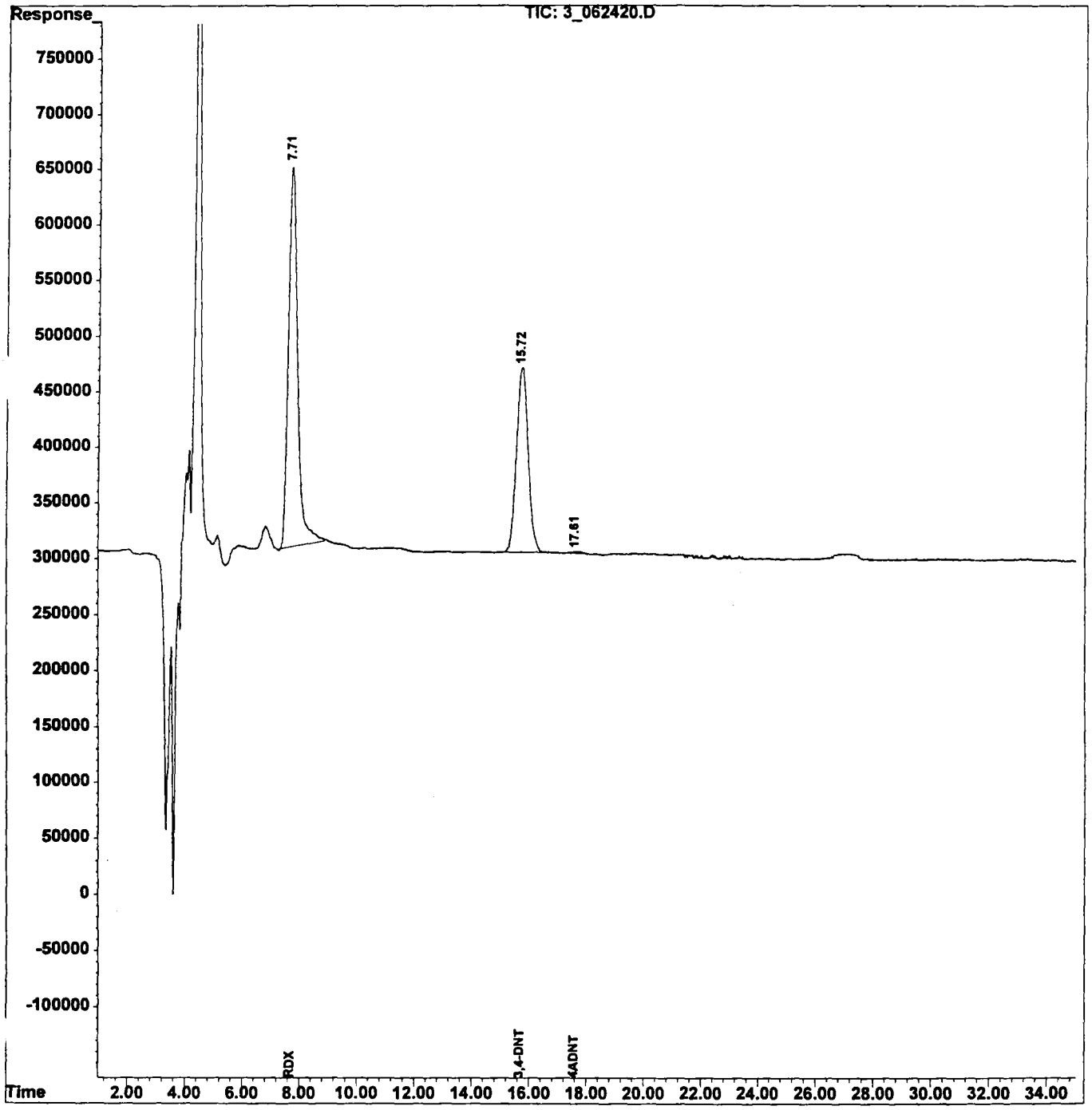
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0624\3_062420.D Vial: 20
Acq On : 25 Jun 1999 09:29 Operator: BW
Sample : 39088.12 Inst : LC3
Misc : MFAPES278 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jun 26 10:39 1999 Quant Results File: 200SF24.RES

Method : F:\HPCHEM\LC3\DATA\3_0624\200SF24.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0624\
Last Update : Sat Jun 26 10:29:16 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062443.D Vial: 32
Acq On : 25 Jun 1999 11:34 Operator: SM
Sample : 39088.12 Inst : LC5
Misc : MFAPES278 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 25 15:01 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 14:54:40 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

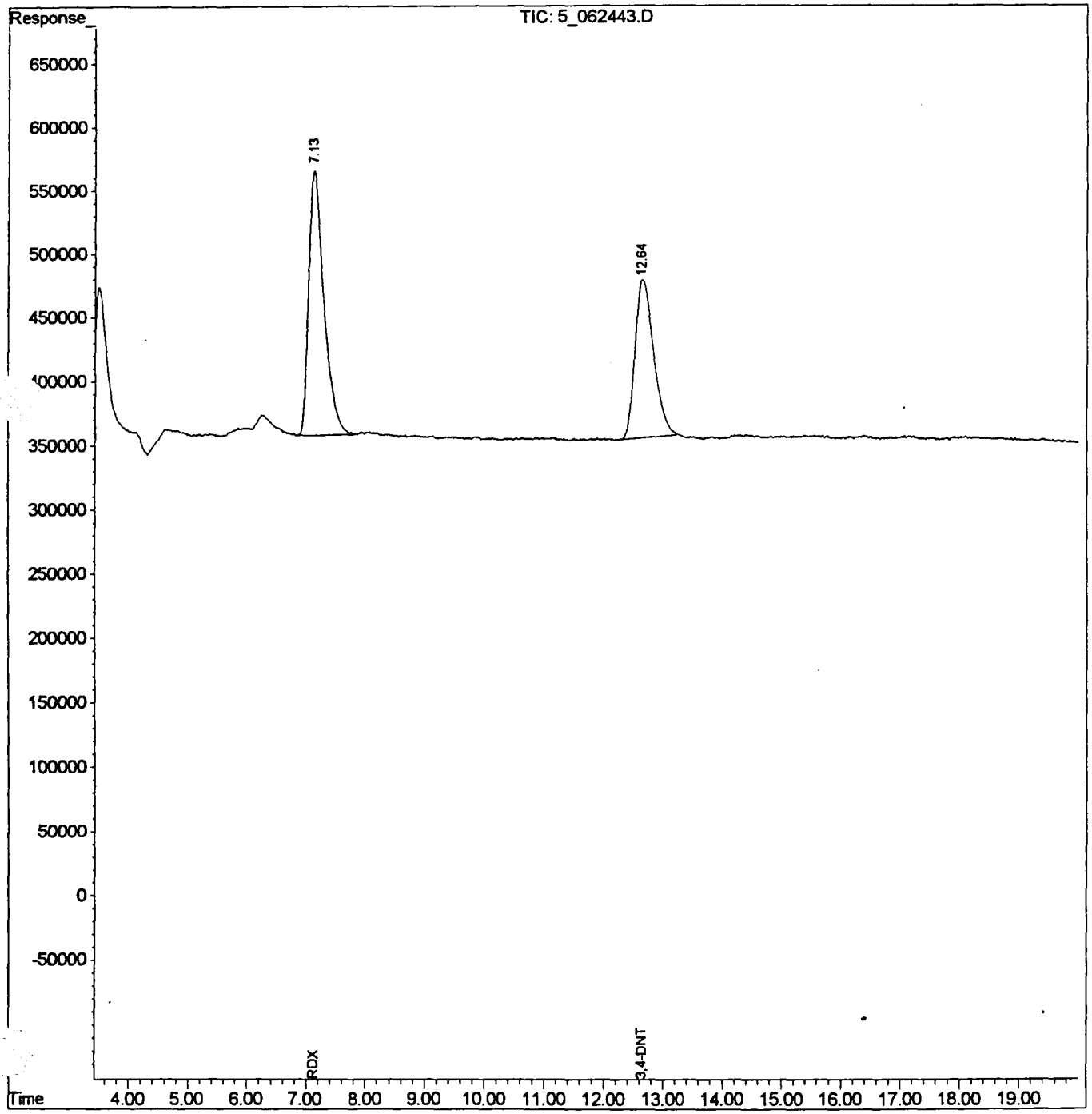
Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.64W	26730496	2258.4	m	A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.13W	37244269	3401.2	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	0.00	0	N.D.		A
9) B 4ADNT	0.00	0	N.D.		A
10) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.	d	A
12) B 24DNT	0.00	0	N.D.	d	A

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Data File : F:\HPCHEM\LC5\DATA\5_0624\5_062443.D Vial: 32
Acq On : 25 Jun 1999 11:34 Operator: SM
Sample : 39088.12 Inst : LC5
Misc : MFAPES278 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 25 15:01 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0624\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Fri Jun 25 14:54:40 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFAPES278

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) SOIL Lab Sample ID: 39088.12

Sample Amt: 2.0 G % Moisture: 17.7 Date Received: 06/22/99

Extraction Volume: 10 ML Date Extracted: 06/22/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
75-11-5	PETN	250	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063052.D Vial: 52
Acq On : 01-Jul-1999, 17:40 Operator: JF
Sample : 39088.12 Inst : ~~G1314A~~ LC4
Misc : MFAPES278 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 5 10:39 1999 Quant Results File: 201SF30.RES

JF 07/05/99

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Initial Calibration

07/05/99

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/Kg	Curve
Target Compounds:				
1) PETN	0.00	0	N.D.	A

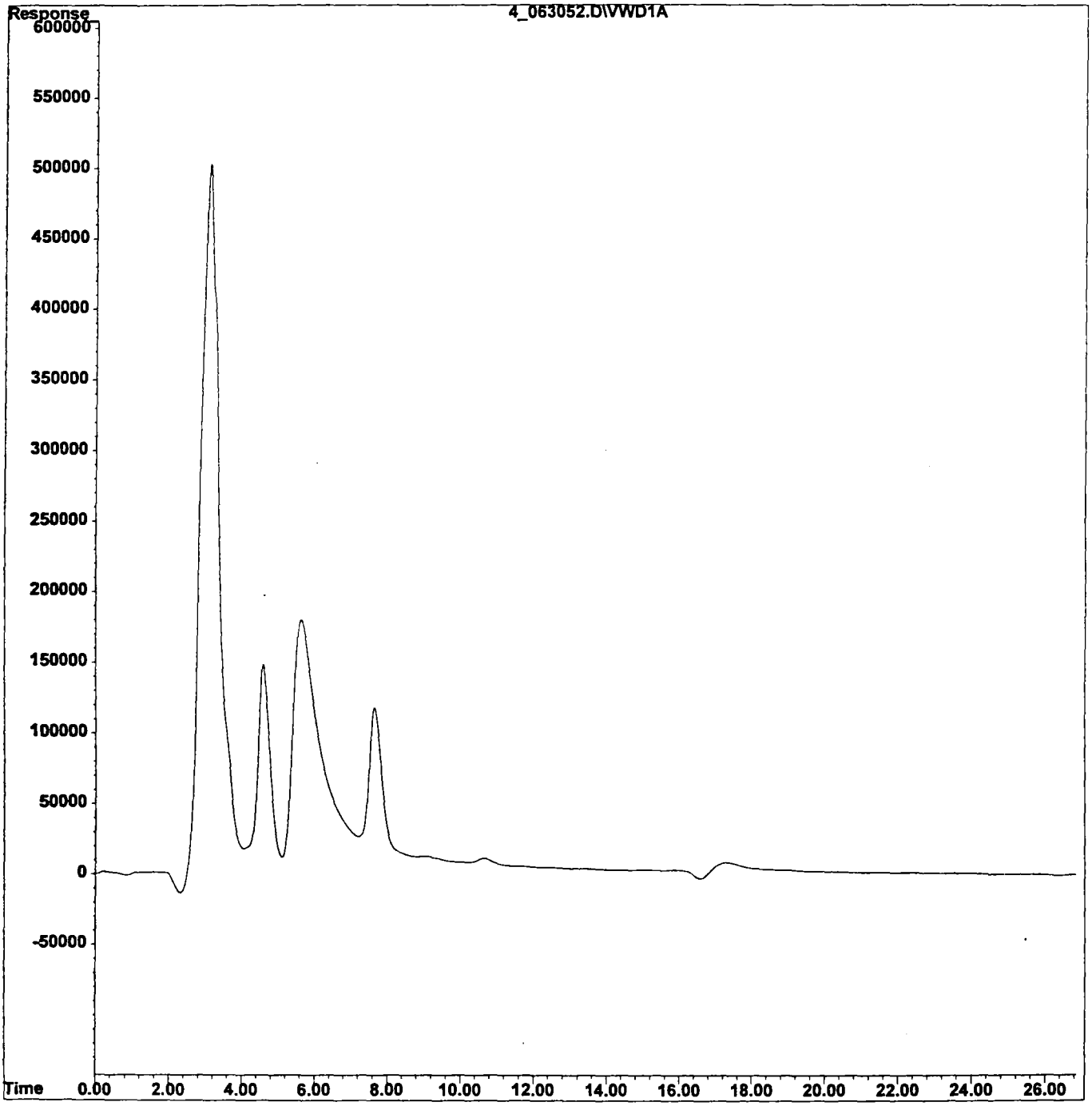
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.
4_063052.D 201SF30.M Mon Jul 05 11:18:45 1999

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063052.D Vial: 52
Acq On : 01-Jul-1999, 17:40 Operator: JF
Sample : 39088.12 Inst : ~~G1314A~~ LC4
Misc : MFAPES278 Multiplr: 10.0000 07/05/99
IntFile : EVENTS.E
Quant Time: Jul 5 10:39 1999 Quant Results File: 201SF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201SF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Fri Jul 02 15:18:31 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFARB062199

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) WATER Lab Sample ID: 39088.17

Sample Amt: 5 ML % Moisture: _____ Date Received: 06/22/99

Extraction Volume: 5 ML Date Extracted: 06/23/99

Extraction Method: SEPF Date Analyzed: 06/26/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		200.00	

FORM I

Data File : F:\HPCHEM\LC1\DATA\1_0625\1_062534.D Vial: 34
Acq On : 26 Jun 1999 13:33 Operator: SM
Sample : 39088.17 Inst : LC1
Misc : MFARB062199 Multiplr: 2.0000
IntFile : EVENTS.E
Quant Time: Jul 15 15:48 1999 Quant Results File: 200WF25H.RES

Method : F:\HPCHEM\LC1\DATA\1_0625\200WF25H.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0625\
Last Update : Mon Jun 28 10:39:24 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/L		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.93	11130005	179.8	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	0.00	0	N.D.		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

Jm 07/15/99

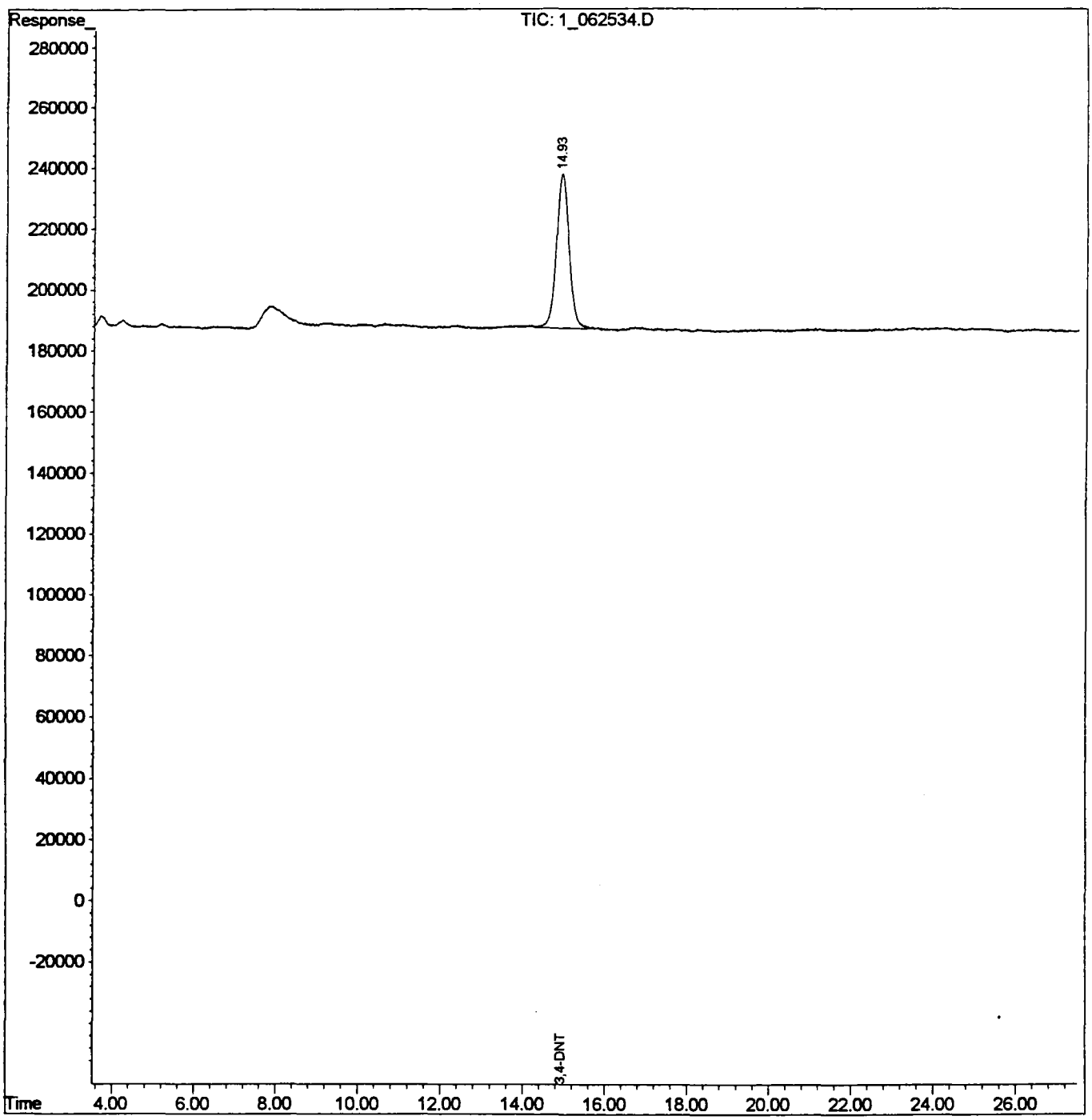
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0625\1_062534.D Vial: 34
Acq On : 26 Jun 1999 13:33 Operator: SM
Sample : 39088.17 Inst : LC1
Misc : MFARB062199 Multiplr: 2.0000
IntFile : EVENTS.E
Quant Time: Jul 15 15:48 1999 Quant Results File: 200WF25H.RES

Method : F:\HPCHEM\LC1\DATA\1_0625\200WF25H.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0625\
Last Update : Mon Jun 28 10:39:24 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
PETN ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MFARB062199

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

Matrix: (soil/water) WATER Lab Sample ID: 39088.17

Sample Amt: 5 ML % Moisture: _____ Date Received: 06/22/99

Extraction Volume: 5 ML Date Extracted: 06/25/99

Extraction Method: SEPF Date Analyzed: 06/30/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
75-11-5	PETN	20.0	U

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063015.D Vial: 15
Acq On : 30-Jun-1999, 21:14 Operator: JF
Sample : 39088.17 Inst : LC4
Misc : MFARB062199 Multiplr: 2.0000
IntFile : EVENTS.E
Quant Time: Jul 1 9:33 1999 Quant Results File: 201WF30.RES

07/03/99

Method : F:\HPCHEM\LC4\DATA\4_0630\201WF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Thu Jul 01 09:24:29 1999
Response via : Initial Calibration

Volume Inj. : 200uL
Signal Phase : ODS II

Compound	R.T.	Response	ug/L	Curve
Target Compounds:				
1) PETN	0.00	0	N.D.	L

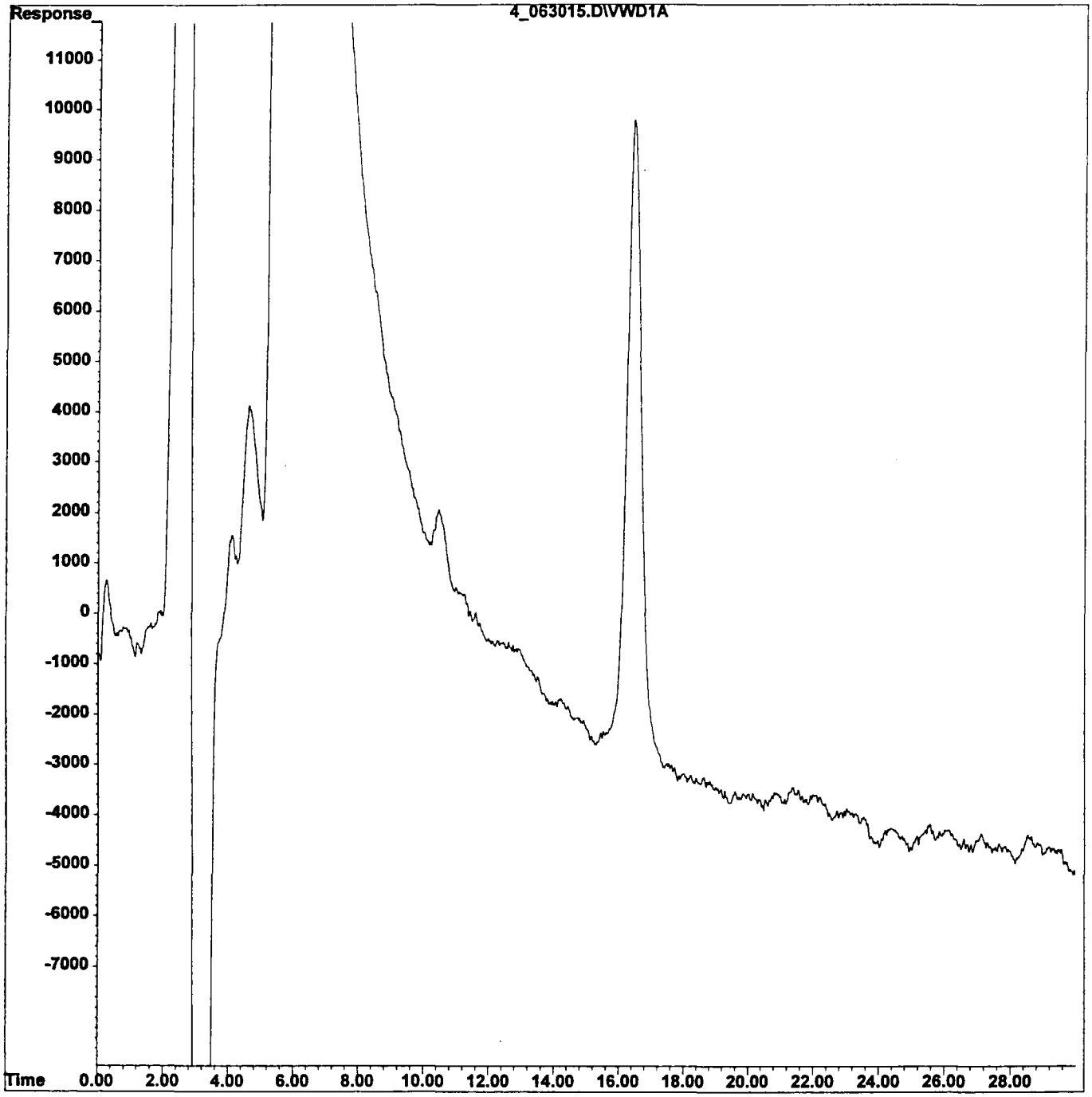
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0630\4_063015.D Vial: 15
Acq On : 30-Jun-1999, 21:14 Operator: JF
Sample : 39088.17 Inst : LC4
Misc : MFARB062199 Multiplr: 2.0000
IntFile : EVENTS.E
Quant Time: Jul 1 9:33 1999 Quant Results File: 201WF30.RES

Method : F:\HPCHEM\LC4\DATA\4_0630\201WF30.M
Title-Path : - F:\HPCHEM\LC4\DATA\4_0630\
Last Update : Thu Jul 01 09:24:29 1999
Response via : Multiple Level Calibration

Volume Inj. : 200uL
Signal Phase : ODS II



8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: METASIL Init. Calib. Date(s): 06/19/99 06/20/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.36

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/19/99	2044	0.00	*
02	EXPL1A	L1A 5-186	06/19/99	2149	12.27	
03	EXPL2A	L2A 5-185	06/19/99	2221	12.27	
04	EXPL3A	L3A 6-5	06/19/99	2254	12.31	
05	EXPL4A	L4A 5-183	06/19/99	2326	12.25	
06	EXPL5A	L5A 5-184	06/19/99	2359	12.27	
07	EXPL1B	L1B 5-191	06/20/99	0031	0.00	*
08	EXPL2B	L2B 5-190	06/20/99	0104	0.00	*
09	EXPL3B	L3B 6-3	06/20/99	0137	0.00	*
10	EXPL4B	L4B 5-188	06/20/99	0209	0.00	*
11	EXPL5B	L5B 5-205	06/20/99	0242	0.00	*
12	EXPL3A	L3A 6-03	06/24/99	2235	12.44	
13	EXPL3B	L3B 6-05	06/24/99	2307	0.00	*
14	BL0622SF	BL0622SF	06/25/99	0432	12.41	
15	EXPL3A	L3A 6-05	06/25/99	0505	12.38	
16	EXPL3B	L3B 6-03	06/25/99	0537	0.00	*
17	MFAPES270	39088.01	06/25/99	0610	12.10	
18	MFAPES274	39088.08	06/25/99	1029	12.36	
19	MFAPES278	39088.12	06/25/99	1134	12.64	
20	MFAPES280	39088.14	06/25/99	1207	12.72	
21	EXPL3A	L3A 6-05	06/25/99	1344	12.67	
22	EXPL3B	L3B 6-03	06/25/99	1417	0.00	*
23	MFAPES276	39088.10	06/25/99	1533	12.69	
24	EXPL3A	L3A 6-05	06/25/99	1606	12.60	
25	EXPL3B	L3B 6-03	06/25/99	1638	0.00	*
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: CARBOSORB Init. Calib. Date(s): 06/24/99 06/24/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.38

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/24/99	1922	0.00	*
02	EXPL1	L1 5-190A	06/24/99	2051	15.33	
03	EXPL2	L2 5-173	06/24/99	2136	15.31	
04	EXPL3	L3 6-34	06/24/99	2220	15.33	
05	EXPL4	L4 5-192	06/24/99	2305	15.35	
06	EXPL5	L5 5-141	06/24/99	2349	15.37	
07	BL0622SF	BL0622SF	06/25/99	0034	15.42	
08	LC0622SF	LC0622SF	06/25/99	0119	15.56	
09	LD0622SF	LD0622SF	06/25/99	0203	15.58	
10	MFAPES270	39088.01	06/25/99	0248	15.54	
11	MFAPES270MS	39088.01MS	06/25/99	0332	15.63	
12	MFAPES270MSD	39088.01MSD	06/25/99	0417	15.67	
13	MFAPES270FD	39088.02	06/25/99	0502	15.68	
14	MFAPES272	39088.06	06/25/99	0546	15.70	
15	MFAPES274	39088.08	06/25/99	0631	15.71	
16	MFAPES276	39088.10	06/25/99	0716	15.75	
17	EXPL3	L3 6-34	06/25/99	0845	15.73	
18	MFAPES278	39088.12	06/25/99	0929	15.72	
19	MFAPES280	39088.14	06/25/99	1014	15.74	
20	EXPL3	L3 6-34	06/25/99	1655	15.22	
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: CARBOSORB Init. Calib. Date(s): 06/25/99 06/25/99

Instrument ID: LC1

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 14.81

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/25/99	1846	0.00	*
02	EXPL1	L1 6-41	06/25/99	2015	14.75	
03	EXPL2	L2 6-40	06/25/99	2100	14.92	
04	EXPL3	L3 6-39	06/25/99	2145	14.71	
05	EXPL4	L4 6-38	06/25/99	2229	14.86	
06	EXPL5	L5 5-102	06/25/99	2314	14.74	
07	EXPL3	L3 6-39	06/26/99	0811	14.78	
08	BL0623WH	BL0623WH	06/26/99	1119	14.91	
09	LC0623WH	LC0623WH	06/26/99	1204	15.04	
10	LD0623WH	LD0623WH	06/26/99	1248	15.01	
11	MFARB062199	39088.17	06/26/99	1333	14.93	
12	MFARB062199MS	39088.17MS	06/26/99	1418	14.95	
13	MFARB062199MSD	39088.17MSD	06/26/99	1503	14.95	
14	EXPL3	L3 6-39	06/26/99	1556	14.92	
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: METASIL Init. Calib. Date(s): 07/27/99 07/27/99

Instrument ID: LC2

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.76

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	07/27/99	1323	0.00	*
02	EXPL1A	L1A 6-95	07/27/99	1352	15.74	
03	EXPL2A	L2A 6-94	07/27/99	1420	15.71	
04	EXPL3A	L3A 6-93	07/27/99	1448	15.69	
05	EXPL4A	L4A 6-101	07/27/99	1518	15.66	
06	EXPL5A	L5A 6-91	07/27/99	1547	15.64	
07	EXPL1B	L1B 6-85	07/27/99	1615	0.00	*
08	EXPL2B	L2B 6-86	07/27/99	1643	0.00	*
09	EXPL3B	L3B 6-87	07/27/99	1711	0.00	*
10	EXPL4B	L4B 6-88	07/27/99	1740	0.00	*
11	EXPL5B	L5B 6-89	07/27/99	1808	0.00	*
12	EXPL3B	L3B 6-87	07/27/99	2154	0.00	*
13	EXPL3A	L3A 6-93	07/27/99	2222	15.86	
14	MFAPES270FD	39088.02	07/27/99	2319	15.86	
15	MFAPES272	39088.06	07/27/99	2347	15.83	
16	EXPL3A	L3A 6-93	07/28/99	0448	16.06	
17	EXPL3B	L3B 6-87	07/28/99	0516	0.00	*
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
PETN ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: ODS II Init. Calib. Date(s): 06/30/99 06/30/99

Instrument ID: LC4

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
01	INSTRUMENT BLANK	INSTRUMENT B	06/30/99	1330
02	PETNL1	L1 6-42	06/30/99	1436
03	PETNL2	L2 6-19	06/30/99	1509
04	PETNL3	L3 6-18	06/30/99	1542
05	PETNL4	L4 6-17	06/30/99	1615
06	PETNL5	L5 6-16	06/30/99	1648
07	PETNL3	ICV 6-26	06/30/99	1722
08	BL0625WH	BL0625WH	06/30/99	1755
09	LC0625WH	LC0625WH	06/30/99	1828
10	LD0625WH	LD0625WH	06/30/99	1901
11	MFARB062199	39088.17	06/30/99	2114
12	PETNL3	L3 6-18	06/30/99	2147
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
PETN ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088

LC Column: ODS II Init. Calib. Date(s): 06/30/99 07/01/99

Instrument ID: LC4

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
01	INSTRUMENT BLANK	INSTRUMENT B	06/30/99	2253
02	PETNL1	L1 6-42	06/30/99	2359
03	PETNL2	L2 6-19	07/01/99	0032
04	PETNL3	L3 6-18	07/01/99	0106
05	PETNL4	L4 6-17	07/01/99	0139
06	PETNL5	L5 6-16	07/01/99	0212
07	PETNL3	ICV 6-26	07/01/99	0245
08	PETNL3	L3 6-37	07/01/99	0849
09	BL0622SG	BL0622SG	07/01/99	1102
10	LC0622SG	LC0622SG	07/01/99	1135
11	LD0622SG	LD0622SG	07/01/99	1208
12	MFAPES270	39088.01	07/01/99	1241
13	MFAPES270MS	39088.01MS	07/01/99	1315
14	MFAPES270MSD	39088.01MSD	07/01/99	1348
15	MFAPES270FD	39088.02	07/01/99	1421
16	MFAPES272	39088.06	07/01/99	1454
17	PETNL5	L5 6-62	07/01/99	1527
18	MFAPES274	39088.08	07/01/99	1633
19	MFAPES276	39088.10	07/01/99	1707
20	MFAPES278	39088.12	07/01/99	1740
21	MFAPES280	39088.14	07/01/99	1813
22	PETNL3	L3 6-37	07/01/99	1846
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

\b Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 06/24/99 06/24/99

Method: 200SF24

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	208356000	235120271	221601286
RDX	276661542	284014192	248437530
TNB	584964722	608033444	550353980
DNB	591005800	676106360	638191500
TETRYL	285252455	320250182	327734580
NB	302525250	340434040	324576190
TNT	452099750	502914363	504048515
4ADNT	390915571	416911000	381949897
2ADNT	461805357	463485543	449144437
26DNT	330190625	348417742	309699578
24DNT	598686571	598282014	580825306
2NT	284593100	246653542	234639605
4NT	200159300	167017082	153280319
3NT	244890600	206096432	200008283
3,4-DNT	259474067	280250260	248666904

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	220847543	234909148	224166850	5.00
RDX	239422853	259287969	261564817	7.15
TNB	534246258	571467604	569813202	5.07
DNB	635776674	680611035	644338274	5.64
TETRYL	320793402	311071822	313020488	5.31
NB	327139496	348577600	328650515	5.35
TNT	471552451	520023037	490127623	5.63
4ADNT	378800993	415511176	396817727	4.60
2ADNT	440544593	465261156	456048217	2.35
26DNT	310230758	344896685	328687078	5.60
24DNT	590254387	606637401	594937136	1.65
2NT	234120976	251033082	250208061	8.23
4NT	153940539	165683705	168016189	11.35
3NT	202497642	216773385	214053268	8.59
3,4-DNT	266014191	269839725	264849029	4.44
MEAN RSD				5.73

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC3 Method: 200SF24

LC Column: CARBOSORB Init. Calib Date(s): 06/24/99 06/24/99

Client Sample No.: EXPL3 Date Analyzed : 06/25/99

Lab Sample ID : L3 6-34 Time Analyzed : 0845

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.15	5.06	5.16	224928281	224166850	-0.3
RDX	7.71	7.43	7.77	255529568	261564817	2.3
TNB	10.29	9.96	10.34	559493493	569813202	1.8
DNB	12.67	12.14	12.76	645410892	644338274	-0.2
TETRYL	13.63	12.91	13.75	320345615	313020488	-2.3
NB	14.39	13.79	14.47	323462084	328650515	1.6
TNT	16.19	15.52	16.30	503976840	490127623	-2.8
4ADNT	17.42	16.22	17.64	391382943	396817727	1.4
2ADNT	18.41	17.06	18.66	419072631	456048217	8.1
26DNT	19.14	18.15	19.31	336815412	328687078	-2.5
24DNT	19.85	18.77	20.03	563856023	594937136	5.2
2NT	23.29	22.10	23.48	233741000	250208061	6.6
4NT	24.95	23.59	25.17	154464626	168016189	8.1
3NT	26.88	25.44	27.12	204851263	214053268	4.3
3,4-DNT	15.73	14.89	15.87	255101812	264849029	3.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC3 Method: 200SF24

LC Column: CARBOSORB Init. Calib Date(s): 06/24/99 06/24/99

Client Sample No.: EXPL3 Date Analyzed : 06/25/99

Lab Sample ID : L3 6-34 Time Analyzed : 1655

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.10	5.06	5.16	228164493	224166850	-1.8
RDX	7.53	7.43	7.77	252424553	261564817	3.5
TNB	10.09	9.96	10.34	561412558	569813202	1.5
DNB	12.34	12.14	12.76	654245988	644338274	-1.5
TETRYL	13.20	12.91	13.75	318282675	313020488	-1.7
NB	14.03	13.79	14.47	329331293	328650515	-0.2
TNT	15.79	15.52	16.30	488840803	490127623	0.3
4ADNT	16.64	16.22	17.64	394322924	396817727	0.6
2ADNT	17.55	17.06	18.66	459842400	456048217	-0.8
26DNT	18.53	18.15	19.31	319032035	328687078	2.9
24DNT	19.17	18.77	20.03	585068665	594937136	1.7
2NT	22.57	22.10	23.48	237252527	250208061	5.2
4NT	24.13	23.59	25.17	158477150	168016189	5.7
3NT	26.00	25.44	27.12	204563830	214053268	4.4
3,4-DNT	15.22	14.89	15.87	268459122	264849029	-1.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

HIGH WATER EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.010	0.096	0.388	1.54	6.16
RDX	0.004	0.037	0.151	0.598	2.39
TNB	0.003	0.028	0.113	0.450	1.80
DNB	0.002	0.016	0.063	0.251	1.00
TETRYL	0.003	0.034	0.140	0.554	2.21
NB	0.003	0.031	0.127	0.502	2.01
TNT	0.003	0.025	0.101	0.402	1.61
4ADNT	0.002	0.022	0.089	0.352	1.41
2ADNT	0.002	0.022	0.088	0.351	1.40
26DNT	0.004	0.037	0.150	0.596	2.38
24DNT	0.002	0.021	0.087	0.344	1.37
2NT	0.003	0.031	0.125	0.495	1.98
4NT	0.003	0.031	0.126	0.499	2.00
3NT	0.003	0.031	0.126	0.499	2.00
3,4-DNT	0.005	0.046	0.186	0.736	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/24/99 06/24/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.11	5.11	5.11	5.11	5.11
RDX	7.60	7.58	7.58	7.58	7.59
TNB	10.15	10.13	10.13	10.14	10.15
DNB	12.43	12.41	12.42	12.44	12.45
TETRYL	13.28	13.27	13.29	13.31	13.34
NB	14.09	14.09	14.10	14.12	14.13
TNT	15.86	15.86	15.86	15.89	15.91
4ADNT	16.90	16.85	16.86	16.89	16.94
2ADNT	17.76	17.77	17.80	17.84	17.89
26DNT	18.70	18.64	18.67	18.70	18.73
24DNT	19.35	19.33	19.34	19.36	19.40
2NT	22.72	22.68	22.72	22.75	22.79
4NT	24.26	24.28	24.31	24.34	24.38
3NT	26.22	26.16	26.19	26.23	26.28
3,4-DNT	15.33	15.31	15.33	15.35	15.37

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	5.15	5.10
RDX	7.71	7.53
TNB	10.29	10.09
DNB	12.67	12.34
TETRYL	13.63	13.20
NB	14.38	14.03
TNT	16.19	15.79
4ADNT	17.42	16.64
2ADNT	18.41	17.55
26DNT	19.14	18.53
24DNT	19.85	19.17
2NT	23.29	22.57
4NT	24.95	24.13
3NT	26.88	26.00
3,4-DNT	15.73	15.22

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.11	0.017	0.050	5.06 - 5.16
RDX	7.60	0.055	0.166	7.43 - 7.76
TNB	10.15	0.063	0.190	9.96 - 10.34
DNB	12.45	0.103	0.309	12.14 - 12.76

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/24/99 06/24/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.33	0.139	0.416	12.91 - 13.74
NB	14.13	0.113	0.339	13.79 - 14.47
TNT	15.91	0.130	0.389	15.52 - 16.30
4ADNT	16.93	0.237	0.712	16.22 - 17.64
2ADNT	17.86	0.265	0.795	17.06 - 18.66
26DNT	18.73	0.192	0.577	18.15 - 19.31
24DNT	19.40	0.211	0.634	18.77 - 20.03
2NT	22.79	0.232	0.695	22.10 - 23.48
4NT	24.38	0.264	0.792	23.59 - 25.17
3NT	26.28	0.279	0.837	25.44 - 27.12
3,4-DNT	15.38	0.163	0.488	14.89 - 15.87

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

b Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC5

LC Column: METASIL Date(s) Analyzed: 06/19/99 06/20/99

Method: 200SF20C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	108359800	102092123	102502243
RDX	120375094	118843624	73077464
TNB	269686230	267786110	260374311
DNB	349134098	348293020	218653427
TETRYL	190919200	189131558	181389930
NB	201299354	202510475	127696286
TNT	233380109	234497561	228731722
4ADNT	125541935	128291073	87966911
2ADNT	278317850	288051016	174021845
26DNT	187688740	190451718	180372404
24DNT	303463400	314634241	197079188
3,4-DNT	121686803	117621208	113818210

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	109077659	101904299	104787225	3.44
RDX	118738881	116485547	109504122	18.64
TNB	278700386	261806101	267670628	2.73
DNB	343834737	338416490	319666354	17.71
TETRYL	198002068	187066981	189301947	3.19
NB	199469812	197664769	185728139	17.49
TNT	239373627	225944765	232385557	2.25
4ADNT	116196613	114633923	114526091	13.94
2ADNT	292975394	288946239	264462469	19.23
26DNT	194607072	184421065	187508200	2.92
24DNT	306998726	301461572	284727425	17.30
3,4-DNT	121474799	117194462	118359096	2.78
MEAN RSD				10.13

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC5 Method: 200SPLOC

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/24/99 : 06/24/99

Lab Sample IDs : L3A 6-03 : L3B 6-05 Time Analyzed : 2235 : 2307

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.56	4.46	4.62	105885320	104787225	-1.0
RDX	7.03	6.88	7.06	121045262	109504122	-10.5
TNB	6.85	6.73	6.93	265325152	267670628	0.9
DNB	8.77	8.56	8.80	354661740	319666354	-10.9
TETRYL	10.81	10.45	11.07	161403703	189301947	14.7
NB	9.97	9.69	10.01	203045462	185728139	-9.3
TNT	10.17	9.91	10.35	232403056	232385557	-0.0
4ADNT	13.72	13.09	13.83	124037242	114526091	-8.3
2ADNT	14.09	13.45	14.21	294580818	264462469	-11.4
26DNT	12.95	12.45	13.29	186044651	187508200	0.8
24DNT	12.63	12.21	12.71	318198835	284727425	-11.8
3,4-DNT	12.44	11.93	12.79	116067535	118359096	1.9

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC5 Method: 200SF20C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/25/99 : 06/25/99

Lab Sample IDs : L3A 6-05 : L3B 6-03 Time Analyzed : 0505 : 0537

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.54	4.46	4.62	106336599	104787225	-1.5
RDX	6.97	6.88	7.06	120911770	109504122	-10.4
TNB	6.82	6.73	6.93	269205510	267670628	-0.6
DNB	8.68	8.56	8.80	351947161	319666354	-10.1
TETRYL	10.74	10.45	11.07	177223215	189301947	6.4
NB	9.84	9.69	10.01	205372036	185728139	-10.6
TNT	10.13	9.91	10.35	233689710	232385557	-0.6
4ADNT	13.33	13.09	13.83	122801847	114526091	-7.2
2ADNT	13.69	13.45	14.21	301122354	264462469	-13.9
26DNT	12.90	12.45	13.29	186633275	187508200	0.5
24DNT	12.37	12.21	12.71	321580489	284727425	-12.9
3,4-DNT	12.38	11.93	12.79	117088909	118359096	1.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC5 Method: 200SK..C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/25/99 : 06/25/99

Lab Sample IDs : L3A 6-05 : L3B 6-03 Time Analyzed : 1344 : 1417

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.60	4.46	4.62	102726102	104787225	2.0
RDX	7.10	6.88	7.06	120921776	109504122	-10.4
TNB	6.90	6.73	6.93	260028454	267670628	2.9
DNB	8.84	8.56	8.80	353136827	319666354	-10.5
TETRYL	11.00	10.45	11.07	176565116	189301947	6.7
NB	10.06	9.69	10.01	203215658	185728139	-9.4
TNT	10.30	9.91	10.35	231517280	232385557	0.4
4ADNT	13.92	13.09	13.83	131457843	114526091	-14.8
2ADNT	14.32	13.45	14.21	287038283	264462469	-8.5
26DNT	13.17	12.45	13.29	182833928	187508200	2.5
24DNT	12.77	12.21	12.71	315298749	284727425	-10.7
3,4-DNT	12.67	11.93	12.79	113016767	118359096	4.5

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC5 Method: 200SF20C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/25/99 : 06/25/99

Lab Sample IDs : L3A 6-05 : L3B 6-03 Time Analyzed : 1606 : 1638

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.59	4.46	4.62	102489724	104787225	2.2
RDX	7.12	6.88	7.06	123082634	109504122	-12.4
TNB	6.89	6.73	6.93	257941350	267670628	3.6
DNB	8.86	8.56	8.80	353480672	319666354	-10.6
TETRYL	10.95	10.45	11.07	175744644	189301947	7.2
NB	10.08	9.69	10.01	202489093	185728139	-9.0
TNT	10.27	9.91	10.35	230096684	232385557	1.0
4ADNT	13.94	13.09	13.83	131124450	114526091	-14.5
2ADNT	14.34	13.45	14.21	291650532	264462469	-10.3
26DNT	13.11	12.45	13.29	183104674	187508200	2.3
24DNT	12.79	12.21	12.71	310628846	284727425	-9.1
3,4-DNT	12.60	11.93	12.79	112267078	118359096	5.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

HIGH WATER EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.010	0.096	0.388	1.54	6.16
RDX	0.004	0.037	0.151	0.598	2.39
TNB	0.003	0.028	0.113	0.450	1.80
DNB	0.002	0.016	0.063	0.251	1.00
TETRYL	0.003	0.034	0.140	0.554	2.21
NB	0.003	0.031	0.127	0.502	2.01
TNT	0.003	0.025	0.101	0.402	1.61
4ADNT	0.002	0.022	0.089	0.352	1.41
2ADNT	0.002	0.022	0.088	0.351	1.40
26DNT	0.004	0.037	0.150	0.596	2.38
24DNT	0.002	0.021	0.087	0.344	1.37
2NT	0.003	0.031	0.125	0.495	1.98
4NT	0.003	0.031	0.126	0.499	2.00
3NT	0.003	0.031	0.126	0.499	2.00
3,4-DNT	0.005	0.046	0.186	0.736	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.54	4.53	4.54	4.53	4.52
RDX	6.96	6.94	6.97	6.97	6.94
TNB	6.81	6.81	6.83	6.81	6.80
DNB	8.66	8.65	8.68	8.68	8.64
TETRYL	10.72	10.70	10.74	10.68	10.69
NB	9.83	9.82	9.86	9.85	9.81
TNT	10.08	10.09	10.12	10.08	10.09
4ADNT	13.42	13.42	13.47	13.47	13.42
2ADNT	13.78	13.80	13.87	13.83	13.76
26DNT	12.79	12.78	12.82	12.76	12.78
24DNT	12.44	12.42	12.47	12.46	12.40
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.27	12.27	12.31	12.25	12.27

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	4.56	0.00	4.54	0.00	4.60
RDX	0.00	7.03	0.00	6.97	0.00
TNB	6.85	0.00	6.82	0.00	6.90
DNB	0.00	8.76	0.00	8.68	0.00
TETRYL	10.80	0.00	10.74	0.00	11.00
NB	0.00	9.97	0.00	9.84	0.00
TNT	10.17	0.00	10.13	0.00	10.30
4ADNT	0.00	13.72	0.00	13.33	0.00
2ADNT	0.00	14.09	0.00	13.69	0.00
26DNT	12.95	0.00	12.90	0.00	13.17
24DNT	0.00	12.63	0.00	12.37	0.00
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.44	0.00	12.38	0.00	12.67

COMPOUND	RT CCAL 6	RT CCAL 7	RT CCAL 8
HMX	0.00	4.59	0.00
RDX	7.10	0.00	7.12
TNB	0.00	6.89	0.00
DNB	8.84	0.00	8.86

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	RT CCAL 6	RT CCAL 7	RT CCAL 8
TETRYL	0.00	10.94	0.00
NB	10.06	0.00	10.08
TNT	0.00	10.27	0.00
4ADNT	13.92	0.00	13.94
2ADNT	14.32	0.00	14.34
26DNT	0.00	13.11	0.00
24DNT	12.77	0.00	12.79
2NT	0.00	0.00	0.00
4NT	0.00	0.00	0.00
3NT	0.00	0.00	0.00
3,4-DNT	0.00	12.60	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.54	0.026	0.077	4.46 - 4.62
RDX	6.97	0.030	0.091	6.88 - 7.06
TNB	6.83	0.033	0.098	6.73 - 6.93
DNB	8.68	0.039	0.118	8.56 - 8.80
TETRYL	10.76	0.105	0.314	10.45 - 11.07
NB	9.85	0.054	0.162	9.69 - 10.01
TNT	10.13	0.074	0.223	9.91 - 10.35
4ADNT	13.46	0.122	0.366	13.09 - 13.83
2ADNT	13.83	0.127	0.382	13.45 - 14.21
26DNT	12.87	0.139	0.416	12.45 - 13.28
24DNT	12.46	0.084	0.253	12.21 - 12.71
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	12.36	0.142	0.427	11.93 - 12.79

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC2

LC Column: METASIL Date(s) Analyzed: 07/27/99 07/27/99

Method: 200SG27C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	83427243	86165305	88306958
RDX	93167980	96092188	111119553
TNB	275941261	284235291	284041689
DNB	328999400	337711385	396407412
TETRYL	222932144	228640917	231193902
NB	260003760	272447576	315247680
TNT	289714326	294711251	294901349
4ADNT	97337402	95358459	121706283
2ADNT	305209420	314680828	358313258
26DNT	199589740	210949040	211212492
24DNT	315379640	323936584	380891677
3,4-DNT	199670894	208236033	208115371

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	89238525	87977702	87023147	2.64
RDX	113568586	118877162	106565094	10.60
TNB	285971768	282643074	282566617	1.38
DNB	400412471	413167129	375339559	10.38
TETRYL	232409602	225414318	228118177	1.73
NB	318199038	331858092	299551229	10.47
TNT	296420847	292660867	293681728	0.88
4ADNT	118881051	102673735	107191386	11.47
2ADNT	364658682	394070871	347386612	10.62
26DNT	211776272	209985446	208702598	2.46
24DNT	382624266	394486124	359463658	10.25
3,4-DNT	209026394	205411096	206091958	1.86
MEAN RSD				6.23

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC2 Method: 200SG/C

LC Column: METASIL Init. Calib Date(s): 07/27/99 07/27/99

Client Sample Nos.: EXPL3B : EXPL3A Date Analyzed : 07/27/99 : 06/25/99

Lab Sample IDs : L3B 6-87 : L3B 6-03 Time Analyzed : 2154 : 1638

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.19	5.11	5.25	88287057	87023147	-1.5
RDX	8.19	7.99	8.33	111586852	106565094	-4.7
TNB	8.25	8.16	8.32	285125706	282566617	-0.9
DNB	10.67	10.45	10.83	393501726	375339559	-4.8
TETRYL	13.61	13.19	13.89	225951330	228118177	0.9
NB	12.24	11.98	12.42	314229828	299551229	-4.9
TNT	12.87	12.60	13.04	300641827	293681728	-2.4
4ADNT	17.11	16.42	17.64	104509217	107191386	2.5
2ADNT	17.42	16.69	17.97	372892836	347386612	-7.3
26DNT	16.55	16.02	16.90	211488067	208702598	-1.3
24DNT	15.94	15.52	16.24	381043520	359463658	-6.0
3,4-DNT	15.86	15.31	16.21	209118268	206091958	-1.5

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC2 Method: 200SG27C

LC Column: METASIL Init. Calib Date(s): 07/27/99 07/27/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/28/99 : 07/28/99

Lab Sample IDs : L3A 6-93 : L3B 6-87 Time Analyzed : 0448 : 0516

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.23	5.11	5.25	89961648	87023147	-3.4
RDX	8.27	7.99	8.33	114820103	106565094	-7.7
TNB	8.28	8.16	8.32	295403784	282566617	-4.5
DNB	10.75	10.45	10.83	406356148	375339559	-8.3
TETRYL	13.77	13.19	13.89	233611801	228118177	-2.4
NB	12.34	11.98	12.42	316419013	299551229	-5.6
TNT	12.96	12.60	13.04	310824750	293681728	-5.8
4ADNT	17.45	16.42	17.64	117719173	107191386	-9.8
2ADNT	17.78	16.69	17.97	374122519	347386612	-7.7
26DNT	16.75	16.02	16.90	219358995	208702598	-5.1
24DNT	16.11	15.52	16.24	394921370	359463658	-9.9
3,4-DNT	16.06	15.31	16.21	215464760	206091958	-4.5

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

HIGH WATER EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.010	0.096	0.388	1.54	6.16
RDX	0.004	0.037	0.151	0.598	2.39
TNB	0.003	0.028	0.113	0.450	1.80
DNB	0.002	0.016	0.063	0.251	1.00
TETRYL	0.003	0.034	0.140	0.554	2.21
NB	0.003	0.031	0.127	0.502	2.01
TNT	0.003	0.025	0.101	0.402	1.61
4ADNT	0.002	0.022	0.089	0.352	1.41
2ADNT	0.002	0.022	0.088	0.351	1.40
26DNT	0.004	0.037	0.150	0.596	2.38
24DNT	0.002	0.021	0.087	0.344	1.37
2NT	0.003	0.031	0.125	0.495	1.98
4NT	0.003	0.031	0.126	0.499	2.00
3NT	0.003	0.031	0.126	0.499	2.00
3,4-DNT	0.005	0.046	0.186	0.736	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.[illegible]
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 07/27/99 07/27/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.19	5.18	5.18	5.16	5.16
RDX	8.09	8.15	8.15	8.15	8.15
TNB	8.26	8.22	8.25	8.21	8.21
DNB	10.55	10.60	10.62	10.63	10.63
TETRYL	13.54	13.50	13.48	13.46	13.44
NB	12.11	12.16	12.18	12.19	12.18
TNT	12.84	12.80	12.79	12.77	12.75
4ADNT	16.83	16.93	16.98	16.98	16.94
2ADNT	17.13	17.24	17.25	17.26	17.26
26DNT	16.46	16.41	16.38	16.36	16.33
24DNT	15.73	15.82	15.84	15.85	15.86
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	15.74	15.71	15.69	15.66	15.64

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4
HMX	0.00	5.19	5.23	0.00
RDX	8.19	0.00	0.00	8.27
TNB	0.00	8.25	8.28	0.00
DNB	10.67	0.00	0.00	10.75
TETRYL	0.00	13.61	13.77	0.00
NB	12.24	0.00	0.00	12.34
TNT	0.00	12.87	12.96	0.00
4ADNT	17.10	0.00	0.00	17.45
2ADNT	17.42	0.00	0.00	17.78
26DNT	0.00	16.55	16.75	0.00
24DNT	15.94	0.00	0.00	16.11
2NT	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00
3,4-DNT	0.00	15.86	16.06	0.00

COMPOUND	AVG RT	STD DEV	3X STD	RT WINDOW
HMX	5.18	0.024	0.072	5.11 - 5.25
RDX	8.16	0.055	0.166	7.99 - 8.32
TNB	8.24	0.027	0.081	8.16 - 8.32
DNB	10.64	0.062	0.187	10.45 - 10.83

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 07/27/99 07/27/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.54	0.115	0.345	13.19 - 13.88
NB	12.20	0.073	0.218	11.98 - 12.42
TNT	12.82	0.072	0.216	12.60 - 13.04
4ADNT	17.03	0.202	0.605	16.42 - 17.64
2ADNT	17.33	0.214	0.642	16.69 - 17.97
26DNT	16.46	0.146	0.438	16.02 - 16.90
24DNT	15.88	0.119	0.358	15.52 - 16.24
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	15.76	0.148	0.445	15.31 - 16.20

6E

SOIL PETN INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4

LC Column: ODS II Date(s) Analyzed: 06/30/99 07/01/99

Method: 201SF30

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
PETN	40086	53009	55645

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
PETN	56091	56808	52328	13.36
MEAN RSD				13.36

7E

PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201SP

LC Column: ODS II Init. Calib Date(s): 06/30/99 07/01/99

Client Sample No.: PETNL3 Date Analyzed : 07/01/99

Lab Sample ID : ICV 6-26 Time Analyzed : 0245

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
PETN	9.08	9.00	9.22	55095	52328	-5.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201SF30

LC Column: ODS II Init. Calib Date(s): 06/30/99 07/01/99

Client Sample No.: PETNL3 Date Analyzed : 07/01/99

Lab Sample ID : L3 6-37 Time Analyzed : 0849

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
PETN	9.09	9.00	9.22	55830	52328	-6.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201SR

LC Column: ODS II Init. Calib Date(s): 06/30/99 07/01/99

Client Sample No.: PETNL5 Date Analyzed : 07/01/99

Lab Sample ID : L5 6-62 Time Analyzed : 1527

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
PETN	9.11	9.00	9.22	51349	52328	1.9

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201SF30

LC Column: ODS II Init. Calib Date(s): 06/30/99 07/01/99

Client Sample No.: PETNL3 Date Analyzed : 07/01/99

Lab Sample ID : L3 6-37 Time Analyzed : 1846

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
PETN	9.20	9.00	9.22	56052	52328	-7.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL PETN CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS Level 1	Level 2	Level 3	Level 4	Level 5
PETN	20.0	160	320	1280	2560

9E
PETN RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC4

LC Column: ODS II Date(s) ICAL Analyzed: 06/30/99 07/01/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
PETN	9.10	9.12	9.12	9.09	9.08

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4
PETN	9.08	9.09	9.11	9.20

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
PETN	9.11	0.037	0.111	9.00 - 9.22

6E

HIGH WATER EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 06/25/99 06/25/99

Method: 200WF25H

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	59192604	59223466	61056231
RDX	117121351	77415121	79735715
TNB	171941429	163717778	185085053
DNB	270119375	249801603	247002512
TETRYL	136673235	135378338	104396007
NB	203105161	233889167	160859968
TNT	178662400	226505261	172318914
4ADNT	179036818	179318394	120634870
2ADNT	248436364	255815622	176786376
26DNT	161478378	145123054	120914048
24DNT	318473333	240901502	229603857
2NT	167824194	117675993	114011299
4NT	121635161	94088091	81062753
3NT	147079032	105748706	101045553
3,4-DNT	101709130	156655592	116417445

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	69996325	69733068	63840339	8.70
RDX	84944998	88630179	89569473	17.88
TNB	197853241	203383681	184396236	9.09
DNB	259221780	269819161	259192886	4.18
TETRYL	104856550	115617640	119384354	13.27
NB	160906048	177879100	187327889	16.68
TNT	180075456	191643601	189841126	11.40
4ADNT	125306795	134944216	147848219	19.66
2ADNT	182604636	193257348	211380069	17.86
26DNT	128270133	133548249	137866773	11.52
24DNT	243344537	246844049	255833456	13.92
2NT	121953690	125964393	129485914	16.91
4NT	87051102	91981136	95163648	16.42
3NT	111872913	115656961	116280633	15.57
3,4-DNT	117776445	126480778	123807878	16.48
MEAN RSD				13.97

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC1 Method: 200WF25H

LC Column: CARBOSORB Init. Calib Date(s): 06/25/99 06/25/99

Client Sample No.: EXPL3 Date Analyzed : 06/26/99

Lab Sample ID : L3 6-39 Time Analyzed : 0811

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.66	4.61	4.67	63943916	63840339	-0.2
RDX	7.17	7.09	7.21	78696005	89569473	12.1
TNB	9.75	9.63	9.85	179949929	184396236	2.4
DNB	11.93	11.78	12.10	251879731	259192886	2.8
TETRYL	12.67	12.48	12.92	108313950	119384354	9.3
NB	13.67	13.52	13.88	164971343	187327889	11.9
TNT	15.39	15.18	15.68	175111066	189841126	7.8
4ADNT	15.97	15.75	16.31	125383754	147848219	15.2*
2ADNT	16.78	16.59	17.07	177063817	211380069	16.2*
26DNT	18.09	17.83	18.39	120814740	137866773	12.4
24DNT	18.68	18.46	18.96	230753845	255833456	9.8
2NT	22.22	21.90	22.58	113078436	129485914	12.7
4NT	23.74	23.40	24.12	82038337	95163648	13.8
3NT	25.67	25.25	25.99	101466030	116280633	12.7
3,4-DNT	14.78	14.55	15.07	121338059	123807878	2.0

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC1 Method: 200WF25H

LC Column: CARBOSORB Init. Calib Date(s): 06/25/99 06/25/99

Client Sample No.: EXPL3 Date Analyzed : 06/26/99

Lab Sample ID : L3 6-39 Time Analyzed : 1556

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.64	4.61	4.67	65461680	63840339	-2.5
RDX	7.15	7.09	7.21	89495075	89569473	0.1
TNB	9.78	9.63	9.85	178319244	184396236	3.3
DNB	12.01	11.78	12.10	250728752	259192886	3.3
TETRYL	12.81	12.48	12.92	108330280	119384354	9.3
NB	13.77	13.52	13.88	166636588	187327889	11.0
TNT	15.54	15.18	15.68	173008825	189841126	8.9
4ADNT	16.14	15.75	16.31	125518850	147848219	15.1*
2ADNT	16.93	16.59	17.07	177520747	211380069	16.0*
26DNT	18.24	17.83	18.39	120153515	137866773	12.8
24DNT	18.82	18.46	18.96	230514550	255833456	9.9
2NT	22.39	21.90	22.58	111696881	129485914	13.7
4NT	23.92	23.40	24.12	80005497	95163648	15.9*
3NT	25.77	25.25	25.99	105610756	116280633	9.2
3,4-DNT	14.92	14.55	15.07	117929849	123807878	4.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL PETN CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS Level 1	Level 2	Level 3	Level 4	Level 5
PETN	20.0	160	320	1280	2560

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/25/99 06/25/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.64	4.64	4.65	4.65	4.64
RDX	7.13	7.15	7.14	7.18	7.12
TNB	9.71	9.77	9.71	9.79	9.70
DNB	11.89	11.99	11.89	11.99	11.89
TETRYL	12.64	12.77	12.63	12.77	12.65
NB	13.66	13.77	13.64	13.74	13.64
TNT	15.35	15.53	15.34	15.47	15.38
4ADNT	15.98	16.15	15.91	16.07	15.97
2ADNT	16.81	16.92	16.72	16.87	16.78
26DNT	18.04	18.22	17.99	18.15	18.06
24DNT	18.69	18.80	18.58	18.75	18.66
2NT	22.17	22.35	22.08	22.29	22.15
4NT	23.77	23.85	23.58	23.82	23.63
3NT	25.54	25.71	25.45	25.71	25.49
3,4-DNT	14.75	14.92	14.71	14.86	14.74

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	4.66	4.64
RDX	7.17	7.15
TNB	9.75	9.78
DNB	11.93	12.01
TETRYL	12.67	12.80
NB	13.67	13.77
TNT	15.39	15.54
4ADNT	15.97	16.14
2ADNT	16.78	16.93
26DNT	18.09	18.24
24DNT	18.68	18.82
2NT	22.22	22.39
4NT	23.74	23.92
3NT	25.67	25.77
3,4-DNT	14.78	14.92

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.64	0.010	0.030	4.61 - 4.67
RDX	7.15	0.021	0.064	7.09 - 7.21
TNB	9.74	0.038	0.113	9.63 - 9.85
DNB	11.94	0.054	0.162	11.78 - 12.10

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/25/99 06/25/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	12.70	0.073	0.218	12.48 - 12.92
NB	13.70	0.059	0.178	13.52 - 13.88
TNT	15.43	0.084	0.252	15.18 - 15.68
4ADNT	16.03	0.093	0.280	15.75 - 16.31
2ADNT	16.83	0.079	0.236	16.59 - 17.07
26DNT	18.11	0.094	0.281	17.83 - 18.39
24DNT	18.71	0.084	0.252	18.46 - 18.96
2NT	22.24	0.113	0.338	21.90 - 22.58
4NT	23.76	0.120	0.361	23.40 - 24.12
3NT	25.62	0.125	0.374	25.24 - 25.99
3,4-DNT	14.81	0.088	0.263	14.55 - 15.07

6E

HIGH WATER PETN INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4

LC Column: ODS II Date(s) Analyzed: 06/30/99 06/30/99

Method: 201WF30

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
PETN	41111	41768	50941

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
PETN	57597	67615	51806	21.57
MEAN RSD				21.57

7E

HIGH WATER PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201WI

LC Column: ODS II Init. Calib Date(s): 06/30/99 06/30/99

Client Sample No.: PETNL3 Date Analyzed : 06/30/99

Lab Sample ID : ICV 6-26 Time Analyzed : 1722

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
PETN	9.09	9.01	9.19	315	320	-1.7

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

7E

HIGH WATER PETN CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39088 Inst. ID: LC4 Method: 201WF30

LC Column: ODS II Init. Calib Date(s): 06/30/99 06/30/99

Client Sample No.: PETNL3 Date Analyzed : 06/30/99

Lab Sample ID : L3 6-18 Time Analyzed : 2147

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
PETN	9.16	9.01	9.19	314	320	-1.8

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

9D

SOIL PETN CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS Level 1	Level 2	Level 3	Level 4	Level 5
PETN	20.0	160	320	1280	2560

9E
PETN RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39088

Lab Code: SWOK Instrument ID: LC4

LC Column: ODS II Date(s) ICAL Analyzed: 06/30/99 06/30/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
PETN	9.08	9.10	9.10	9.10	9.06

COMPOUND	RT CCAL 1	RT CCAL 2
PETN	9.09	9.16

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
PETN	9.10	0.031	0.092	9.01 - 9.19

FORM IX

	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP [ ]XIN

SAMPLE EXTRACTION L

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990622SF

EXTRACT DATE: 1999-06-22 12:08

000008
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0622SF			S/L				2.01	10.00						10.0	N		1000		
BB0622SF			S/L				2.04	10.00						10.0	N		1000		
LC0622SF			S/L				2.00	10.00						10.0	N	500	1000		
LD0622SF			S/L				2.01	10.00						10.0	N	500	1000		
39088.01 GC200	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.6	2.00	10.00						10.0	N		1000		
39088.01MS GC200	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.7	2.03	10.00						10.0	N	500	1000		
39088.01MSD GC200	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.7	2.05	10.00						10.0	N	500	1000		
39088.02 GC200	TOLTEST	06/22/1999 10:55 MFAPES270FD	S/L		17.75	1.7	2.02	10.00						10.0	N		1000		
39088.06 GC200	TOLTEST	06/22/1999 10:55 MFAPES272	S/L		17.34	1.7	2.03	10.00						10.0	N		1000		
39088.08 GC200	TOLTEST	06/22/1999 10:55 MFAPES274	S/L		18.56	1.6	2.00	10.00						10.0	N		1000		
39088.10 GC200	TOLTEST	06/22/1999 10:55 MFAPES276	S/L		17.71	1.7	2.02	10.00						10.0	N		1000		
39088.12 GC200	TOLTEST	06/22/1999 10:55 MFAPES278	S/L		17.70	1.7	2.05	10.00						10.0	N		1000		
39088.14 GC200	TOLTEST	06/22/1999 10:55 MFAPES280	S/L		15.85	1.7	2.04	10.00						10.0	N		1000		

35

INITIALS		
WEIGHING: JR	EXTRACTION: GS	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER: GS	VERIFIER: BW	
MATRIX SPIKER: GS	VERIFIER: BW	
SUBMITTED BY: GS	REVIEWED BY: DC 6-23-99	

ID NUMBERS
FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #: 6-7
MATRIX SPIKE SOLID/CONC #(s): 5-158
SOP - METHOD # : SWL-OP- 200 Rev. 4.0

COMMENTS

	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP ☐ OXIN

SAMPLE EXTRACTION L

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990622SG

EXTRACT DATE: 1999-06-22 12:15

000009
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
BL0622SG			S/L				2.01	10.00						10.0	N				
BB0622SG			S/L				2.02	10.00						10.0	N				
LC0622SG			S/L				2.04	10.00						10.0	N	120			
LD0622SG			S/L				2.03	10.00						10.0	N	120			
39088.01 GC201	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.6	2.00	10.00						10.0	N				
39088.01MS GC201	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.7	2.01	10.00						10.0	N	120			
39088.01MSD GC201	TOLTEST	06/22/1999 10:55 MFAPES270	S/L		17.58	1.7	2.03	10.00						10.0	N	120			
39088.02 GC201	TOLTEST	06/22/1999 10:55 MFAPES270FD	S/L		17.75	1.7	2.02	10.00						10.0	N				
39088.06 GC201	TOLTEST	06/22/1999 10:55 MFAPES272	S/L		17.34	1.7	2.03	10.00						10.0	N				
39088.08 GC201	TOLTEST	06/22/1999 10:55 MFAPES274	S/L		18.56	1.6	2.00	10.00						10.0	N				
39088.10 GC201	TOLTEST	06/22/1999 10:55 MFAPES276	S/L		17.71	1.7	2.02	10.00						10.0	N				
39088.12 GC201	TOLTEST	06/22/1999 10:55 MFAPES278	S/L		17.70	1.7	2.05	10.00						10.0	N				
39088.14 GC201	TOLTEST	06/22/1999 10:55 MFAPES280	S/L		15.85	1.7	2.04	10.00						10.0	N				

354

INITIALS		
WEIGHING: JR	EXTRACTION: GS	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER:	VERIFIER:	
MATRIX SPIKER: GS	VERIFIER: BW	
SUBMITTED BY: G	REVIEWED BY:	

6-23-99

ID NUMBERS
FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #:
MATRIX SPIKE SOLID/CONC #(s): 5-187
SOP - METHOD # : SWL-OP- 201 R 1.0

COMMENTS

METHOD	SV	ST • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			XXXXX
SHAKER			
SONC. (3550)			
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP ☐ DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990625WH

EXTRACT DATE: 1999-06-25 13:55

000036
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION	
					%	g	g • (ml)	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL			
BL0625WH			W/L				5.0							5.0	N					
BB0625WH			W/L				5.0							5.0	N					
LC0625WH			W/L				5.0							5.0	N	120				
LD0625WH			W/L				5.0							5.0	N	120				
39088.17 GC201	TOLTEST	06/22/1999 10:55 MFARB062199	W/L				5.0							5.0	N					
39123.14 GC201	TOLTEST	06/24/1999 10:20 MFBRB062399	W/L				5.0							5.0	N					
39123.14MS GC201	TOLTEST	06/24/1999 10:20 MFBRB062399	W/L				5.0							5.0	N	120				
39123.14MSD GC201	TOLTEST	06/24/1999 10:20 MFBRB062399	W/L				5.0							5.0	N	120				

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INITIALS

WEIGHING:	EXTRACTION:	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER:	VERIFIER:	
MATRIX SPIKER: SM	VERIFIER: JF	
SUBMITTED BY:	REVIEWED BY:	06/30/99

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #:

MATRIX SPIKE SOLID/CONC #(s): 6-9

SOP - METHOD # : SWL-OP- OL 206 Rev. 1.1

COMMENTS

[redacted]	SV	OD ST • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			XXXXX
SHAKER			
SONC. (3550)			
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP ☐ 'OXIN

SAMPLE EXTRACTION L'

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990623WH

EXTRACT DATE: 1999-06-23 15:45

000019
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0623WH			W/L				5.0							5.0	N		500		
BB0623WH			W/L				5.0							5.0	N		500		
LC0623WH			W/L				5.0							5.0	N	500	500		
LD0623WH			W/L				5.0							5.0	N	500	500		
39088.17 GC200	TOLTEST	06/22/1999 10:55 MFARB062199	W/L				5.0							5.0	N		500		
39088.17MS GC200	TOLTEST	06/22/1999 10:55 MFARB062199	W/L				5.0							5.0	N	500	500		
39088.17MSD GC200	TOLTEST	06/22/1999 10:55 MFARB062199	W/L				5.0							5.0	N	500	500		

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INITIALS

WEIGHING:	SM	EXTRACTION:	FLORISIL:
CLEANUP:		KD:	
BLOWDOWN:		TV:	
SURROG. SPIKER:	SM	VERIFIER: GW	
MATRIX SPIKER:	SM	VERIFIER: GW	
SUBMITTED BY:		REVIEWED BY:	06/24/99

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 5-160

MATRIX SPIKE SOLID/CONC #(s): 5-161

SOP - METHOD # : SWL-~~OP~~-OL 200 Rev. 4.1

COMMENTS

MORRISON KNUDSEN CORPORATION

CHAIN OF CUSTODY RECORD

BIO-062

720 Park Blvd., P.O. Box 73
Boise, Idaho 83729
(208) 386-5000

Project No.: 4324-0009-07-35

Project Name: NSGC Chaus Bio Facility

Samplers: (Signature)

Sampler: (Print) Ryan H. Erwin

Split Samples

Analysis Required: 2,3,7,8 TCDD Grab

Sample Type	Sampling Point Description	Sample Date	Time	Sample I.D. Number	Split Yes	Split No	2,3,7,8 TCDD	Grab	Remarks
Composite	Column 03 SL1	8/11/98	1258	BIO-M-013 07-03-1		✓	✓		VMS/VMSD
	03 SL2		1310	BIO-M-013 07-03-2		✓	✓		Dup 07
	03 2		1310	BIO-M-013 07-03-2FD		✓	✓		MT013
	03 3		1301	BIO-M-013 07-03-3		✓	✓		
	Column 05 SL1		1313	BIO-M-013 07-05-1		✓	✓		
	05 2		1319	BIO-M-013 07-05-2		✓	✓		
	05 3		1322	BIO-M-013 07-05-3		✓	✓		
	Column 07 SL1		1326	BIO-M-013 07-07-1		✓	✓		
	07 2		1331	BIO-M-013 07-07-2		✓	✓		
	07 3		1335	BIO-M-013 07-07-3		✓	✓		
Liquid	Rinse Blank		1340	BIO-RB-08/11/98		✓	✓		
									South
									West
									Labs

Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Ryan H. Erwin	8/11/98 1530				
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Received for Laboratory By: (Signature) / Company:	Date/Time	Total No. Samples This Shipping Container: / Company:
Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:	Relinquished By: (Signature) / Company:	Date/Time	Received By: (Signature) / Company:

Seal #'s 2361, 2362

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115 ATT2 AB1) / SWL-GA-115 Rev 5.0 / GA-115-CRLOGIN.F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA / AMERICAN ANALYTICAL & TECH SRVS

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): SARAH HODSON/ LIZ MAIMBOURG/ SUE HALL

RECEIVED BY (SIGNATURE): E. Maimbourg

LOGGED IN BY (SIGNATURE): S. Hodson

REC'D DATE: 8-13-98

TIME REC'D: 925

LOG-IN DATE: 8-13-98

PROJECT:	EPISODE:	SAMPLE DELIVERY GROUP:
NSWC CRANE	35218	35218

REMARKS:

1. CUSTODY SEAL(S): PRESENT / ABSENT; INTACT / BROKEN
2. CUSTODY SEAL NOS.: 2361; 2362
3. CHAIN - OF - CUSTODY: PRESENT / ABSENT
   - SEALED IN PLASTIC? YES / NO
   - TAPED TO LID? YES / NO
   - PROPERLY FILLED OUT (INK, SIGNED, ETC.)? YES / NO
4. AIRBILL: AIRBILL / STICKER PRESENT / ABSENT
5. AIRBILL NO: 8006 123994745
6. COOLER CONDITIONS
   - ENOUGH ICE? YES / NO
   - TYPE OF ICE? wet
   - TYPE OF PACKING? bubble wrap
7. SAMPLE TAGS: PRESENT / ABSENT
8. SAMPLE CONDITION: INTACT / BROKEN* / LEAKING
   - BOTTLES SEALED IN SEPARATE PLASTIC BAGS? YES / NO
   - CORRECT CONTAINERS USED FOR FOR TESTS INDICATED? YES / NO
   - CORRECT PRESERVATIVE? YES / NO
   - SUFFICIENT SAMPLE? YES / NO
   - LABELS COMPLETE (I.D., DATE, TIME, SIGNATURE, PRESERVATIVE? YES / NO
   - VOA SAMPLES WITHOUT BUBBLES? YES / NO
9. DOES INFORMATION ON CUSTODY RECORDS, LABELS, TAGS AGREE? YES / NO*
10. RAD SCREEN WITH GIEGER COUNTER? YES / NO
11. P.O. CALLED? YES / NO

CLIENT SAMPLE #	SAMPLE FRACTION(S)	ASSIGNED LAB #	COOLER I.D.	pH CHECK	ACID / BASE LOT #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
B10M01307031	9C	01	MKF-OH 8-13-98-1			6.1 2
31MS		02				
31MSD		03				
32		04				
32FD		05				
33		06				
51		07				
52		08				
53		09				
71		10				
72		11				
73		12				
B10RB081198		13				

* Contact PO and attach record of resolution

* Sample Fractions: 8= SV GC/MS V= VOA GC/MS or GC

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2599

SDG NARRATIVE

September 19, 1998

CLIENT : MKF-OH
CASE : NSWC CRANE
SDG : 35218
EPISODE(S): 35218
FRACTION : EXPLOSIVES
SAMPLE(S) : BIOM01307031, BIOM01307032, BIOM01307033, BIOM01307051, BIOM01307052, BIOM01307053, BIOM01307071, BIOM01307072, BIOM01307073, BIORB081198

This SDG consisted of 10 soil and 1 water samples with applicable MS and MSD for the explosive analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

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1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2

CASE SUMMARY:

SOIL:

4ADNT was reported above the PQL in the preliminary data of the sample BIOM01307032. Since the analyte was not confirmed it was not reported in the data package.

4ADNT was reported above the PQL in the preliminary data of the sample BIOM01307032FD. Since the analyte was not confirmed it was not reported in the data package.

TNT was reported above the PQL in the preliminary data of the sample BIOM01307033. Since the analyte was not confirmed it was not reported in the data package.

RDX was reported above the PQL in the preliminary data of the sample BIOM01307051. Since the analyte was not confirmed it was not reported in the data package.

4ADNT was reported above the PQL in the preliminary data of the sample BIOM01307072. The analyte was "P" flagged in the data package.

HMX and RDX were not reported in the preliminary data of the sample BIOM01307073. The analytes were "J" flagged in the data package.

Percent RSD exceeded 20% for RDX in the initial calibration standard 5EX0814. Since the correlation coefficient for the analyte was greater than 0.99, the slope was utilized to calculate the concentration of the analyte.

NB was out of the QC limits in the samples BIOM01307031MS and BIOM01307031MSD. The analyte was within the QC limits in the LCS and LCSD.

All of the analytes were within the QC limits in the laboratory control spike (LCS) and the laboratory control spike duplicate (LCSD).

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WATER:

The ICV slightly exceeded 15% deviation in the initial calibration standard 081598W. Since the PETN was not detected in the associated sample, the sample was not re-analyzed.

Tetryl exceeded the QC limits in the LC0815WA and LD0815WA. The analyte was not reported in the associated samples.

To analyze PETN, LC ChemStation software was utilized. Unlike the VG software, the Response Factor in the ChemStation is calculated by dividing the concentration by the area.

Multiplier = final volume / extracted amount.

The following is an example of the calculation for the LC0815WB:

Mean response factor * area of the sample * dilution * Multiplier = the concentration

5.47 * 111.4 * 2 * 1 = 1219 ug/L

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

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We use the following flags where appropriate. "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Shahriar Shahreza
LC Supervisor

2E

EXPLOSIVE SURROGATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Code: SWOK Case No: MKF-OH SDG No:35218

	SAMPLE NUMBER	S1 #	OTHER
1	BIOM01307031	81.6	0
2	BIOM01307031 MS	78.8	0
3	BIOM01307031 MSD	78.2	0
4	BIOM01307032	85.2	0
5	BIOM01307032FD	85.3	0
6	BIOM01307033	85.4	0
7	BIOM01307051	81.1	0
8	BIOM01307052	85.0	0
9	BIOM01307053	84.0	0
10	BIOM01307071	81.3	0
11	BIOM01307072	87.9	0
12	BIOM01307073	85.4	0
13	BIORB081198	100	0
14	BL0815SB	92.5	0
15	BL0815WA	95.7	0
16	LC0815SB	114	0
17	LC0815WA	84.6	0
18	LD0815SB	112	0
19	LD0815WA	73.5	0
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT (60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

page _ 1

FORM II

3F

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: BIOM01307031 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
HMX	9500		10200	107	54-128
RDX	9500		9060	95	66-109
TNB	9500		9770	103	57-130
DNB	9500		7960	84	74-122
TETRYL	9500		3380	36	32-119
NB	9500		6560	69*	70-135
TNT	9500		9710	102	44-124
4ADNT	9500		9850	104	60-140
2ADNT	9500		9280	98	60-140
26DNT	9500		9130	96	58-125
24DNT	9500		9680	102	59-120
2NT	9500		9420	99	79-124
4NT	9500		10100	106	74-128
3NT	9500		9700	102	79-121

No of Analyte recoveries out of QC Advisory Limits = 1

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	8570	90	17	30	54-128
RDX	9500	9500	100	5	30	66-109
TNB	9500	9890	104	1	30	57-130
DNB	9500	7970	84	0	45	74-122
TETRYL	9500	3760	40	11	30	32-119
NB	9500	6530	69*	0	35	70-135
TNT	9500	8320	88	15	30	44-124
4ADNT	9500	9680	102	2	40	60-140
2ADNT	9500	9350	98	1	40	60-140
26DNT	9500	8910	94	2	35	58-125
24DNT	9500	9600	101	1	35	59-120
2NT	9500	9820	103	4	35	79-124
4NT	9500	10300	108	2	35	74-128
3NT	9500	9740	102	0	35	79-121

No of Analyte recoveries out of QC Advisory Limits = 1
No of RPD's out of QC Limits 0

SOIL EXPLOSIVE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: BIOM01307031MSD

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
PETN	3000		2920	97	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD#	QC LIMITS RPD	REC.
PETN	3000	2830	94	3	30	70-130

No of Analyte recoveries out of QC Advisory Limits = 0
No of RPD's out of QC Limits 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LC0815SB

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
HMX	9500		10100	106	57-137
RDX	9500		8690	92	77-113
TNB	9500		10100	106	64-125
DNB	9500		8270	87	82-118
TETRYL	9500		9470	100	23-124
NB	9500		7240	76	69-143
TNT	9500		8160	86	75-118
4ADNT	9500		8440	89	60-140
2ADNT	9500		9790	103	60-140
26DNT	9500		9560	101	78-117
24DNT	9500		10000	105	74-126
2NT	9500		9780	103	78-123
4NT	9500		10200	107	79-125
3NT	9500		10000	105	78-121

No of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LD0815SB

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
HMX	9500		10300	108	57-137
RDX	9500		8710	92	77-113
TNB	9500		10000	105	64-125
DNB	9500		8220	87	82-118
TETRYL	9500		8320	88	23-124
NB	9500		7180	76	69-143
TNT	9500		8140	86	75-118
4ADNT	9500		8940	94	60-140
2ADNT	9500		9770	103	60-140
26DNT	9500		9530	100	78-117
24DNT	9500		10000	105	74-126
2NT	9500		9770	103	78-123
4NT	9500		10200	107	79-125
3NT	9500		10000	105	78-121

# of Analyte recoveries out of QC Advisory Limits = 0

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LC0815SA

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
PETN	3000		3200	107	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

3G

SOIL EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LD0815SA

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	QC LIMITS REC.
PETN	3000		3210	107	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LC0815WA

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
HMX	400		376	94	46-151
RDX	150		152	101	72-129
TNB	225		205	91	74-118
DNB	125		116	93	79-132
TETRYL	413		548	133*	58-120
NB	213		219	103	68-135
TNT	188		190	101	61-145
4ADNT	313		305	97	60-140
2ADNT	313		310	99	60-140
26DNT	288		271	94	77-125
24DNT	175		163	93	70-134
2NT	363		356	98	73-131
4NT	250		286	114	73-116
3NT	238		246	103	71- 127

# of Analyte recoveries out of QC Advisory Limits = 1

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LD0815WA

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
HMX	400		364	91	46-151
RDX	150		137	91	72-129
TNB	225		198	88	74-118
DNB	125		112	90	79-132
TETRYL	413		524	127*	58-120
NB	213		215	101	68-135
TNT	188		194	103	61-145
4ADNT	313		294	94	60-140
2ADNT	313		299	96	60-140
26DNT	288		269	93	77-125
24DNT	175		161	92	70-134
2NT	363		337	93	73-131
4NT	250		272	109	73-116
3NT	238		237	100	71- 127

No of Analyte recoveries out of QC Advisory Limits = 1

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LC0815WB

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
PETN	1200		1220	102	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

3G

WATER EXPLOSIVE CONTROL SPIKE RECOVERY FORM

Name: SWL-TULSA Contract:

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Client Sample No: LD0815WB

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	QC LIMITS REC.
PETN	1200		1240	103	70-130

No of Analyte recoveries out of QC Advisory Limits = 0

4C

Lab Name: SWL-TULSA Contract:

Lab Sample ID: BL0815SB

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Matrix: (soil/water) Soil

Date Extracted: 08/15/97 Extn. Method: SONC

Date Analyzed (1): 08/17/98 Date Analyzed(2): 09/13/98

Time Analyzed (1): 19:12:15 Time Analyzed(2): 22:44:10

Instrument ID (1): IN13 Instrument ID(2): IN10

LC Column ID (1): CARB-02 LC Column ID (2): MET-01

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0815SB	LC0815SB	08/17/98	
2	LD0815SB	LD0815SB	08/17/98	
3	BIOM01307031	35218.01	08/18/98	
4	BIOM01307031 MS	35218.02MS	08/18/98	
	BIOM01307031 MSD	35218.03MSD	08/18/98	
	BIOM01307032	35218.04	08/18/98	09/14/98
7	BIOM01307032FD	35218.05	08/18/98	09/14/98
8	BIOM01307033	35218.06	08/18/98	09/14/98
9	BIOM01307051	35218.07	08/18/98	09/14/98
10	BIOM01307052	35218.08	08/18/98	
11	BIOM01307053	35218.09	08/18/98	
12	BIOM01307071	35218.10	08/18/98	
13	BIOM01307072	35218.11	08/18/98	09/14/98
14	BIOM01307073	35218.12	08/18/98	09/15/98
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

Lab Name: SWL-TULSA Contract:

Sample ID: BL0815SA

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Matrix: (soil/water) Soil

Date Extracted: 08/15/97 Extn. Method: SONC

Date Analyzed (1): 08/21/98 Date Analyzed(2):

Time Analyzed (1): 00:43:14 Time Analyzed(2):

Instrument ID (1): LC4 Instrument ID(2):

LC Column ID (1): LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0815SA	LC0815SA	08/21/98	
2	LD0815SA	LD0815SA	08/21/98	
3	BIOM01307031	35218.01	08/21/98	
4	BIOM01307031MS	35218.02MS	08/21/98	
5	BIOM01307031MSD	35218.03MSD	08/21/98	
6	BIOM01307032	35218.04	08/21/98	
7	BIOM01307032FD	35218.05	08/21/98	
8	BIOM01307033	35218.06	08/21/98	
9	BIOM01307051	35218.07	08/21/98	
10	BIOM01307052	35218.08	08/21/98	
11	BIOM01307053	35218.09	08/21/98	
12	BIOM01307071	35218.10	08/21/98	
13	BIOM01307072	35218.11	08/21/98	
14	BIOM01307073	35218.12	08/21/98	
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

Lab Name: SWL-TULSA Contract:

Sample ID: BL0815WA

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Matrix: (soil/water) Water

Date Extracted: Extn. Method: DIRECT

Date Analyzed (1): 08/18/98 Date Analyzed(2):

Time Analyzed (1): 00:10:48 Time Analyzed(2):

Instrument ID (1): IN12 Instrument ID(2):

LC Column ID (1): CARB-11 LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0815WA	LC0815WA	08/18/98	
2	LD0815WA	LD0815WA	08/18/98	
3	BIORB081198	35218.13	08/18/98	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

Lab Name: SWL-TULSA Contract:

Sample ID: BL0815WB

Lab Code: SWOK Case No: MKF-OH SDG No:35218

Matrix: (soil/water) Water

Date Extracted: Extn. Method: DIRECT

Date Analyzed (1): 08/18/98 Date Analyzed(2):

Time Analyzed (1): 01:00:16 Time Analyzed(2):

Instrument ID (1): LC4 Instrument ID(2):

LC Column ID (1): LC Column ID (2):

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S.

	CUSTOMER SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
1	LC0815WB	LC0815WB	08/18/98	
2	LD0815WB	LD0815WB	08/18/98	
3	BIORB081198	35218.13	08/18/98	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

FORM IV

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307031

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.01

Sample Amt: 2g % Moisture 29.18 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

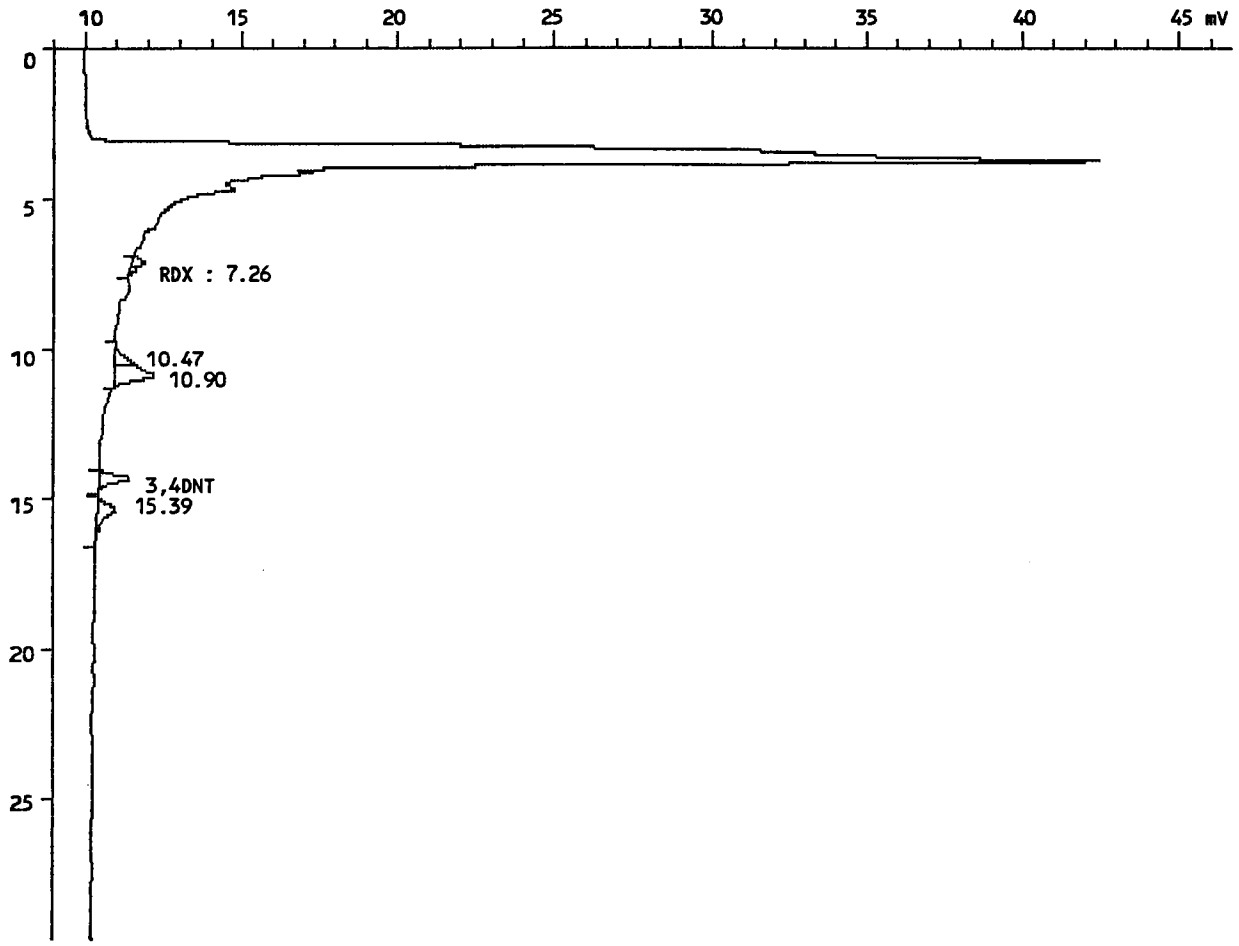
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,11,1

Sample name.....: BIOM01307031
Sample ID.....: 35218.01
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 02:39:07
Reported on 18-Aug-98 at 19:32:45



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,11,1

Acquired on 18-Aug-98 at 02:39:07
Modified on 18-Aug-82 at 19:18:24
Reported on 18-Aug-98 at 19:26:23

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307031
Sample ID.....: 35218.01
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	7.152	438	6024	636.734	RDX
5	14.341	1026	19052	1631.183	3,4DNT 8|
Total		1464	25076	2267.917	
Residual		2701	69267	6919.861	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307031

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.01

Sample Amt: 2g % Moisture 29.18 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

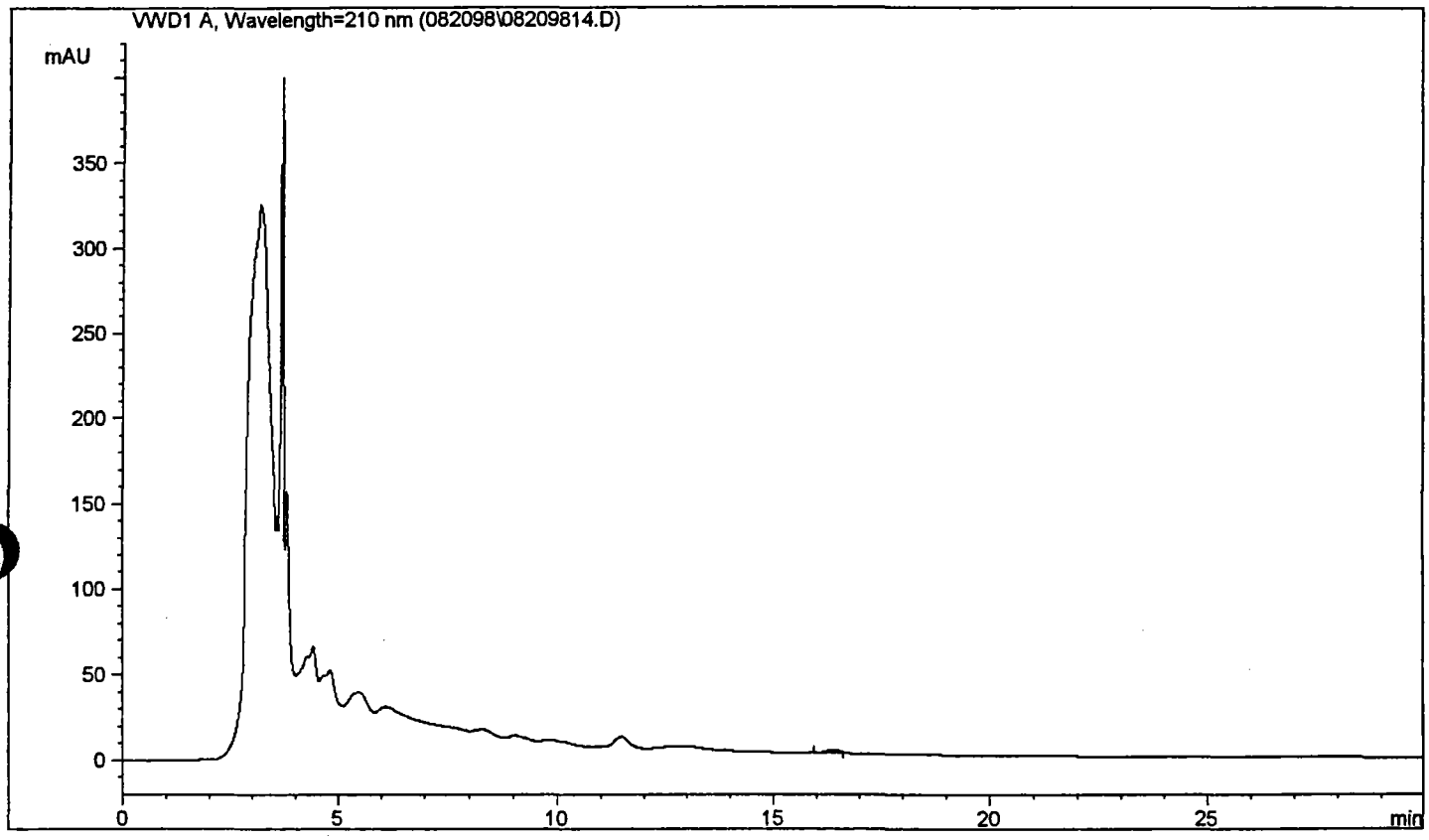
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209814.D
Sample Name: 35218.01 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 14
Sample Name	: 35218.01	Vial No.	: 14
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
16.386	PBA	30.69761	0.00000	0.00000	
Totals:				0.00000	

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1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307032

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.04

Sample Amt: 2g % Moisture 24.36 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	7040	
121-82-4	RDX	5370	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

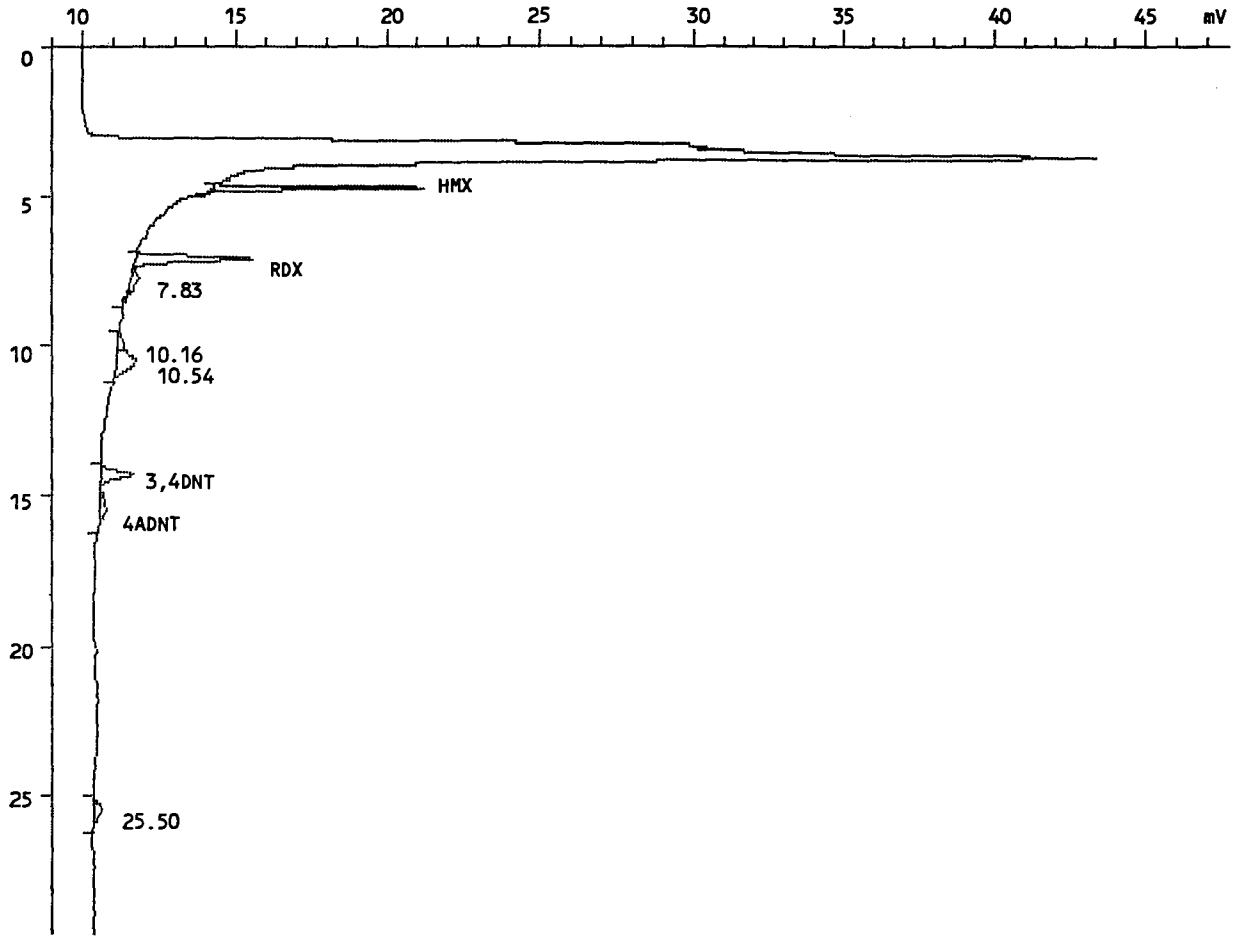
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,14,1

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 04:53:16
Reported on 16-Sep-98 at 16:54:23



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,14,1

Acquired on 18-Aug-98 at 04:53:16
Modified on 18-Aug-82 at 19:18:36
Reported on 16-Sep-98 at 16:48:57

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 14-Sep-82 at 09:11:00
Method file.....: EXPLOS Last modified on 16-Sep-82 at 16:12:18
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

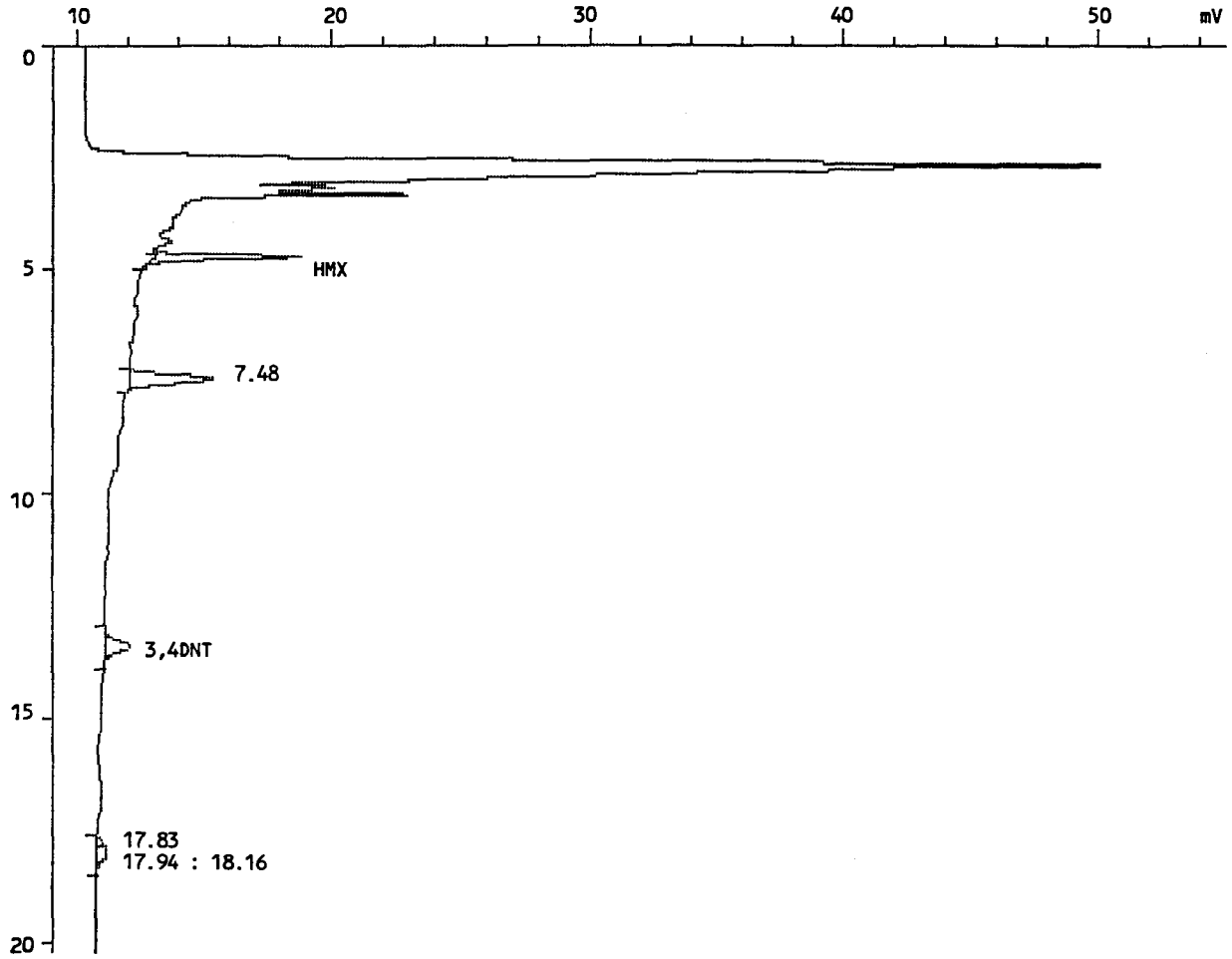
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.768	7039	50800	7036.016	HMX *
2	7.152	3806	50790	5368.944	RDX *
6	14.325	1047	19898	1703.617	3,4DNT 85
7	15.520	208	9100	525.398	4ADNT
Total		12099	130588	14633.975	
Residual		1500	49924	4797.195	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,7,1

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 00:07:07
Reported on 16-Sep-98 at 16:28:46



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,7,1

Acquired on 14-Sep-98 at 00:07:07
Modified on 16-Sep-82 at 16:24:28
Reported on 16-Sep-98 at 16:28:27

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911A Last modified on 16-Sep-82 at 16:26:00
Method file.....: LCCN Last modified on 16-Sep-82 at 16:27:16
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

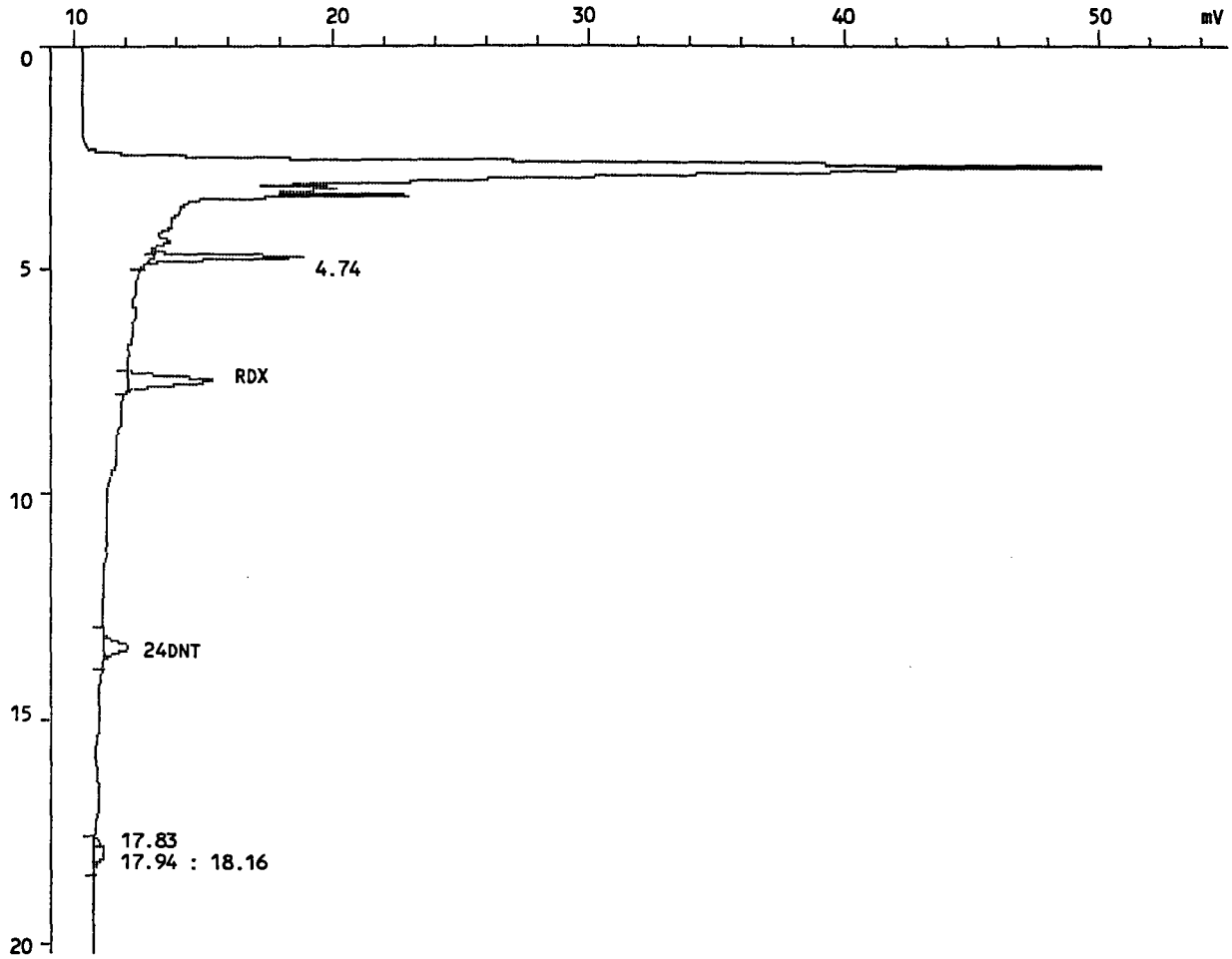
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.736	5910	45539	6422.970	HMX
3	13.397	1052	19093	395.146	3,4DNT
Total		6962	64632	6818.115	
Residual		4245	55891	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,7,1

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 00:07:07
Reported on 16-Sep-98 at 16:35:11



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,7,1

Acquired on 14-Sep-98 at 00:07:07
Modified on 16-Sep-82 at 16:32:00
Reported on 16-Sep-98 at 16:34:57

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911B Last modified on 16-Sep-82 at 16:33:04
Method file.....: LCCN Last modified on 16-Sep-82 at 16:33:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032
Sample ID.....: 35218.04
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	7.477	3365	45477	5883.224	RDX
3	13.397	1052	19093	900.634	24DNT
Total		4417	64571	6783.857	
Residual		6790	55953	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307032

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.04

Sample Amt: 2g % Moisture 24.36 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

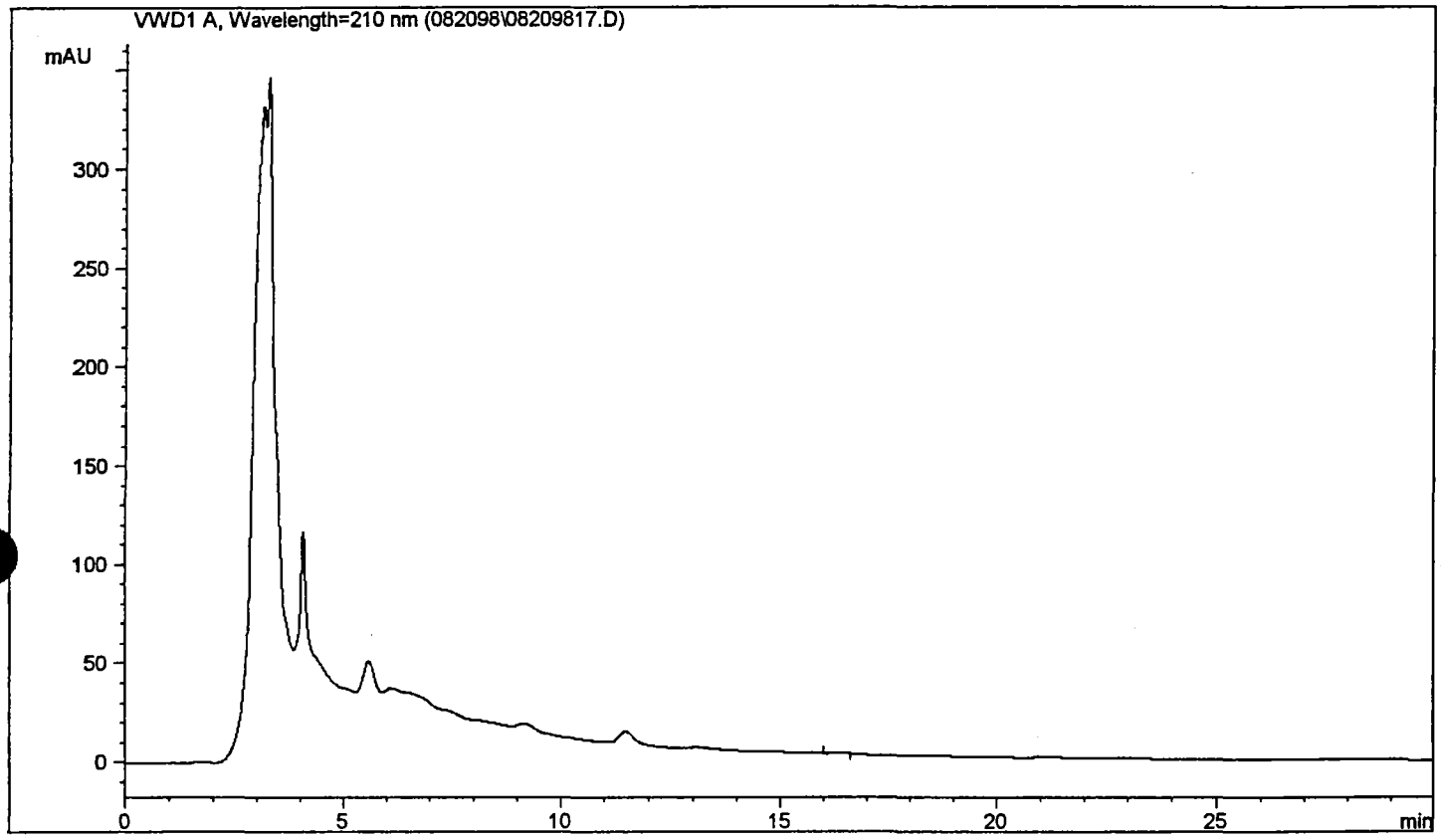
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209817.D
Sample Name: 35218.04 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 17
Sample Name	: 35218.04	Vial No.	: 17
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
16.384	PBA	9.35884	0.00000	0.00000	
Totals:				0.00000	

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1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307032FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.05

Sample Amt: 2g % Moisture 27.53 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	RPD of FD
2691-41-0	HMX	12600		56.6
121-82-4	RDX	12300		78.4
99-35-4	TNB	250	U	0
99-65-0	DNB	250	U	0
479-45-8	TETRYL	650	U	0
98-95-3	NB	260	U	0
118-96-7	TNT	250	U	0
1946-51-0	4ADNT	250	U	0
35572-78-2	2ADNT	250	U	0
606-20-2	26DNT	260	U	0
121-14-2	24DNT	250	U	0
88-72-2	2NT	250	U	0
99-99-0	4NT	250	U	0
99-08-1	3NT	250	U	0

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

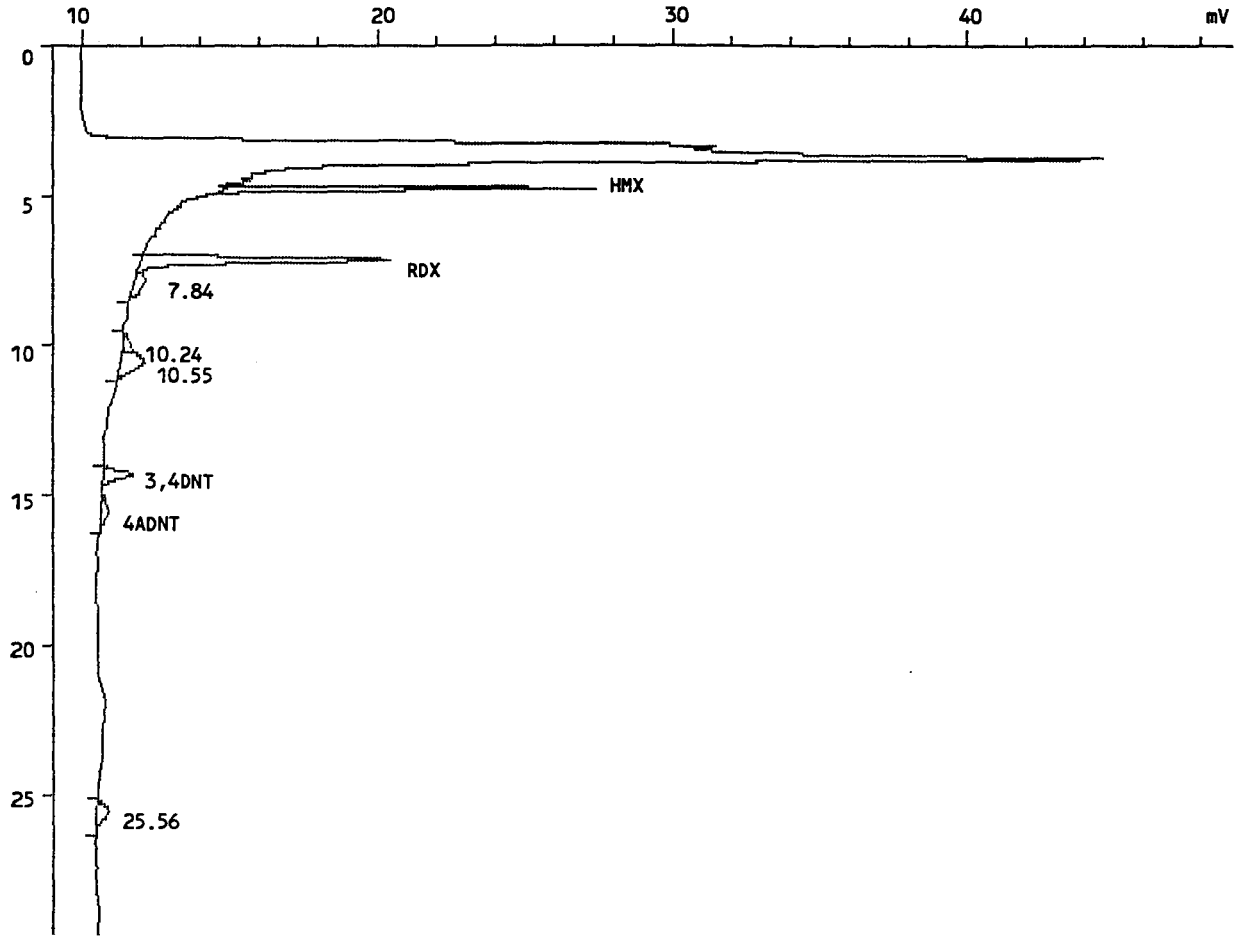
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,15,1

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 05:38:00
Reported on 16-Sep-98 at 16:56:14



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,15,1

Acquired on 18-Aug-98 at 05:38:00
Modified on 18-Aug-82 at 19:18:38
Reported on 16-Sep-98 at 16:55:43

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 14-Sep-82 at 09:11:00
Method file.....: EXPLOS Last modified on 16-Sep-82 at 16:12:18
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

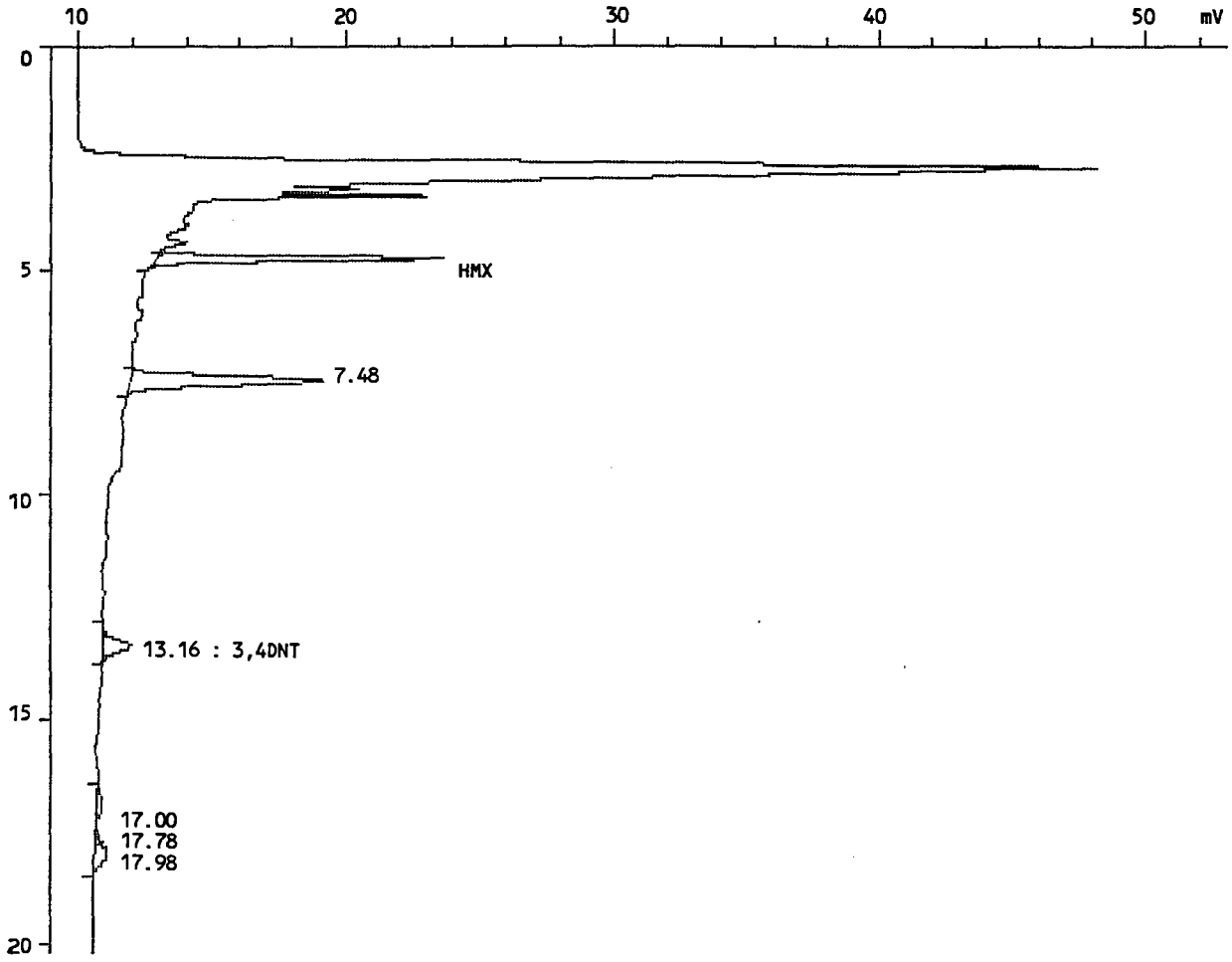
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.784	12584	90617	12550.814	HMX *
2	7.168	8444	116635	12329.309	RDX *
6	14.352	1047	19928	1706.129	3,4DNT 85
7	15.637	247	10342	597.134	4ADNT
Total		22322	237522	27183.387	
Residual		2116	70186	6784.824	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,8,1

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 00:48:35
Reported on 16-Sep-98 at 16:29:12



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,8,1

Acquired on 14-Sep-98 at 00:48:35
Modified on 16-Sep-82 at 16:24:32
Reported on 16-Sep-98 at 16:28:58

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911A Last modified on 16-Sep-82 at 16:26:00
Method file.....: LCCN Last modified on 16-Sep-82 at 16:27:16
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

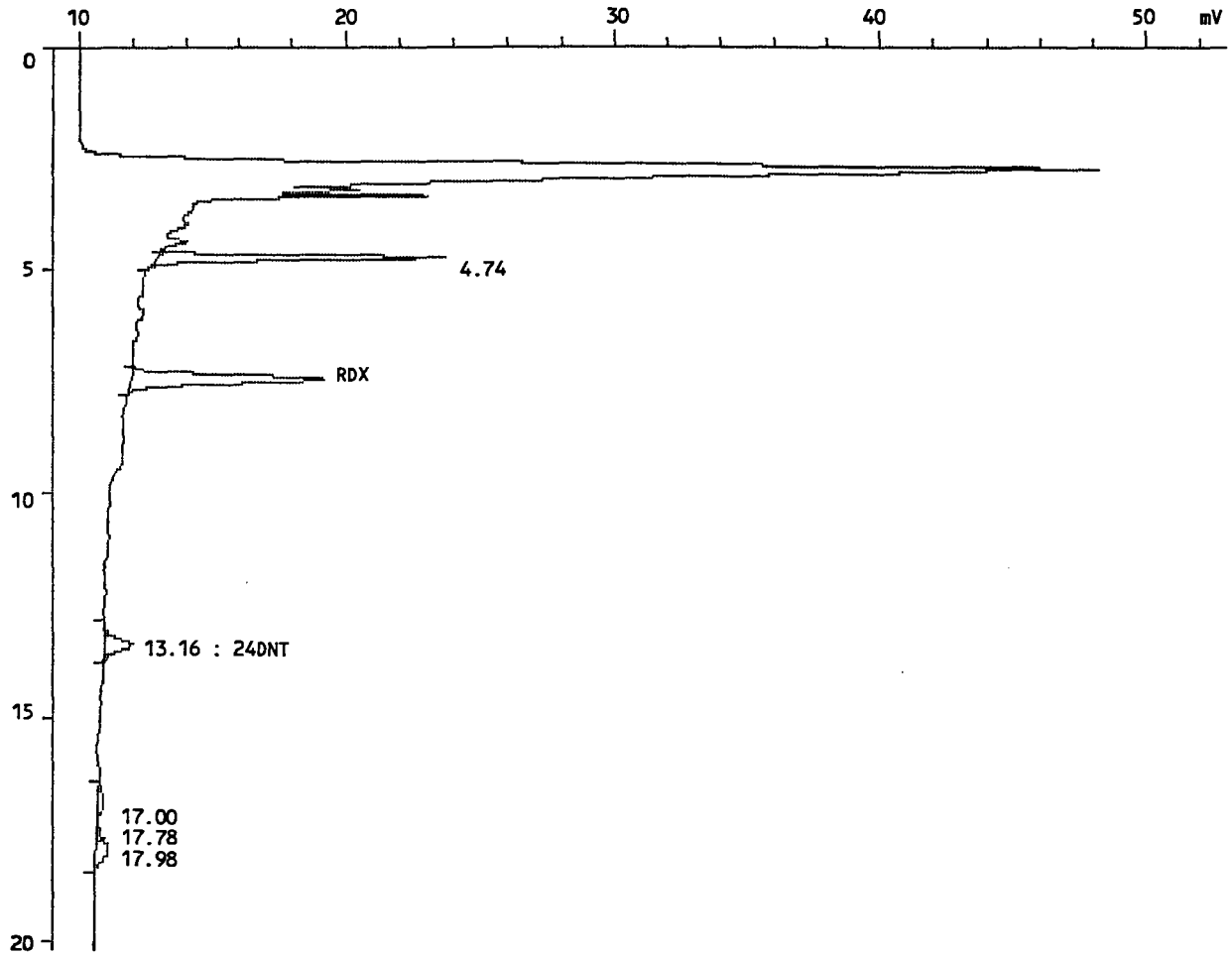
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.736	10827	86517	12202.706	HMX
4	13.397	1075	19120	395.702	3,4DNT
Total		11902	105638	12598.408	
Residual		8294	123065	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,8,1

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 00:48:35
Reported on 16-Sep-98 at 16:35:38



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,8,1

Acquired on 14-Sep-98 at 00:48:35
Modified on 16-Sep-82 at 16:32:02
Reported on 16-Sep-98 at 16:35:24

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911B Last modified on 16-Sep-82 at 16:33:04
Method file.....: LCCN Last modified on 16-Sep-82 at 16:33:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307032FD
Sample ID.....: 35218.05
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	7.483	7234	100660	13022.053	RDX
4	13.397	1075	19120	901.902	24DNT
Total		8309	119781	13923.954	
Residual		11887	108922	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307032FD

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.05

Sample Amt: 2g % Moisture 27.53 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	RPD of FD
75-11-5	PETN	250	U	0

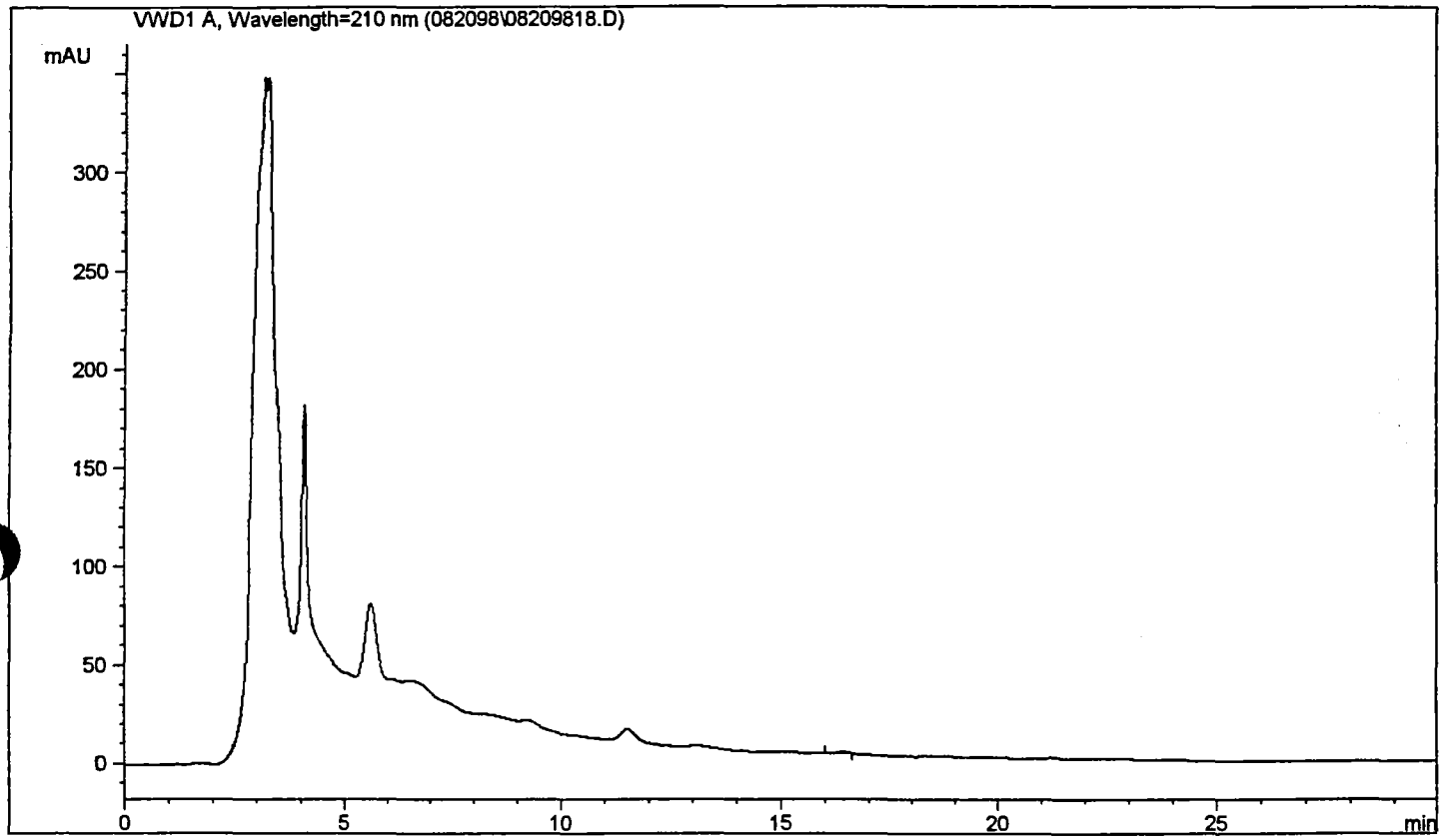
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209818.D
Sample Name: 35218.05 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 18
Sample Name	: 35218.05	Vial No.	: 18
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
16.411	PBA	11.90877	0.00000	0.00000	
Totals:				0.00000	

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1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307033

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.06

Sample Amt: 2g % Moisture 25.30 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	1230	J
121-82-4	RDX	398	J
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

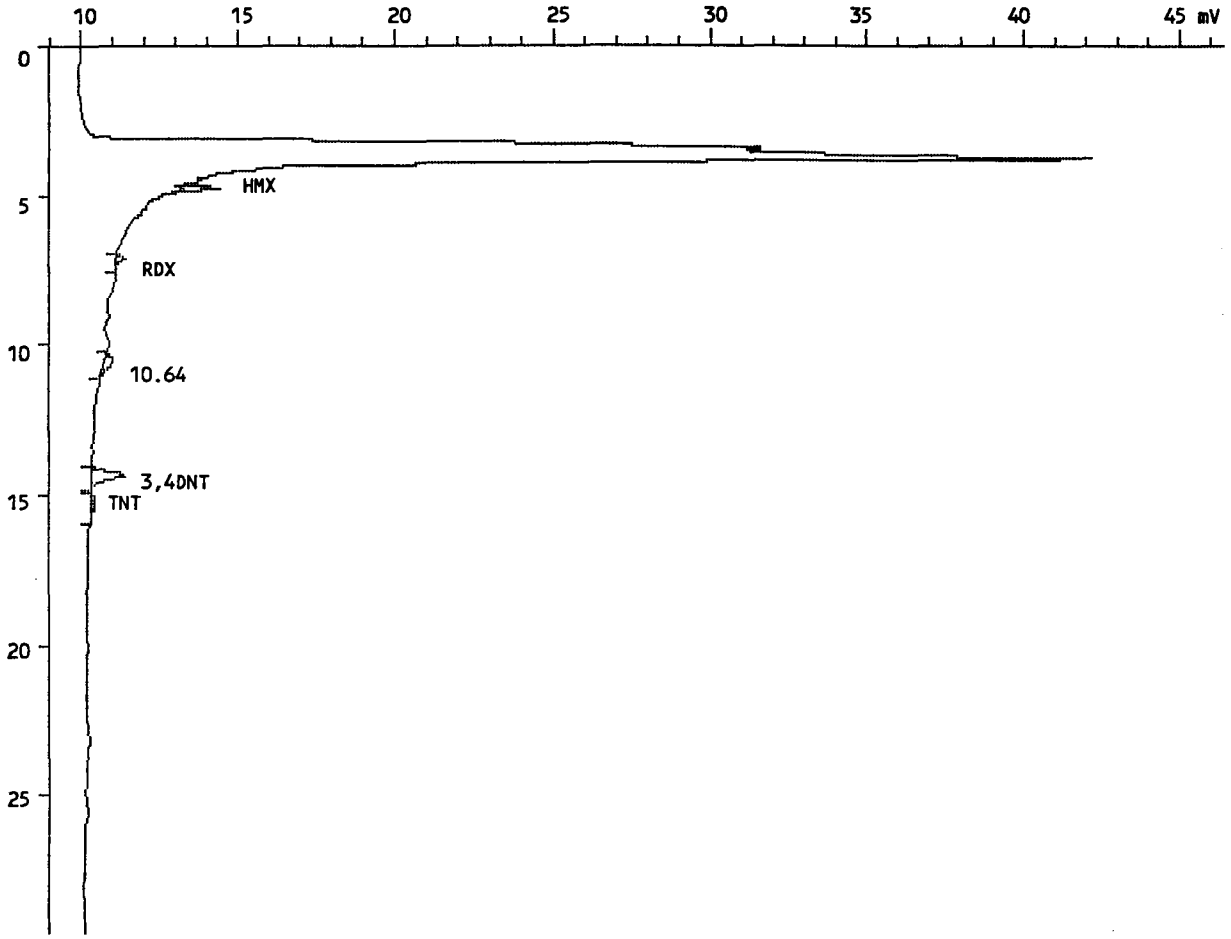
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,16,1

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 06:22:45
Reported on 16-Sep-98 at 16:58:24



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,16,1

Acquired on 18-Aug-98 at 06:22:45
Modified on 18-Aug-82 at 19:18:42
Reported on 16-Sep-98 at 16:57:44

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 14-Sep-82 at 09:11:00
Method file.....: EXPLOS Last modified on 16-Sep-82 at 16:12:18
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

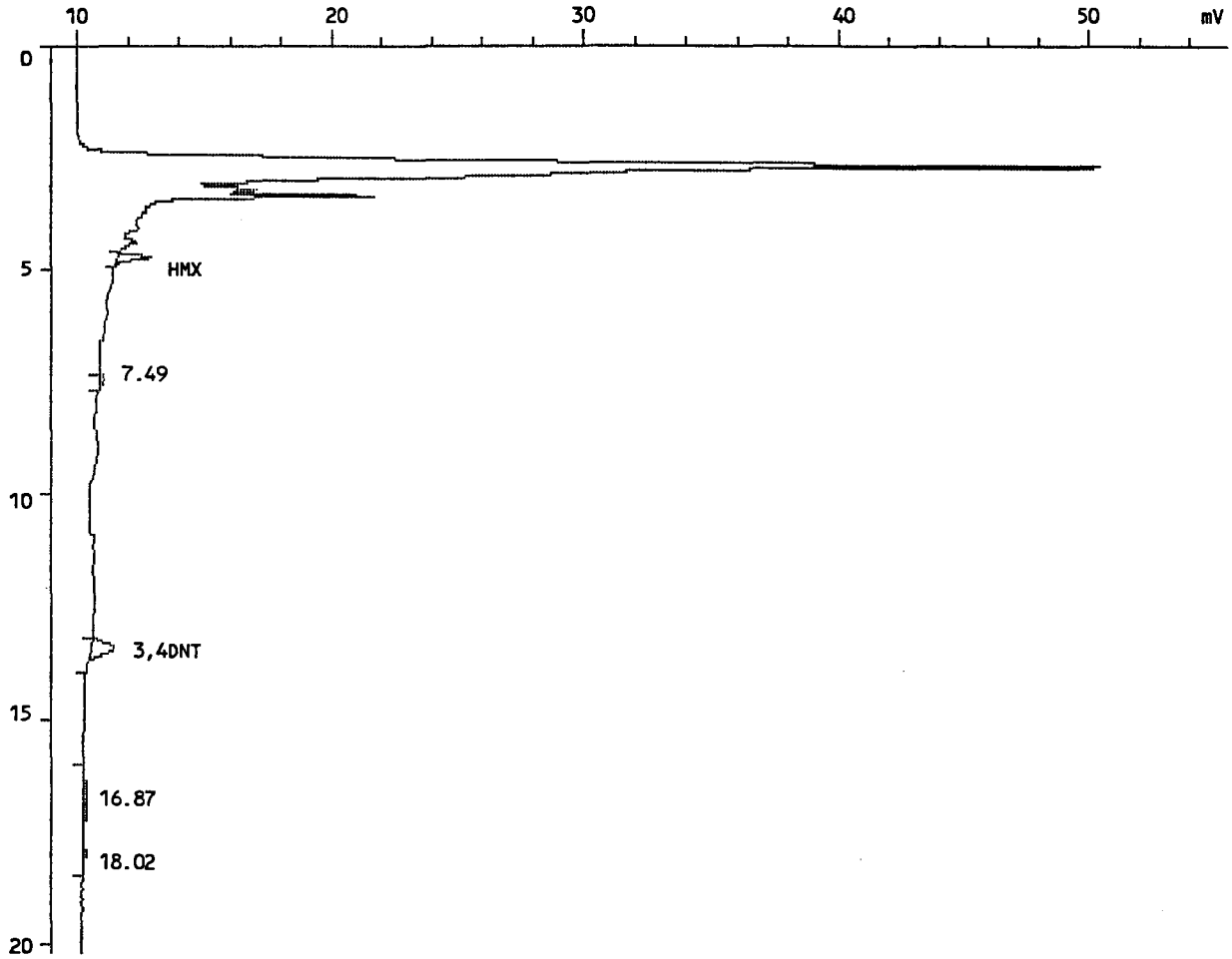
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.795	1351	8894	1231.886	HMX J
2	7.173	298	3764	397.861	RDX J
4	14.357	1063	19948	1707.874	3,4DNT 85
5	15.157	135	5551	267.407	TNT
Total		2846	38157	3605.027	
Residual		262	6650	702.909	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,9,1

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 01:30:04
Reported on 16-Sep-98 at 16:29:40



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,9,1

Acquired on 14-Sep-98 at 01:30:04
Modified on 16-Sep-82 at 16:27:08
Reported on 16-Sep-98 at 16:29:26

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911A Last modified on 16-Sep-82 at 16:26:00
Method file.....: LCCN Last modified on 16-Sep-82 at 16:27:16
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

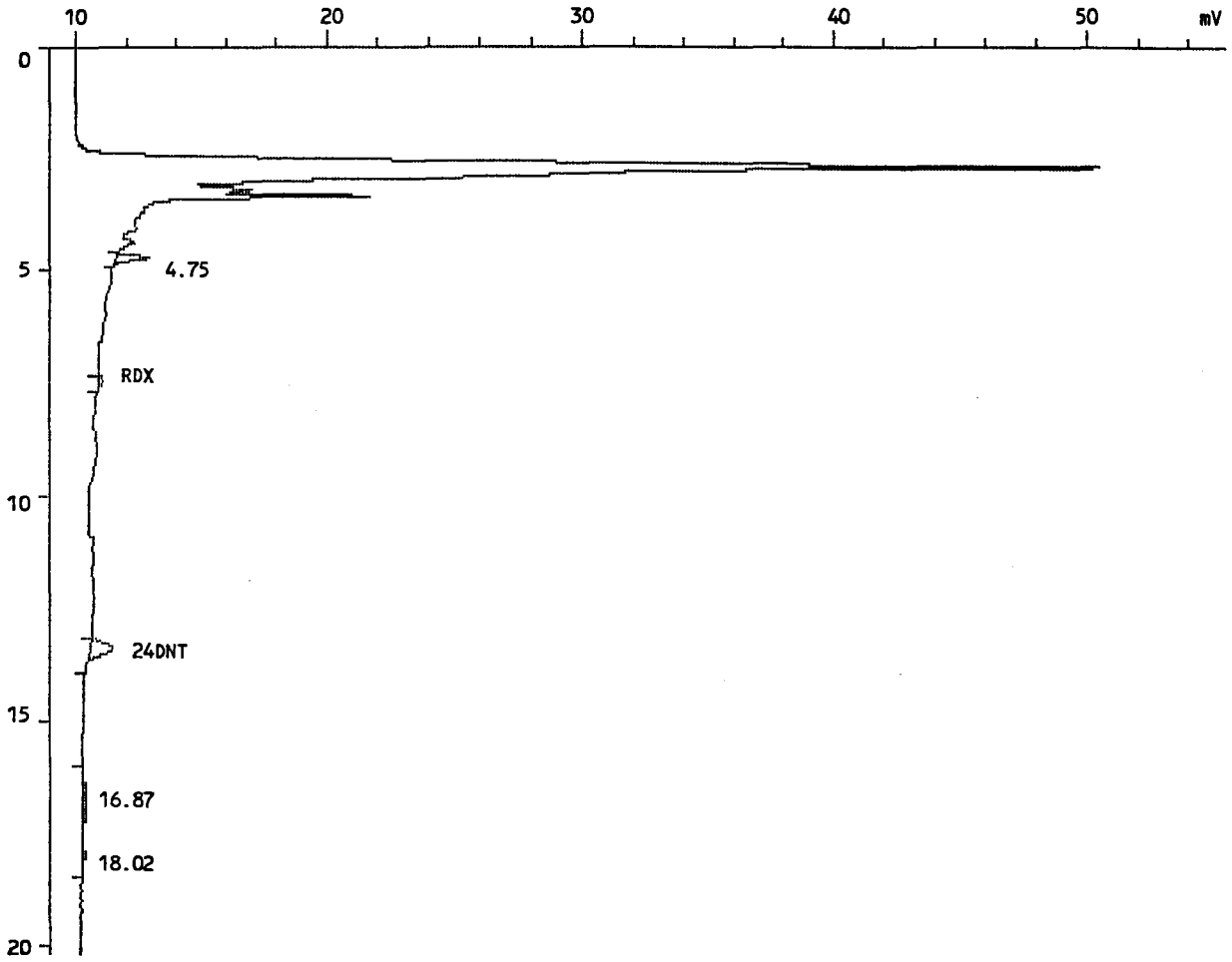
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.752	1255	9432	1330.357	HMX
3	13.429	954	16214	335.549	3,4DNT
Total		2208	25646	1665.907	
Residual		479	12608	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,9,1

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 01:30:04
Reported on 16-Sep-98 at 16:36:05



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,9,1

Acquired on 14-Sep-98 at 01:30:04
Modified on 16-Sep-82 at 16:32:20
Reported on 16-Sep-98 at 16:35:51

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911B Last modified on 16-Sep-82 at 16:33:04
Method file.....: LCCN Last modified on 16-Sep-82 at 16:33:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307033
Sample ID.....: 35218.06
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	7.493	224	2631	340.336	RDX
3	13.429	954	16214	764.799	24DNT
Total		1178	18845	1105.135	
Residual		1510	19409	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307033

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.06

Sample Amt: 2g % Moisture 25.30 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

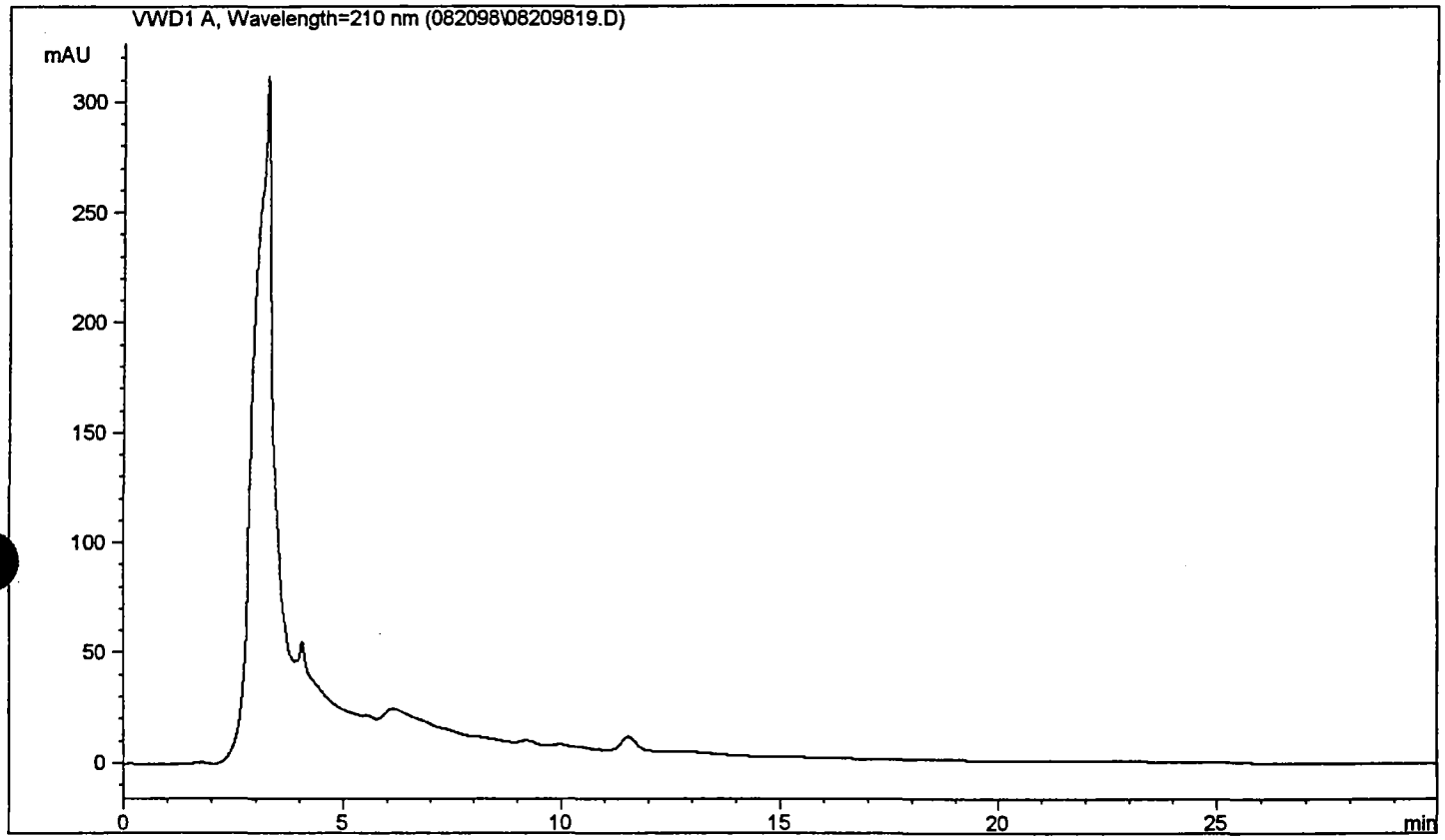
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209819.D
Sample Name: 35218.06 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 19
Sample Name	: 35218.06	Vial No.	: 19
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

1D
EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307051

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.07

Sample Amt: 2g % Moisture 36.43 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	9710	
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

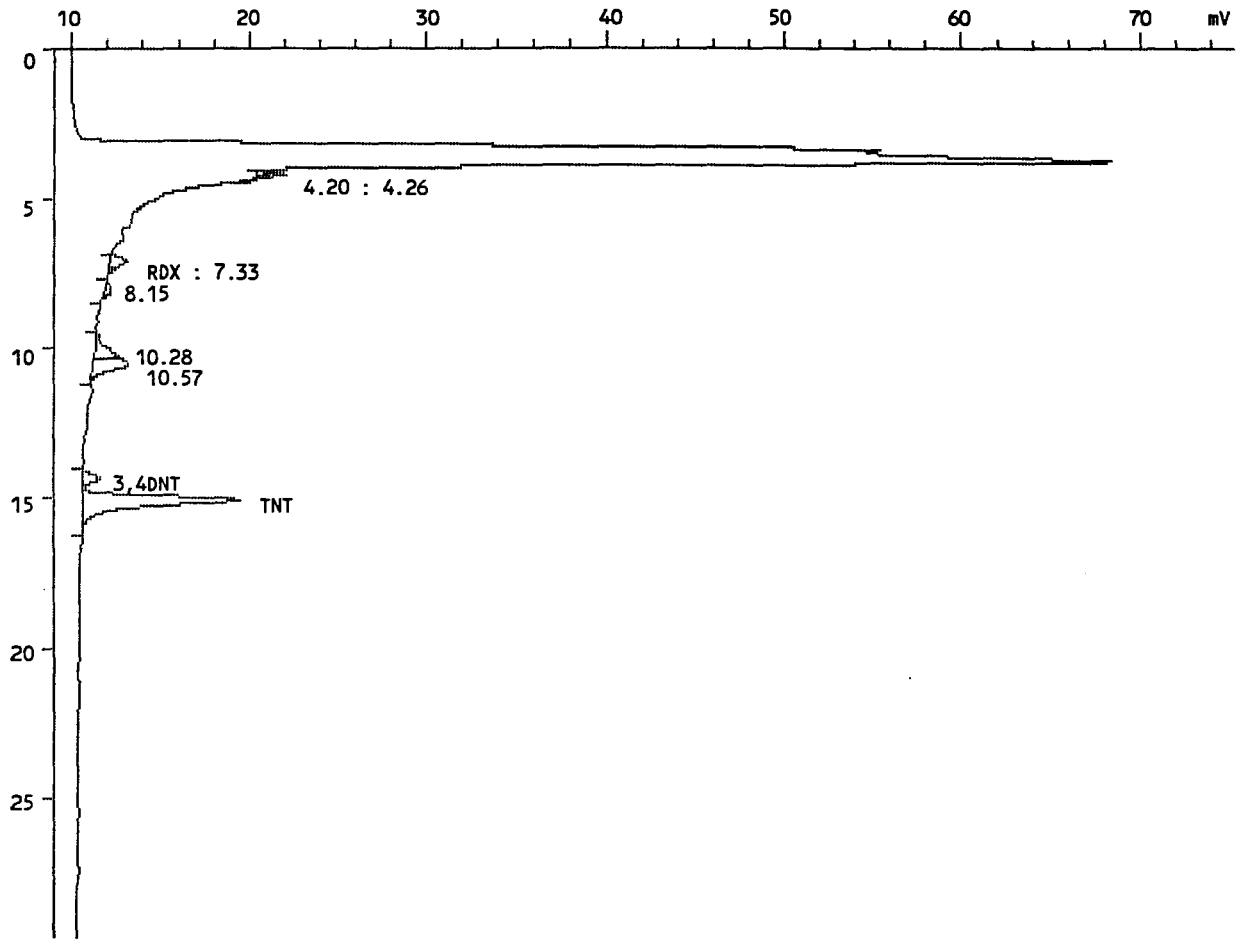
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,17,1

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 07:07:29
Reported on 16-Sep-98 at 16:59:47



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,17,1

Acquired on 18-Aug-98 at 07:07:29
Modified on 18-Aug-82 at 19:18:46
Reported on 16-Sep-98 at 16:59:01

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 14-Sep-82 at 09:11:00
Method file.....: EXPLOS Last modified on 16-Sep-82 at 16:12:18
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

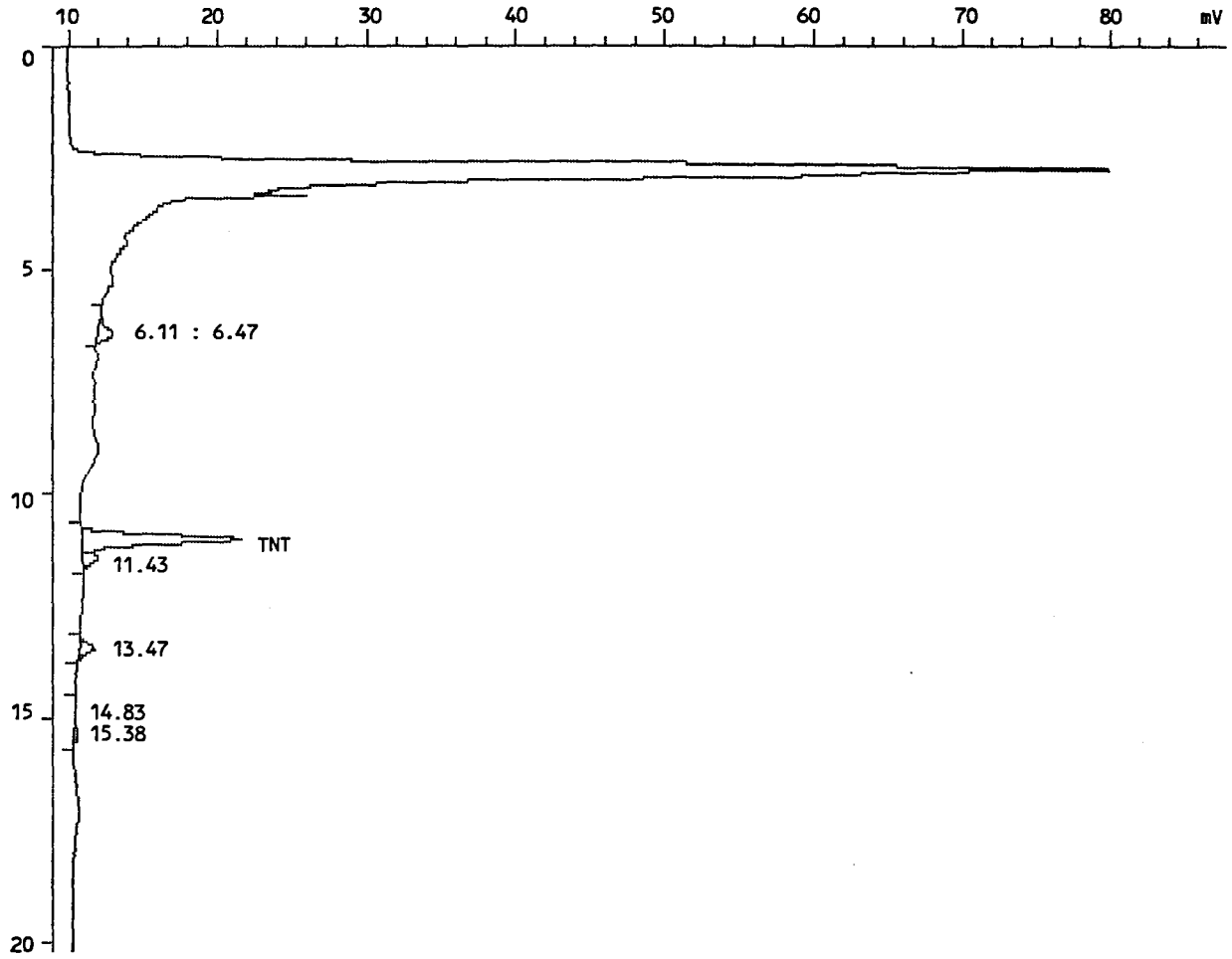
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
3	7.168	994	16181	1710.453	RDX
8	14.373	1039	18956	1622.979	3,4DNT 8l
9	15.115	8847	201672	9714.428	TNT *
Total		10880	236809	13047.861	
Residual		6925	117162	12384.992	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,10,1

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 02:11:33
Reported on 16-Sep-98 at 16:30:07



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,10,1

Acquired on 14-Sep-98 at 02:11:33
Modified on 16-Sep-82 at 16:26:50
Reported on 16-Sep-98 at 16:29:53

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911A Last modified on 16-Sep-82 at 16:26:00
Method file.....: LCCN Last modified on 16-Sep-82 at 16:27:16
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

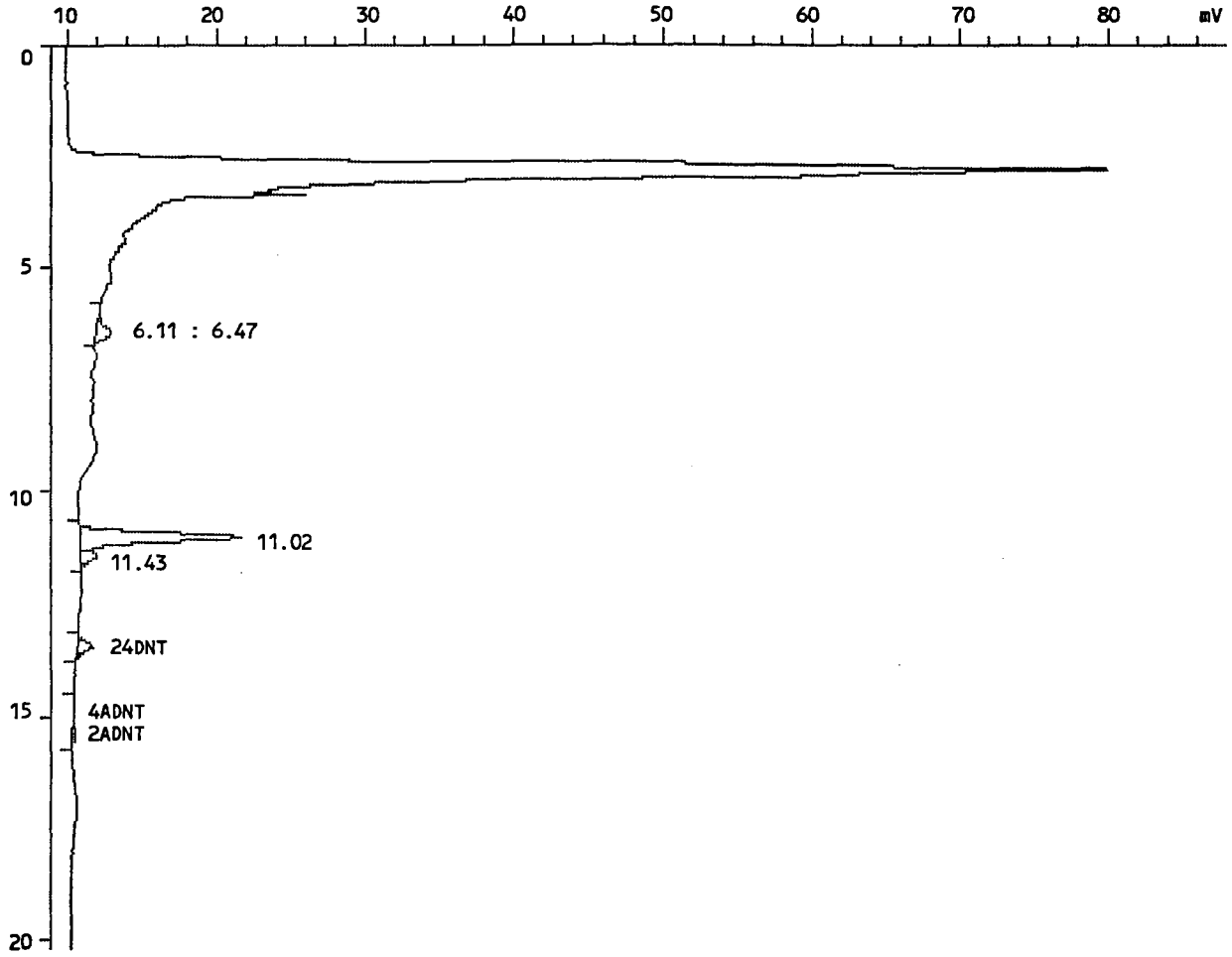
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
3	11.024	10800	152134	7122.359	TNT
Total		10800	152134	7122.359	
Residual		3596	62214	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,10,1

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 02:11:33
Reported on 16-Sep-98 at 16:36:32



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,10,1

Acquired on 14-Sep-98 at 02:11:33
Modified on 16-Sep-82 at 16:33:36
Reported on 16-Sep-98 at 16:36:18

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911B Last modified on 16-Sep-82 at 16:33:04
Method file.....: LCCN Last modified on 16-Sep-82 at 16:33:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307051
Sample ID.....: 35218.07
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
5	13.467	996	16362	771.810	24DNT
6	14.827	105	1767	164.093	4ADNT
7	15.376	158	4117	258.412	2ADNT
Total		1260	22246	1194.314	
Residual		13136	192101	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307051

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.07

Sample Amt: 2g % Moisture 36.43 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

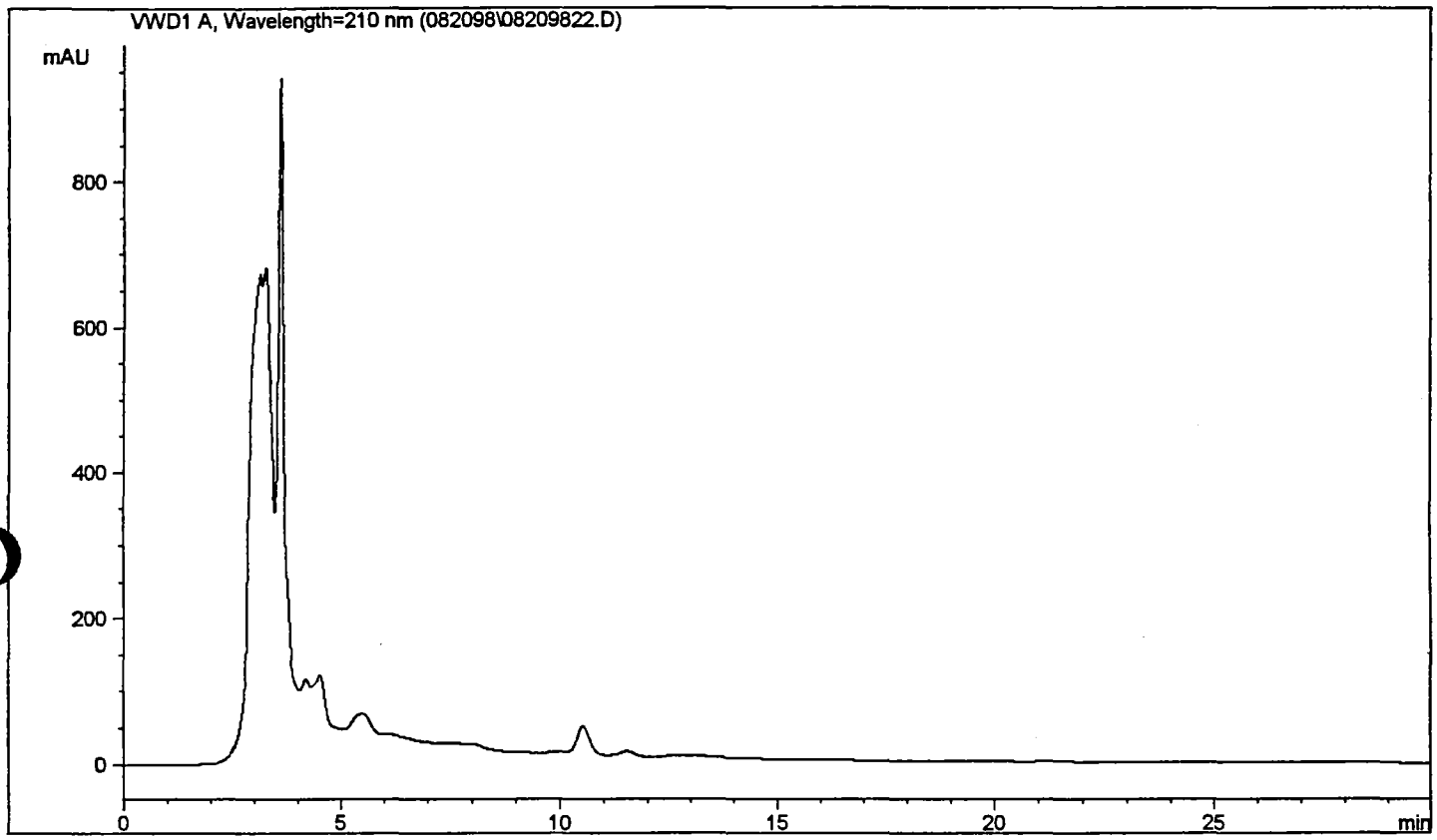
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209822.D
Sample Name: 35218.07 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 22
Sample Name	: 35218.07	Vial No.	: 22
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

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1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307052

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.08

Sample Amt: 2g % Moisture 33.05 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

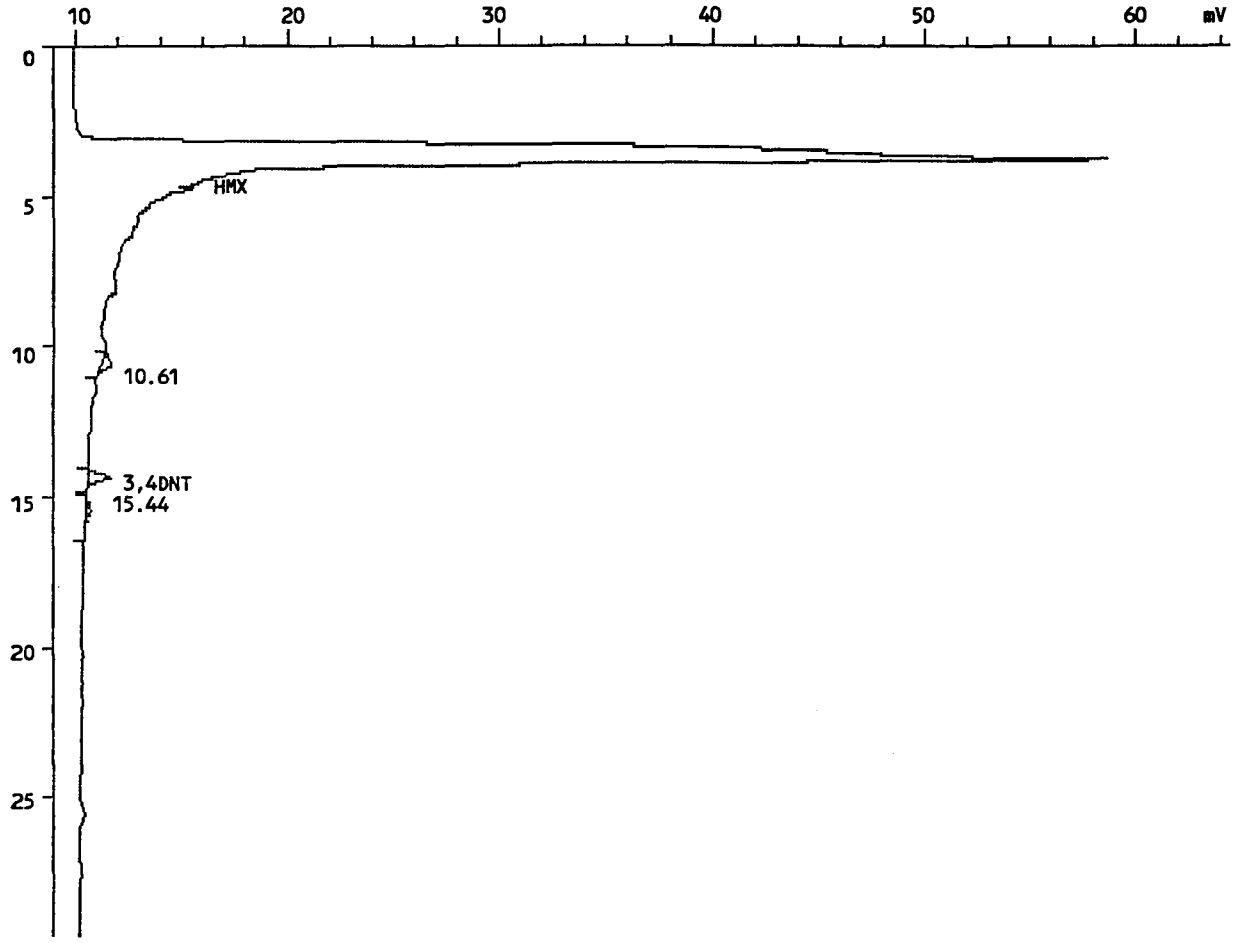
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,18,1

Sample name.....: BIOM01307052
Sample ID.....: 35218.08
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 07:52:14
Reported on 18-Aug-98 at 19:34:22



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,18,1

Acquired on 18-Aug-98 at 07:52:14
Modified on 18-Aug-82 at 19:18:52
Reported on 18-Aug-98 at 19:28:18

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307052
Sample ID.....: 35218.08
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.789	386	2032	281.499	HMX
3	14.368	1066	19856	1699.969	3,4DNT 85
Total		1452	21888	1981.469	
Residual		800	22780	2634.978	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307052

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.08

Sample Amt: 2g % Moisture 33.05 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

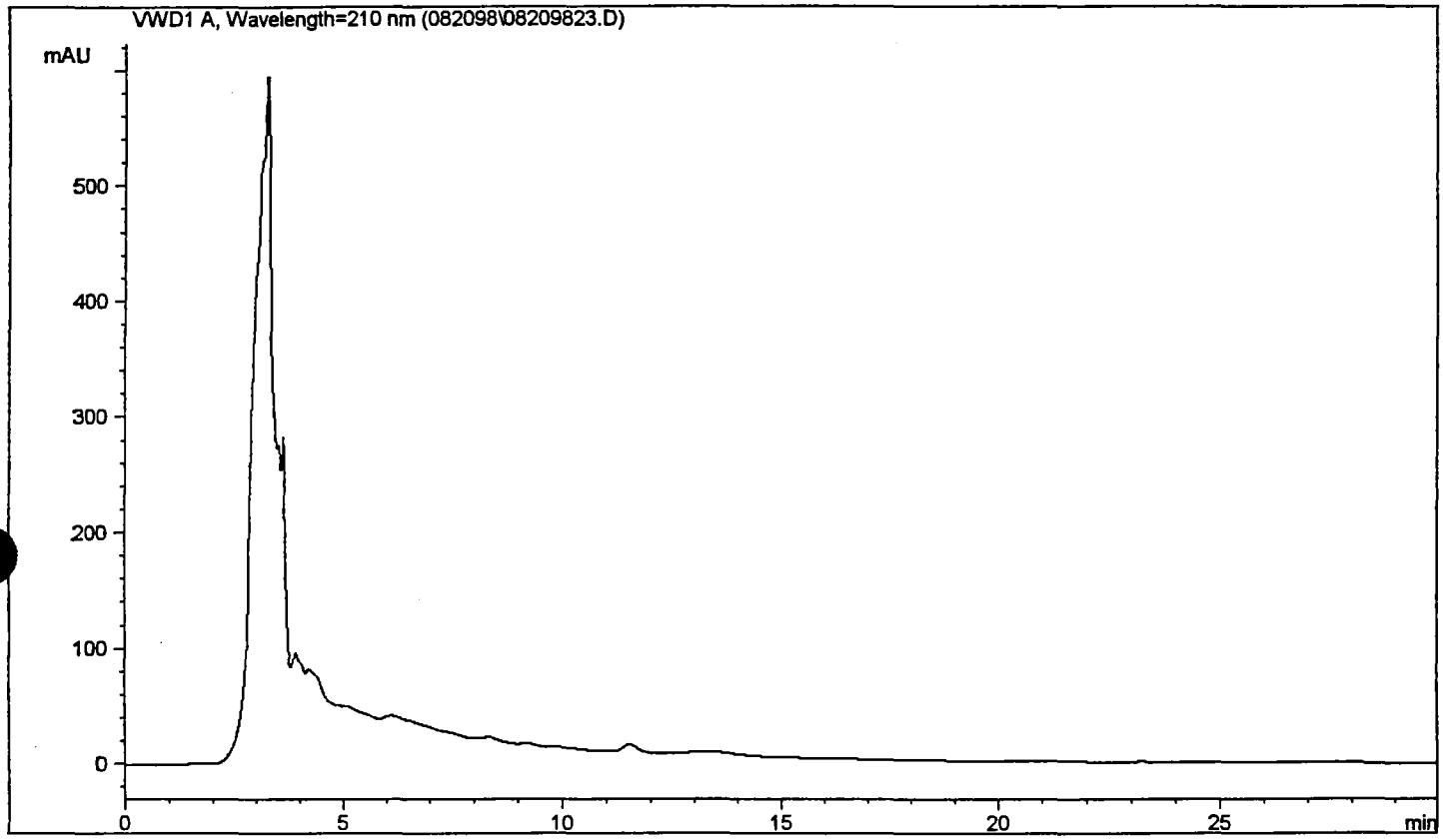
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209823.D
Sample Name: 35218.08 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 23
Sample Name	: 35218.08	Vial No.	: 23
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307053

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.09

Sample Amt: 2g % Moisture 27.22 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

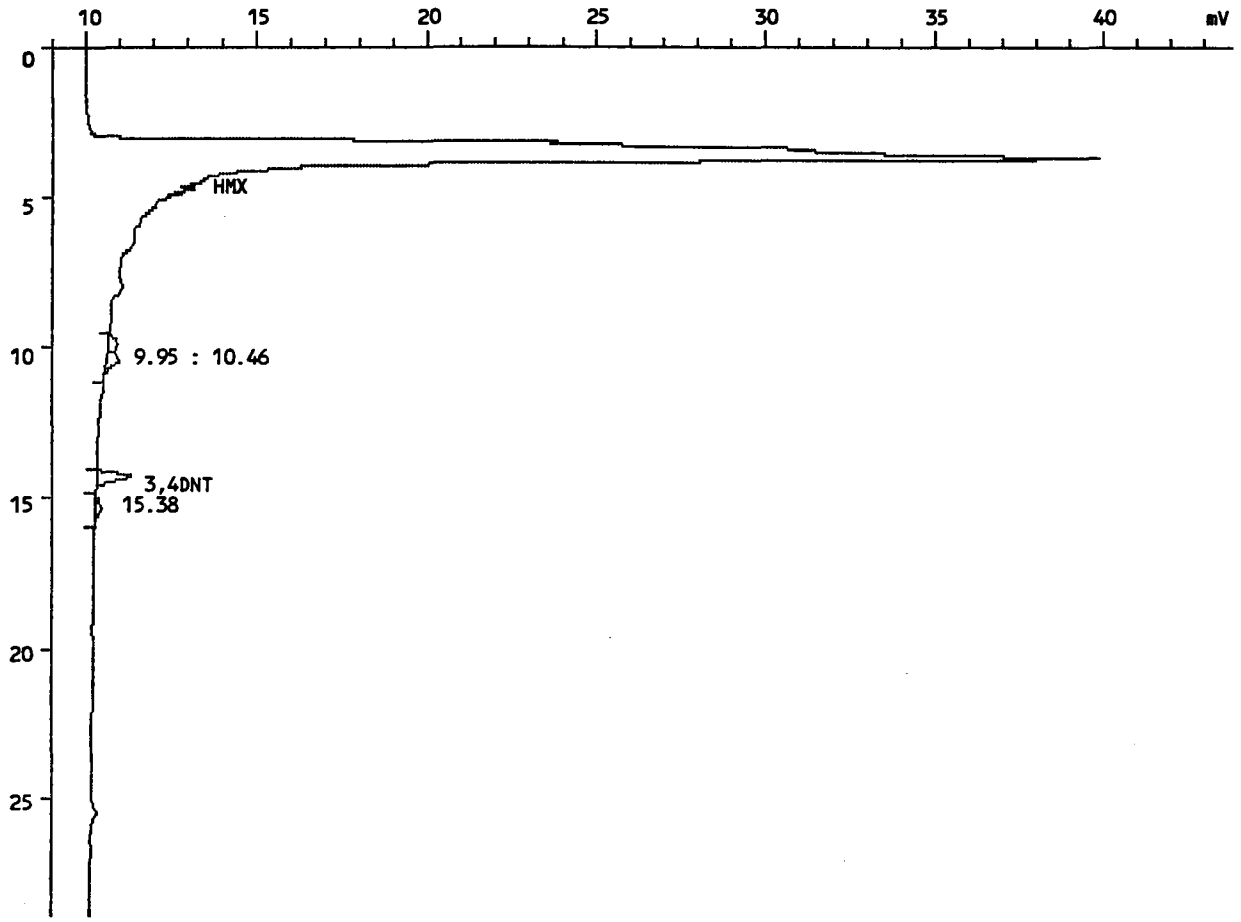
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,21,1

Sample name.....: BIOM01307053
Sample ID.....: 35218.09
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 10:06:31
Reported on 18-Aug-98 at 19:34:49



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,21,1

Acquired on 18-Aug-98 at 10:06:31
Modified on 18-Aug-82 at 19:18:56
Reported on 18-Aug-98 at 19:28:31

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307053
Sample ID.....: 35218.09
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.779	256	1507	208.768	HMX
4	14.320	1045	19620	1679.797	3,4DNT 84
Total		1301	21127	1888.564	
Residual		858	23506	2987.249	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307053

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.09

Sample Amt: 2g % Moisture 27.22 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

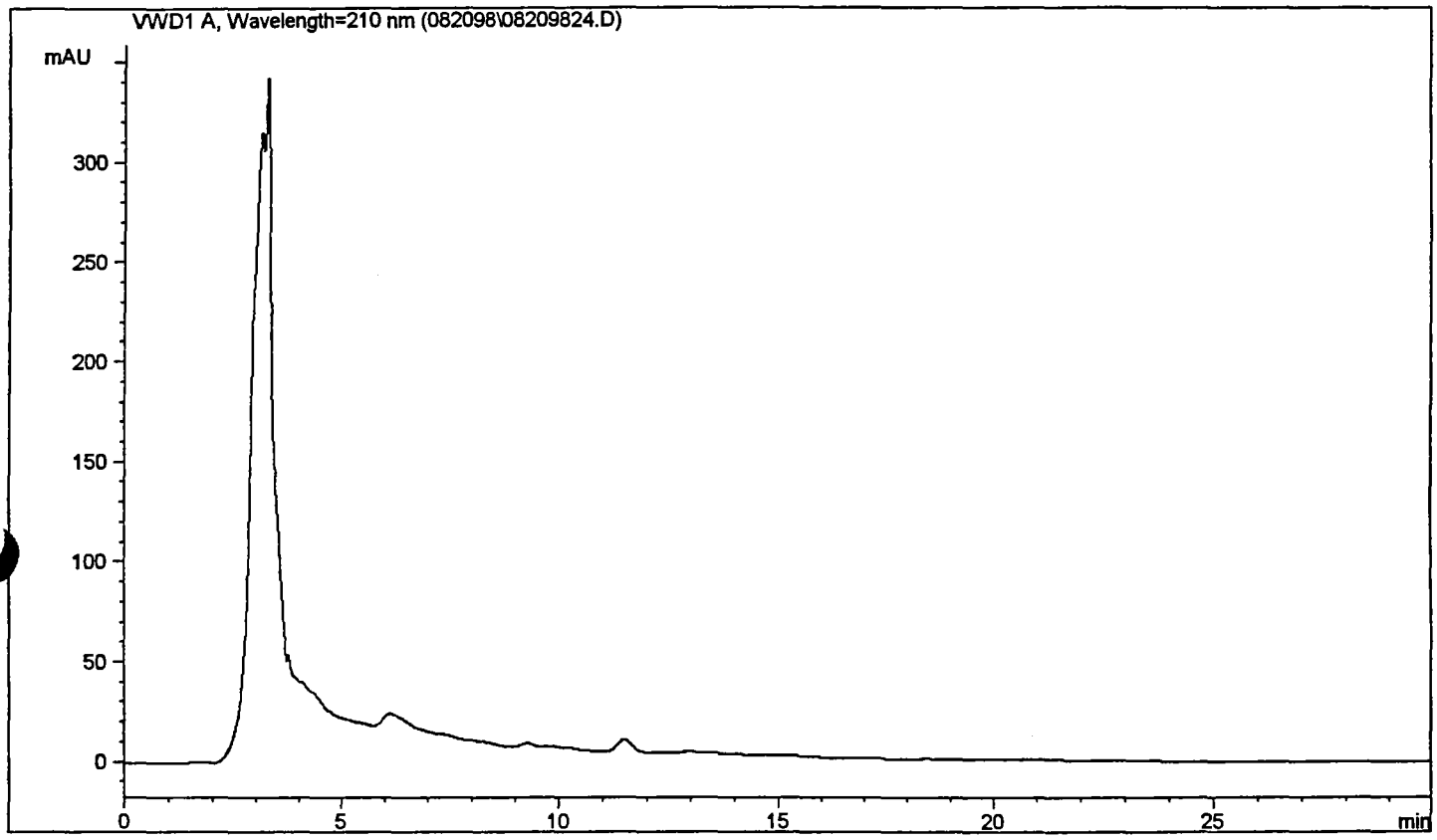
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209824.D
Sample Name: 35218.09 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	:	24
Sample Name	: 35218.09	Vial No.	:	24
Acq Operator	: MP	Inj. No.	:	1
		Inj. Vol.	:	200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

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1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307071

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.10

Sample Amt: 2g % Moisture 30.35 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

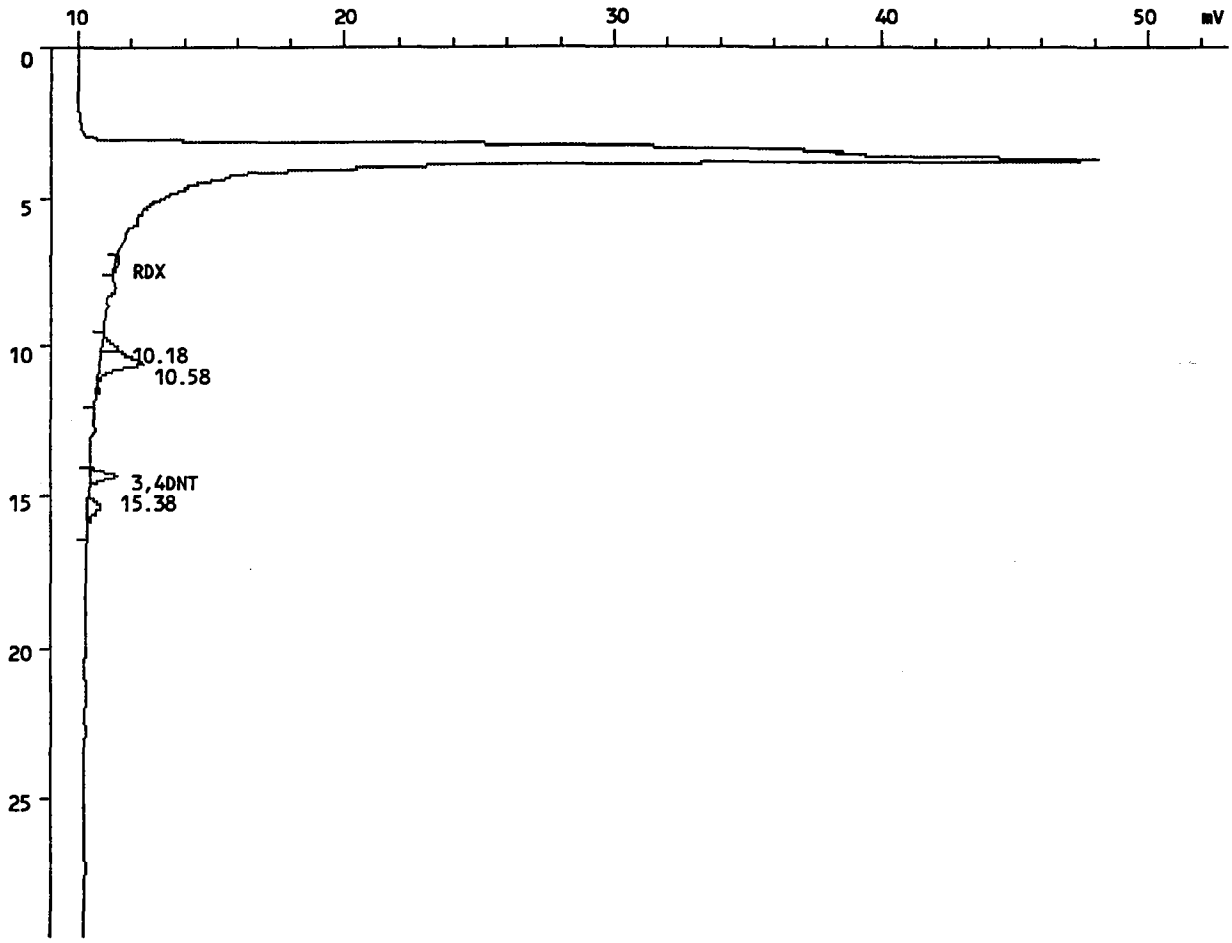
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,22,1

Sample name.....: BIOM01307071
Sample ID.....: 35218.10
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 10:51:24
Reported on 18-Aug-98 at 19:36:46



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,22,1

Acquired on 18-Aug-98 at 10:51:24
Modified on 18-Aug-82 at 19:19:02
Reported on 18-Aug-98 at 19:28:44

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307071
Sample ID.....: 35218.10
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	7.152	185	5207	550.401	RDX
4	14.325	1024	18985	1625.386	3,4DNT 81
Total		1210	24191	2175.787	
Residual		2824	79929	8175.791	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307071

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.10

Sample Amt: 2g % Moisture 30.35 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

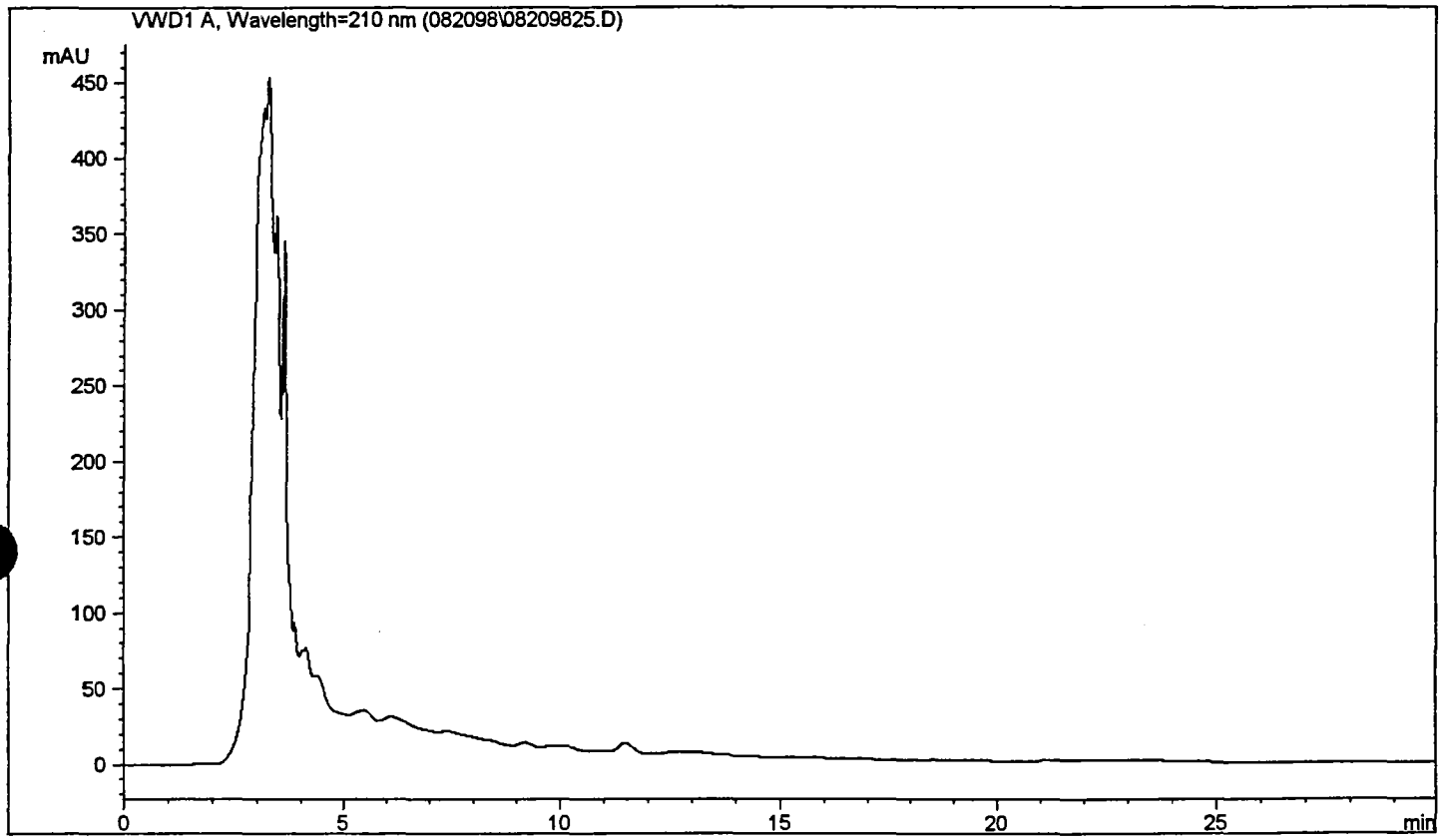
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209825.D
Sample Name: 35218.10 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 25
Sample Name	: 35218.10	Vial No.	: 25
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

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1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307072

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.11

Sample Amt: 2g % Moisture 22.76 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	4610	
121-82-4	RDX	1250	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	704	P
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

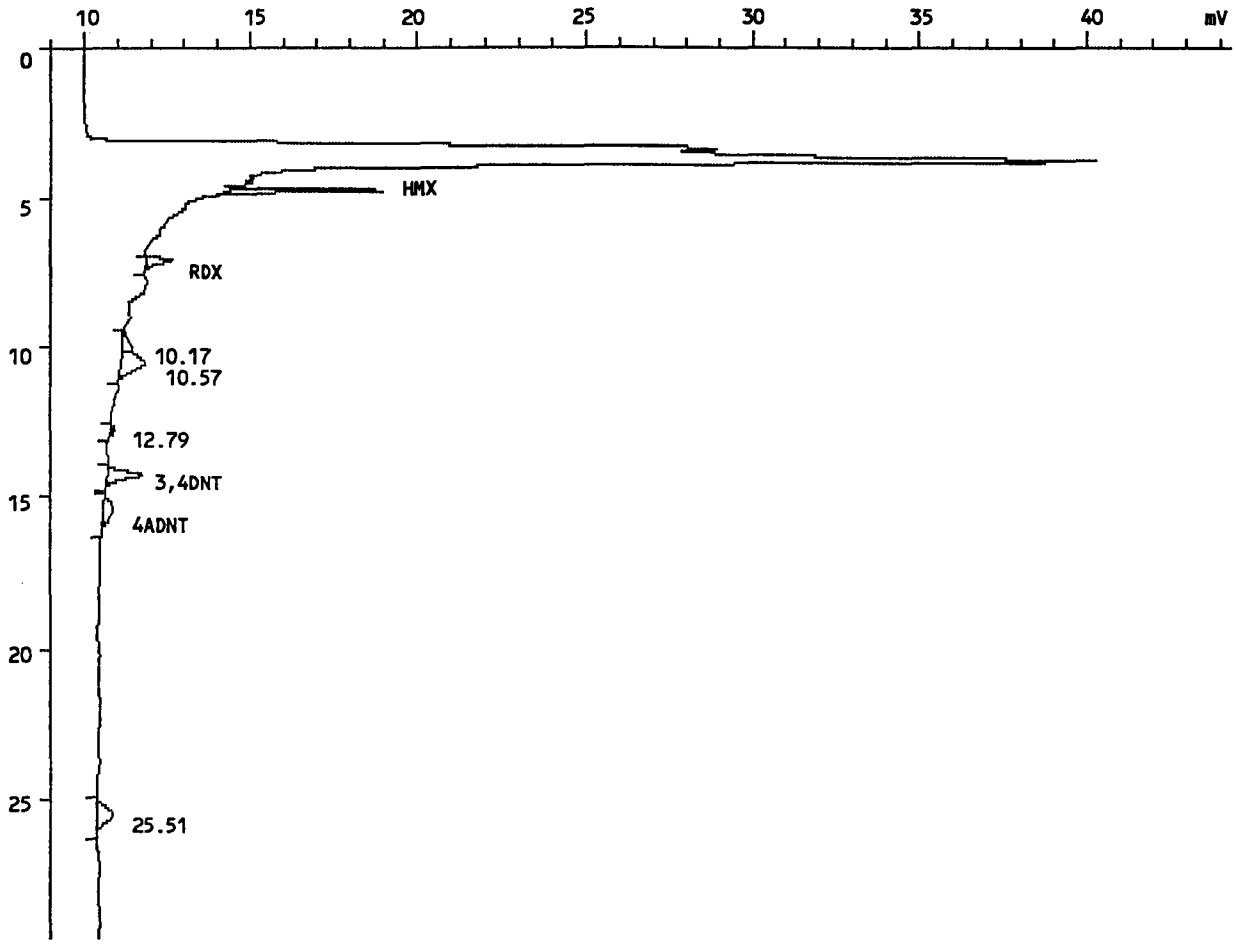
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,23,1

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 11:36:04
Reported on 18-Aug-98 at 19:36:59



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,23,1

Acquired on 18-Aug-98 at 11:36:04
Modified on 18-Aug-82 at 19:19:04
Reported on 18-Aug-98 at 19:28:57

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

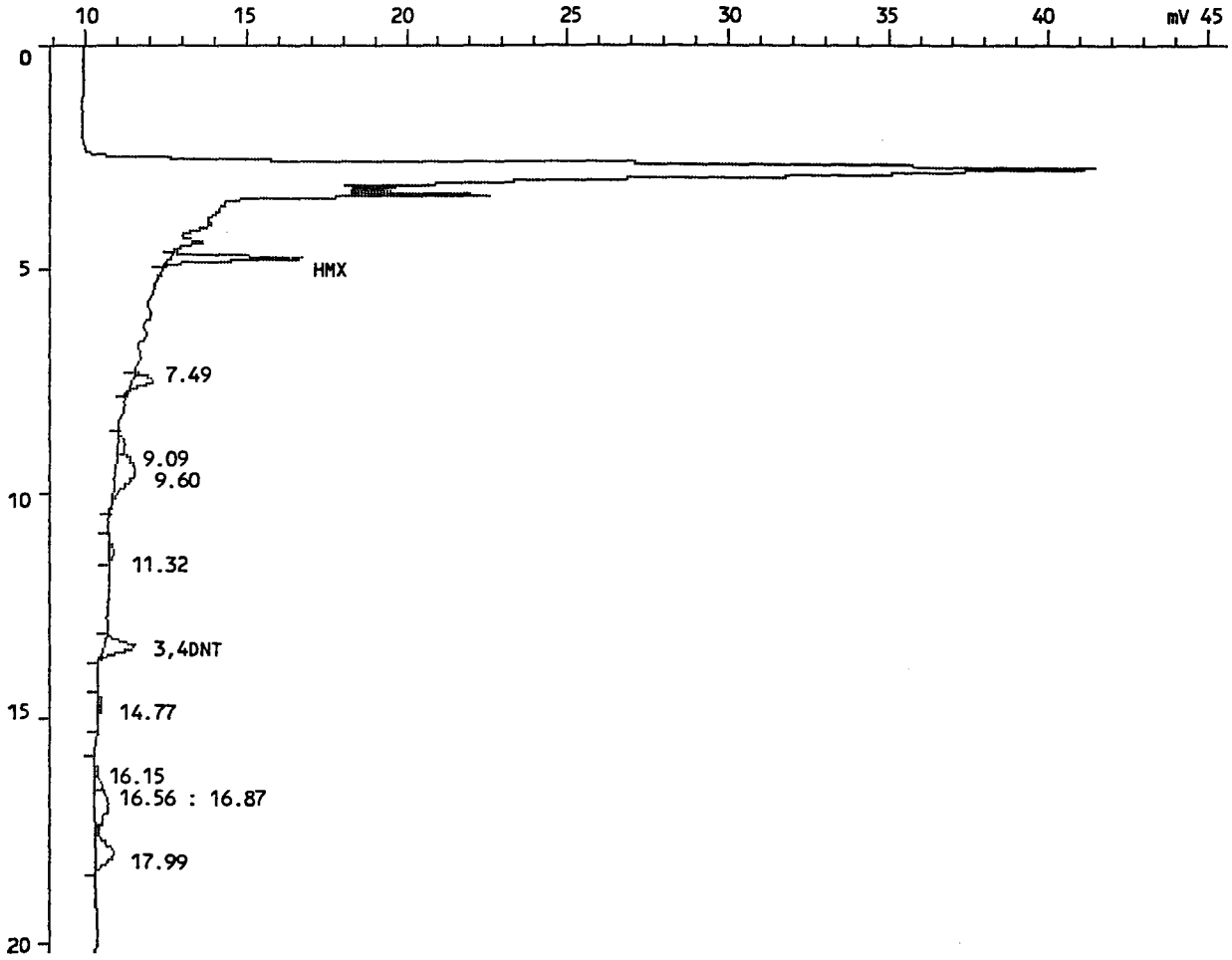
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.773	4760	33302	4612.407	HMX *
2	7.147	831	11834	1250.943	RDX *
6	14.315	1070	20526	1757.402	3,4DNT 88
7	15.536	301	12204	704.598	4ADNT *-P
Total		6962	77866	8325.350	
Residual		1817	55425	4985.148	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,11,1

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 02:53:02
Reported on 16-Sep-98 at 16:30:33



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,11,1

Acquired on 14-Sep-98 at 02:53:02
Modified on 16-Sep-82 at 16:26:52
Reported on 16-Sep-98 at 16:30:20

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911A Last modified on 16-Sep-82 at 16:26:00
Method file.....: LCCN Last modified on 16-Sep-82 at 16:27:16
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

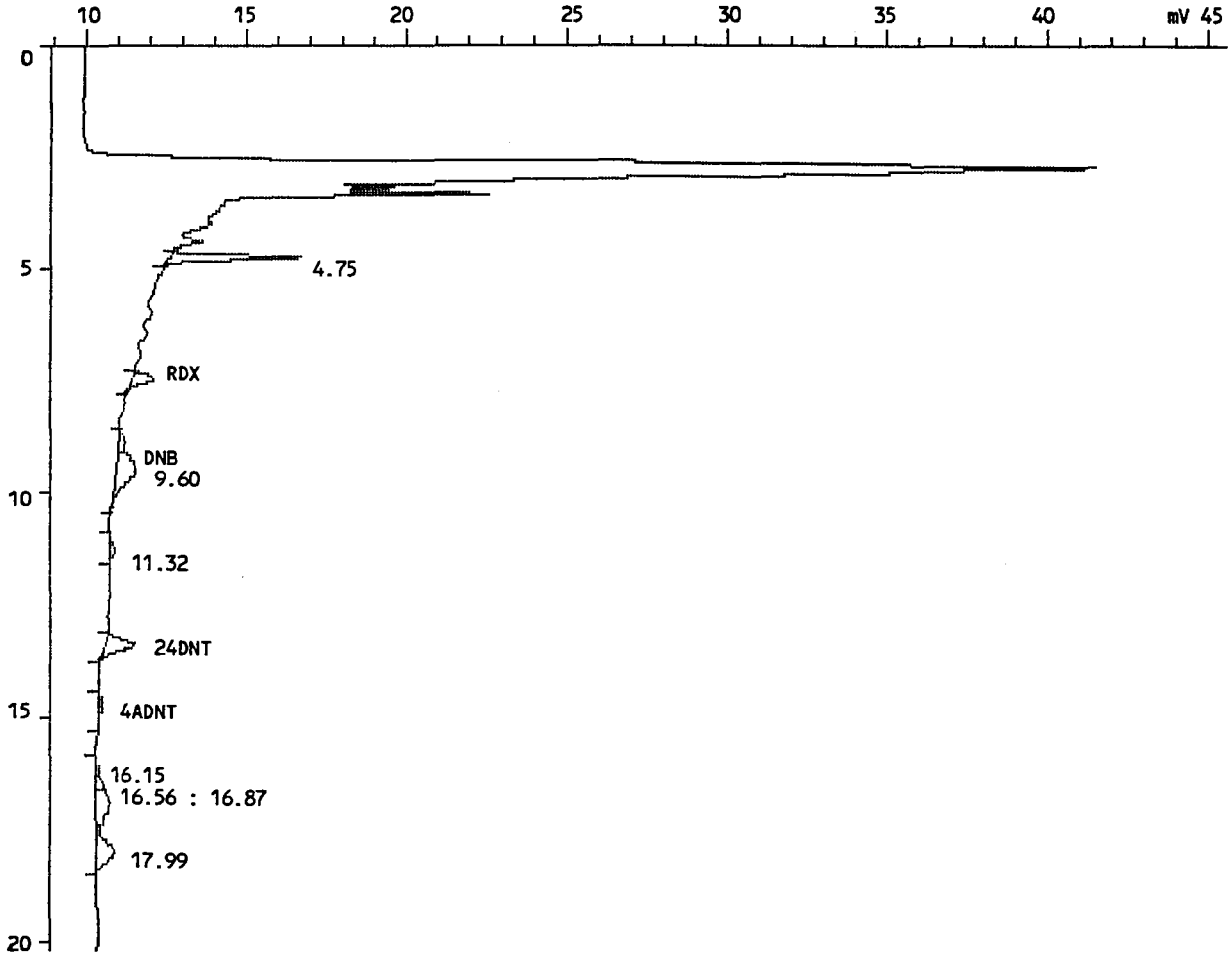
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.747	4118	32444	4576.050	HMX
6	13.419	991	16500	341.478	3,4DNT
Total		5109	48944	4917.529	
Residual		3099	84817	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0911F,11,1

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 14-Sep-98 at 02:53:02
Reported on 16-Sep-98 at 16:37:01



INJECTION REPORT

Injection F: <MC4> 1 1CN0911F,11,1

Acquired on 14-Sep-98 at 02:53:02
Modified on 16-Sep-82 at 16:33:40
Reported on 16-Sep-98 at 16:36:45

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 14
Calibration file..: 1CN0911B Last modified on 16-Sep-82 at 16:33:04
Method file.....: LCCN Last modified on 16-Sep-82 at 16:33:50
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307072
Sample ID.....: 35218.11
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
2	7.488	684	9323	1206.050	RDX
3	9.088	229	4048	176.250	DNB
6	13.419	991	16500	778.313	24DNT
7	14.768	117	2635	244.643	4ADNT
Total		2021	32506	2405.257	
Residual		6188	101255	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307072

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.11

Sample Amt: 2g % Moisture 22.76 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

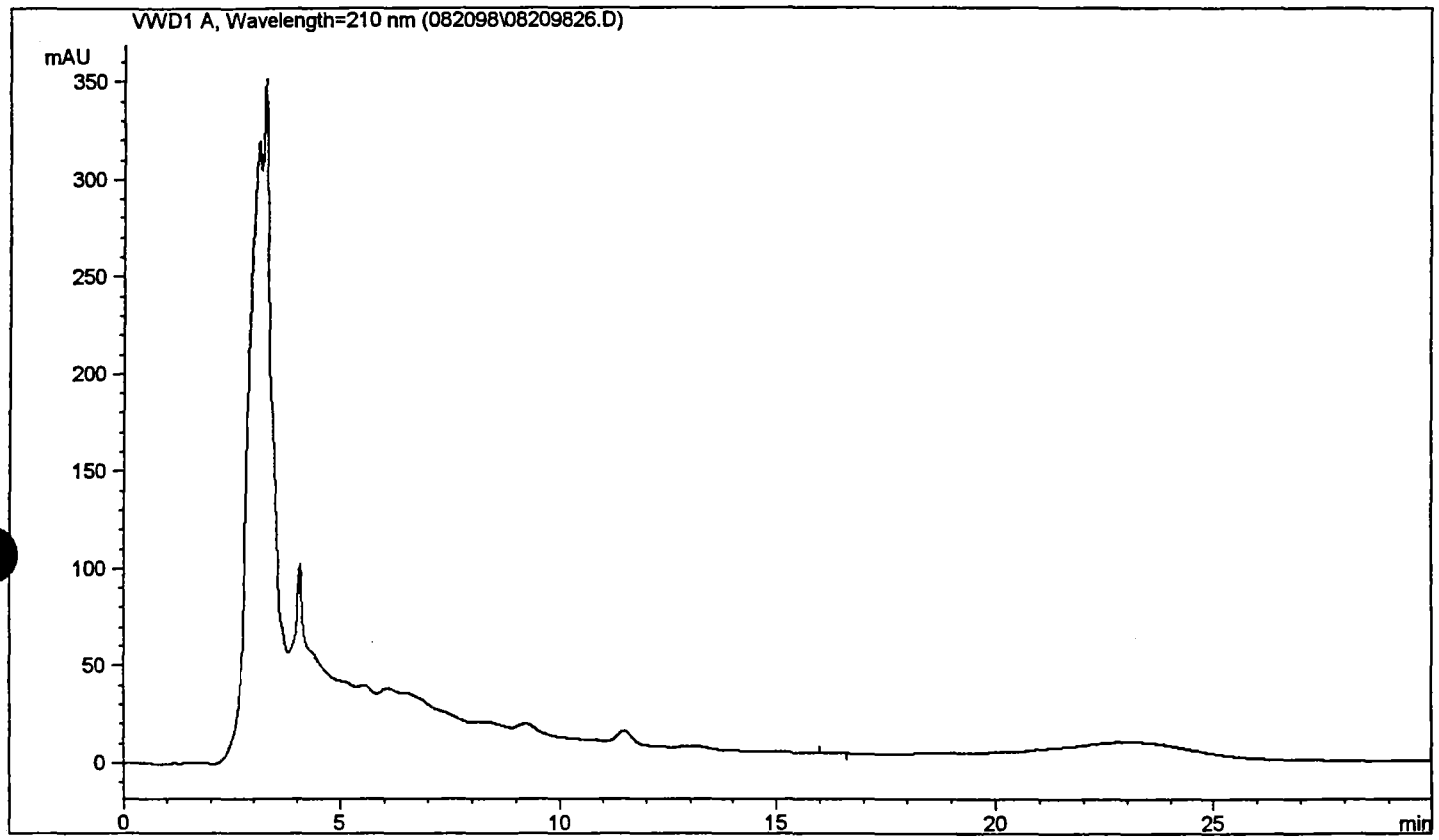
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209826.D
Sample Name: 35218.11 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 26
Sample Name	: 35218.11	Vial No.	: 26
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
16.386	PBA	4.18142	0.00000	0.00000	
Totals:				0.00000	

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1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307073

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.12

Sample Amt: 2g % Moisture 21.55 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
2691-41-0	HMX	1570	J
121-82-4	RDX	820	J
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U

SURROGATE AMOUNT SPIKED (ug/kg dry wt.) 2000
3,4-DNT

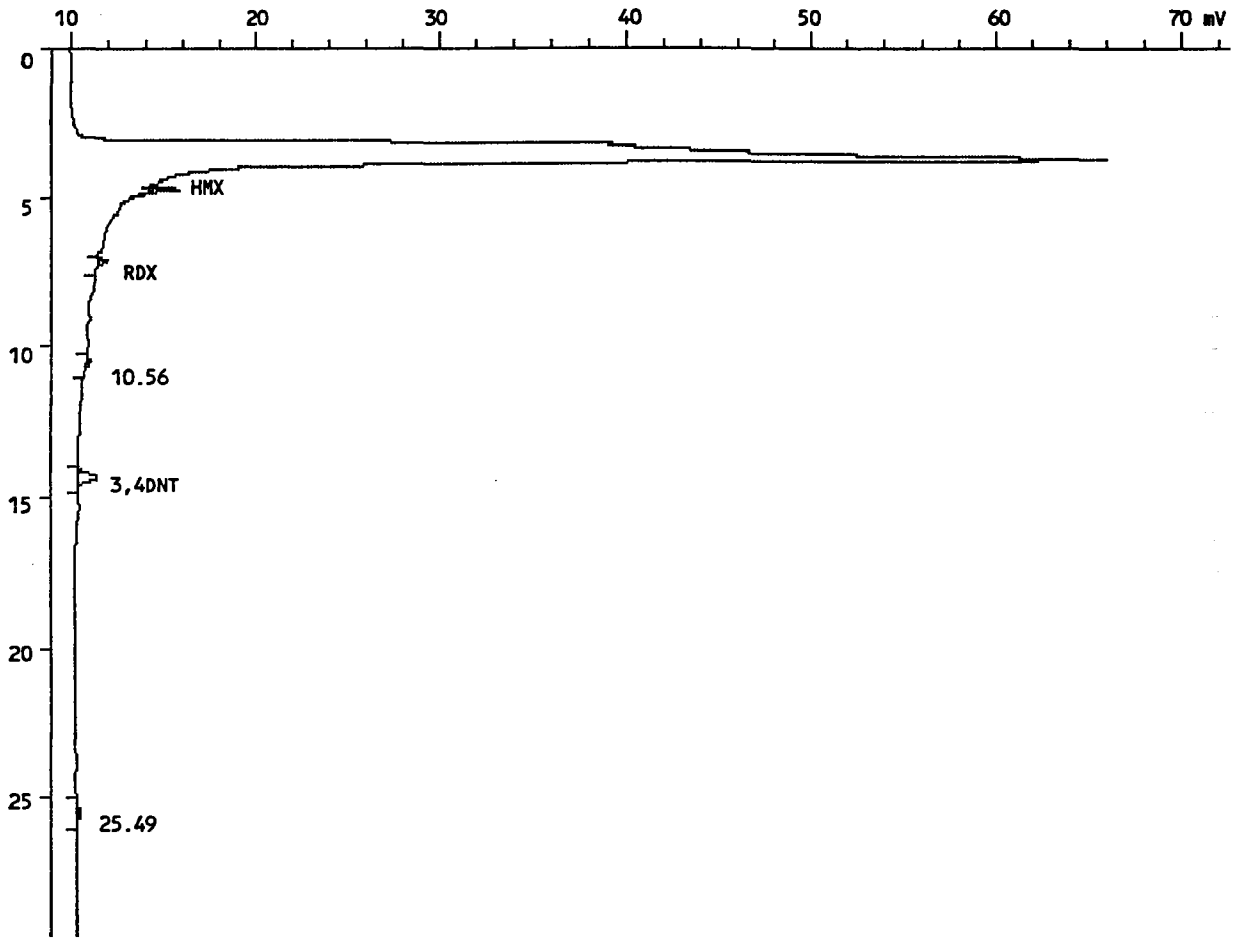
FORM I

LONG PLOT

Injection F: <MC3> 5 5EX0814E,24,1

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02, INJ:200,COL#1

Acquired on 18-Aug-98 at 12:20:44
Reported on 18-Aug-98 at 19:37:13



INJECTION REPORT

Injection F: <MC3> 5 5EX0814E,24,1

Acquired on 18-Aug-98 at 12:20:44
Modified on 18-Aug-82 at 19:19:10
Reported on 18-Aug-98 at 19:29:11

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN13, COL. TYPE: ODS-II, ID: CARB-02,INJ:200,COL#1
Number of samples.: 26
Calibration file..: 5EX0814 Last modified on 18-Aug-82 at 19:18:06
Method file.....: EXPLOS Last modified on 18-Aug-82 at 19:17:36
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

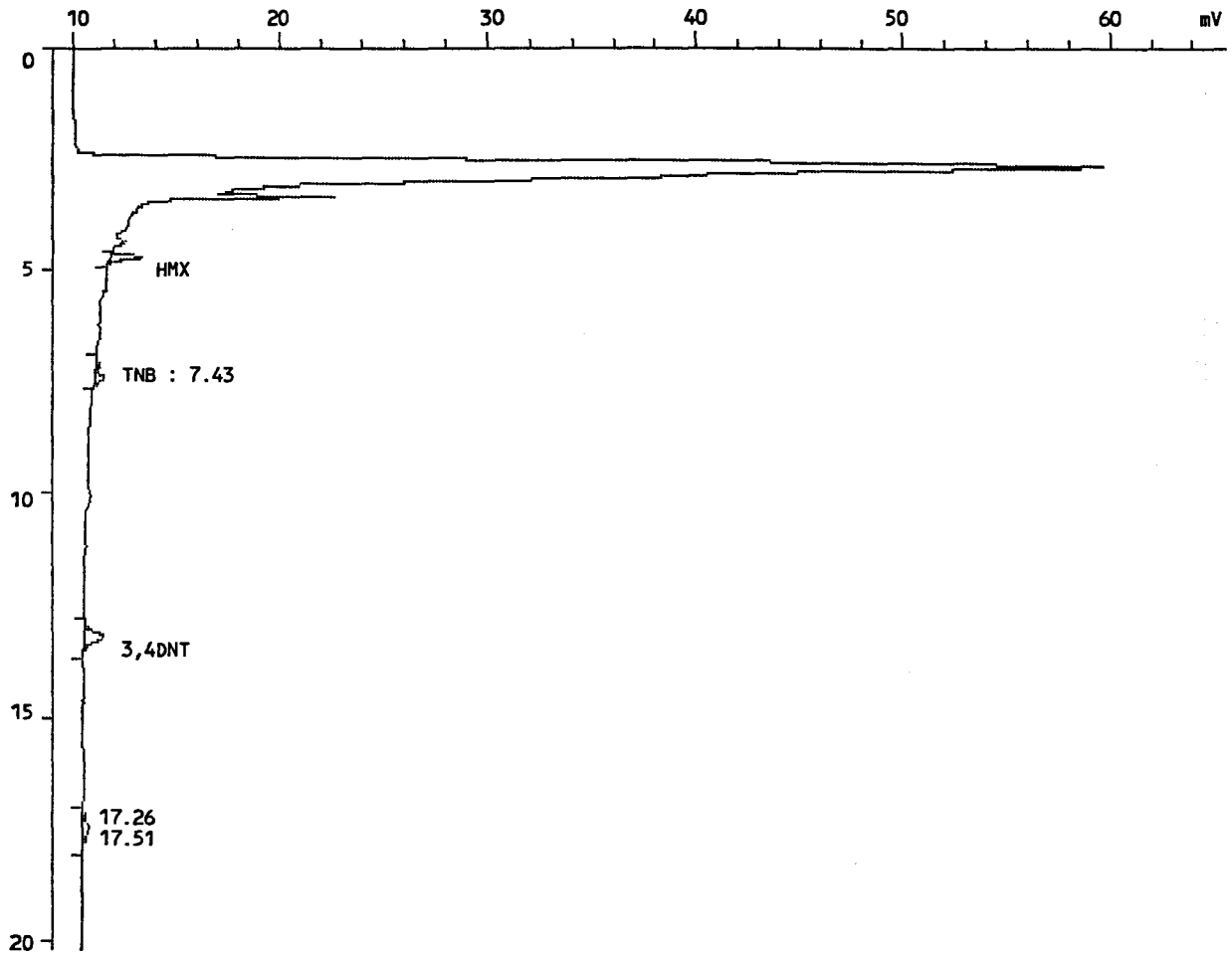
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.779	1759	11307	1566.005	HMX J
2	7.147	577	7758	820.109	RDX J
4	14.315	1047	19962	1709.050	3,4DNT 85
Total		3383	39026	4095.163	
Residual		397	10609	990.557	

LONG PLOT

Injection F: <MC4> 1 1CN0914A,3,1

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 15-Sep-98 at 11:10:03
Reported on 16-Sep-98 at 16:00:51



INJECTION REPORT

Injection F: <MC4> 1 1CN0914A,3,1

Acquired on 15-Sep-98 at 11:10:03
Modified on 16-Sep-82 at 15:59:52
Reported on 16-Sep-98 at 16:00:01

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 19
Calibration file..: 1CN0914A Last modified on 15-Sep-82 at 17:03:16
Method file.....: LCCN Last modified on 16-Sep-82 at 15:59:48
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

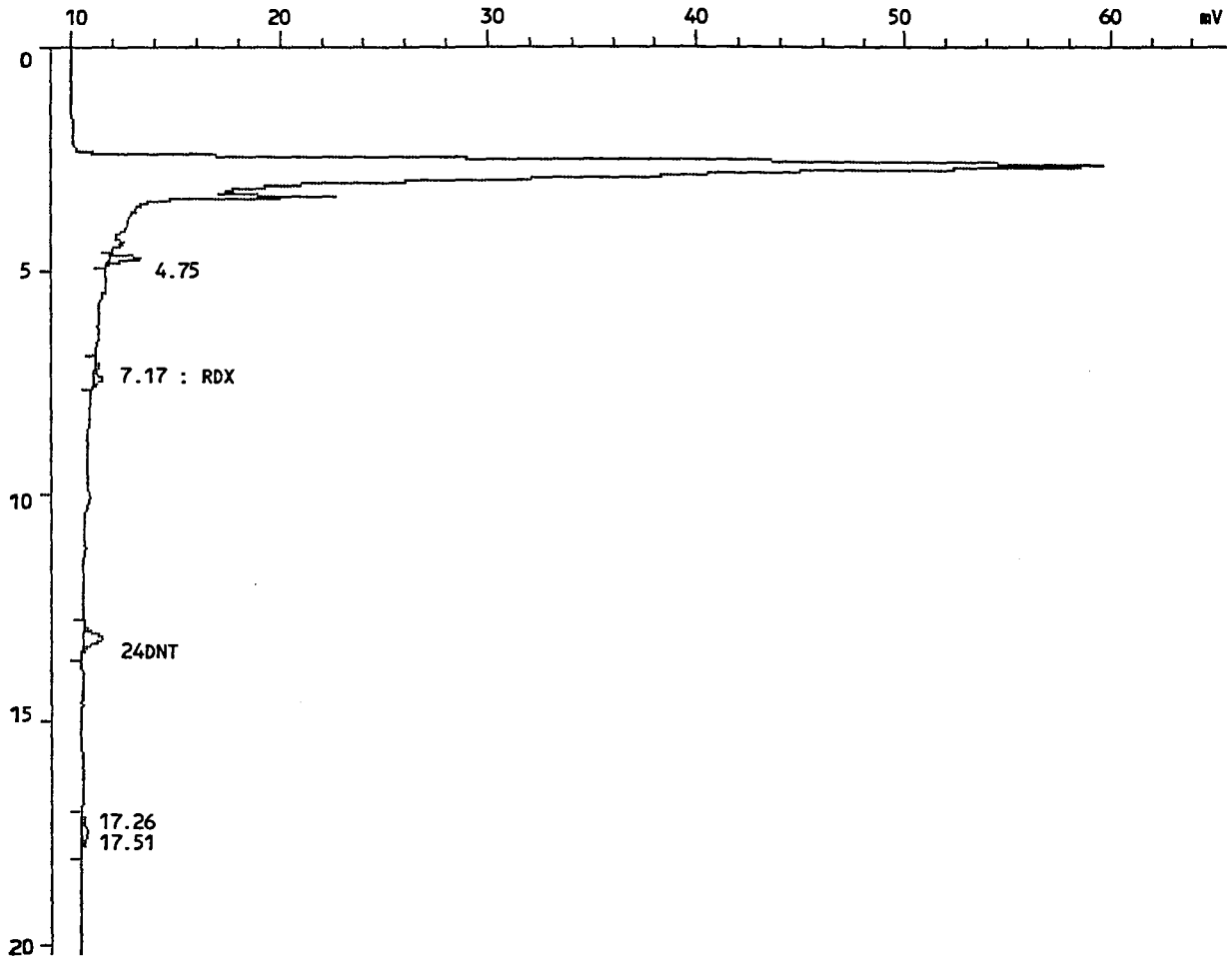
Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
1	4.747	1621	12687	1812.418	HMX
2	7.168	209	2408	135.224	TNB
4	13.195	973	16432	350.731	3,4DNT
Total		2803	31527	2298.373	
Residual		913	14713	0.000	

LONG PLOT

Injection F: <MC4> 1 1CN0914A,3,1

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
INST ID: IN10, COL. TYPE: METASIL, ID: MET-01, INJ:100, UV

Acquired on 15-Sep-98 at 11:10:03
Reported on 16-Sep-98 at 16:03:04



INJECTION REPORT

Injection F: <MC4> 1 1CN0914A,3,1

Acquired on 15-Sep-98 at 11:10:03
Modified on 16-Sep-82 at 16:02:40
Reported on 16-Sep-98 at 16:02:47

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC200
Analyst name.....: SS
Comment.....: INST ID: IN10, COL. TYPE: METASIL, ID: MET-01,INJ:100, UV
Number of samples.: 19
Calibration file..: 1CN0914B Last modified on 16-Sep-82 at 11:03:50
Method file.....: LCCN Last modified on 16-Sep-82 at 15:59:48
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIOM01307073
Sample ID.....: 35218.12
Sample type.....: Sample
Sample amount.....: 2.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 10.000
Dilution.....: 2.000
Amount (g or mL).....: 2.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/Kg	Peak name
3	7.435	509	7071	860.279	RDX
4	13.195	973	16432	779.125	24DNT
Total		1482	23503	1639.404	
Residual		2233	22737	0.000	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIOM01307073

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) SOIL Lab Sample ID: 35218.12

Sample Amt: 2g % Moisture 21.55 Date Received: 08/13/98

Extraction Volume: 10ml Date Extracted: 08/15/98

Extraction Method: SONC Date Analyzed: 08/21/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-11-5	PETN----------	250	U

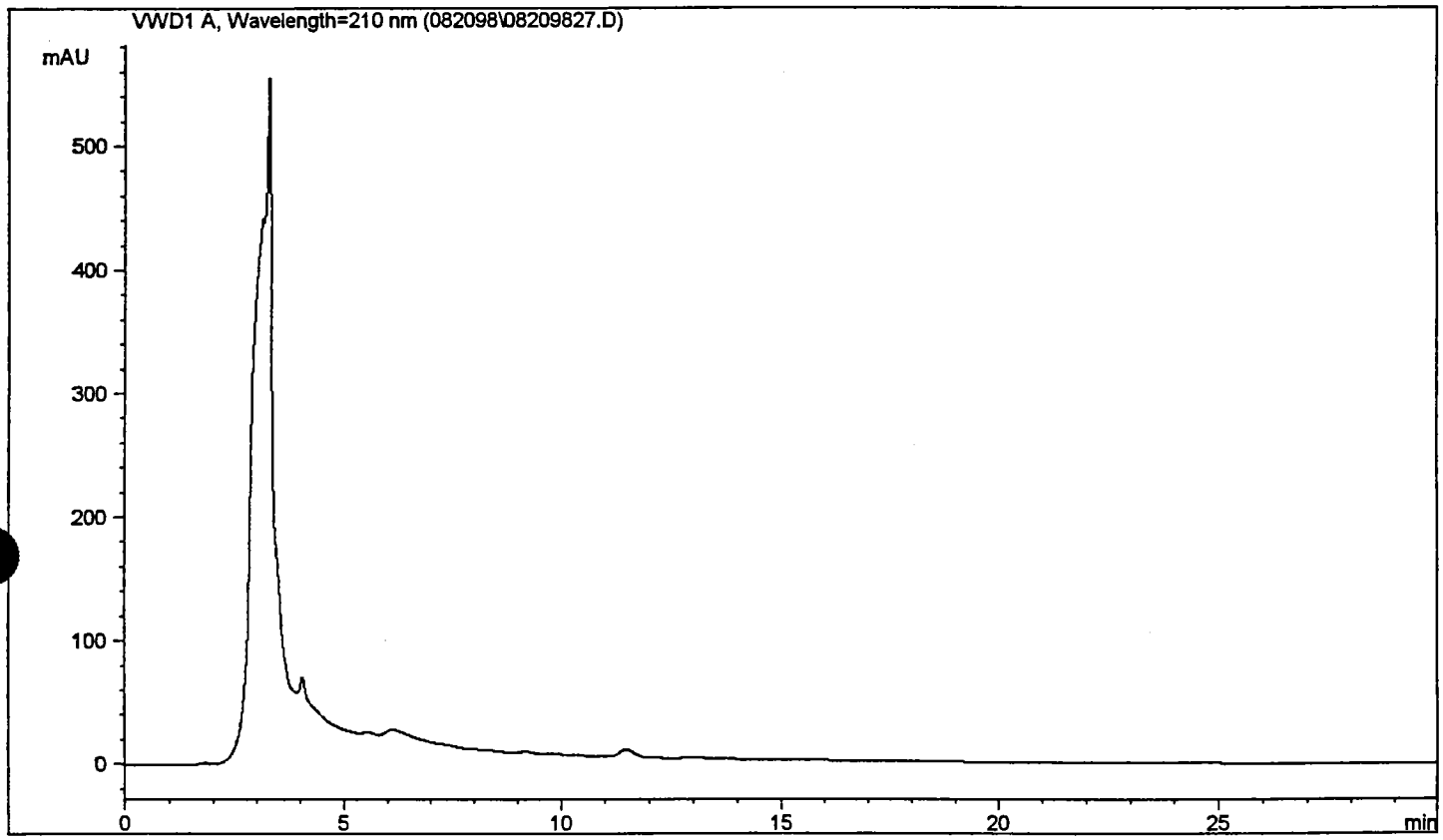
FORM I

Data file : F:\HPCHEM\LC4\DATA\082098\08209827.D
Sample Name: 35218.12 1

Injection Date	: Fri, 21. Aug. 1998	Seq Line	: 27
Sample Name	: 35218.12	Vial No.	: 27
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 200 µl

Acq. Method : 082098.M
Analysis Method : F:\HPCHEM\LC4\METHODS\082098.M
Last Changed : Fri, 21. Aug. 1998, 10:58:13 am

PETN SOIL



Customized Report: extstd.frp

Sorted By Signal
Calib. Data Modified : Fri, 21. Aug. 1998,10:57:25 am
Multiplier : 5.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/Kg]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

*** End of Report ***

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIORB081198

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) WATER Lab Sample ID: 35218.13

Sample Amt: 1ml % Moisture Date Received: 08/13/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	8.00	U
99-08-1	3NT	7.90	U

SURROGATE AMOUNT SPIKED (ug/L) 200
3,4-DNT

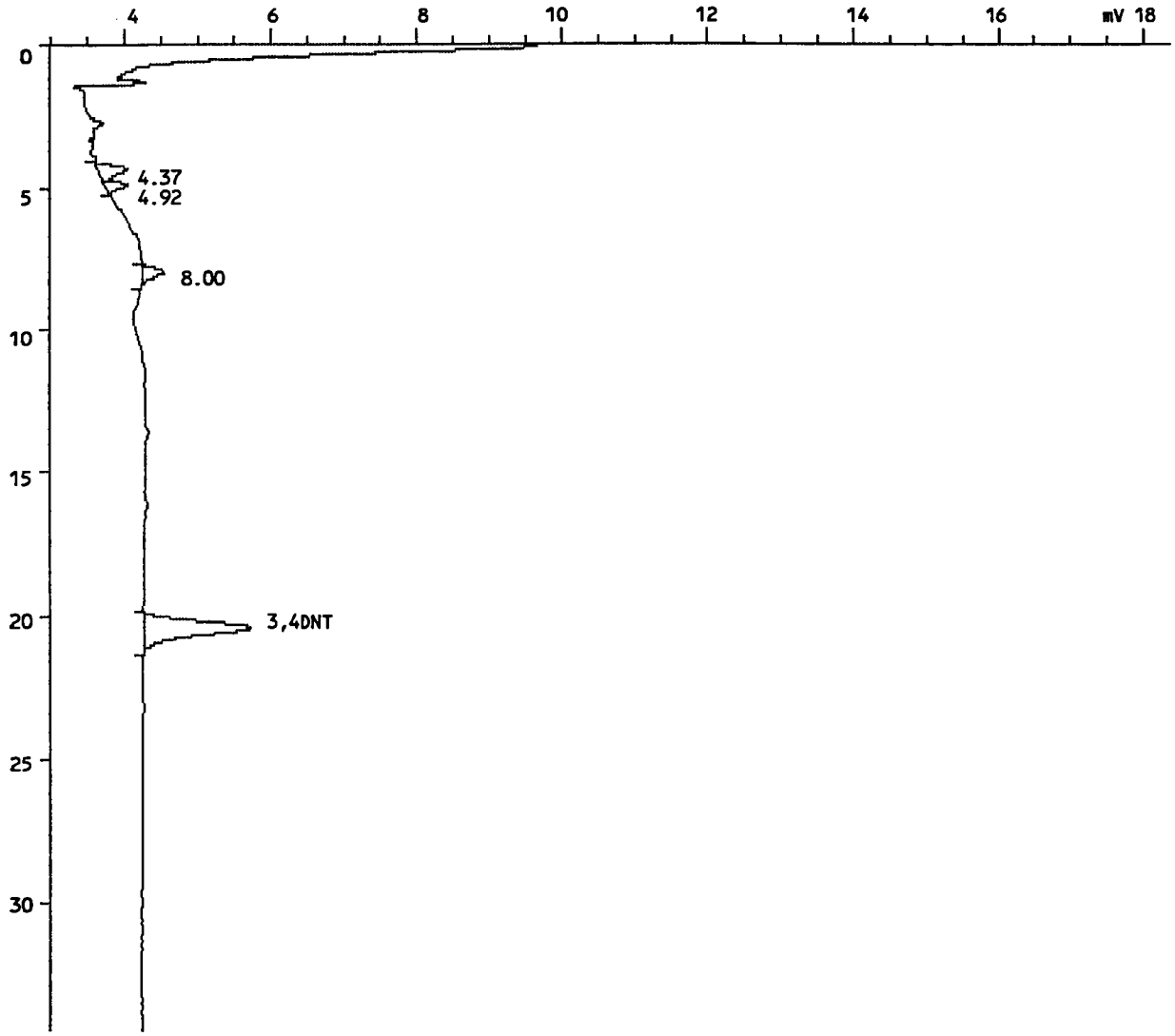
FORM I

LONG PLOT

Injection F: <MC3> 2 2E0817WA,11,1

Sample name.....: BIORB081198
Sample ID.....: 35218.13
INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-11, INJ:200,COL#1

Acquired on 18-Aug-98 at 07:37:08
Reported on 18-Aug-98 at 13:43:36



INJECTION REPORT

Injection F: <MC3> 2 2E0817WA,11,1

Acquired on 18-Aug-98 at 07:37:08
Modified on 18-Aug-82 at 11:51:44
Reported on 18-Aug-98 at 11:55:51

ANALYSIS INFORMATION

Analysis ID.....: EXP, GC 200
Analyst name.....: SS
Comment.....: INST ID: IN12, COL. TYPE: ODS-II, ID: CARB-11, INJ:200,COL#1
Number of samples.: 15
Calibration file..: 2E0817W Last modified on 18-Aug-82 at 11:51:44
Method file.....: EXPLOS Last modified on 18-Aug-82 at 11:52:48
Method title.....: SW846-8330

SAMPLE INFORMATION

Sample name.....: BIORB081198
Sample ID.....: 35218.13
Sample type.....: Sample
Sample amount.....: 1.0000
Number of injections.....: 1
Bottle Number.....: 1

Dilution factor amounts:
PERCENT MOISTURE.....: 0.000

User factors:
Volume (mL).....: 1.000
Dilution.....: 2.000
Amount (g or mL).....: 1.000

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	ug/L	Peak name
4	20.400	1453	47843	200.682	3,4DNT 100
Total		1453	47843	200.682	
Residual		993	21176	-33.088	

1D

EXPLOSIVE ANALYSIS DATA SHEET

EPA SAMPLE NO:

BIORB081198

Lab Name: SWL-TULSA Contract:

Lab Code: SWOK Case No:MKF-OH SDG No: 35218

Matrix: (soil/water) WATER Lab Sample ID: 35218.13

Sample Amt: 1ml % Moisture Date Received: 08/13/98

Extraction Volume: 1ml Date Extracted: DIRECT INJ

Extraction Method: DIRECT Date Analyzed: 08/18/98

GPC Cleanup: (Y/N) N Dilution Factor: 2.00

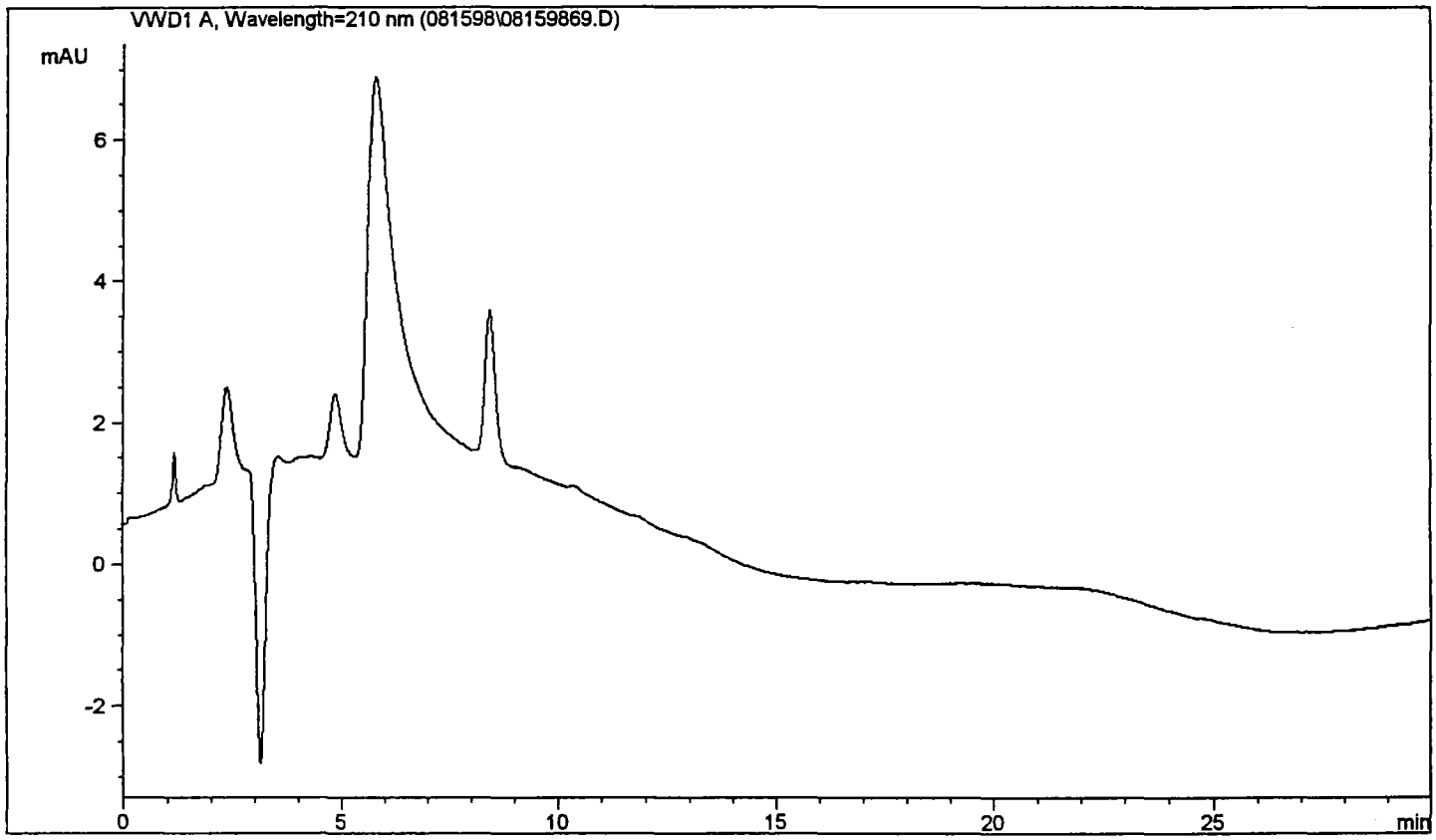
CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-11-5	PETN----------	20.0	U

FORM I

Injection Date	: Tue, 18. Aug. 1998	Seq Line	: 69
Sample Name	: 35218.13	Vial No.	: 69
Acq Operator	: MP	Inj. No.	: 1
		Inj. Vol.	: 100 µl

Acq. Method : 081598W.M
Analysis Method : F:\HPCHEM\LC4\METHODS\081598W.M
Last Changed : Tue, 18. Aug. 1998, 02:36:58 pm

PETN SOIL



==========
Customized Report: extstd.frp
==========

Sorted By Signal
Calib. Data Modified : Tue, 18. Aug. 1998,01:45:05 pm
Multiplier : 1.000000
Dilution : 2.000000
Uncalibrated Peaks : not reported

Signal Description : VWD1 A, Wavelength=210 nm

RT [min]	Type	Area	Amt/Area	Amount [ug/L]	Name
0.000		0.00000	0.00000	0.00000	PETN
Totals:				0.00000	

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ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN13 Column ID: CARB-02
Calibration: 5EX0814
Dates of Anlayses: 08/14/98 to 08/18/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1 SOIL STD	3-112:IA1	08/14/98	13:42
EXP L2 SOIL STD	3-111:IA2	08/14/98	14:27
EXP L3 SOIL STD	3-110:IA3	08/14/98	15:12
EXP L4 SOIL STD	3-109:IA4	08/14/98	15:56
EXP L5 SOIL STD	3-108:IA5	08/14/98	16:41
EXP L3 SOIL STD	3-128:CA9	08/17/98	17:43
BL0815SB	BL0815SB	08/17/98	19:12
LC0815SB	LC0815SB	08/17/98	20:41
LD0815SB	LD0815SB	08/17/98	21:26
EXP L3 SOIL STD	3-128:CA10	08/18/98	01:09
BIOM01307031	35218.01	08/18/98	02:39
BIOM01307031 MS	35218.02MS	08/18/98	03:23
BIOM01307031 MSD	35218.03MSD	08/18/98	04:08
BIOM01307032	35218.04	08/18/98	04:53
BIOM01307032FD	35218.05	08/18/98	05:38
BIOM01307033	35218.06	08/18/98	06:22
BIOM01307051	35218.07	08/18/98	07:07
BIOM01307052	35218.08	08/18/98	07:52
EXP L3 SOIL STD	3-128:CA11	08/18/98	08:37

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN13 Column ID: CARB-02
Calibration: 5EX0814
Dates of Anlayses: 08/14/98 to 08/18/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
BIOM01307053	35218.09	08/18/98	10:06
BIOM01307071	35218.10	08/18/98	10:51
BIOM01307072	35218.11	08/18/98	11:36
BIOM01307073	35218.12	08/18/98	12:20
EXP L3 SOIL STD	3-128:CA12	08/18/98	13:05

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: LC4 Column ID:
Calibration: 082098
Dates of Anlayses: 08/20/98 to 08/21/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
instrument blank	instrument bla	08/20/98	19:44
L1 3-136:IA1	L1 3-136:IA1	08/20/98	21:24
L2 3-135:IA2	L2 3-135:IA2	08/20/98	21:57
L3 3-134:IA3	L3 3-134:IA3	08/20/98	22:30
L4 3-133:IA4	L4 3-133:IA4	08/20/98	23:03
L5 3-132:IA5	L5 3-132:IA5	08/20/98	23:36
ICV 3-100:CA1	ICV 3-100:CA1	08/21/98	00:10
BL0815SA	BL0815SA	08/21/98	00:43
LC0815SA	LC0815SA	08/21/98	01:49
LD0815SA	LD0815SA	08/21/98	02:22
BIOM01307031	35218.01	08/21/98	02:55
BIOM01307031MS	35218.02MS	08/21/98	03:29
BIOM01307031MSD	35218.03MSD	08/21/98	04:02
BIOM01307032	35218.04	08/21/98	04:35
BIOM01307032FD	35218.05	08/21/98	05:08
BIOM01307033	35218.06	08/21/98	05:41
L3 3-81:CA2	L3 3-81:CA2	08/21/98	06:15
BIOM01307051	35218.07	08/21/98	07:21
BIOM01307052	35218.08	08/21/98	07:54

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: LC4 Column ID:
Calibration: 082098
Dates of Anlayses: 08/20/98 to 08/21/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
BIOM01307053	35218.09	08/21/98	08:27
BIOM01307071	35218.10	08/21/98	09:00
BIOM01307072	35218.11	08/21/98	09:34
BIOM01307073	35218.12	08/21/98	10:07
L3 3-81:CA3	L3 3-81:CA3	08/21/98	12:53

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN12 Column ID: CARB-11
Calibration: 2E0817W
Dates of Anlayses: 08/17/98 to 08/18/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
INST. BLANK	INST.BLK.	08/17/98	18:13
EXP HIGH WATER L1 ST	3-96:IA1	08/17/98	20:27
EXP HIGH WATER L2 ST	3-95:IA2	08/17/98	21:12
EXP HIGH WATER L3 ST	3-94:IA3	08/17/98	21:56
EXP HIGH WATER L4 ST	3-93:IA4	08/17/98	22:41
EXP HIGH WATER L5 ST	3-92:IA5	08/17/98	23:26
BL0815WA	BL0815WA	08/18/98	00:10
LC0815WA	LC0815WA	08/18/98	01:40
LD0815WA	LD0815WA	08/18/98	02:24
EXP HIGH WATER L3 ST	3-94:CA1	08/18/98	05:23
BIORB081198	35218.13	08/18/98	07:37
EXP HIGH WATER L3 ST	3-94:CA2	08/18/98	09:51

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FORM VIII

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ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: LC4 Column ID:
Calibration: 081598W
Dates of Anlayses: 08/17/98 to 08/18/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
instrument blank	instrument bla	08/17/98	20:13
L1 3-65:IA1	L1 3-65:IA1	08/17/98	20:45
L2 3-64:IA2	L2 3-64:IA2	08/17/98	22:21
L3 3-97:IA3	L3 3-97:IA3	08/17/98	22:52
L4 3-62:IA4	L4 3-62:IA4	08/17/98	23:24
L5 3-61:IA5	L5 3-61:IA5	08/17/98	23:56
BL0815WB	BL0815WB	08/18/98	01:00
LC0815WB	LC0815WB	08/18/98	02:04
LD0815WB	LD0815WB	08/18/98	02:35
BIORB081198	35218.13	08/18/98	05:15
L3 3-97:CA2	L3 3-97:CA2	08/18/98	06:18
ICV 3-124:CA1	ICV 3-124:CA1	08/18/98	12:13

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FORM VIII

8D

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN10 Column ID: MET-01
Calibration: 1CN0911
Dates of Anlayses: 09/11/98 to 09/14/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1A STD	3-117:IA1	09/11/98	21:18
EXP L2A STD	3-116:IA2	09/11/98	21:59
EXP L3A STD	3-115:IA3	09/11/98	22:41
EXP L4A STD	3-114:IA4	09/11/98	23:22
EXP L5A STD	3-113:IA5	09/12/98	00:04
EXP L1B STD	3-141:IB1	09/12/98	00:45
EXP L2B STD	3-140:IB2	09/12/98	01:27
EXP L3B STD	3-139:IB3	09/12/98	02:08
EXP L4B STD	3-138:IB4	09/12/98	02:50
EXP L5B STD	3-137:IB5	09/12/98	03:31
EXP L3A STD	3-115:CA5	09/13/98	21:21
EXP L3B STD	3-139:CB5	09/13/98	22:02
BL0815SB	BL0815SB	09/13/98	22:44
BIOM01307032	35218.04	09/14/98	00:07
BIOM01307032FD	35218.05	09/14/98	00:48
BIOM01307033	35218.06	09/14/98	01:30
BIOM01307051	35218.07	09/14/98	02:11
BIOM01307072	35218.11	09/14/98	02:53
EXP L3A STD	3-115:CA6	09/14/98	04:16

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FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN10 Column ID: MET-01
Calibration: 1CN0911
Dates of Anlayses: 09/11/98 to 09/14/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L3B STD	3-139:CB6	09/14/98	04:57

FORM VIII

ANALYTICAL SEQUENCE SUMMARY

Lab Name: SOUTHWEST LABORATORY OF OKLAHOMA

Lab Code: SWOK Case No: MKF-OH SDG No: 35218
Instrument ID: IN10 Column ID: MET-01
Calibration: 1CN0914
Dates of Anlayses: 09/14/98 to 09/15/98

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
EXP L1A STD	3-117:IA1	09/14/98	13:56
EXP L2A STD	3-116:IA2	09/14/98	14:38
EXP L3A STD	3-115:IA3	09/14/98	15:19
EXP L4A STD	3-114:IA4	09/14/98	16:01
EXP L5A STD	3-113:IA5	09/14/98	16:42
EXP L1B STD	3-141:IB1	09/14/98	17:24
EXP L2B STD	3-140:IB2	09/14/98	18:05
EXP L3B STD	3-139:IB3	09/14/98	18:47
EXP L4B STD	3-138:IB4	09/14/98	19:28
EXP L5B STD	3-137:IB5	09/14/98	20:16
EXP L3A STD	3-115:CA1	09/15/98	09:47
EXP L3B STD	3-139:CB1	09/15/98	10:28
BIOM01307073	35218.12	09/15/98	11:10
EXP L3A STD	3-115:CA2	09/15/98	12:33
EXP L3B STD	3-139:CB2	09/15/98	13:14

FORM VIII

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-02

Inj 1

Injection File Name Level 1 : 5EX0814,4
Injection File Name Level 2 : 5EX0814,5
Injection File Name Level 3 : 5EX0814,6
Injection File Name Level 4 : 5EX0814,7
Injection File Name Level 5 : 5EX0814,8

Calibration Date : 08/14/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	3353	331	92490	364	248583	377	364972	369	483821	367
RDX	983	233	47878	453	131420	476	193369	469	260902	474
TNB	2373	786	68802	910	197843	1004	273256	923	370421	940
DNB	2434	1502	64543	1590	174101	1649	255249	1611	340949	1608
TETRYL	1468	395	43960	473	116683	482	176366	485	233342	482
NB	3595	1089	102723	1247	271037	1267	411686	1279	548789	1276
3,4-DNT	3027	596	72494	572	194590	590	287844	580	383055	580
TNT	2946	1091	67925	1005	182841	1039	271049	1027	361623	1027
4ADNT	2112	895	49821	842	135448	880	198426	855	264132	858
2ADNT	2068	876	54915	928	149489	971	220370	950	295011	958
26DNT	2280	588	59482	612	161217	635	237474	625	315793	624
24DNT	2796	1185	71077	1201	193553	1257	285378	1230	380853	1237
	1759	520	45566	539	123031	559	185757	563	247101	562
	1359	402	36999	437	101192	460	151398	459	201566	458
[illegible]	1567	487	46730	581	126890	604	190554	607	253730	607

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN13
Column ID : CARB-02

Inj 1

Injection File Name Level 1 : 5EX0814,4
Injection File Name Level 2 : 5EX0814,5
Injection File Name Level 3 : 5EX0814,6
Injection File Name Level 4 : 5EX0814,7
Injection File Name Level 5 : 5EX0814,8

Calibration Date : 08/14/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	361	4.92	0.99989	369	0.000
RDX	421	25.08	0.99994	473	0.000
TNB	913	8.73	0.99901	944	0.000
DNB	1592	3.42	0.99990	1614	0.000
TETRYL	463	8.34	0.99999	483	0.000
NB	1231	6.53	0.99999	1275	0.000
2,4-DNT	584	1.60	0.99995	581	0.000
[illegible]	1038	3.11	0.99997	1028	0.000
4ADNT	866	2.45	0.99988	860	0.000
2ADNT	936	3.96	0.99992	957	0.000
26DNT	617	2.94	0.99994	626	0.000
24DNT	1222	2.36	0.99992	1237	0.000
2NT	549	3.39	0.99997	561	0.000
4NT	443	5.61	0.99996	458	0.000
3NT	577	8.97	0.99998	606	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/14/1998
Continuing Calibration #: 9
Continuing Cal Date : 08/17/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-02
Injection File Name : 5EX0814D,32
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	253293	384	361	6.21	369	4.14
RDX	133945	485	421	15.21	473	2.67
TNB	187414	951	913	4.24	944	0.81
DNB	173770	1646	1592	3.36	1614	1.93
TETRYL	124504	514	463	11.07	483	6.59
NB	278210	1300	1231	5.57	1275	1.96
3,4-DNT	197629	599	584	2.62	581	2.99
TNT	187173	1063	1038	2.48	1028	3.42
4ADNT	137706	894	866	3.28	860	4.03
2ADNT	152918	993	936	6.03	957	3.80
26DNT	161869	637	617	3.34	626	1.87
24DNT	195638	1270	1222	3.98	1237	2.73
2NT	124495	566	549	3.16	561	0.83
NT	102619	466	443	5.23	458	1.81
T	128820	613	577	6.28	606	1.21

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/14/1998
Continuing Calibration #: 10
Continuing Cal Date : 08/18/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-02
Injection File Name : 5EX0814E,9
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	264132	400	361	10.76	369	8.59
RDX	140104	508	421	20.51	473	7.39
TNB	186956	949	913	3.98	944	0.56
DNB	182256	1726	1592	8.40	1614	6.91
TETRYL	121178	501	463	8.10	483	3.74
NB	284324	1329	1231	7.89	1275	4.20
3,4-DNT	206101	625	584	7.02	581	7.41
TNT	193512	1100	1038	5.95	1028	6.93
4ADNT	142648	926	866	6.99	860	7.76
2ADNT	157581	1023	936	9.27	957	6.97
26DNT	168947	665	617	7.86	626	6.33
24DNT	203429	1321	1222	8.12	1237	6.82
2NT	128133	582	549	6.18	561	3.78
4NT	105681	480	443	8.37	458	4.85
T	131670	627	577	8.63	606	3.45

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/14/1998
Continuing Calibration #: 11
Continuing Cal Date : 08/18/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-02
Injection File Name : 5EX0814E,19
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	270946	411	361	13.62	369	11.40
RDX	141813	514	421	21.98	473	8.70
TNB	202359	1027	913	12.55	944	8.85
DNB	185529	1757	1592	10.35	1614	8.83
TETRYL	134976	558	463	20.41	483	15.56
NB	274808	1284	1231	4.28	1275	0.71
3,4-DNT	210817	639	584	9.47	581	9.87
TNT	199546	1134	1038	9.25	1028	10.26
4ADNT	149546	971	866	12.16	860	12.97
2ADNT	163486	1062	936	13.36	957	10.98
26DNT	175332	690	617	11.94	626	10.34
24DNT	213058	1383	1222	13.24	1237	11.87
2NT	124025	564	549	2.77	561	0.45
NT	104340	474	443	7.00	458	3.52
T	130464	621	577	7.63	606	2.50

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/14/1998
Continuing Calibration #: 12
Continuing Cal Date : 08/18/1998
Continuing Cal Level : 3
Instrument ID : IN13
Column ID : CARB-02
Injection File Name : 5EX0814E,25
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	266967	404	361	11.95	369	9.76
RDX	141023	511	421	21.30	473	8.09
TNB	200579	1018	913	11.56	944	7.89
DNB	181505	1719	1592	7.96	1614	6.47
TETRYL	143190	592	463	27.73	483	22.59
NB	283427	1324	1231	7.55	1275	3.87
3,4-DNT	208203	631	584	8.11	581	8.50
TNT	197485	1122	1038	8.12	1028	9.12
4ADNT	148108	962	866	11.08	860	11.88
2ADNT	162028	1052	936	12.35	957	9.99
26DNT	171782	676	617	9.67	626	8.11
24DNT	206305	1340	1222	9.65	1237	8.33
2NT	127763	581	549	5.87	561	3.48
[illegible]T	106207	483	443	8.91	458	5.37
[illegible]	132232	630	577	9.09	606	3.89

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	10.140	254.000	660.000	990.000	1320.000
RDX	4.220	105.600	276.000	412.000	550.000
TNB	3.020	75.600	197.000	296.000	394.000
DNB	1.620	40.600	105.600	158.400	212.000
TETRYL	3.720	93.000	242.000	364.000	484.000
NB	3.300	82.400	214.000	322.000	430.000
3,4-DNT	5.080	126.800	330.000	496.000	660.000
TNT	2.700	67.600	176.000	264.000	352.000
4ADNT	2.360	59.200	154.000	232.000	308.000
2ADNT	2.360	59.200	154.000	232.000	308.000
26DNT	3.880	97.200	254.000	380.000	506.000
24DNT	2.360	59.200	154.000	232.000	308.000
2NT	3.380	84.600	220.000	330.000	440.000
4NT	3.380	84.600	220.000	330.000	440.000
3NT	3.220	80.400	210.000	314.000	418.000

5EX0814
CAL6 → CA1C
page 1

CALIBRATION FACTOR DAT
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN13
Column ID : CARB-02
Calibration Date : 08/14/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.78	4.77	4.79	4.78	4.77
RDX	7.16	7.15	7.17	7.16	7.15
TNB	9.65	9.64	9.65	9.65	9.64
DNB	11.77	11.76	11.77	11.76	11.75
TETRYL	12.43	12.45	12.46	12.45	12.45
NB	13.37	13.34	13.36	13.35	13.34
3,4-DNT	14.37	14.35	14.36	14.35	14.34
TNT	15.12	15.09	15.10	15.09	15.09
4ADNT	15.67	15.64	15.66	15.64	15.64
2ADNT	16.50	16.46	16.47	16.46	16.45
26DNT	17.61	17.58	17.60	17.58	17.58
24DNT	18.22	18.18	18.19	18.17	18.17
2NT	21.44	21.38	21.40	21.38	21.38
4NT	22.86	22.83	22.85	22.83	22.83
3NT	24.63	24.59	24.61	24.59	24.59

COMPONENT NAME	RT Cont CA6	RT Cont CA7	RT Cont CA8	RT Cont CA9	RT Cont CA10
HMX	4.77	4.78	4.78	4.77	4.78
RDX	7.15	7.16	7.17	7.13	7.16
TNB	9.64	9.64	9.66	9.62	9.64
DNB	11.74	11.76	11.77	11.71	11.74
TETRYL	12.45	12.46	12.49	12.39	12.42
NB	13.34	13.36	13.37	13.30	13.34
3,4-DNT	14.33	14.36	14.37	14.27	14.32
TNT	15.07	15.10	15.11	15.02	15.07
4ADNT	15.64	15.69	15.66	15.52	15.61
2ADNT	16.45	16.51	16.48	16.32	16.42
26DNT	17.57	17.61	17.61	17.49	17.55
24DNT	18.16	18.20	18.20	18.06	18.13
2NT	21.37	21.40	21.42	21.27	21.34
4NT	22.82	22.86	22.88	22.70	22.78
3NT	24.57	24.62	24.64	24.45	24.54

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.78	0.007	0.020	4.76 - 4.80
RDX	7.16	0.010	0.031	7.13 - 7.19
TNB	9.64	0.011	0.032	9.61 - 9.67
DNB	11.75	0.016	0.048	11.70 - 11.80
TETRYL	12.44	0.022	0.066	12.38 - 12.51
NB	13.34	0.017	0.052	13.29 - 13.40
3,4-DNT	14.33	0.026	0.078	14.26 - 14.41
TNT	15.08	0.022	0.065	15.01 - 15.14
4ADNT	15.63	0.039	0.118	15.51 - 15.75

5EX0814
CAL→CAL
page 2

2ADNT	16.44	0.044	0.132	16.31 - 16.57
26DNT	17.57	0.031	0.092	17.48 - 17.66
24DNT	18.16	0.035	0.106	18.05 - 18.26
2NT	21.36	0.037	0.111	21.25 - 21.47
NT	22.81	0.040	0.119	22.69 - 22.93
T	24.57	0.043	0.129	24.44 - 24.70

5EX0814
CA11→CA15
page 1

CALIBRATION FACTOR DAT
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN13
Column ID : CARB-02
Calibration Date : 08/14/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.78	4.77	4.79	4.78	4.77
RDX	7.16	7.15	7.17	7.16	7.15
TNB	9.65	9.64	9.65	9.65	9.64
DNB	11.77	11.76	11.77	11.76	11.75
TETRYL	12.43	12.45	12.46	12.45	12.45
NB	13.37	13.34	13.36	13.35	13.34
3,4-DNT	14.37	14.35	14.36	14.35	14.34
TNT	15.12	15.09	15.10	15.09	15.09
4ADNT	15.67	15.64	15.66	15.64	15.64
2ADNT	16.50	16.46	16.47	16.46	16.45
26DNT	17.61	17.58	17.60	17.58	17.58
24DNT	18.22	18.18	18.19	18.17	18.17
2NT	21.44	21.38	21.40	21.38	21.38
4NT	22.86	22.83	22.85	22.83	22.83
3NT	24.63	24.59	24.61	24.59	24.59

COMPONENT NAME	RT Cont CA11	RT Cont CA12	RT Cont CA13	RT Cont CA14	RT Cont CA15
HMX	4.78	4.79	4.79	4.78	4.77
RDX	7.17	7.15	7.15	7.16	7.14
TNB	9.66	9.64	9.63	9.64	9.63
DNB	11.77	11.73	11.72	11.76	11.73
TETRYL	12.46	12.42	12.41	12.45	12.42
NB	13.37	13.34	13.32	13.36	13.33
3,4-DNT	14.36	14.31	14.29	14.35	14.32
TNT	15.10	15.06	15.05	15.09	15.07
4ADNT	15.66	15.58	15.57	15.66	15.60
2ADNT	16.46	16.38	16.38	16.48	16.40
26DNT	17.59	17.54	17.52	17.60	17.55
24DNT	18.18	18.12	18.11	18.19	18.13
2NT	21.38	21.34	21.31	21.40	21.35
4NT	22.83	22.78	22.75	22.85	22.80
3NT	24.58	24.54	24.51	24.61	24.56

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.78	0.007	0.020	4.76 - 4.80
RDX	7.16	0.010	0.031	7.13 - 7.19
TNB	9.64	0.011	0.032	9.61 - 9.67
DNB	11.75	0.016	0.048	11.70 - 11.80
TETRYL	12.44	0.022	0.066	12.38 - 12.51
NB	13.34	0.017	0.052	13.29 - 13.40
3,4-DNT	14.33	0.026	0.078	14.26 - 14.41
TNT	15.08	0.022	0.065	15.01 - 15.14
4ADNT	15.63	0.039	0.118	15.51 - 15.75

5EX0814
CA11→CA15
page 2

2ADNT	16.44	0.044	0.132	16.31 - 16.57
26DNT	17.57	0.031	0.092	17.48 - 17.66
24DNT	18.16	0.035	0.106	18.05 - 18.26
2NT	21.36	0.037	0.111	21.25 - 21.47
NT	22.81	0.040	0.119	22.69 - 22.93
T	24.57	0.043	0.129	24.44 - 24.70

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: LC4
Column ID :

Inj 1

Injection File Name Level 1 : 082098,4
Injection File Name Level 2 : 082098,5
Injection File Name Level 3 : 082098,6
Injection File Name Level 4 : 082098,7
Injection File Name Level 5 : 082098,8

Calibration Date : 08/20/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	RESP. FACT Level 1	Area Level 2	RESP. FACT Level 2	Area Level 3	RESP. FACT Level 3	Area Level 4	RESP. FACT Level 4	Area Level 5	RESP. FACT Level 5
PETN	6.48059	3.09E0	53.3067	3.00E0	110.658	2.89E0	441.446	2.90E0	888.094	2.88E0

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: LC4
Column ID :

Inj 1

Injection File Name Level 1 : 082098,4
Injection File Name Level 2 : 082098,5
Injection File Name Level 3 : 082098,6
Injection File Name Level 4 : 082098,7
Injection File Name Level 5 : 082098,8

Calibration Date : 08/20/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Resp Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
PETN	2.95E0	3.01	0.99999	2.89E0	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/20/98
Continuing Calibration #: 1
Continuing Cal Date : 08/21/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 082098,9
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	110.628	2.89E0	2.95E0	2.02	2.89E0	0.21

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/20/98
Continuing Calibration #: 2
Continuing Cal Date : 08/21/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 082098,20
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	109.675	2.92E0	2.95E0	1.17	2.89E0	1.09

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/20/98
Continuing Calibration #: 3
Continuing Cal Date : 08/21/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 082098,32
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	111.664	2.87E0	2.95E0	2.93	2.89E0	0.72

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200ul

Amount Units = ug/L

COMPONENT NAME	SPIKE AMT Level 1	SPIKE AMT Level 2	SPIKE AMT Level 3	SPIKE AMT Level 4	SPIKE AMT Level 5
PETN	20	160	320	1280	2560

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : LC4
Column ID :
Calibration Date : 08/20/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
PETN	15.76	15.76	15.78	15.75	15.77

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
PETN	15.77	15.89	15.79	15.74	16.02

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
PETN	15.82	0.111	0.334	15.49 - 16.16

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-11

Inj 1

Injection File Name Level 1 : 2E0817W,4
Injection File Name Level 2 : 2E0817W,5
Injection File Name Level 3 : 2E0817W,6
Injection File Name Level 4 : 2E0817W,7
Injection File Name Level 5 : 2E0817W,8

Calibration Date : 08/17/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	1083	846	3189	1003	189332	1191	388627	1222	777540	1223
RDX	1351	1299	3584	1378	214596	1651	439961	1692	869519	1679
TNB	2392	3322	6635	3686	337240	3764	694022	3877	1368634	3823
DNB	2196	5779	5098	5310	279542	5873	574478	6047	1141829	6010
TETRYL	1059	1177	3509	1553	182136	1612	324501	1436	548702	1219
NB	2673	3931	7591	4465	392886	4622	832953	4900	1714023	5041
3,4-DNT	2805	2191	7626	2368	385889	2412	815856	2550	1535472	2399
TNT	3082	4816	8426	5266	394384	4930	831970	5200	1726663	5396
4ADNT	2517	2517	6579	2611	330209	2642	685923	2744	1363829	2728
2ADNT	2177	3888	5649	4035	295213	4217	615080	4393	1233466	4405
26DNT	2398	2498	5201	2167	278702	2423	581471	2528	1130260	2457
24DNT	2874	5132	7494	5353	403356	5762	842170	6016	1708887	6103
	2244	2004	7113	2540	379632	2618	788627	2719	1578760	2722
	1427	1784	4849	2425	251938	2519	518346	2592	1036516	2591
	3186	3983	5385	2693	304317	3203	625129	3290	1252817	3297

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN12
Column ID : CARB-11

Inj 1
Injection File Name Level 1 : 2E0817W,4
Injection File Name Level 2 : 2E0817W,5
Injection File Name Level 3 : 2E0817W,6
Injection File Name Level 4 : 2E0817W,7
Injection File Name Level 5 : 2E0817W,8

Calibration Date : 08/17/1998
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	1097	15.26	0.99998	1221	0.000
RDX	1540	12.10	0.99998	1680	0.000
TNB	3694	5.95	0.99996	3831	0.000
DNB	5804	5.10	0.99997	6010	0.000
TETRYL	1399	13.93	0.99404	1290	0.000
NB	4592	9.43	0.99973	4996	0.000
3,4-DNT	2384	5.38	0.99948	2430	0.000
[illegible]	5121	4.71	0.99966	5339	0.000
[illegible]NT	2648	3.49	0.99996	2727	0.000
2ADNT	4188	5.39	0.99994	4394	0.000
26DNT	2415	5.96	0.99987	2469	0.000
24DNT	5673	7.40	0.99989	6071	0.000
2NT	2521	11.86	0.99995	2717	0.000
4NT	2382	14.33	0.99998	2588	0.000
3NT	3293	13.95	0.99997	3291	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/17/1998
Continuing Calibration #: 1
Continuing Cal Date : 08/18/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-11
Injection File Name : 2E0817WA,8
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	197946	1245	1097	13.50	1221	1.96
RDX	227572	1751	1540	13.69	1680	4.21
TNB	357081	3985	3694	7.87	3831	4.04
DNB	290162	6096	5804	5.03	6010	1.42
TETRYL	186574	1651	1399	18.00	1290	28.03
NB	398302	4686	4592	2.05	4996	6.21
3,4-DNT	378408	2365	2384	0.80	2430	2.67
TNT	437736	5472	5121	6.84	5339	2.49
4ADNT	341579	2733	2648	3.19	2727	0.22
2ADNT	307238	4389	4188	4.81	4394	0.12
26DNT	293552	2553	2415	5.71	2469	3.37
24DNT	424972	6071	5673	7.01	6071	0.00
2NT	382633	2639	2521	4.69	2717	2.87
[illegible]NT	251836	2518	2382	5.72	2588	2.69
[illegible]	301749	3176	3293	3.55	3291	3.49

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/17/1998
Continuing Calibration #: 2
Continuing Cal Date : 08/18/1998
Continuing Cal Level : 3
Instrument ID : IN12
Column ID : CARB-11
Injection File Name : 2E0817WA,14
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	197635	1243	1097	13.32	1221	1.80
RDX	227486	1750	1540	13.64	1680	4.17
TNB	354302	3954	3694	7.03	3831	3.23
DNB	286574	6020	5804	3.73	6010	0.17
TETRYL	161602	1430	1399	2.20	1290	10.89
NB	394941	4646	4592	1.19	4996	7.00
3,4-DNT	371660	2323	2384	2.57	2430	4.40
TNT	449887	5624	5121	9.80	5339	5.33
4ADNT	338083	2705	2648	2.13	2727	0.81
2ADNT	304122	4345	4188	3.75	4394	1.13
26DNT	292169	2541	2415	5.21	2469	2.88
24DNT	422256	6032	5673	6.33	6071	0.64
2NT	378619	2611	2521	3.59	2717	3.89
4NT	250018	2500	2382	4.96	2588	3.39
T	298192	3139	3293	4.68	3291	4.63

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 200uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	1.280	3.180	159.000	318.000	636.000
RDX	1.040	2.600	130.000	260.000	518.000
TNB	0.720	1.800	89.600	179.000	358.000
DNB	0.380	0.960	47.600	95.000	190.000
TETRYL	0.900	2.260	113.000	226.000	450.000
NB	0.680	1.700	85.000	170.000	340.000
3,4-DNT	1.280	3.220	160.000	320.000	640.000
TNT	0.640	1.600	80.000	160.000	320.000
4ADNT	1.000	2.520	125.000	250.000	500.000
2ADNT	0.560	1.400	70.000	140.000	280.000
26DNT	0.960	2.400	115.000	230.000	460.000
24DNT	0.560	1.400	70.000	140.000	280.000
2NT	1.120	2.800	145.000	290.000	580.000
4NT	0.800	2.000	100.000	200.000	400.000
3NT	0.800	2.000	95.000	190.000	380.000

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CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN12
Column ID : CARB-11
Calibration Date : 08/17/1998
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	5.37	5.36	5.34	5.36	5.33
RDX	8.64	8.66	8.67	8.70	8.69
TNB	12.14	12.23	12.24	12.27	12.26
DNB	15.24	15.32	15.34	15.40	15.40
TETRYL	16.81	16.93	16.96	17.02	17.02
NB	17.71	17.80	17.83	17.89	17.90
3,4-DNT	19.78	19.89	19.97	20.05	20.06
TNT	20.29	20.33	20.44	20.50	20.49
4ADNT	21.36	21.48	21.59	21.70	21.73
2ADNT	22.35	22.57	22.72	22.83	22.88
26DNT	24.19	24.43	24.50	24.60	24.63
24DNT	25.04	25.15	25.25	25.34	25.37
2NT	30.09	30.27	30.45	30.59	30.62
4NT	32.16	32.46	32.56	32.70	32.74
3NT	34.99	35.14	35.30	35.45	35.49

COMPONENT NAME	RT Cont CA1	RT Cont CA2
HMX	5.38	5.41
RDX	8.79	8.85
TNB	12.37	12.44
DNB	15.56	15.66
TETRYL	17.24	17.38
NB	18.09	18.19
3,4-DNT	20.35	20.50
TNT	20.70	20.81
4ADNT	22.06	22.27
2ADNT	23.22	23.45
26DNT	24.92	25.09
24DNT	25.68	25.87
2NT	30.96	31.15
4NT	33.10	33.32
3NT	35.89	36.09

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	5.36	0.024	0.072	5.29 - 5.44
RDX	8.71	0.078	0.233	8.48 - 8.95
TNB	12.28	0.100	0.299	11.98 - 12.58
DNB	15.42	0.148	0.443	14.97 - 15.86
TETRYL	17.05	0.195	0.585	16.47 - 17.64
NB	17.91	0.169	0.506	17.41 - 18.42
3,4-DNT	20.09	0.254	0.761	19.32 - 20.85
TNT	20.51	0.186	0.558	19.95 - 21.07

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4ADNT	21.74	0.322	0.967	20.77 - 22.71
2ADNT	22.86	0.376	1.128	21.73 - 23.99
26DNT	24.62	0.300	0.900	23.72 - 25.52
24DNT	25.39	0.292	0.877	24.51 - 26.26
2NT	30.59	0.372	1.116	29.47 - 31.70
T	32.72	0.391	1.174	31.54 - 33.89
T	35.48	0.394	1.181	34.30 - 36.66

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
nstrument ID: LC4
lumn ID :

Inj 1

Injection File Name Level 1 : 081598W,53
Injection File Name Level 2 : 081598W,56
Injection File Name Level 3 : 081598W,57
Injection File Name Level 4 : 081598W,58
Injection File Name Level 5 : 081598W,59

Calibration Date : 08/17/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	RESP. FACT Level 1	Area Level 2	RESP. FACT Level 2	Area Level 3	RESP. FACT Level 3	Area Level 4	RESP. FACT Level 4	Area Level 5	RESP. FACT Level 5
PETN	2.48435	9.05E0	23.2607	6.88E0	48.1955	6.64E0	190.833	6.71E0	408.223	6.27E0

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: LC4
Column ID :

Inj 1
Injection File Name Level 1 : 081598W,53
Injection File Name Level 2 : 081598W,56
Injection File Name Level 3 : 081598W,57
Injection File Name Level 4 : 081598W,58
Injection File Name Level 5 : 081598W,59

Calibration Date : 08/17/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Resp Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
PETN	6.91E0	9.77	0.99950	6.36E0	0.000

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Injection volume = 100ul

Amount Units = ug/L

COMPONENT NAME	SPIKE AMT Level 1	SPIKE AMT Level 2	SPIKE AMT Level 3	SPIKE AMT Level 4	SPIKE AMT Level 5
PETN	20	160	320	1280	2560

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : LC4
Column ID :
Calibration Date : 08/17/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
PETN	10.66	10.72	10.72	10.71	10.73

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4
PETN	10.78	10.80	10.77	10.74

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
PETN	10.74	0.041	0.122	10.61 - 10.86

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/17/98
Continuing Calibration #: 1
Continuing Cal Date : 08/18/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 081598W,74
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	55.0794	5.81E0	6.91E0	15.91	6.36E0	8.63

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 08/17/98
Continuing Calibration #: 2
Continuing Cal Date : 08/18/98
Continuing Cal Level : 3
Instrument ID : LC4
Column ID :
Injection File Name : 081598W,71
Calculation Mode : Area

Component Name	Response Cont Std	Cont RF	Init RF Mean	%D	Init RF Slope	%D
PETN	47.4598	6.74E0	6.91E0	2.42	6.36E0	6.04

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0911,4
Injection File Name Level 2 : 1CN0911,5
Injection File Name Level 3 : 1CN0911,6
Injection File Name Level 4 : 1CN0911,7
Injection File Name Level 5 : 1CN0911,8

Calibration Date : 09/11/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	4568	653	24631	704	65728	751	124472	711	254464	727
TNB	8155	1773	42770	1860	109331	1901	209226	1819	423914	1843
TNT	9920	2157	47817	2079	126347	2197	241234	2098	494024	2148
TETRYL	10605	1178	56649	1259	148768	1322	279285	1241	557081	1238
3,4DNT	6117	4634	30639	4642	83013	5031	161183	4884	327897	4968
26DNT	7105	1421	31627	1265	86099	1378	160179	1281	329340	1317

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0911,9
Injection File Name Level 2 : 1CN0911,10
Injection File Name Level 3 : 1CN0911,11
Injection File Name Level 4 : 1CN0911,12
Injection File Name Level 5 : 1CN0911,13

Calibration Date : 09/11/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
RDX	3010	602	20231	809	51561	825	103682	829	200112	800
DNB	8541	2135	46045	2302	118219	2364	236057	2361	464379	2322
NB	6917	1383	35985	1439	90287	1445	182056	1456	362041	1448
24DNT	10177	2035	53758	2150	134918	2159	267426	2139	528697	2115
4ADNT	8921	970	49129	1068	131190	1141	257891	1121	500263	1088
2ADNT	14984	1498	81541	1631	197528	1580	408208	1633	810539	1621

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0911,4
Injection File Name Level 2 : 1CN0911,5
Injection File Name Level 3 : 1CN0911,6
Injection File Name Level 4 : 1CN0911,7
Injection File Name Level 5 : 1CN0911,8

Calibration Date : 09/11/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	709	5.14	0.99985	725	0.000
TNB	1839	2.59	0.99992	1842	0.000
TNT	2136	2.23	0.99987	2141	0.000
TETRYL	1248	4.14	0.99983	1243	0.000
3,4DNT	4832	3.82	0.99993	4953	0.000
26DNT	1332	4.93	0.99975	1313	0.000

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0911,9
Injection File Name Level 2 : 1CN0911,10
Injection File Name Level 3 : 1CN0911,11
Injection File Name Level 4 : 1CN0911,12
Injection File Name Level 5 : 1CN0911,13

Calibration Date : 09/11/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
RDX	773	12.47	0.99976	807	0.000
DNB	2297	4.10	0.99995	2331	0.000
NB	1434	2.03	0.99999	1449	0.000
24DNT	2120	2.36	0.99997	2122	0.000
4ADNT	1077	6.18	0.99978	1096	0.000
2ADNT	1593	3.57	0.99996	1621	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/11/98
Continuing Calibration #: 5
Continuing Cal Date : 09/13/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0911F,3
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	63770	729	709	2.77	725	0.51
TNB	103663	1803	1839	1.98	1842	2.11
TNT	119701	2082	2136	2.53	2141	2.75
TETRYL	137960	1226	1248	1.72	1243	1.34
3,4DNT	74747	4530	4832	6.25	4953	8.54
26DNT	83732	1340	1332	0.54	1313	2.01

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/11/98
Continuing Calibration #: 5
Continuing Cal Date : 09/13/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0911F,4
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
RDX	49428	791	773	2.28	807	2.04
DNB	116024	2320	2297	1.03	2331	0.46
NB	87852	1406	1434	2.01	1449	3.03
24DNT	130873	2094	2120	1.21	2122	1.31
4ADNT	128144	1114	1077	3.42	1096	1.62
2ADNT	199074	1593	1593	0.00	1621	1.78

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/11/98
Continuing Calibration #: 6
Continuing Cal Date : 09/14/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0911F,13
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	62907	719	709	1.38	725	0.85
TNB	103331	1797	1839	2.29	1842	2.42
TNT	120578	2097	2136	1.81	2141	2.03
TETRYL	142701	1268	1248	1.66	1243	2.05
3,4DNT	76137	4614	4832	4.50	4953	6.84
26DNT	78721	1260	1332	5.48	1313	4.10

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/11/98
Continuing Calibration #: 6
Continuing Cal Date : 09/14/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0911F,14
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
RDX	51746	828	773	7.08	807	2.56
DNB	120438	2409	2297	4.87	2331	3.33
NB	89436	1431	1434	0.24	1449	1.28
24DNT	137344	2198	2120	3.67	2122	3.57
4ADNT	133022	1157	1077	7.36	1096	5.49
2ADNT	206799	1654	1593	3.88	1621	2.03

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

)jection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	7.000	35.000	87.500	175.000	350.000
TNB	4.600	23.000	57.500	115.000	230.000
TNT	4.600	23.000	57.500	115.000	230.000
TETRYL	9.000	45.000	112.500	225.000	450.000
3,4DNT	1.320	6.600	16.500	33.000	66.000
26DNT	5.000	25.000	62.500	125.000	250.000

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

jection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
RDX	5.000	25.000	62.500	125.000	250.000
DNB	4.000	20.000	50.000	100.000	200.000
NB	5.000	25.000	62.500	125.000	250.000
24DNT	5.000	25.000	62.500	125.000	250.000
4ADNT	9.200	46.000	115.000	230.000	460.000
2ADNT	10.000	50.000	125.000	250.000	500.000

1CN0911
CA1→CA5
Page 1
A STD

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : MET-01
Calibration Date : 09/11/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.70	4.67	4.72	4.72	4.72
TNB	7.13	7.08	7.14	7.14	7.14
TNT	10.84	10.70	10.84	10.84	10.87
TETRYL	11.81	11.64	11.84	11.85	11.90
3,4DNT	13.13	12.91	13.15	13.17	13.23
26DNT	13.57	13.40	13.62	13.64	13.70

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
HMX	4.72	4.73	4.73	4.73	4.74
TNB	7.15	7.16	7.16	7.17	7.20
TNT	10.88	10.88	10.89	10.92	10.98
TETRYL	11.89	11.89	11.90	11.93	12.01
3,4DNT	13.21	13.21	13.23	13.28	13.39
26DNT	13.68	13.69	13.71	13.76	13.87

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.72	0.021	0.063	4.66 - 4.78
TNB	7.15	0.034	0.103	7.05 - 7.26
TNT	10.89	0.084	0.253	10.63 - 11.14
TETRYL	11.90	0.117	0.352	11.55 - 12.25
3,4DNT	13.23	0.146	0.439	12.79 - 13.67
26DNT	13.70	0.147	0.441	13.26 - 14.15

CALIBRATION FACTOR DAT
FORM 9E

1CN0911
CA6, CA7

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : MET-01
Calibration Date : 09/11/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
HMX	4.70	4.67	4.72	4.72	4.72
TNB	7.13	7.08	7.14	7.14	7.14
TNT	10.84	10.70	10.84	10.84	10.87
TETRYL	11.81	11.64	11.84	11.85	11.90
3,4DNT	13.13	12.91	13.15	13.17	13.23
26DNT	13.57	13.40	13.62	13.64	13.70

COMPONENT NAME	RT Cont CA6	RT Cont CA7
HMX	4.75	4.74
TNB	7.21	7.18
TNT	11.01	10.99
TETRYL	12.07	12.06
3,4DNT	13.44	13.43
26DNT	13.93	13.89

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
HMX	4.72	0.021	0.063	4.66 - 4.78
TNB	7.15	0.034	0.103	7.05 - 7.26
TNT	10.89	0.084	0.253	10.63 - 11.14
TETRYL	11.90	0.117	0.352	11.55 - 12.25
3,4DNT	13.23	0.146	0.439	12.79 - 13.67
26DNT	13.70	0.147	0.441	13.26 - 14.15

1CN0911
CB1→CB5

CALIBRATION FACTOR DATA
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : MET-01
Calibration Date : 09/11/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
RDX	7.48	7.43	7.46	7.43	7.44
DNB	9.17	9.11	9.14	9.11	9.11
NB	10.27	10.20	10.25	10.20	10.21
24DNT	13.41	13.32	13.38	13.33	13.35
4ADNT	14.66	14.53	14.61	14.54	14.58
2ADNT	15.22	15.08	15.16	15.10	15.13

COMPONENT NAME	RT Cont CA1	RT Cont CA2	RT Cont CA3	RT Cont CA4	RT Cont CA5
RDX	7.43	7.41	7.42	7.42	7.48
DNB	9.11	9.10	9.11	9.13	9.19
NB	10.20	10.20	10.21	10.24	10.33
24DNT	13.32	13.31	13.34	13.38	13.50
4ADNT	14.52	14.51	14.55	14.59	14.75
2ADNT	15.06	15.06	15.09	15.12	15.28

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
RDX	7.45	0.032	0.096	7.35 - 7.55
DNB	9.14	0.040	0.119	9.02 - 9.26
NB	10.25	0.054	0.163	10.08 - 10.41
24DNT	13.39	0.080	0.240	13.15 - 13.63
4ADNT	14.62	0.108	0.323	14.30 - 14.94
2ADNT	15.17	0.108	0.323	14.84 - 15.49

ICN0911
CB6→CB7
Page

CALIBRATION FACTOR DAT
FORM 9E

EXPLOSIVE CALIBRATION - METHOD SW846-8330

Instrument ID : IN10
Column ID : MET-01
Calibration Date : 09/11/98
Number of Calibration Levels: 5

COMPONENT NAME	RT Level 1	RT Level 2	RT Level 3	RT Level 4	RT Level 5
RDX	7.48	7.43	7.46	7.43	7.44
DNB	9.17	9.11	9.14	9.11	9.11
NB	10.27	10.20	10.25	10.20	10.21
24DNT	13.41	13.32	13.38	13.33	13.35
4ADNT	14.66	14.53	14.61	14.54	14.58
2ADNT	15.22	15.08	15.16	15.10	15.13

COMPONENT NAME	RT Cont CA6	RT Cont CA7
RDX	7.48	7.52
DNB	9.18	9.22
NB	10.31	10.35
24DNT	13.50	13.54
4ADNT	14.77	14.83
2ADNT	15.32	15.38

COMPONENT NAME	AVE RT	STD_DEV	3X SD	AVE+-3X SD
RDX	7.45	0.032	0.096	7.35 - 7.55
DNB	9.14	0.040	0.119	9.02 - 9.26
NB	10.25	0.054	0.163	10.08 - 10.41
24DNT	13.39	0.080	0.240	13.15 - 13.63
4ADNT	14.62	0.108	0.323	14.30 - 14.94
2ADNT	15.17	0.108	0.323	14.84 - 15.49

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0914,4
Injection File Name Level 2 : 1CN0914,5
Injection File Name Level 3 : 1CN0914,6
Injection File Name Level 4 : 1CN0914,7
Injection File Name Level 5 : 1CN0914,8

Calibration Date : 09/14/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
HMX	4734	676	23311	666	62444	714	124787	713	256308	732
TNB	7937	1725	38431	1671	104772	1822	210503	1830	426946	1856
TNT	9613	2090	45912	1996	121246	2109	245259	2133	495568	2155
TETRYL	10499	1167	54523	1212	143724	1278	287737	1279	566865	1260
3,4DNT	5950	4508	28709	4350	77476	4696	161616	4897	328221	4973
26DNT	6482	1296	29358	1174	80948	1295	157657	1261	328618	1314

CALIBRATION FACTOR DATA
FORM 9A-1

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0914,9
Injection File Name Level 2 : 1CN0914,10
Injection File Name Level 3 : 1CN0914,11
Injection File Name Level 4 : 1CN0914,12
Injection File Name Level 5 : 1CN0914,13

Calibration Date : 09/14/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

COMPONENT NAME	Area Level 1	CAL FACTOR Level 1	Area Level 2	CAL FACTOR Level 2	Area Level 3	CAL FACTOR Level 3	Area Level 4	CAL FACTOR Level 4	Area Level 5	CAL FACTOR Level 5
RDX	4325	865	19829	793	51626	826	101136	809	204321	817
DNB	9565	2391	46566	2328	117618	2352	235359	2354	466984	2335
NB	7393	1479	36202	1448	89294	1429	181511	1452	363538	1454
24DNT	10459	2092	52877	2115	131704	2107	266249	2130	525516	2102
4ADNT	9122	992	49565	1078	130220	1132	257205	1118	500849	1089
2ADNT	15528	1553	81882	1638	198518	1588	404368	1617	802187	1604

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0914,4
Injection File Name Level 2 : 1CN0914,5
Injection File Name Level 3 : 1CN0914,6
Injection File Name Level 4 : 1CN0914,7
Injection File Name Level 5 : 1CN0914,8

Calibration Date : 09/14/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
HMX	700	3.99	0.99991	727	0.000
TNB	1781	4.44	0.99996	1849	0.000
TNT	2096	2.92	0.99997	2147	0.000
TETRYL	1239	3.93	0.99994	1264	0.000
3,4DNT	4685	5.57	0.99990	4942	0.000
26DNT	1268	4.41	0.99977	1303	0.000

CALIBRATION FACTOR DATA
FORM 9B

EXPLOSIVE CALIBRATION - METHOD SW846-8330
Instrument ID: IN10
Column ID : MET-01

Inj 1

Injection File Name Level 1 : 1CN0914,9
Injection File Name Level 2 : 1CN0914,10
Injection File Name Level 3 : 1CN0914,11
Injection File Name Level 4 : 1CN0914,12
Injection File Name Level 5 : 1CN0914,13

Calibration Date : 09/14/98
Number of Calibration Levels: 5
Line forced thru zero : Yes
Calculation Method : Area

Component Name	Mean Cal Factor	% RSD	Corr. Coeff.	Slope area/amt	Intercept
RDX	822	3.27	0.99997	816	0.000
DNB	2352	1.04	0.99999	2339	0.000
NB	1452	1.23	0.99999	1453	0.000
24DNT	2109	0.68	0.99997	2108	0.000
4ADNT	1082	5.09	0.99985	1096	0.000
2ADNT	1600	2.00	0.99998	1606	0.000

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/14/98
Continuing Calibration #: 1
Continuing Cal Date : 09/15/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0914A,1
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	63338	724	700	3.37	727	0.49
TNB	104673	1820	1781	2.21	1849	1.52
TNT	120512	2096	2096	0.02	2147	2.39
TETRYL	139528	1240	1239	0.11	1264	1.87
3,4DNT	76565	4640	4685	0.95	4942	6.11
26DNT	83002	1328	1268	4.71	1303	1.93

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/14/98
Continuing Calibration #: 1
Continuing Cal Date : 09/15/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0914A,2
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
RDX	51948	831	822	1.10	816	1.86
DNB	117520	2350	2352	0.07	2339	0.48
NB	89275	1428	1452	1.65	1453	1.66
24DNT	133053	2129	2109	0.93	2108	1.00
4ADNT	131233	1141	1082	5.50	1096	4.07
2ADNT	200937	1607	1600	0.46	1606	0.07

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/14/98
Continuing Calibration #: 2
Continuing Cal Date : 09/15/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0914A,5
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
HMX	59707	682	700	2.56	727	6.19
TNB	101583	1767	1781	0.81	1849	4.43
TNT	119143	2072	2096	1.16	2147	3.50
TETRYL	137716	1224	1239	1.19	1264	3.14
3,4DNT	78561	4761	4685	1.63	4942	3.66
26DNT	81772	1308	1268	3.16	1303	0.42

CALIBRATION FACTOR DATA
FORM 9C

Initial Calibration Date: 09/14/98
Continuing Calibration #: 2
Continuing Cal Date : 09/15/98
Continuing Cal Level : 3
Instrument ID : IN10
Column ID : MET-01
Injection File Name : 1CN0914A,6
Calculation Mode : Area

Component Name	Response Cont Std	Cont CF	Init CF Mean	%D	Init CF Slope	%D
RDX	49732	796	822	3.21	816	2.49
DNB	115007	2300	2352	2.21	2339	1.67
NB	89082	1425	1452	1.86	1453	1.87
24DNT	132129	2114	2109	0.23	2108	0.30
4ADNT	129628	1127	1082	4.21	1096	2.80
2ADNT	200893	1607	1600	0.44	1606	0.05

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

)jection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
HMX	7.000	35.000	87.500	175.000	350.000
TNB	4.600	23.000	57.500	115.000	230.000
TNT	4.600	23.000	57.500	115.000	230.000
TETRYL	9.000	45.000	112.500	225.000	450.000
3,4DNT	1.320	6.600	16.500	33.000	66.000
26DNT	5.000	25.000	62.500	125.000	250.000

CALIBRATION FACTOR DATA
FORM 9D

EXPLOSIVE CALIBRATION - METHOD SW846-8330

jection volume = 100uL

Amount Units = ng

COMPONENT NAME	AMT ON COL Level 1	AMT ON COL Level 2	AMT ON COL Level 3	AMT ON COL Level 4	AMT ON COL Level 5
RDX	5.000	25.000	62.500	125.000	250.000
DNB	4.000	20.000	50.000	100.000	200.000
NB	5.000	25.000	62.500	125.000	250.000
24DNT	5.000	25.000	62.500	125.000	250.000
4ADNT	9.200	46.000	115.000	230.000	460.000
2ADNT	10.000	50.000	125.000	250.000	500.000

	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] OXIN

SAMPLE EXTRACTION L

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815SA

EXTRACT DATE: 1998-08-15 10:41

001581
Page: 1 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION	
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL			
BL0815SA			S/L				2.0							10.0	N					
BB0815SA			S/L				2.0							10.0	N					
LC0815SA			S/L				2.0							10.0	N	120				
LO0815SA			S/L				2.0							10.0	N	120				
35217.01 GC201	MKF-OH	08/13/1998 11:12 ABG-ICS-013	S/L		17.04	1.7	2.0							10.0	N					
35217.03 GC201	MKF-OH	08/13/1998 11:12 ABG-ICS-015	S/L		16.61	1.7	2.0							10.0	N					
35217.04 GC201	MKF-OH	08/13/1998 11:12 ABG-ICS-016	S/L		15.74	1.7	2.0							10.0	N					
35217.06 GC201	MKF-OH	08/13/1998 11:12 ABG-ICS-018	S/L		17.72	1.6	2.0							10.0	N					
35218.01 GC201	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N					
35218.02MS GC201	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N	120				
35218.03MSD GC201	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N	120				
35218.04 GC201	MKF-OH	08/13/1998 11:24 BIOM01307032	S/L		24.36	1.5	2.0							10.0	N					
35218.05 GC201	MKF-OH	08/13/1998 11:24 BIOM01307032FD	S/L		27.53	1.4	2.0							10.0	N					
35218.06 GC201	MKF-OH	08/13/1998 11:24 BIOM01307033	S/L		25.30	1.5	2.0							10.0	N					
35218.07 GC201	MKF-OH	08/13/1998 11:24 BIOM01307051	S/L		36.43	1.3	2.0							10.0	N					

INITIALS

WEIGHING:	MK	EXTRACTION:	MK	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:		VERIFIER:			
MATRIX SPIKER:	MM	VERIFIER:	MK		
SUBMITTED BY:		REVIEWED BY:		8/15/98	

ID NUMBERS

FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #:
MATRIX SPIKE SOLID/CONC #(s): 3-119
SOP - METHOD # : SWL-OP-

COMMENTS

	SV	UT • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815SA

EXTRACT DATE: 1998-08-15 10:41

001581
Page: 2 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
35218.08 GC201	MKF-OH	08/13/1998 11:24 BIOM01307052	S/L		33.05	1.3	2.0							10.0	N				
35218.09 GC201	MKF-OH	08/13/1998 11:24 BIOM01307053	S/L		27.22	1.5	2.0							10.0	N				
35218.10 GC201	MKF-OH	08/13/1998 11:24 BIOM01307071	S/L		30.35	1.4	2.0							10.0	N				
35218.11 GC201	MKF-OH	08/13/1998 11:24 BIOM01307072	S/L		22.76	1.5	2.0							10.0	N				
35218.12 GC201	MKF-OH	08/13/1998 11:24 BIOM01307073	S/L		21.55	1.6	2.0							10.0	N				

INITIALS		
WEIGHING:	EXTRACTION: MK	FLORISIL:
CLEANUP: 3 5	KD:	
BLOWDOWN: 3	TV:	
SURROG. SPIKER:	VERIFIER:	
MATRIX SPIKER: MW	VERIFIER: MK	
SUBMITTED BY:	REVIEWED BY: 8/18/98	

ID NUMBERS
FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #:
MATRIX SPIKE SOLID/CONC #(s): 3-119
SOP - METHOD # : SWL-OP-

COMMENTS

	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☒ RUSH ☐ REEXTRACT ☐ TCLP ☐ DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815SB

EXTRACT DATE 1998-08-15 10:54

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SAMPLE ID (EPISODE #)	CLIENT / CASE	DATE RECEIVED / CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE (%)	DRY WEIGHT (g)	AMOUNT EXTRACTED (g ● ml)	EXTRACTED VOLUME (ml)	GPC VOLUME (ml)	GPC ELUTE VOL (ml)	FLORISIL VOL CONC (ml)	FLORISIL FIN VOL CONC (ml)	VOL SV - P (ml)	FIN PROCESS VOLUME (ml)	SCREEN Y/N (Y/N)	MS SV - P (µL)	SURR SV - P (µL)	BASE pH CONFIRMATION	ACID pH CONFIRMATION
BL0815SB			S/L				2.0							10.0	N		1000		
BB0815SB			S/L				2.0							10.0	N		1000		
LC0815SB			S/L				2.0							10.0	N	500	1000		
LD0815SB			S/L				2.0							10.0	N	500	1000		
35217.01 GC200	MKF-OH	08/13/1998 11:12 ABG-ICS-013	S/L		17.04	1.7	2.0							10.0	N		1000		
35217.03 GC200	MKF-OH	08/13/1998 11:12 ABG-ICS-015	S/L		16.61	1.7	2.0							10.0	N		1000		
35217.04 GC200	MKF-OH	08/13/1998 11:12 ABG-ICS-016	S/L		15.74	1.7	2.0							10.0	N		1000		
35217.06 GC200	MKF-OH	08/13/1998 11:12 ABG-ICS-018	S/L		17.72	1.6	2.0							10.0	N		1000		
35218.01 GC200	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N		1000		
35218.02MS GC200	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N	500	1000		
35218.03MSD GC200	MKF-OH	08/13/1998 11:24 BIOM01307031	S/L		29.18	1.4	2.0							10.0	N	500	1000		
35218.04 GC200	MKF-OH	08/13/1998 11:24 BIOM01307032	S/L		24.36	1.5	2.0							10.0	N		1000		
35218.05 GC200	MKF-OH	08/13/1998 11:24 BIOM01307032FD	S/L		27.53	1.4	2.0							10.0	N		1000		
35218.06 GC200	MKF-OH	08/13/1998 11:24 BIOM01307033	S/L		25.30	1.5	2.0							10.0	N		1000		
35218.07 GC200	MKF-OH	08/13/1998 11:24 BIOM01307051	S/L		36.43	1.3	2.0							10.0	N		1000		

INITIALS

WEIGHING: MK	EXTRACTION: MK	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER: MM	VERIFIER: MK	
MATRIX SPIKER: MM	VERIFIER: MK	
SUBMITTED BY:	REVIEWED BY:	8/18/98

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 3-125

MATRIX SPIKE SOLID/CONC #(s): 3-131

SOP - METHOD # : SWL-OP-_____ Rev._____

COMMENTS

	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815SB

EXTRACT DATE: 98-08-15 10:54

001582
Page: 2 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
35218.08 GC200	MKF-OH	08/13/1998 11:24 BIOM01307052	S/L		33.05	1.3	2.0							10.0	N		1000		
35218.09 GC200	MKF-OH	08/13/1998 11:24 BIOM01307053	S/L		27.22	1.5	2.0							10.0	N		1000		
35218.10 GC200	MKF-OH	08/13/1998 11:24 BIOM01307071	S/L		30.35	1.4	2.0							10.0	N		1000		
35218.11 GC200	MKF-OH	08/13/1998 11:24 BIOM01307072	S/L		22.76	1.5	2.0							10.0	N		1000		
35218.12 GC200	MKF-OH	08/13/1998 11:24 BIOM01307073	S/L		21.55	1.6	2.0							10.0	N		1000		

INITIALS		
WEIGHING:	EXTRACTION: MK	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER: MM	VERIFIER: MK	
MATRIX SPIKER: MM	VERIFIER: MK	
SUBMITTED BY:	VIEWED BY: 8/18/98	

ID NUMBERS	
FLORISIL CARTRIDGE #:	
GPC COLUMN #:	
SURROGATES ID CONC #:	3-125
MATRIX SPIKE SOLID/CONC #(s):	3-131
SOP - METHOD # : SWL-OP-	Re

COMMENTS

M	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			XXXXX
SHAKER			
SONC. (3550)			
SOXHLET			

[X] RUSH ☐ REEXTRACT ☐ TCLP ☐ DXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815WA

EXTRACT DATE: 1998-08-15 10:13

001579
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0815WA			W/L					5.0						5.0	N		500		
BB0815WA			W/L					5.0						5.0	N		500		
LC0815WA			W/L					5.0						5.0	N	250	500		
LD0815WA			W/L					5.0						5.0	N	250	500		
35198.01 GC200	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N		500		
35198.02MS GC200	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N	250	500		
35198.03MSD GC200	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N	250	500		
35198.04 GC200	MKF-OH	08/12/1998 11:41 RPW030	W/L					5.0						5.0	N		500		
35218.13 GC200	MKF-OH	08/13/1998 11:24 BIORB081198	W/L					5.0						5.0	N		500		
35268.02 GC200	XXXXXXXX XXXXXXXX	XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXX	W/L	7.14				5.0						5.0	N		500		
35270.19 GC200	MKF-OH	08/15/1998 09:51 BIORB081498	W/L					5.0						5.0	N		500		

INITIALS		
WEIGHING: MK	EXTRACTION: MK	FLORISIL:
CLEANUP: 3	KD:	
BLOWDOWN: 0	TV:	
SURROG. SPIKER: MM	VERIFIER: MK	
MATRIX SPIKER: MM	VERIFIER: MK	
SUBMITTED BY:	REVIEWED BY:	

4.22

ID NUMBERS
FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #: 3-84
MATRIX SPIKE SOLID/CONC #(s): 2-284
SOP - METHOD # : SWL-OP-_____ Rev._____

COMMENTS

	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			XXXXX
SHAKER			
SONC. (3550)			
SOXHLET			

[X] RUSH ☐ REEXTRACT ☐ TCLP ☐ DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 980815WB

EXTRACT DATE: 1998-08-15 10:19

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Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0815WB			W/L					5.0						5.0	N				
BB0815WB			W/L					5.0						5.0	N				
LC0815WB			W/L					5.0						5.0	N	120			
LD0815WB			W/L					5.0						5.0	N	120			
35198.01 GC201	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N				
35198.02MS GC201	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N	120			
35198.03MSD GC201	MKF-OH	08/12/1998 11:41 RPW029	W/L					5.0						5.0	N	120			
35198.04 GC201	MKF-OH	08/12/1998 11:41 RPW030	W/L					5.0						5.0	N				
35218.13 GC201	MKF-OH	08/13/1998 11:24 BIORB081198	W/L					5.0						5.0	N				
35270.19 GC201	MKF-OH	08/15/1998 09:51 BIORB081498	W/L					5.0						5.0	N				

INITIALS		
WEIGHING: MK	EXTRACTION: MK	FLORISIL:
CLEANUP: 360	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER:	VERIFIER:	
MATRIX SPIKER: MM	VERIFIER: MK	
SUBMITTED BY:	VIEWED BY:	

ID NUMBERS
FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #:
MATRIX SPIKE SOLID/CONC #(s): 3-119
SOP - METHOD # : SWL-OP-_____ Re _____

COMMENTS

TOLTEST INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7[illegible] Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

BIU-189

Chain of Cus y Record

25729

Project No.: 37324
Client:
P.O. No.:
Project/Location: NSWC Crane BioFacility
Project Mgr.:
Sampler's Name: Peter J. Chevalier
Phone No.
Sampler's Signature: [signature]

240

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330								Preserved Yes/No	LAB USE ONLY Lab #
1	BIU S061 08 031	5/19/99	1205	G	compost	Column 3 sample location 1	1	✓			MS/MSD						
2	BIU S061 08 032		1206			2											
3	BIU S061 08 033		1204			3											
4	BIU S061 08 051		1208			5 1											
5	BIU S061 08 052		1209			2											
6	BIU S061 08 053		1207			3											
7	BIU S061 08 071		1211			7 1											
8	BIU S061 08 072		1213			2											
9	BIU S061 08 073		1210			3											
10	BIU S061 08 091		1215			9 1											

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
	[signature]	5/19/99 1530		
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By: S. Hooker	5/20/99 930

LAB USE ONLY

Were samples delivered ☐ in person ☑ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 3 °C
Did samples arrive intact and sealed? ☑ yes ☐ no ☐ N/A
Were proper containers used? ☑ yes ☐ no
Was container labeled properly for contents? ☑ yes ☐ no
Were samples packaged properly for type of material? ☑ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Ori[illegible] plus one accompanies shipment (white and yellow); copy to coordinator field [illegible] (pink)

Rev. 7/97

TOLTEST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

B/U - 189

Chain of Custody Record

25728

Project No.: 37324
Client:
P.O. No.:
Project/Location: NSWC Crane Bio-facility
Project Mgr.:
Sampler's Name: Peter J Chevalier
Phone No.:
Sampler's Signature: [signature]

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	Parameters	Preserved Yes/No	LAB USE ONLY Lab #
1	B/U S 061 08 09 1 FD	5/14/99	1215	G	compost	column 9 sample location 1	1	✓			241
2	B/U S 061 08 09 2		1216			2					
3	B/U S 061 08 09 3		1214			3					
4	B/U S 061 08 11 1		1218			11 1					
5	B/U S 061 08 11 2		1214			2					
6	B/U S 061 08 11 3		1217			3					
7											
8											
9											
10											

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
	[signature]	5/14/99 1530		

LAB USE ONLY

Were samples delivered ☐ in person ☑ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 3 °C
Did samples arrive intact and sealed? ☑ yes ☐ no ☐ N/A
Were proper containers used? ☑ yes ☐ no
Was container labeled properly for contents? ☑ yes ☐ no
Were samples packaged properly for type of material? ☑ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no

Comments: _____

TAT

Distribution: Or. plus one accompanies shipment (white and yellow); copy to coordinator field (pink)

Rev. 7/97

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 REV 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): SARAH HODSON

RECEIVED BY (SIGNATURE): S. Hodson

LOGGED IN BY (SIGNATURE): S. Hodson

REC'D DATE 05/20/99

TIME REC'D 09:30

LOG-IN DATE 1999-05-20 10:42

PROJECT: NSWC CRANE

EPISODE: 38614

SAMPLE DELIVERY GROUP:38614

Client Sample #	Sample Fraction @	Assigned LAB#	Cooler I.D.	pH Check	ACID/ BASE LOT#	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
BIOS06108031	gc	38614.01	5/20/99-1	N		3.0 C
BIOS06108031		38614.02		N		
BIOS06108031		38614.03		N		
BIOS06108032		38614.04		N		
BIOS06108033		38614.05		N		
BIOS06108051		38614.06		N		
BIOS06108052		38614.07		N		
BIOS06108053		38614.08		N		
BIOS06108071		38614.09		N		
BIOS06108072		38614.10		N		
BIOS06108073		38614.11		N		
BIOS06108091		38614.12		N		
BIOS06108091FD		38614.13		N		
BIOS06108092		38614.14		N		
BIOS06108093		38614.15		N		
BIOS06108111		38614.16		N		
BIOS06108112		38614.17		N		
BIOS06108113		38614.18		N		

Remarks

1. CUSTODY SEAL(S): Present/Absent
   Intact/ Broken
2. CUSTODY SEALS NOS.:
   NA
3. CHAIN-OF CUSTODY. Present/Absent
   Sealed In Plastic? Yes/ No
   Taped To Lid? Yes/ No
   Properly Filled Out (Ink, Signed, ETC.)? Yes/ No
4. AIRBILL AirBill/ Sticker Present/Absent
5. AIRBILL NO:
   811674014460
6. COOLER CONDITIONS
   Enough Ice? Yes/ No
   Type of Ice? WET
   Type of Packing? BUB
7. SAMPLE TAGS Present/Absent
8. SAMPLE CONDITION: Intact/ Broken*/ Leaking
   Bottles Sealed In Separate Plastic Bags? Yes/ No
   Correct Containers Used For Tests Indicated? Yes/ No
   Correct Preservative? Yes/ No
   Sufficient Sample? Yes/ No
   Labels Complete (I.D., Date, Time, Signature, Preservative? Yes/ No
   VOA Samples Without Bubbles? Yes/ No~
9. Does Information on Custody Records,Labels,Tags Agree? Yes/ No*
10. RAD SCREEN WITH GIEGER COUNTER? Yes/ No
11. P.O. Called? Yes/ No

* Contact PO and attach record of resolution

@ Sample Fractions: B=SV GC/MS, V= VOA GC/MS or GC, P=Pesticide,H=Herbicide, D=Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

June 7, 1999

CONTRACT : TOLTEST

PROJECT : NSWC CRANE

SDG NO : 38614

EPISODE(S): 38614

SAMPLE(S) : BIOS06108031, BIOS06108032, BIOS06108033, BIOS06108051, BIOS06108052, BIOS06108053, BIOS06108071, BIOS06108072, BIOS06108073, BIOS06108091, BIOS06108091FD, BIOS06108092, BIOS06108093, BIOS06108111, BIOS06108112, BIOS06108113

EXPLOSIVE FRACTION

This SDG consisted of 16 soil samples for the explosive analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

CASE SUMMARY:

Blanks: No problems

Surrogate(s): No problems

Matrix Spikes: Some of the analytes were out of the QC limits in MS and MSD. Possibly due to high concentration of the detected analytes in the sample that MS and MSD were designated or samples' matrices these analytes were out of the QC limits. The analytes that were out of the QC limits in the MS and MSD, they were within the QC limits in the LD0521SA.

Laboratory Control Spikes: 26DNT was slightly out of the QC limits in the LC0521SA. The analyte was within the QC limits in the LD0521SA. 26DNT was not detected in the associated samples.

The retention times window is established based on the initial and continuing calibration standards. Sometimes this window is very narrow which slight effect of the sample' matrices contribute broadening of the peak shapes and falling of analytes out of the retention times window.

Due to peak broadening some of the analytes were slightly out of the retention times window in the some of the samples of the above SDG.

RDX was out of the retention times window by .01 minute in the quantitational analysis of the sample BIOS06108032. The analyte was within the retention times window in the confirmational analysis.

Due to samples' matrices some of the analytes slightly exceeded QC limits in the MS and MSD.

Enviroquant software was utilized to process the above samples. The Response Factor in the standard is calculated by dividing the area of each analyte by the concentration of the respective analyte.

Multiplier = (final volume / extracted amount) * dilution.

The following is an example of the calculations for RDX in the quantitation and confirmation of the sample BIOS06108031:

[Sample's response (area) / mean calibration factor] * Multiplier

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

= the concentration

(255541296/ 408736) * 10 = 6252 ug/Kg

(67428967/ 141253) * 10 = 4774 ug/Kg

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

We use the following flags where appropriate. "J" - indicates a uantitated result, which is below the quantitation limit, but above ne detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Shahriar Shahreza
LC Supervisor

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0521SA	110	0
02	BIOS06108032	108	0
03	BIOS06108033	92	0
04	BIOS06108051	94	0
05	BIOS06108052	102	0
06	BIOS06108053	131	0
07	BIOS06108071	73	0
08	BIOS06108072	83	0
09	BIOS06108073	82	0
10	BIOS06108091	81	0
11	LC0521SA	91	0
12	LD0521SA	93	0
13	BIOS06108031	73	0
14	BIOS06108031MS	77	0
15	BIOS06108031MSD	68	0
16	BIOS06108091FD	90	0
17	BIOS06108092	86	0
18	BIOS06108093	76	0
19	BIOS06108111	84	0
20	BIOS06108112	82	0
21	BIOS06108113	73	0
22	BIOS06108031DL	90	0
23	BIOS06108071DL	77	0
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

LCS Sample NO.: LC0521SA

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9050	8250	91	57-137
RDX	9050	8330	92	77-113
TNB	9050	7890	87	64-125
DNB	9050	8320	92	82-118
TETRYL	9050	9100	100	23-124
NB	9050	8450	93	69-143
TNT	9050	7180	79	75-118
4ADNT	9050	9060	100	60-140
2ADNT	9050	8130	90	60-140
26DNT	9050	7000	77 *	78-117
24DNT	9050	8560	94	74-126
2NT	9050	7590	84	78-123
4NT	9050	8960	99	79-125
3NT	9050	8610	95	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 1 out of 14 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

LCS Sample NO.: LD0521SA

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9050	8480	94	57-137
RDX	9050	8580	95	77-113
TNB	9050	7950	88	64-125
DNB	9050	8470	94	82-118
TETRYL	9050	8640	96	23-124
NB	9050	8640	95	69-143
TNT	9050	7390	82	75-118
4ADNT	9050	9220	102	60-140
2ADNT	9050	8290	92	60-140
26DNT	9050	7200	80	78-117
24DNT	9050	8780	97	74-126
2NT	9050	7700	85	78-123
4NT	9050	8840	98	79-125
3NT	9050	8620	95	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix Spike - Client Sample NO.: BIOS06108031

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
HMX	9500	0	8350	88	54-128
RDX	9500	6250	13000	71	66-109
TNB	9500	0	7870	83	57-130
DNB	9500	0	9190	97	74-122
TETRYL	9500	0	6530	69	32-119
NB	9500	0	8630	91	70-135
TNT	9500	28200	9930	0*	44-124
4ADNT	9500	485	8660	86	60-140
2ADNT	9500	662	8820	86	60-140
26DNT	9500	0	8470	89	58-125
24DNT	9500	0	8390	88	59-120
2NT	9500	0	7430	78*	79-124
4NT	9500	0	7870	83	74-128
3NT	9500	0	7950	84	79-121

FORM III

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix Spike - Client Sample NO.: BIOS06108031

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	9500	8390	88	0	30	54-128
RDX	9500	12100	61 *	7	30	66-109
TNB	9500	8150	86	3	30	57-130
DNB	9500	9250	97	1	45	74-122
TETRYL	9500	6930	73	6	30	32-119
NB	9500	8630	91	0	35	70-135
TNT	9500	14600	0 *	38 *	30	44-124
4ADNT	9500	8790	87	2	40	60-140
2ADNT	9500	9370	92	6	40	60-140
26DNT	9500	8390	88	1	35	58-125
24DNT	9500	8740	92	4	35	59-120
2NT	9500	7620	80	2	35	79-124
4NT	9500	8010	84	2	35	74-128
3NT	9500	8410	88	6	35	79-121

Column to be used to flag recovery values

Values outside of QC limits

RPD: 1 out of 14 outside limits
Spike Recovery: 4 out of 28 outside limits

Comments: _____

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0521SA

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Lab Sample ID : BL0521SA Lab File ID : 1_052208

Matrix: (soil/water) SOIL

Date Extracted : 05/21/99 Extraction Method : SONC

Date Analyzed (1): 05/23/99 Date Analyzed (2): 05/23/99

Time Analyzed (1): 0149 Time Analyzed (2): 0334

Instrument ID (1): LC1 Instrument ID (2): LC5

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	BIOS06108032	38614.04	05/23/99	05/23/99
02	BIOS06108033	38614.05	05/23/99	05/23/99
03	BIOS06108051	38614.06	05/23/99	05/23/99
04	BIOS06108052	38614.07	05/23/99	05/23/99
05	BIOS06108053	38614.08	05/23/99	05/23/99
06	BIOS06108071	38614.09	05/23/99	05/24/99
07	BIOS06108072	38614.10	05/23/99	05/23/99
08	BIOS06108073	38614.11	05/23/99	
09	BIOS06108091	38614.12	05/23/99	05/23/99
10	LC0521SA	LC0521SA	05/27/99	
11	LD0521SA	LD0521SA	05/27/99	
12	BIOS06108031	38614.01	05/25/99	05/23/99
13	BIOS06108031MS	38614.02MS	05/25/99	
14	BIOS06108031MSD	38614.03MSD	05/25/99	
15	BIOS06108091FD	38614.13	05/25/99	05/23/99
16	BIOS06108092	38614.14	05/25/99	05/23/99
17	BIOS06108093	38614.15	05/25/99	05/23/99
18	BIOS06108111	38614.16	05/25/99	05/23/99
19	BIOS06108112	38614.17	05/25/99	05/23/99
20	BIOS06108113	38614.18	05/25/99	05/23/99
21	BIOS06108031DL	38614.01DL	05/27/99	05/23/99
22	BIOS06108071DL	38614.09DL	05/27/99	05/24/99
23				
24				
25				
26				

Comments:

FORM IV

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108031

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.01

Sample Amt: 2.0 G % Moisture: 11.1 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	6250	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	28200	E
1946-51-0	4ADNT	485	P
35572-78-2	2ADNT	662	
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052408.D Vial: 8
Acq On : 25 May 1999 02:51 Operator: SM
Sample : 38614.01 Inst : LC3
Misc : BIOS06108031 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 11:00 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.46W	86778537	1467.3	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	8.97W	255541296	6252.0	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	19.13W	2,808,709,744	28174.3	mE	A
9) 4ADNT	19.96	32005540	484.9	m	A
10) 2ADNT	21.32W	59885675	662.0	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

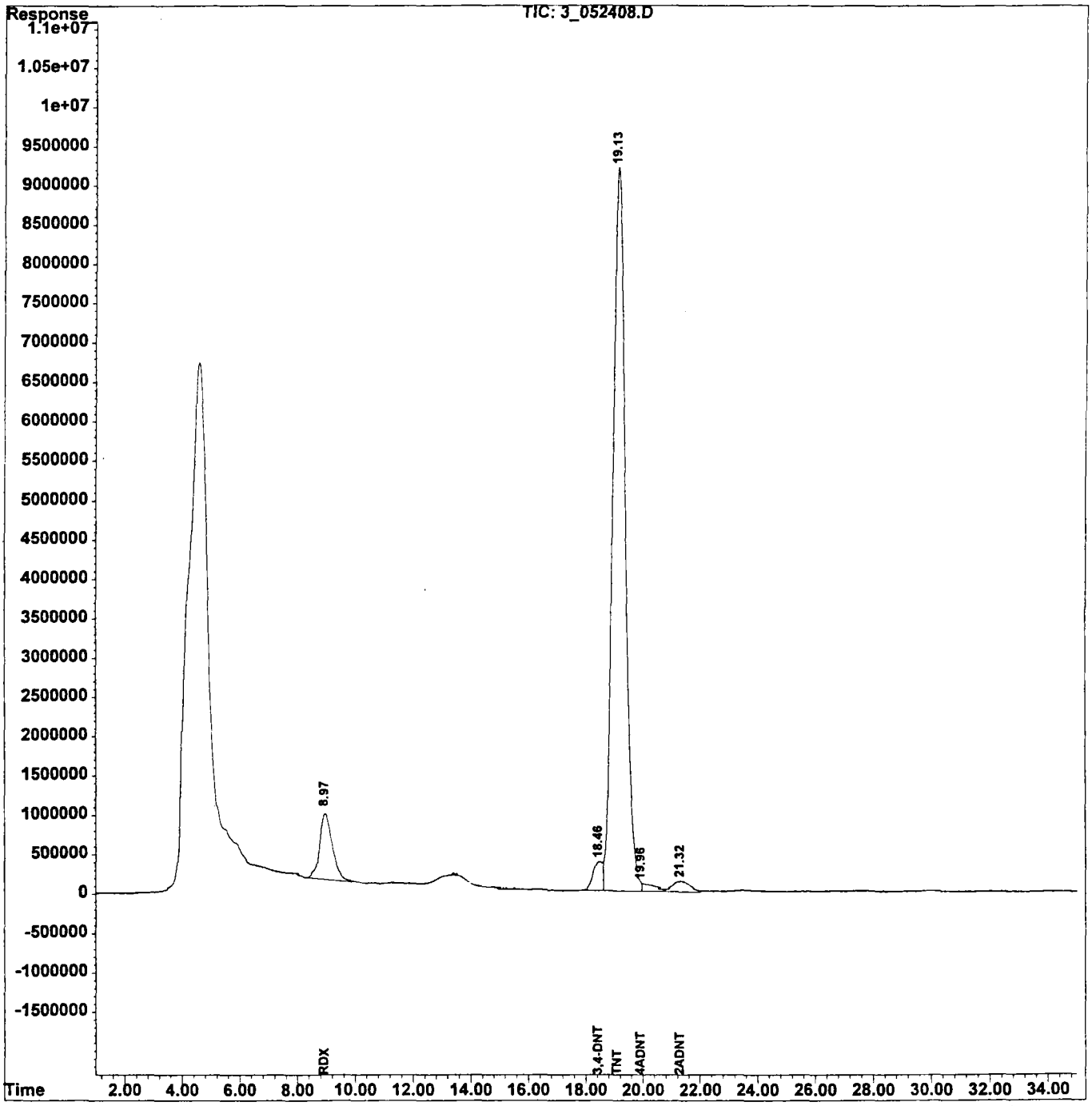
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052408.D Vial: 8
Acq On : 25 May 1999 02:51 Operator: SM
Sample : 38614.01 Inst : LC3
Misc : BIOS06108031 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 11:00 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052215.D Vial: 15
Acq On : 23 May 1999 04:40 Operator: SM
Sample : 38614.01 Inst : LC5
Misc : BIOS06108031 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:11 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.82	30262235	1594.1		A
Target Compounds:					
1) A HMX	4.67W	7777248	644.3	mJ	A
2) B RDX	7.17	67428967	4773.6		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.40	824166620	28367.4	E	A
9) B 4ADNT	14.34	2870500	185.1	mJ	A
10) B 2ADNT	14.61	13881019	427.8	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

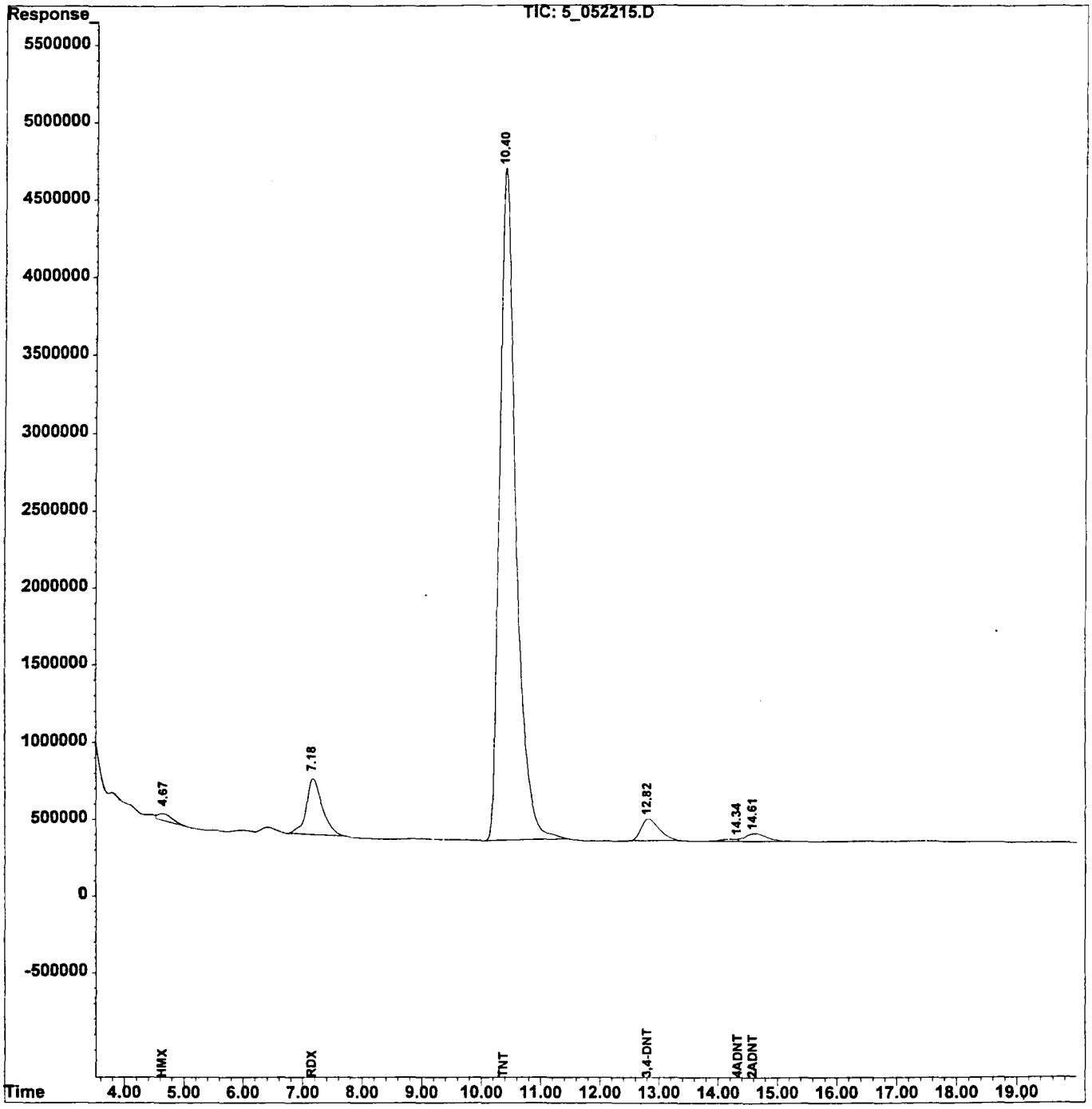
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052215.D Vial: 15
Acq On : 23 May 1999 04:40 Operator: SM
Sample : 38614.01 Inst : LC5
Misc : BIOS06108031 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:11 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



014

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108031DL

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.01DL

Sample Amt: 2.0 G % Moisture: 11.1 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/27/99

GPC Cleanup: (Y/N) N Dilution Factor: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	8800	U
121-82-4	RDX	1960	DPJ
99-35-4	TNB	1000	U
99-65-0	DNB	1000	U
479-45-8	TETRYL	2600	U
98-95-3	NB	1040	U
118-96-7	TNT	28600	D
1946-51-0	4ADNT	1000	U
35572-78-2	2ADNT	642	DJ
606-20-2	26DNT	1040	U
121-14-2	24DNT	1000	U
88-72-2	2NT	1000	U
99-99-0	4NT	1000	U
99-08-1	3NT	1000	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0526\3_052621.D Vial: 21
Acq On : 27 May 1999 07:59 Operator: SM
Sample : 38614.01DL Inst : LC3
Misc : BIOS06108031DL Multiplr: 40.0000
IntFile : EVENTS.E
Quant Time: May 27 16:19 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0526\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Thu May 27 14:13:40 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.05	26496054	1792.0	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	8.85	20039623	1961.1	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	18.76	711572987	28551.3	m	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	20.66	14506675	641.5	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

06/07/99

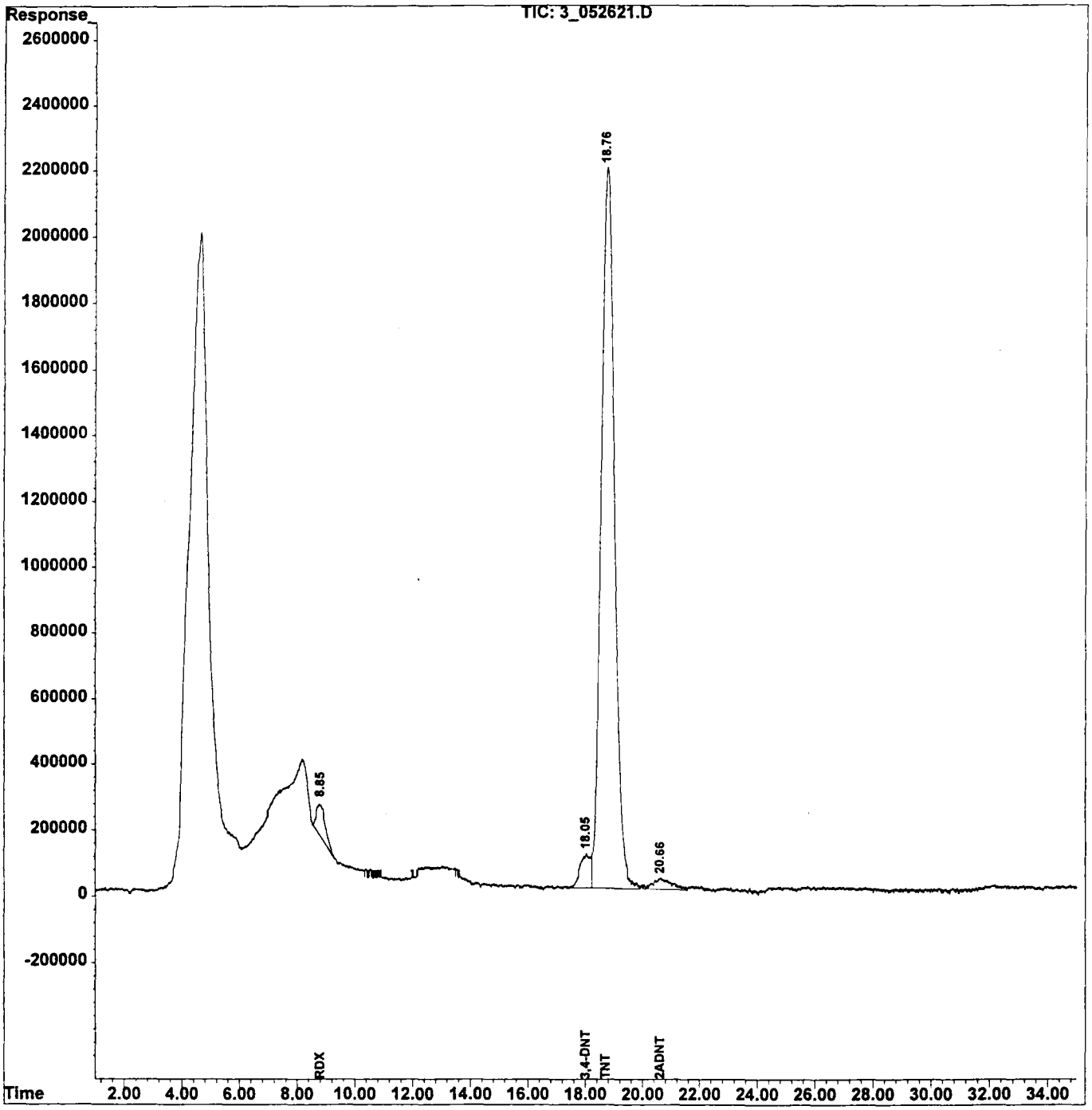
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0526\3_052621.D Vial: 21
Acq On : 27 May 1999 07:59 Operator: SM
Sample : 38614.01DL Inst : LC3
Misc : BIOS06108031DL Multiplr: 40.0000
IntFile : EVENTS.E
Quant Time: May 27 16:19 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0526\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Thu May 27 14:13:40 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



017

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108032

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.04

Sample Amt: 2.2 G % Moisture: 22.6 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2000	U
121-82-4	RDX	1980	
99-35-4	TNB	227	U
99-65-0	DNB	227	U
479-45-8	TETRYL	591	U
98-95-3	NB	236	U
118-96-7	TNT	227	U
1946-51-0	4ADNT	1030	P
35572-78-2	2ADNT	227	U
606-20-2	26DNT	236	U
121-14-2	24DNT	227	U
88-72-2	2NT	227	U
99-99-0	4NT	227	U
99-08-1	3NT	227	U
Surrogate amount spiked		1818.18	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052215.D Vial: 15
Acq On : 23 May 1999 07:04 Operator: SM
Sample : 38614.04 Inst : LC1
Misc : BIOS06108032 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 12:37 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.56	27055484	1964.7	m	A
Target Compounds:					
1) HMX	4.73	6583993	807.7	m	A
2) RDX	7.11W	18950039	1979.2	m *	A olm
3) TNB	9.73W	3277833	137.1	mJ	A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
9) 4ADNT	15.74	14837783	1027.7	m *1	A
10) 2ADNT	16.56	1315840	58.4	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

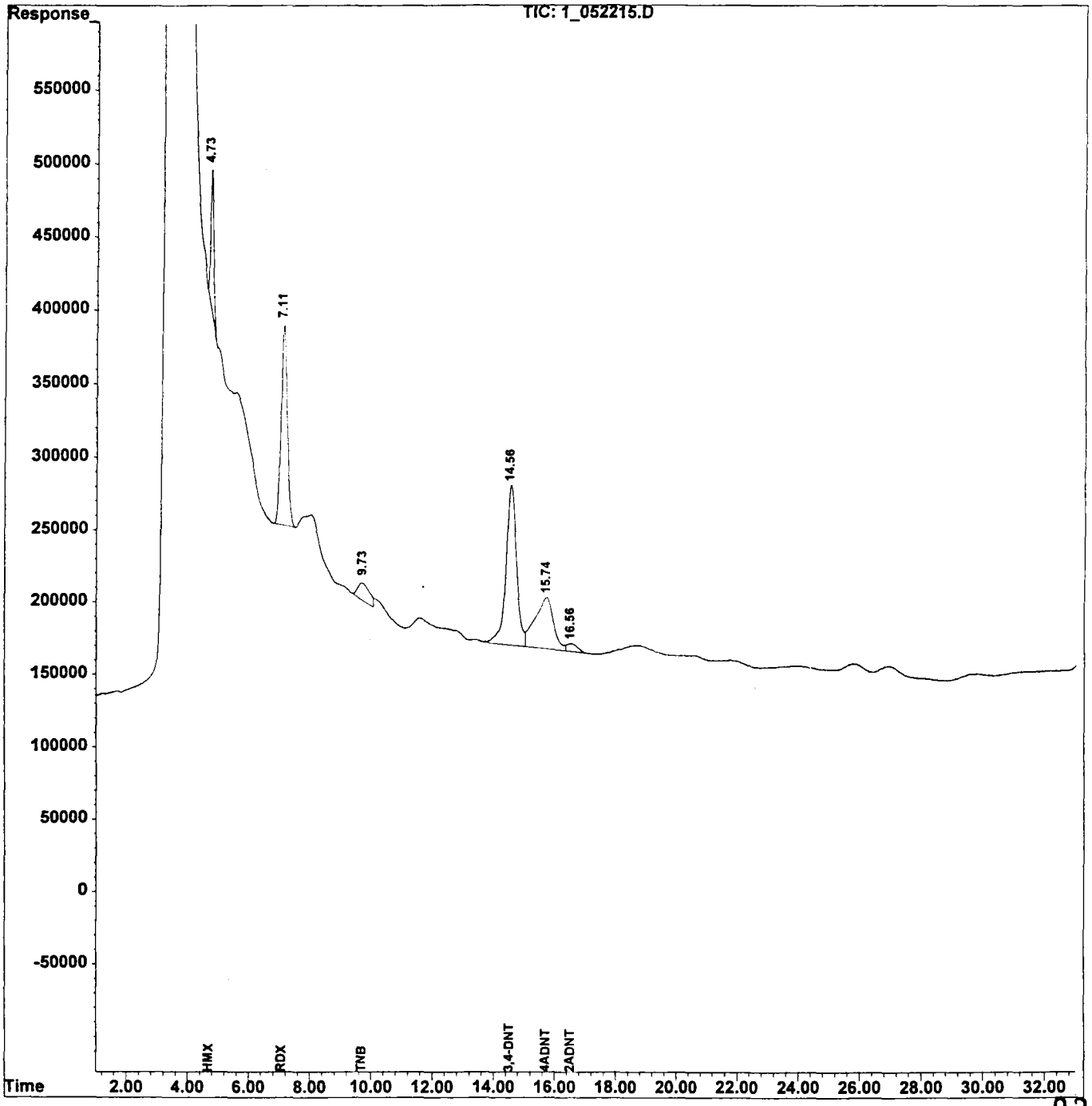
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052215.D Vial: 15
Acq On : 23 May 1999 07:04 Operator: SM
Sample : 38614.04 Inst : LC1
Misc : BIOS06108032 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 12:37 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052216.D Vial: 16
Acq On : 23 May 1999 05:13 Operator: SM
Sample : 38614.04 Inst : LC5
Misc : BIOS06108032 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:14 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.81	34852520	1747.8	m	A
Target Compounds:					
1) A HMX	4.62	7285825	574.6	mJ	A
2) B RDX	7.18	25369221	1709.8		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.17	9034473	404.3	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.40	2914175	95.5	mJ	A
9) B 4ADNT	14.15	9315903	572.0	mJ	A
10) B 2ADNT	14.54	2057641	60.4	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

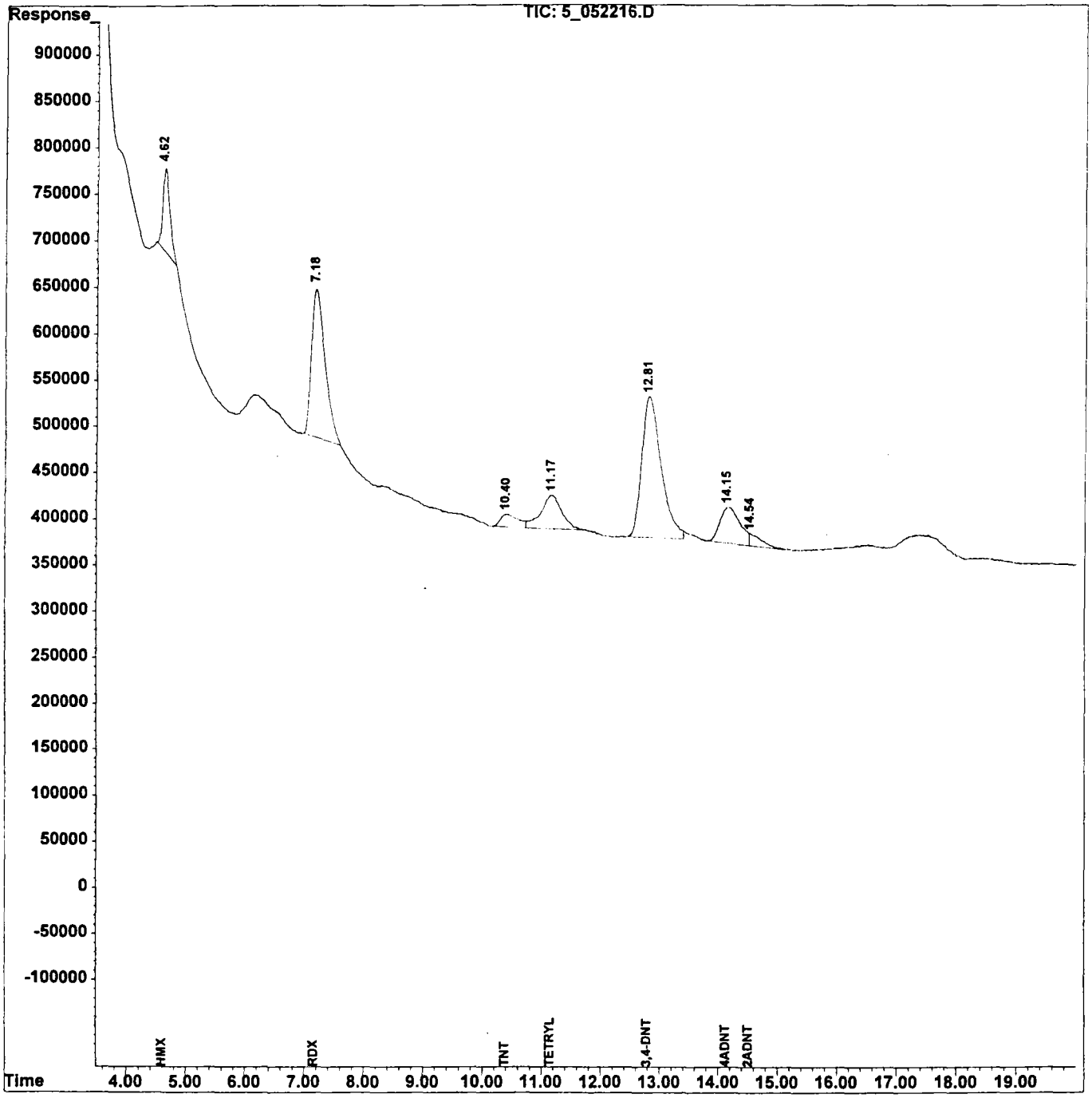
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052216.D Vial: 16
Acq On : 23 May 1999 05:13 Operator: SM
Sample : 38614.04 Inst : LC5
Misc : BIOS06108032 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:14 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108033

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.05

Sample Amt: 2.2 G % Moisture: 25.49 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2000	U
121-82-4	RDX	3760	
99-35-4	TNB	227	U
99-65-0	DNB	227	U
479-45-8	TETRYL	591	U
98-95-3	NB	236	U
118-96-7	TNT	549	
1946-51-0	4ADNT	265	
35572-78-2	2ADNT	227	U
606-20-2	26DNT	236	U
121-14-2	24DNT	227	U
88-72-2	2NT	227	U
99-99-0	4NT	227	U
99-08-1	3NT	227	U
Surrogate amount spiked		1818.18	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052217.D Vial: 17
Acq On : 23 May 1999 08:34 Operator: SM
Sample : 38614.05 Inst : LC1
Misc : BIOS06108033 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 12:54 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.53	22968315	1667.9	m	A
Target Compounds:					
1) HMX	4.73	1797132	220.5	mJ	A
2) RDX	7.09	35963742	3756.2	*	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.18	13622720	549.2	m *	A
9) 4ADNT	15.58	3830872	265.3	m *	A
10) 2ADNT	16.49	639812	28.4	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	21.92W	1293545	91.2	mJ	A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

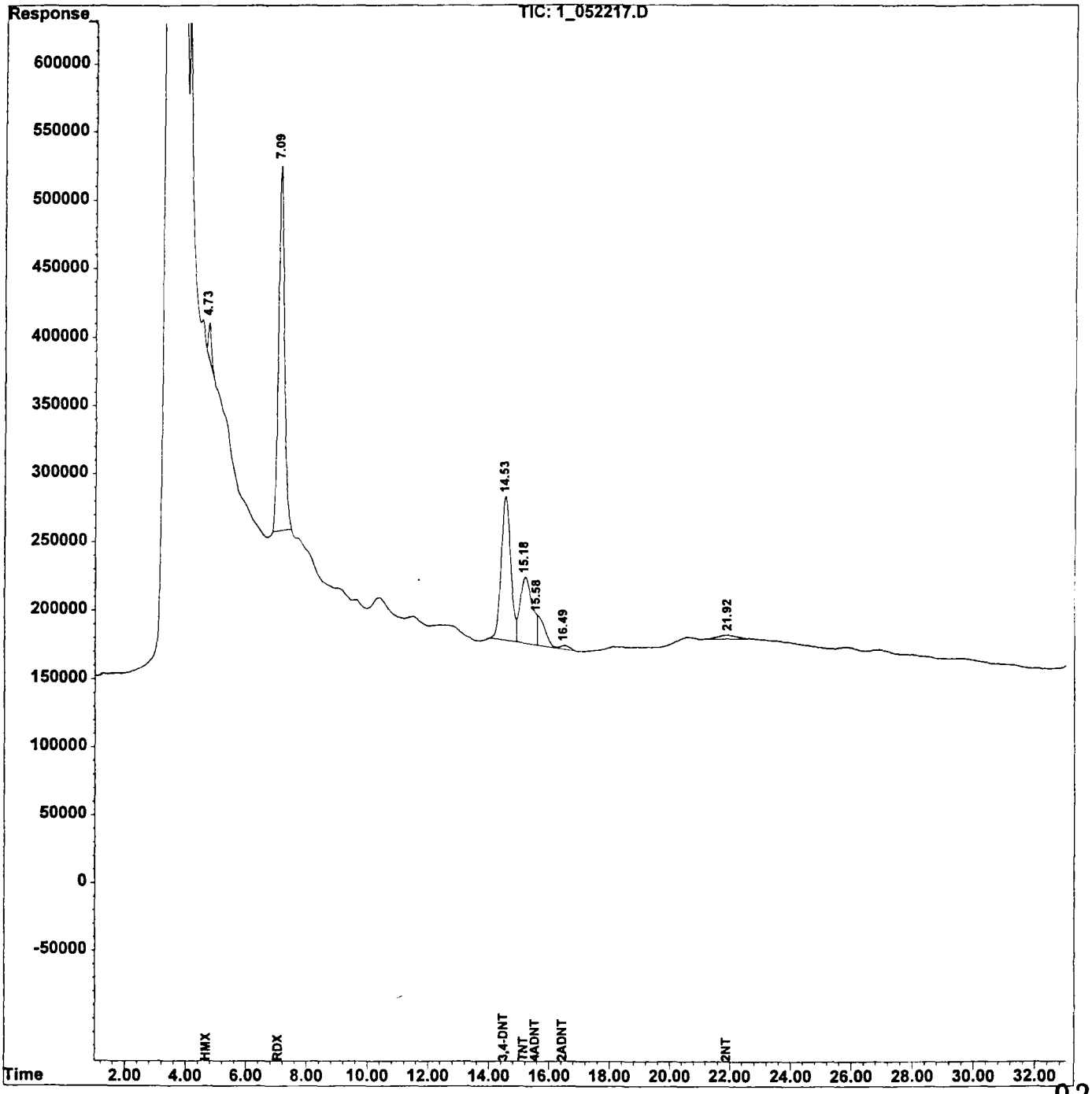
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052217.D Vial: 17
Acq On : 23 May 1999 08:34 Operator: SM
Sample : 38614.05 Inst : LC1
Misc : BIOS06108033 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 12:54 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052217.D Vial: 17
Acq On : 23 May 1999 05:45 Operator: SM
Sample : 38614.05 Inst : LC5
Misc : BIOS06108033 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 25 9:16 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.81	29785020	1426.2		A
Target Compounds:					
1) A HMX	4.61	1005555	75.7	mJ	A
2) B RDX	7.18	50438612	3245.9		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.17	5742283	245.4	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.39	13559009	424.2	mJ	A
9) B 4ADNT	14.16	3370527	197.6	mJ	A
10) B 2ADNT	14.47	2082543	58.3	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

AW 05/25/99

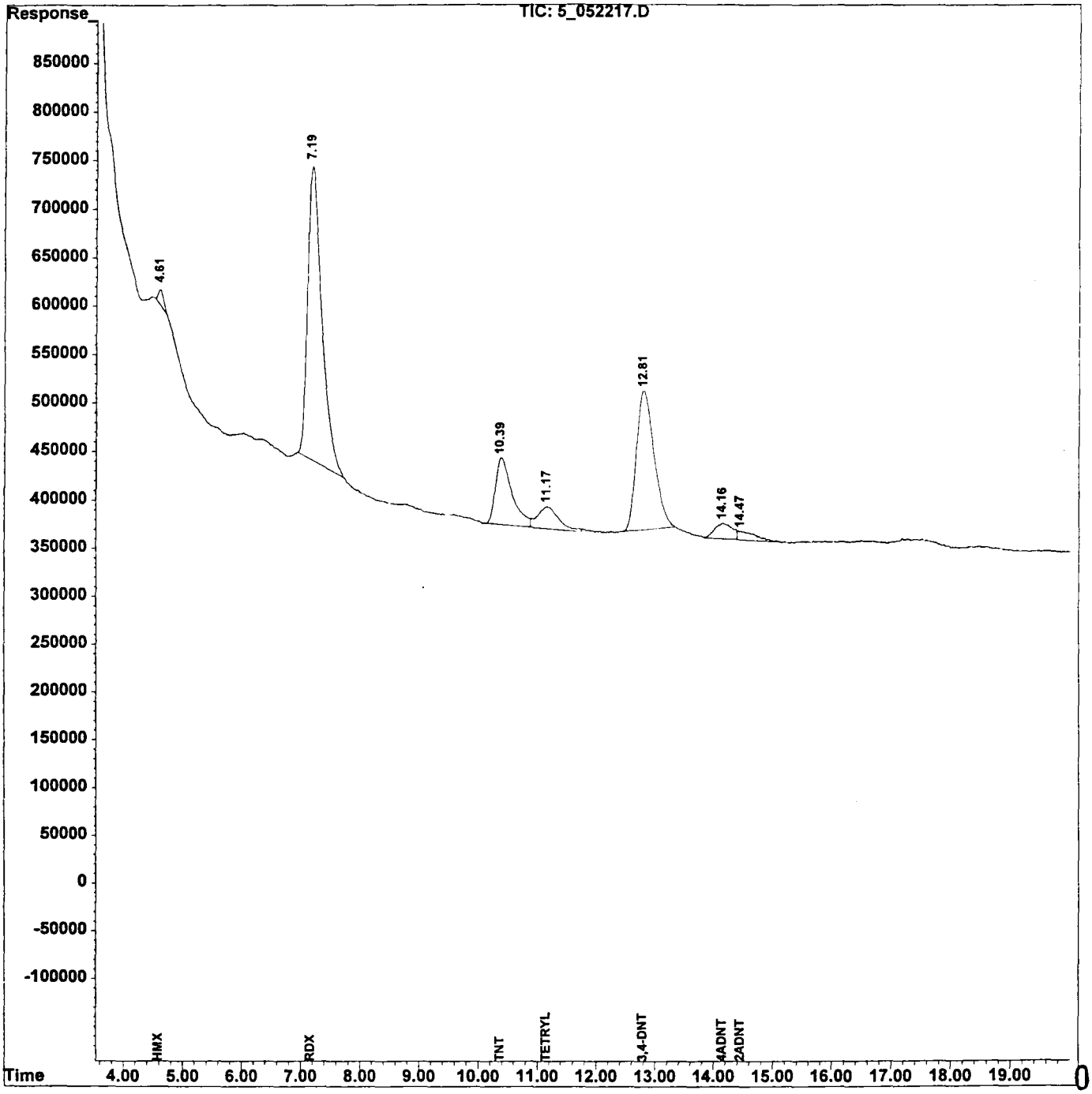
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052217.D Vial: 17
Acq On : 23 May 1999 05:45 Operator: SM
Sample : 38614.05 Inst : LC5
Misc : BIOS06108033 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 25 9:16 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



027

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108051

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.06

Sample Amt: 2.0 G % Moisture: 22 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	4540	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	1820	
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	328	
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052218.D Vial: 18
Acq On : 23 May 1999 09:19 Operator: SM
Sample : 38614.06 Inst : LC1
Misc : BIOS06108051 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 12:59 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.59	23650371	1889.3	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.	d	A
2) RDX	7.08	39517654	4540.6	m *	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.21	40962773	1816.9	m	A
9) 4ADNT	15.70	2487681	189.5	m	A
10) 2ADNT	16.57W	6713683	327.8	m *	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

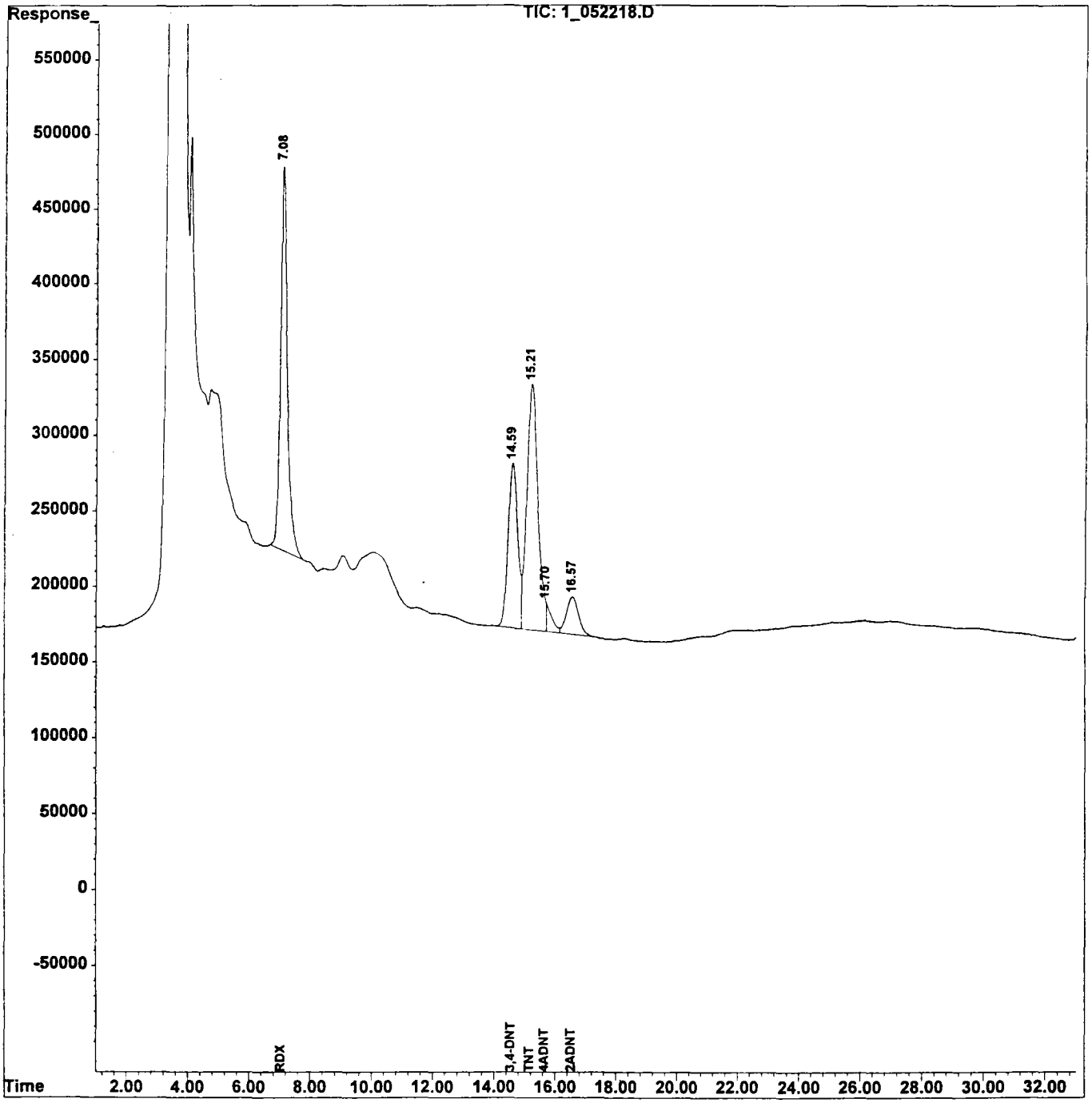
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052218.D Vial: 18
Acq On : 23 May 1999 09:19 Operator: SM
Sample : 38614.06 Inst : LC1
Misc : BIOS06108051 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 12:59 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052218.D Vial: 18
Acq On : 23 May 1999 06:18 Operator: SM
Sample : 38614.06 Inst : LC5
Misc : BIOS06108051 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:18 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

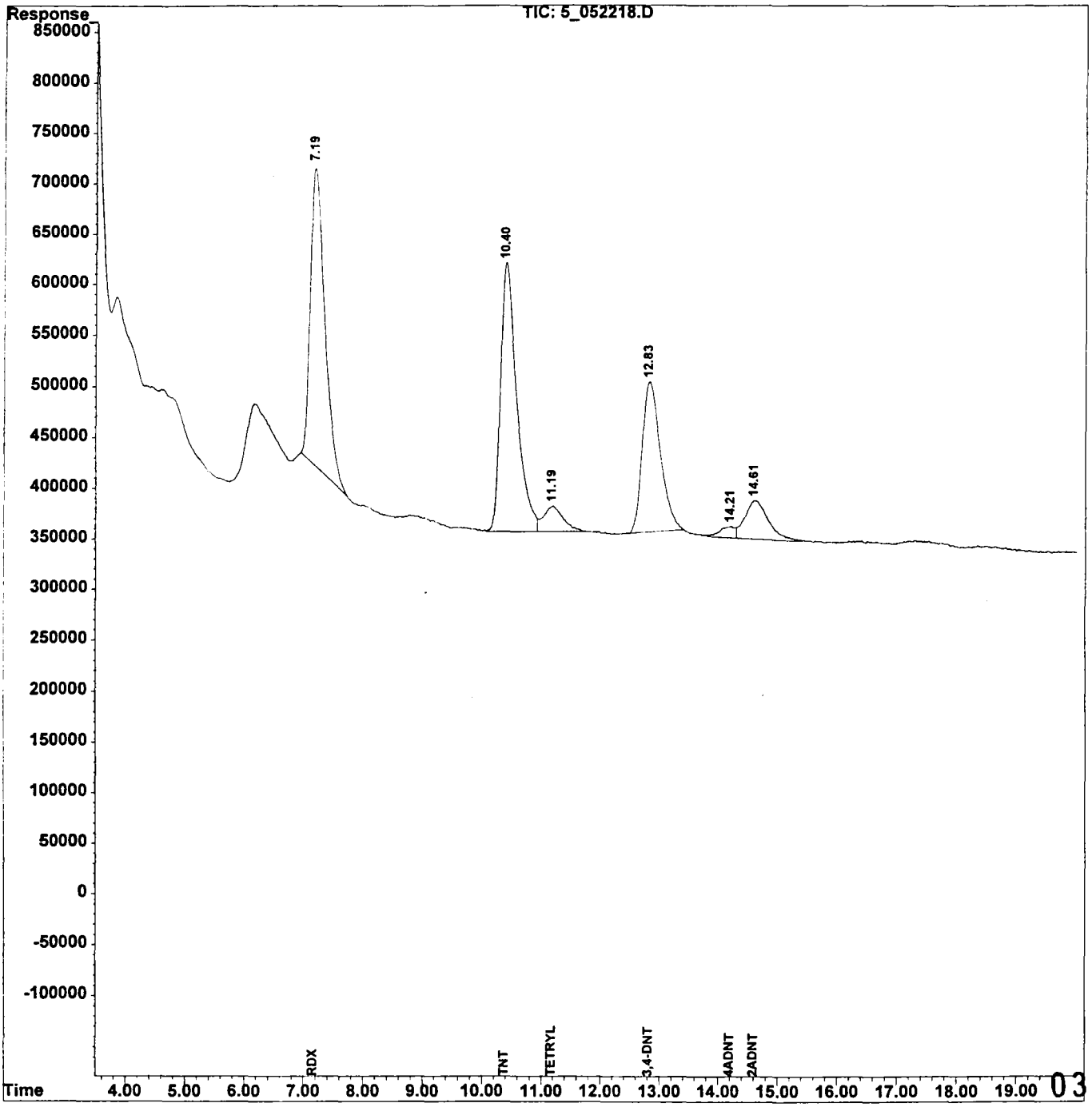
Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.83	31358869	1651.9		A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.18	48474990	3431.8		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.19	5922664	278.4	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.40	50036444	1722.2	m	A
9) B 4ADNT	14.21	1996709	128.8	mJ	A
10) B 2ADNT	14.61	10512582	324.0	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052218.D Vial: 18
Acq On : 23 May 1999 06:18 Operator: SM
Sample : 38614.06 Inst : LC5
Misc : BIOS06108051 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:18 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



032

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108052

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.07

Sample Amt: 2.0 G % Moisture: 20.2 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	8640	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	3080	
1946-51-0	4ADNT	1080	
35572-78-2	2ADNT	306	
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052219.D Vial: 19
Acq On : 23 May 1999 10:04 Operator: SM
Sample : 38614.07 Inst : LC1
Misc : BIOS06108052 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:07 1999 Quant Results File: 200SE22.RES

05/28/99

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.54	25612529	2046.1	m	A
Target Compounds:					
1) HMX	4.72	5090962	687.1	m	A
2) RDX	7.08	75173957	8637.5	*	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.16	69379290	3077.3	m *	A
9) 4ADNT	15.57	14243599	1085.3	m *	A
10) 2ADNT	16.49	6274339	306.3	m *	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

0524 cf

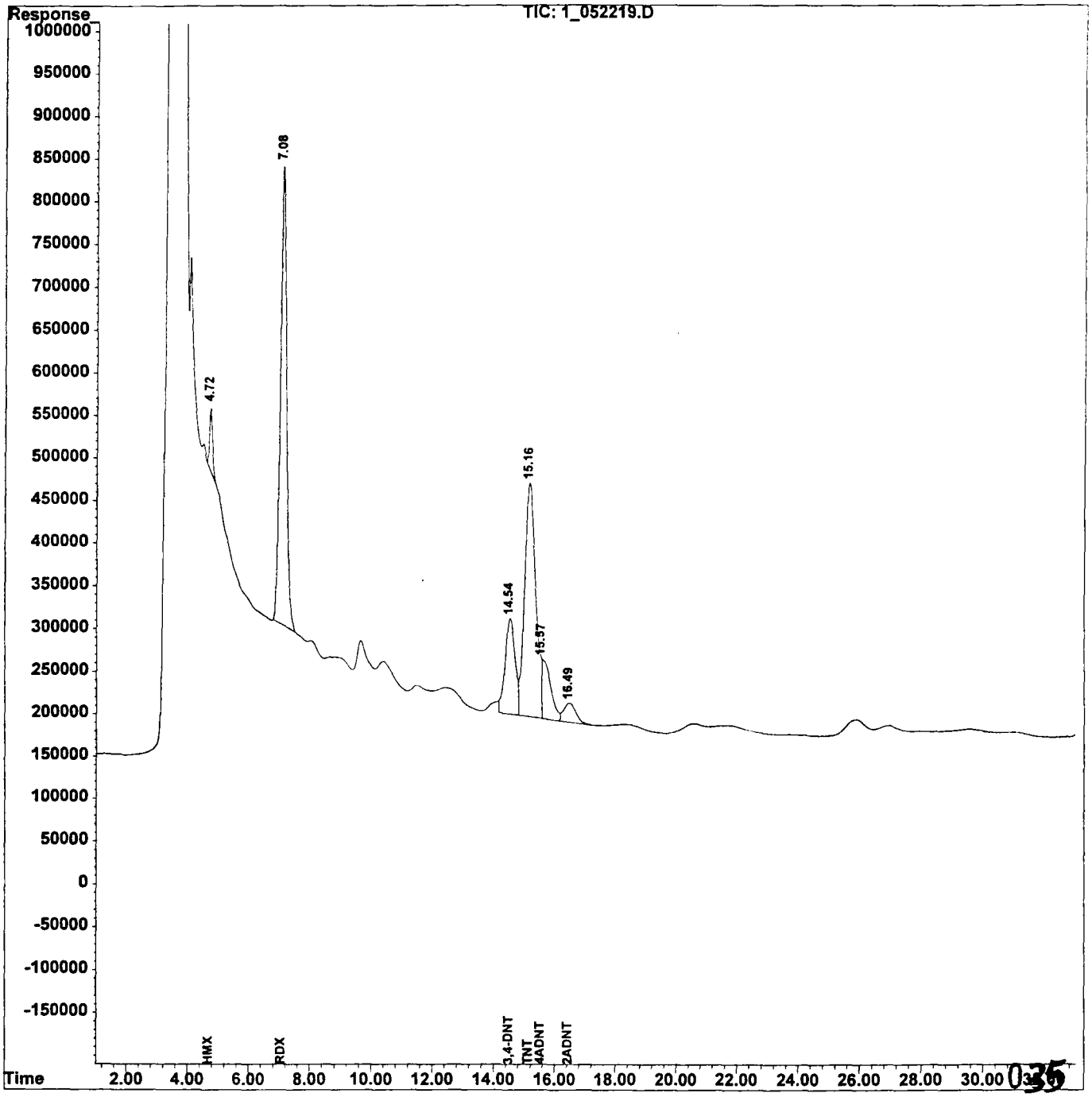
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052219.D Vial: 19
Acq On : 23 May 1999 10:04 Operator: SM
Sample : 38614.07 Inst : LC1
Misc : BIOS06108052 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:07 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052219.D Vial: 19
Acq On : 23 May 1999 06:51 Operator: SM
Sample : 38614.07 Inst : LC5
Misc : BIOS06108052 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:19 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.84	30760249	1620.4		A
Target Compounds:					
1) A HMX	4.62	8647684	716.4	mJ	A
2) B RDX	7.16	113567550	8040.0		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.17	9952489	467.8	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.39	86857041	2989.6	m	A
9) B 4ADNT	14.19	12571096	810.8	mJ	A
10) B 2ADNT	14.57	8510662	262.3	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

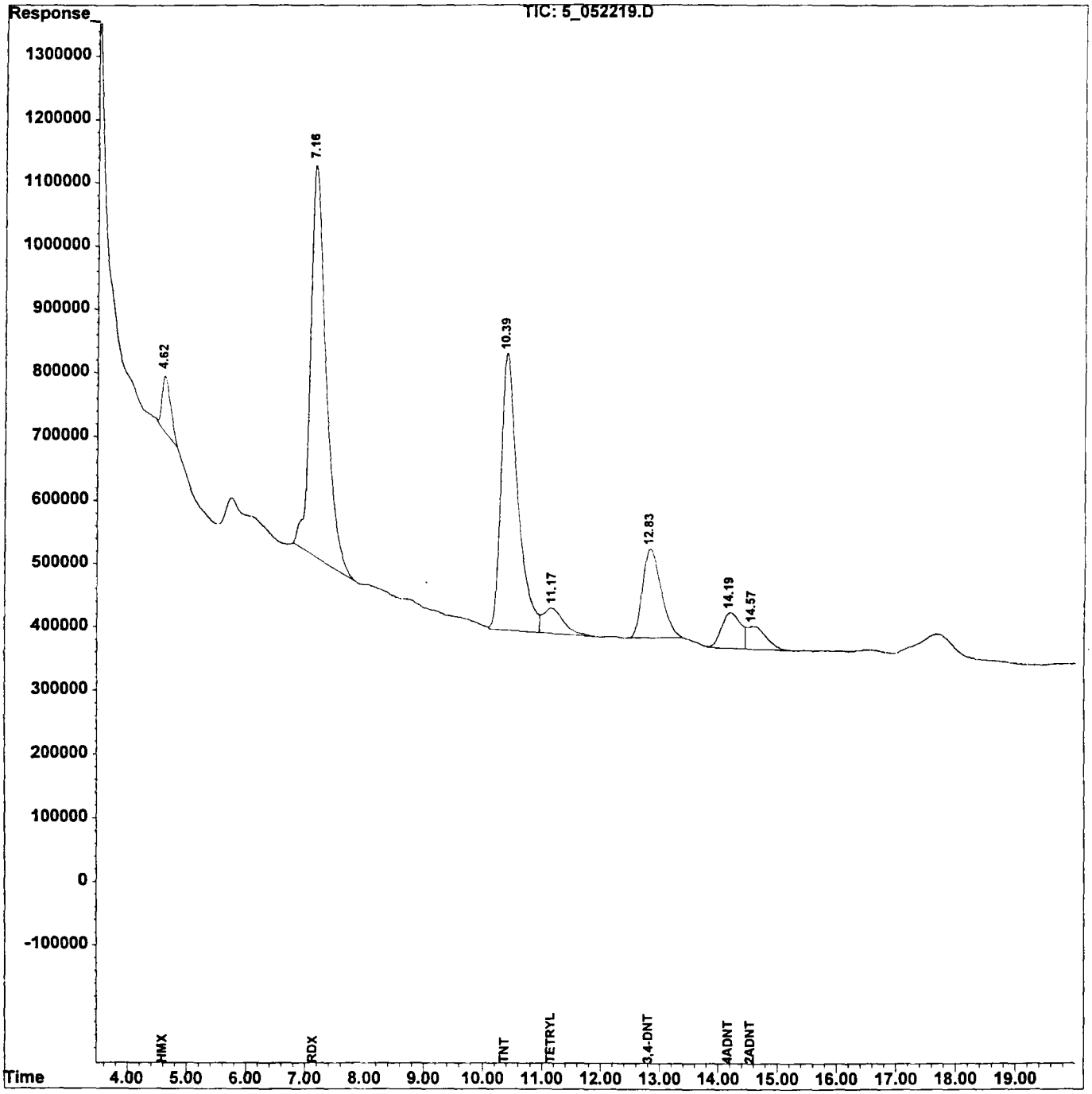
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.
5_052219.D 200SE22C.M Tue May 25 09:40:46 1999

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052219.D Vial: 19
Acq On : 23 May 1999 06:51 Operator: SM
Sample : 38614.07 Inst : LC5
Misc : BIOS06108052 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:19 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108053

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.08

Sample Amt: 2.0 G % Moisture: 19.7 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	999	P
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052220.D Vial: 20
Acq On : 23 May 1999 10:49 Operator: SM
Sample : 38614.08 Inst : LC1
Misc : BIOS06108053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:15 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

	Compound	R.T.	Response	ug/Kg		Curve
	Surrogates/System Monitoring Compounds:					
7) S	3,4-DNT	14.57	32885506	2627.1	m	A
	Target Compounds:					
1)	HMX	4.73	2187501	295.2	mJ	A
2)	RDX	7.10	5084641	584.2	m	A
3)	TNB	0.00	0	N.D.		A
4)	DNB	0.00	0	N.D.		A
5)	TETRYL	0.00	0	N.D.		A
6)	NB	0.00	0	N.D.		A
8)	TNT	0.00	0	N.D.		A
9)	4ADNT	15.60	13110946	999.0	m * P	A
10)	2ADNT	0.00	0	N.D.		A
11)	26DNT	0.00	0	N.D.		A
12)	24DNT	0.00	0	N.D.		A
13)	2NT	0.00	0	N.D.		A
14)	4NT	0.00	0	N.D.		A
15)	3NT	0.00	0	N.D.		A

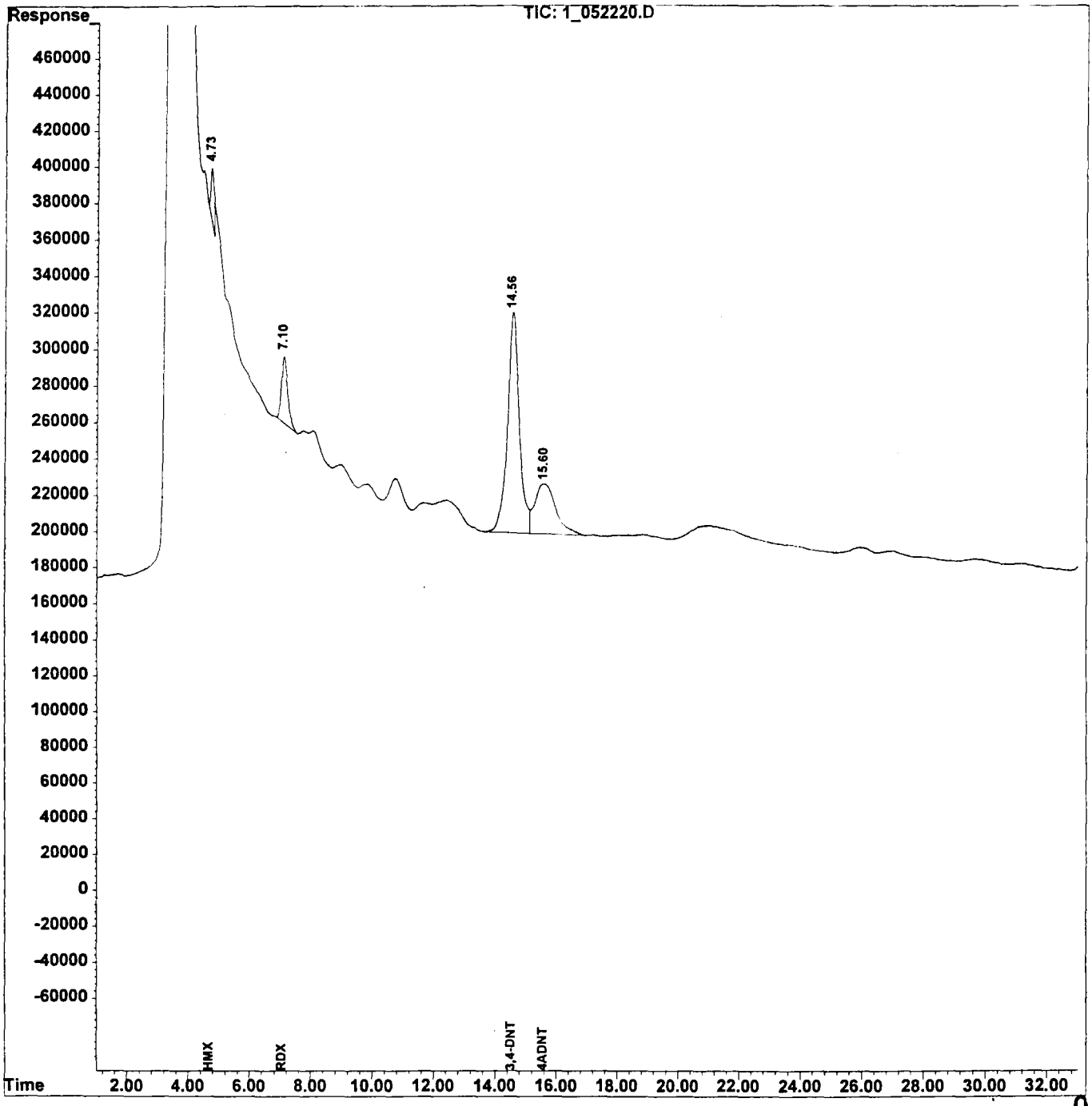
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052220.D Vial: 20
Acq On : 23 May 1999 10:49 Operator: SM
Sample : 38614.08 Inst : LC1
Misc : BIOS06108053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:15 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052220.D Vial: 20
Acq On : 23 May 1999 07:23 Operator: SM
Sample : 38614.08 Inst : LC5
Misc : BIOS06108053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:21 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.82	31671670	1668.4	m	A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.16	13082835	926.2	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.17	9832457	462.2	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.74W	1677911	57.8	mJ	A
9) B 4ADNT	14.20	2998503	193.4	mJ	A
10) B 2ADNT	14.51	629283	19.4	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

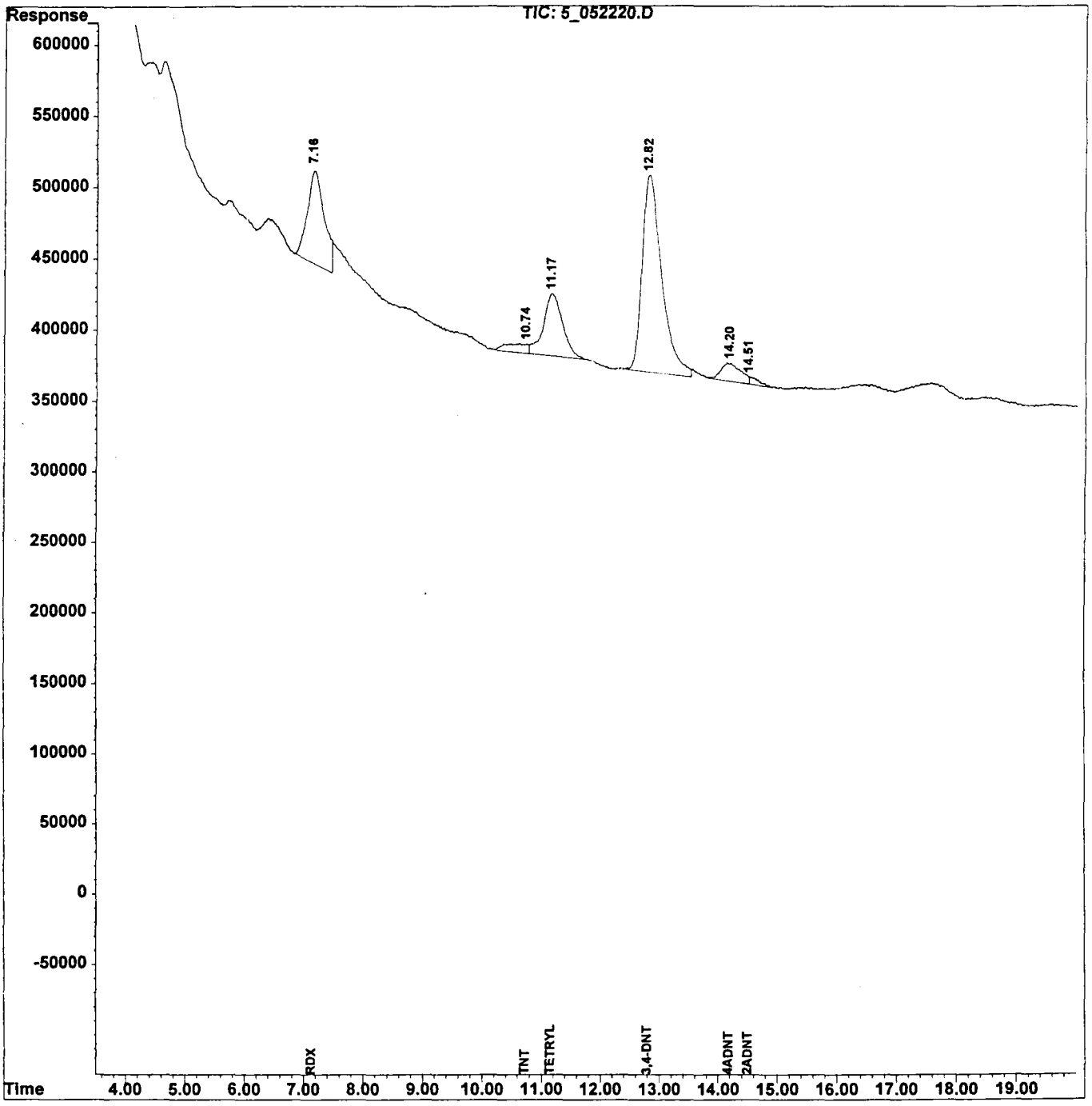
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.
5_052220.D 200SE22C.M Tue May 25 09:41:18 1999

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052220.D Vial: 20
Acq On : 23 May 1999 07:23 Operator: SM
Sample : 38614.08 Inst : LC5
Misc : BIOS06108053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:21 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



042

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108071

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.09

Sample Amt: 2.2 G % Moisture: 26.4 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2000	U
121-82-4	RDX	5410	
99-35-4	TNB	227	U
99-65-0	DNB	227	U
479-45-8	TETRYL	591	U
98-95-3	NB	236	U
118-96-7	TNT	30700	E
1946-51-0	4ADNT	227	U
35572-78-2	2ADNT	227	U
606-20-2	26DNT	236	U
121-14-2	24DNT	227	U
88-72-2	2NT	227	U
99-99-0	4NT	227	U
99-08-1	3NT	227	U
Surrogate amount spiked		1818.18	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052221.D Vial: 21
Acq On : 23 May 1999 11:34 Operator: SM
Sample : 38614.09 Inst : LC1
Misc : BIOS06108071 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 13:17 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.51	18316173	1330.1	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	7.07	51756453	5405.7		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.14	761177275	30689.4	mE	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	16.47	1735064	77.0	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.	d	A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

AW 052545

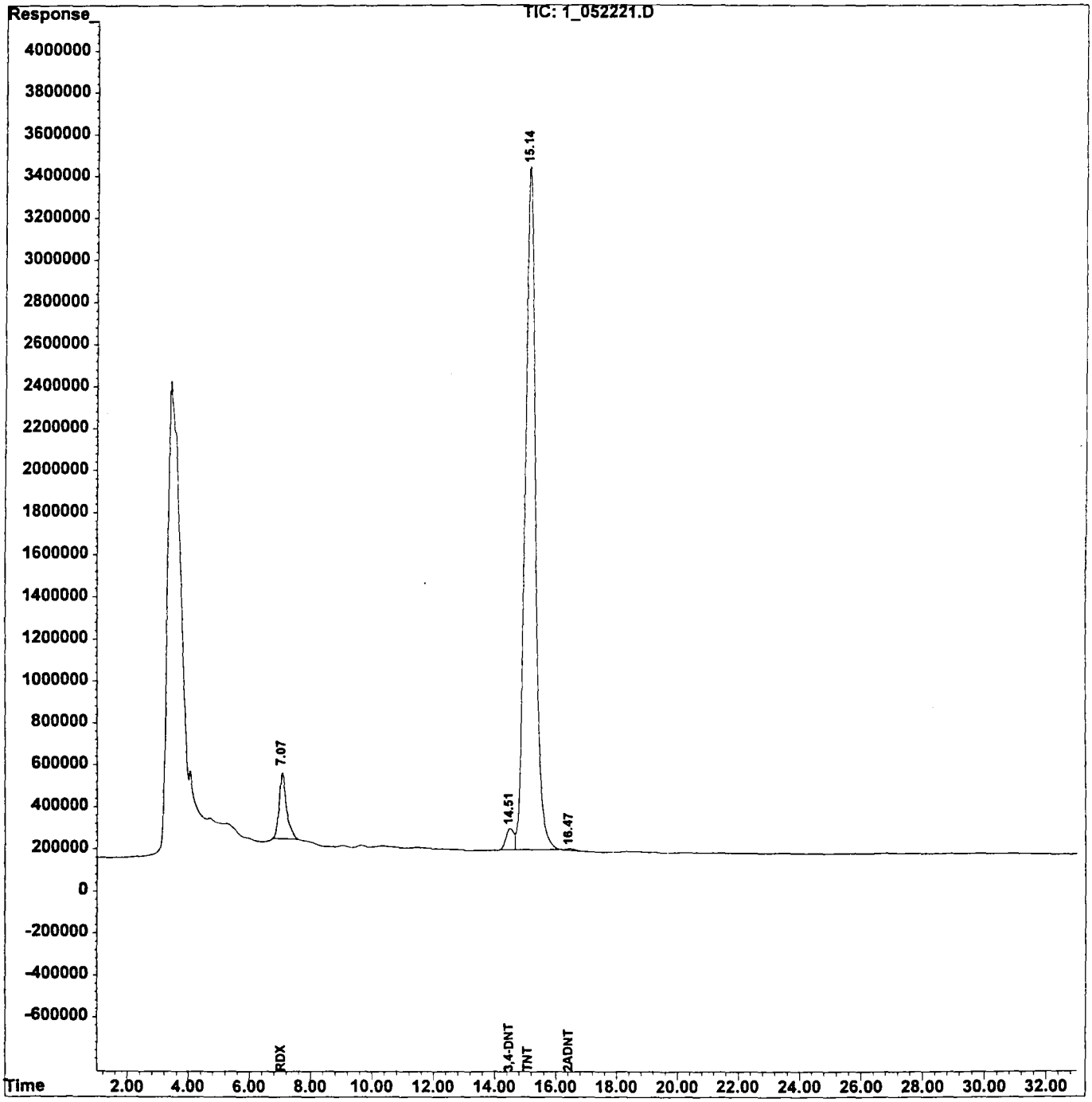
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052221.D Vial: 21
Acq On : 23 May 1999 11:34 Operator: SM
Sample : 38614.09 Inst : LC1
Misc : BIOS06108071 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 24 13:17 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



045

Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0524\5_052401.D Vial: 1
Acq On : 24 May 1999 16:55 Operator: SM
Sample : 38614.09 Inst : LC5
Misc : BIOS06108071 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: May 25 10:35 1999 Quant Results File: 200se22c.RES

Method : f:\hpchem\lc5\data\5_0524\200se22c.m
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Tue May 25 10:29:37 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.85	28410093	1360.5		A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.21	75026480	4828.6	m	A
3) A TNB	7.00	7412665	221.1	mJ	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.42	1012123663	31669.8	E	A
9) B 4ADNT	14.19	2317029	135.9	mJ	A
10) B 2ADNT	14.70	4619939	129.4	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

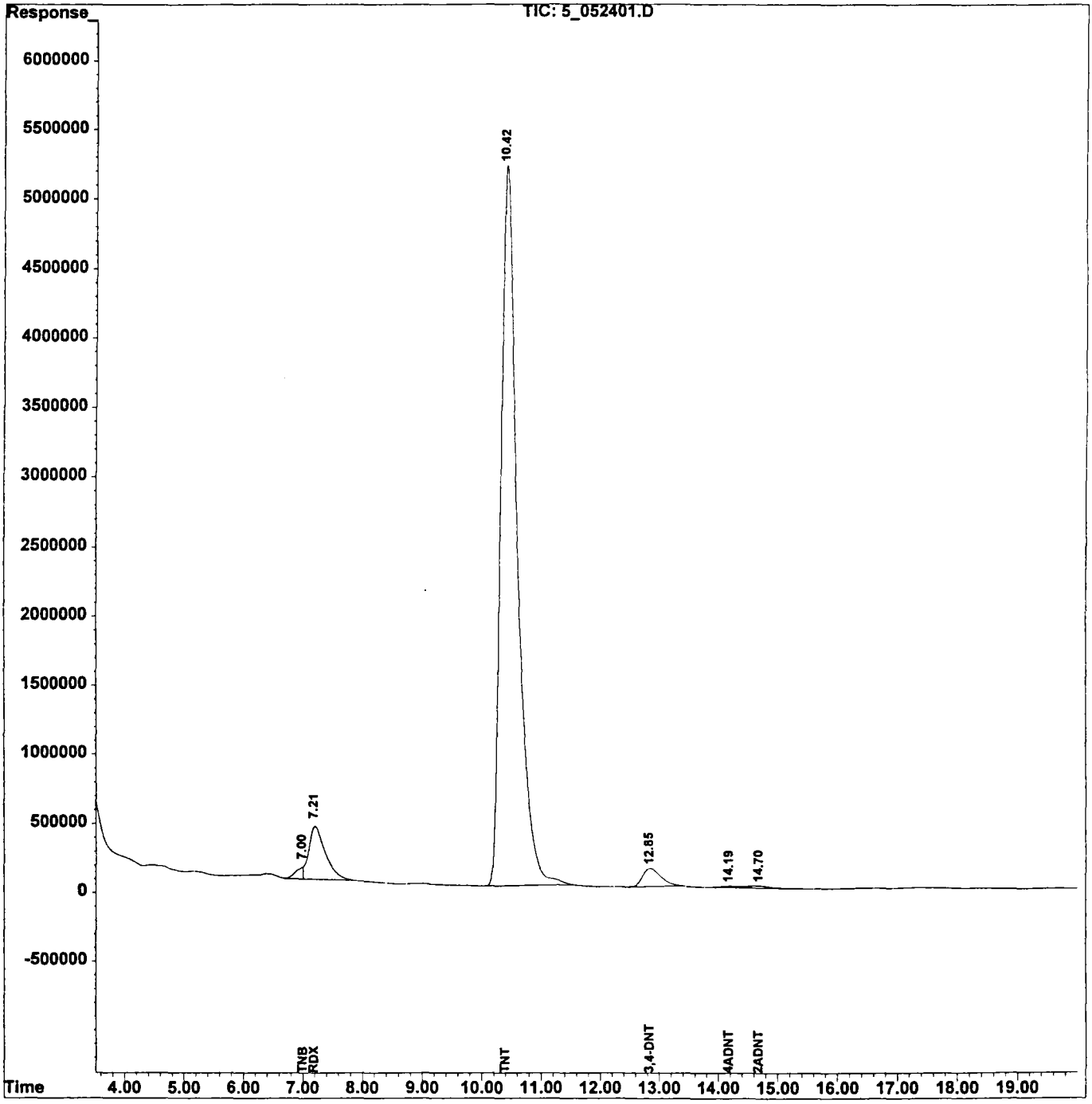
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0524\5_052401.D Vial: 1
Acq On : 24 May 1999 16:55 Operator: SM
Sample : 38614.09 Inst : LC5
Misc : BIOS06108071 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: May 25 10:35 1999 Quant Results File: 200se22c.RES

Method : f:\hpchem\lc5\data\5_0524\200se22c.m
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Tue May 25 10:29:37 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



048

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108071DL

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.09DL

Sample Amt: 2.2 G % Moisture: 26.4 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/27/99

GPC Cleanup: (Y/N) N Dilution Factor: 8.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	8000	U
121-82-4	RDX	4100	D
99-35-4	TNB	909	U
99-65-0	DNB	909	U
479-45-8	TETRYL	2360	U
98-95-3	NB	945	U
118-96-7	TNT	31100	D
1946-51-0	4ADNT	909	U
35572-78-2	2ADNT	909	U
606-20-2	26DNT	945	U
121-14-2	24DNT	909	U
88-72-2	2NT	909	U
99-99-0	4NT	909	U
99-08-1	3NT	909	U
Surrogate amount spiked		1818.18	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0526\3_052622.D Vial: 22
Acq On : 27 May 1999 08:43 Operator: SM
Sample : 38614.09DL Inst : LC3
Misc : BIOS06108071DL Multiplr: 36.3636
IntFile : EVENTS.E
Quant Time: May 27 16:27 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0526\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Thu May 27 14:13:40 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	17.99	22773394	1400.2	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	8.77W	46042011	4096.2	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	18.74	852993235	31114.2	m	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

1 calibration
06/04/99

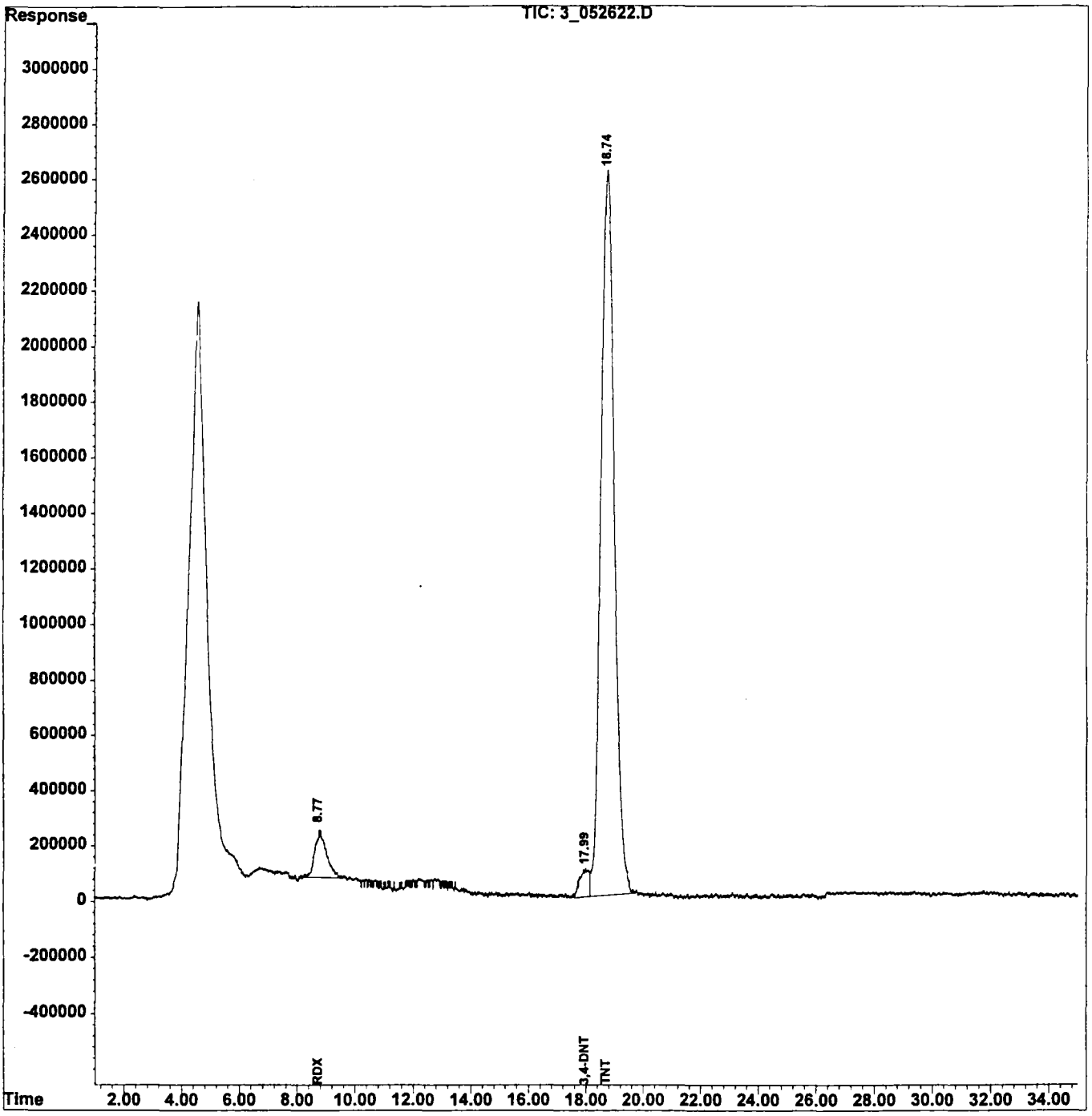
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0526\3_052622.D Vial: 22
Acq On : 27 May 1999 08:43 Operator: SM
Sample : 38614.09DL Inst : LC3
Misc : BIOS06108071DL Multiplr: 36.3636
IntFile : EVENTS.E
Quant Time: May 27 16:27 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0526\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Thu May 27 14:13:40 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108072

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.10

Sample Amt: 2.1 G % Moisture: 26.9 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2450	
121-82-4	RDX	12500	
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	238	U
1946-51-0	4ADNT	364	
35572-78-2	2ADNT	238	U
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052222.D Vial: 22
Acq On : 23 May 1999 12:48 Operator: SM
Sample : 38614.10 Inst : LC1
Misc : BIOS06108072 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 24 13:21 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

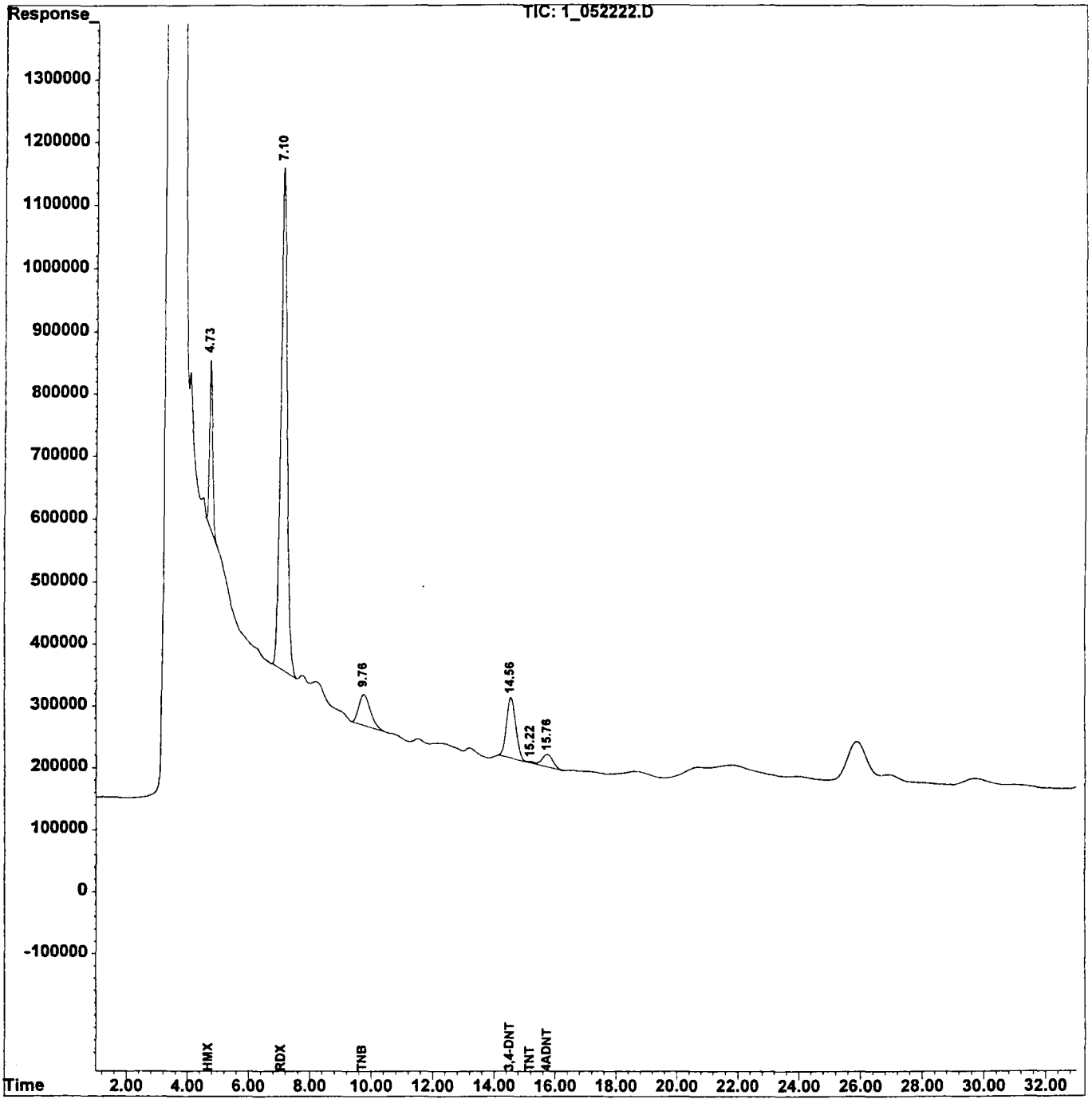
Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.56	20801261	1582.0	m	A
Target Compounds:					
1) HMX	4.73	19093932	2453.3	*	A
2) RDX	7.10W	114597538	12535.2	m *	A
3) TNB	9.76W	13456359	589.7	m	A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.22W	457492	19.3	mJ	A
9) 4ADNT	15.76	5017939	364.0	m *	A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052222.D Vial: 22
Acq On : 23 May 1999 12:48 Operator: SM
Sample : 38614.10 Inst : LC1
Misc : BIOS06108072 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 24 13:21 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052224.D Vial: 24
Acq On : 23 May 1999 12:14 Operator: SM
Sample : 38614.10 Inst : LC5
Misc : BIOS06108072 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:23 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.80	28948513	1451.7		A
Target Compounds:					
1) A HMX	4.61	33390238	2633.5	m	A
2) B RDX	7.17	159808419	10770.6		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	10.99	2605239	116.6	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.39	2830021	92.7	mJ	A
9) B 4ADNT	14.14	8100745	497.4	mJ	A
10) B 2ADNT	14.48	3052928	89.6	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

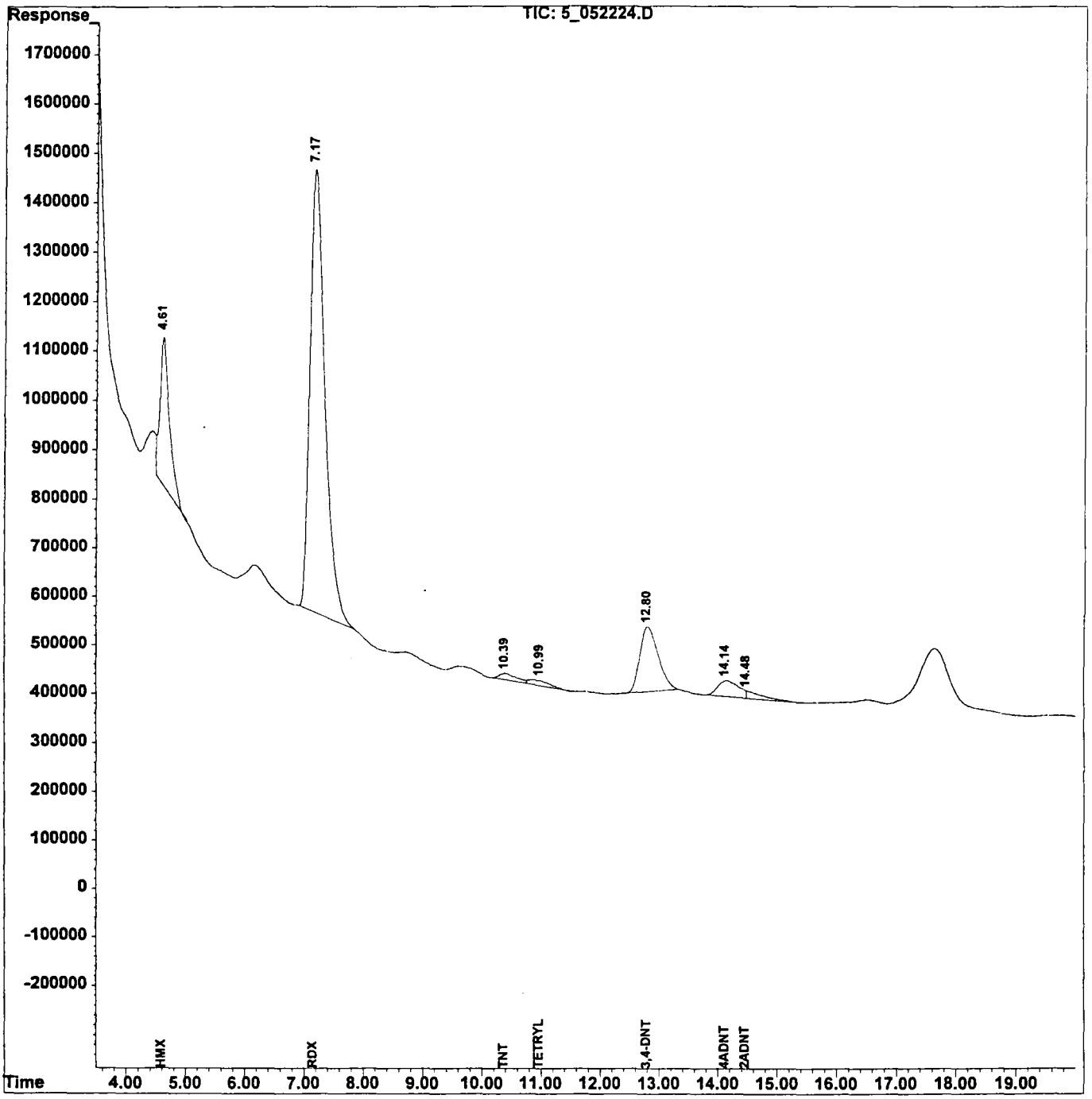
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052224.D Vial: 24
Acq On : 23 May 1999 12:14 Operator: SM
Sample : 38614.10 Inst : LC5
Misc : BIOS06108072 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:23 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108073

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.11

Sample Amt: 2.0 G % Moisture: 26.9 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	1000	U
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	250	U
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052223.D Vial: 23
Acq On : 23 May 1999 13:33 Operator: SM
Sample : 38614.11 Inst : LC1
Misc : BIOS06108073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:24 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.55	20407517	1630.3	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	7.06	1597313	183.5	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
9) 4ADNT	15.48W	2893541	220.5	m	A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	21.84	1823914	141.5	mJ	A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

AW 052445

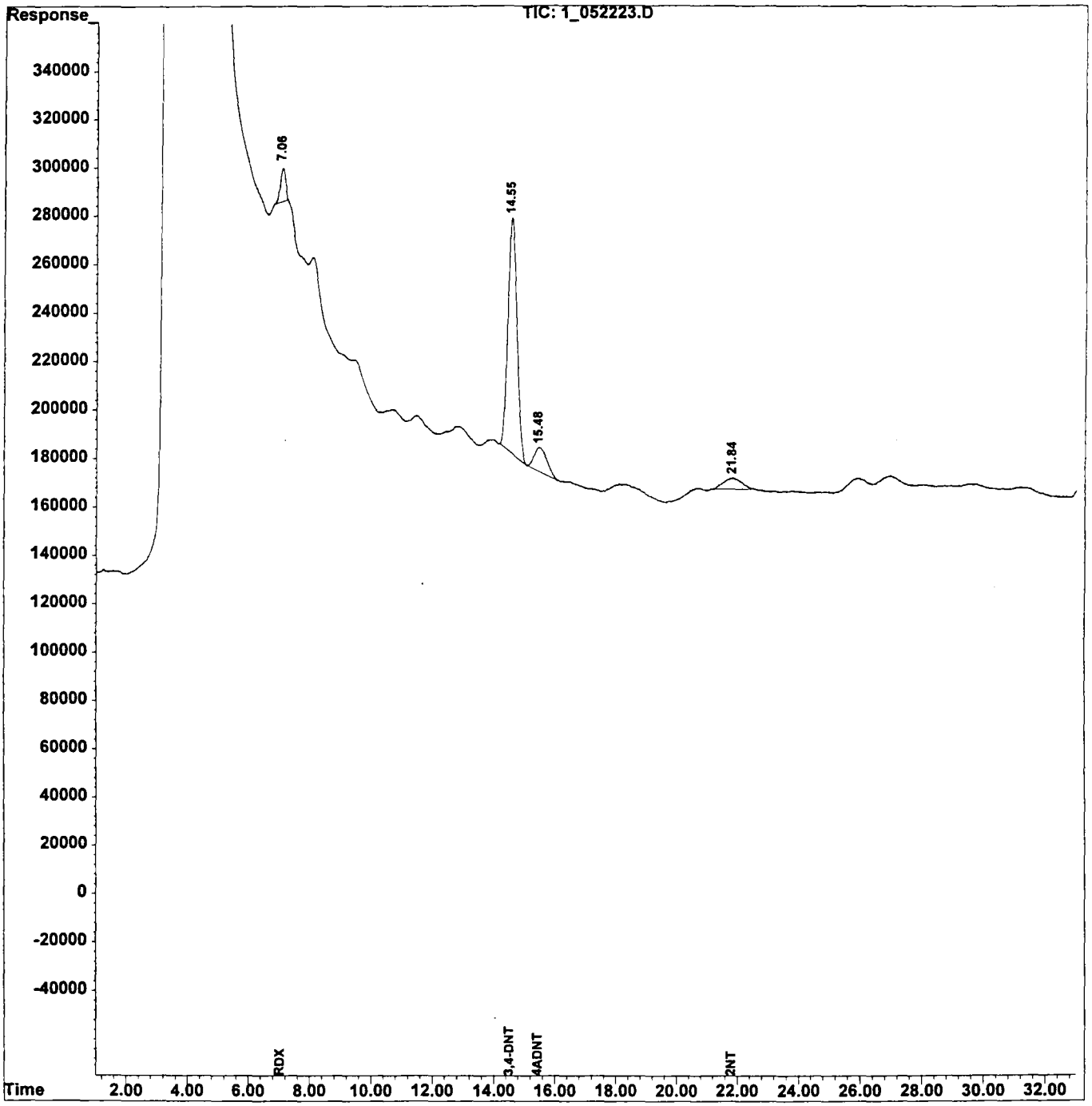
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052223.D Vial: 23
Acq On : 23 May 1999 13:33 Operator: SM
Sample : 38614.11 Inst : LC1
Misc : BIOS06108073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 24 13:24 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108091

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.12

Sample Amt: 2.1 G % Moisture: 27.3 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/23/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2100	U
121-82-4	RDX	1860	
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	238	U
1946-51-0	4ADNT	238	U
35572-78-2	2ADNT	238	U
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052224.D Vial: 24
Acq On : 23 May 1999 14:18 Operator: SM
Sample : 38614.12 Inst : LC1
Misc : BIOS06108091 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 24 13:27 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

	Compound	R.T.	Response	ug/Kg		Curve
	Surrogates/System Monitoring Compounds:					
7) S	3,4-DNT	14.53	20399324	1551.4	m	A
	Target Compounds:					
1)	HMX	0.00	0	N.D.		A
2)	RDX	7.08	16961259	1855.3	m *	A
3)	TNB	0.00	0	N.D.		A
4)	DNB	0.00	0	N.D.		A
5)	TETRYL	0.00	0	N.D.		A
6)	NB	0.00	0	N.D.		A
8)	TNT	0.00	0	N.D.		A
9)	4ADNT	15.50W	4962633	360.0	m	A : co-mounted
10)	2ADNT	16.50	1705587	79.3	mJ	A
11)	26DNT	0.00	0	N.D.		A
12)	24DNT	0.00	0	N.D.		A
13)	2NT	0.00	0	N.D.		A
14)	4NT	0.00	0	N.D.		A
15)	3NT	0.00	0	N.D.		A

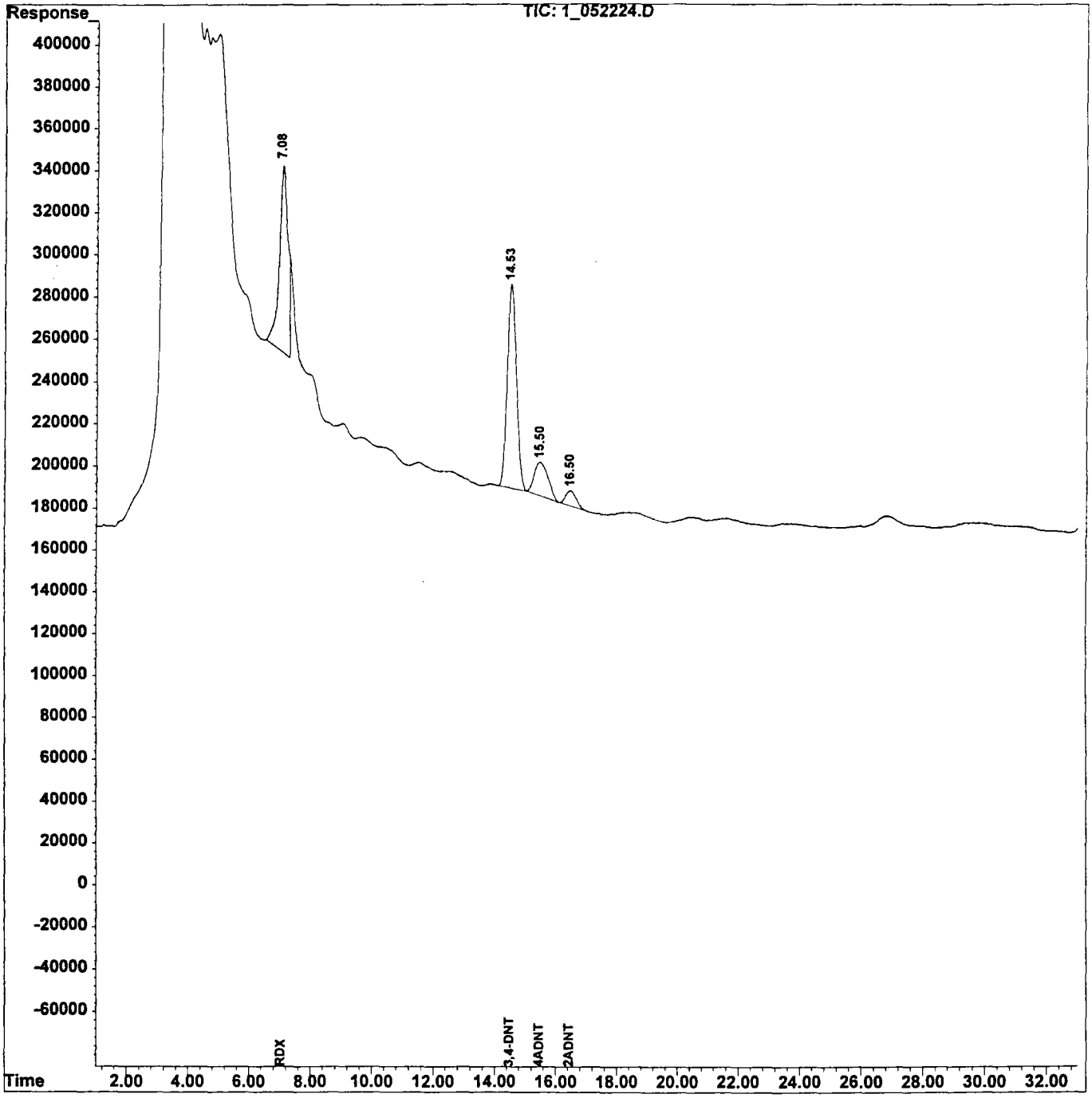
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0522\1_052224.D Vial: 24
Acq On : 23 May 1999 14:18 Operator: SM
Sample : 38614.12 Inst : LC1
Misc : BIOS06108091 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 24 13:27 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC1\DATA\1_0522\200SE22.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0522\
Last Update : Mon May 24 10:29:05 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052226.D Vial: 26
Acq On : 23 May 1999 13:20 Operator: SM
Sample : 38614.12 Inst : LC5
Misc : BIOS06108091 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:26 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.82	32974497	1653.6	m	A
Target Compounds:					
1) A HMX	4.49W	7272257	573.6	mJ	A
2) B RDX	7.15	25367037	1709.7	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.17	8471727	379.1	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	0.00	0	N.D.	d	A
9) B 4ADNT	14.14	1915071	117.6	mJ	A
10) B 2ADNT	14.54	4148245	121.7	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

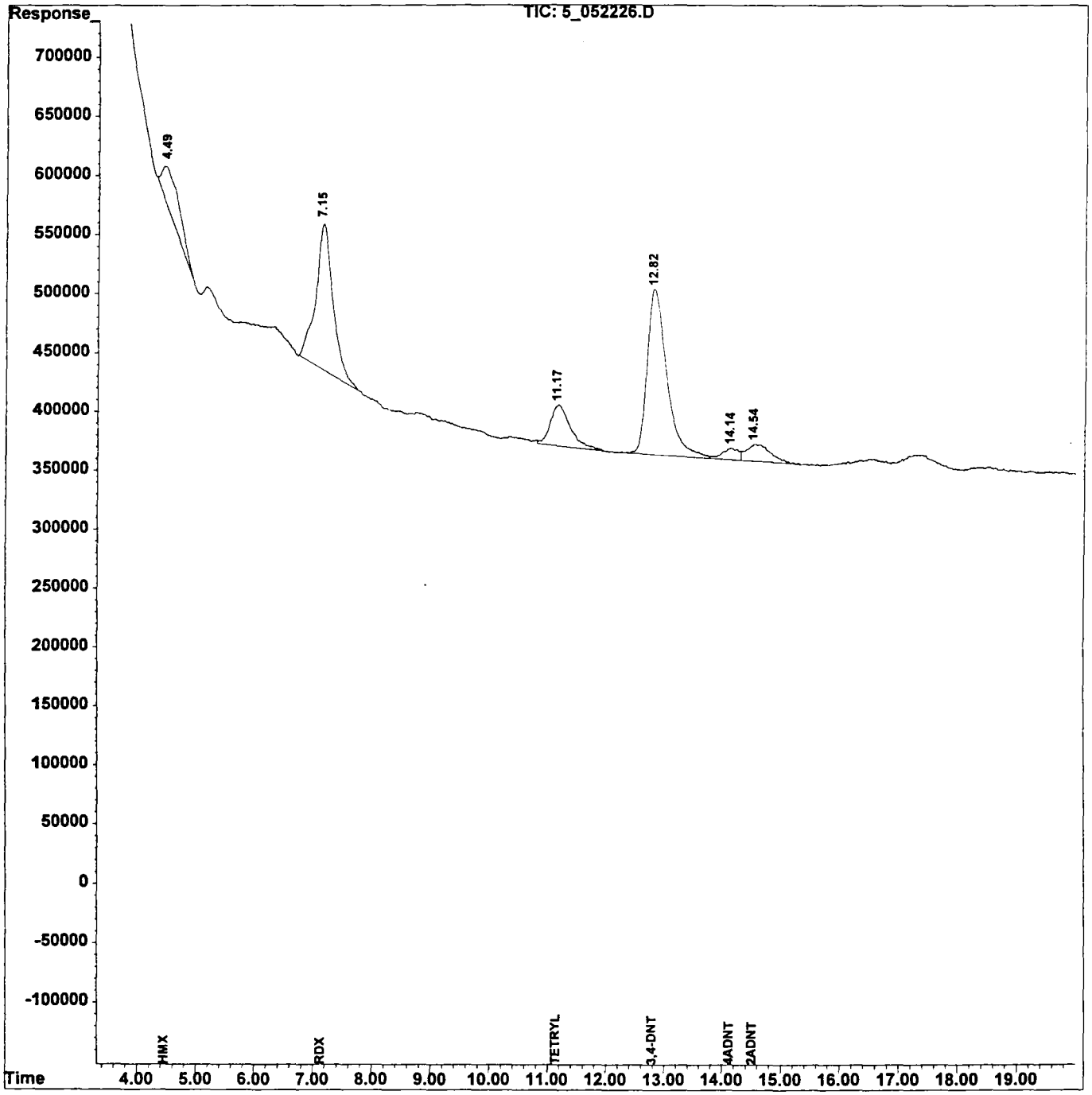
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052226.D Vial: 26
Acq On : 23 May 1999 13:20 Operator: SM
Sample : 38614.12 Inst : LC5
Misc : BIOS06108091 Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:26 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108091FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.13

Sample Amt: 2.1 G % Moisture: 23.1 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2100	U
121-82-4	RDX	1870	
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	1030	
1946-51-0	4ADNT	238	U
35572-78-2	2ADNT	238	U
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052413.D Vial: 13
Acq On : 25 May 1999 06:34 Operator: SM
Sample : 38614.13 Inst : LC3
Misc : BIOS06108091FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:06 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.38	106223442	1710.5	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	8.94W	80193959	1868.6	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	19.12W	107397786	1026.0	m	A
9) 4ADNT	20.05	9518989	137.3	m	A
10) 2ADNT	21.14	9360346	98.5	mJ	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

1 [illegible] 06/04/99

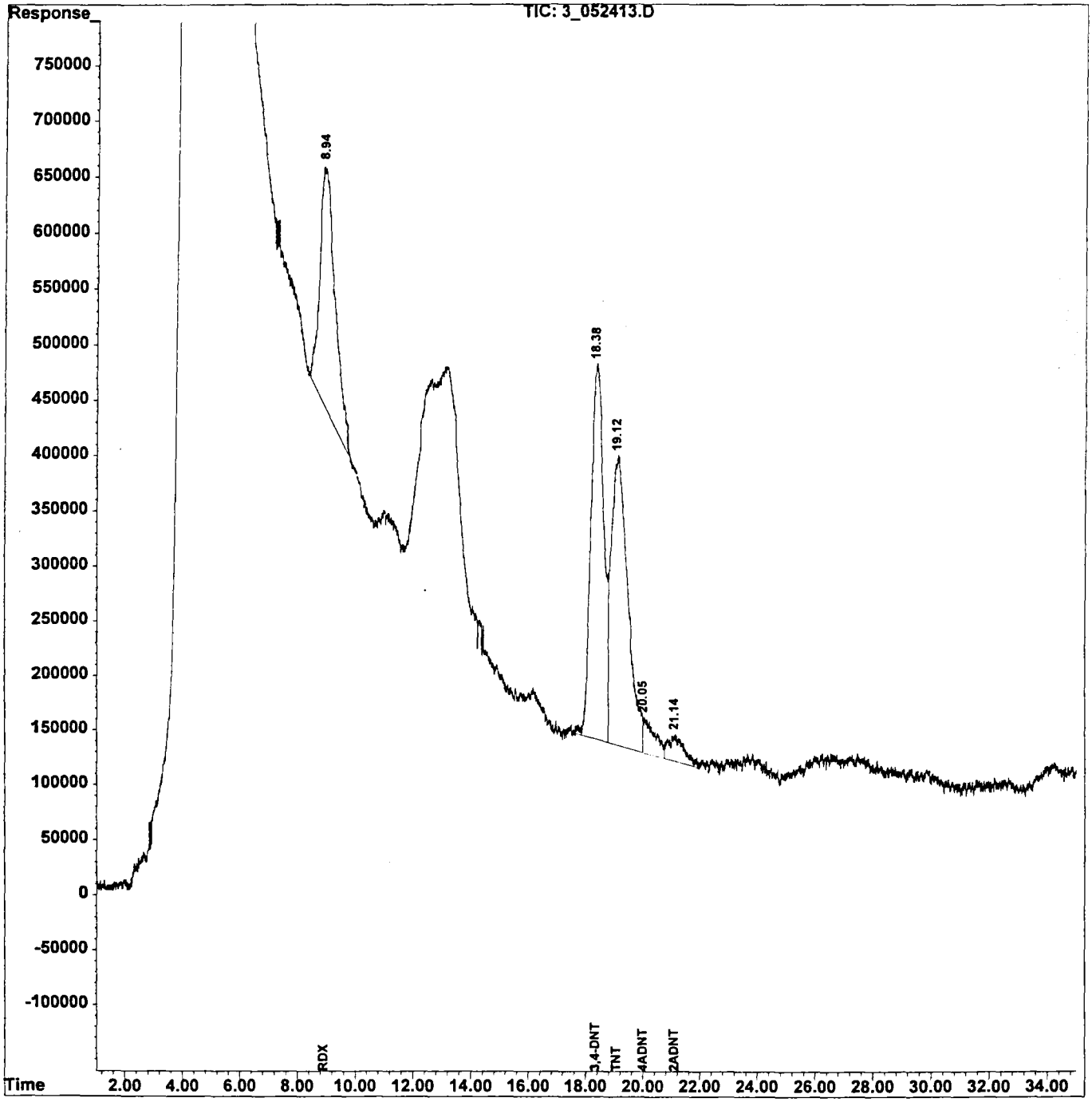
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052413.D Vial: 13
Acq On : 25 May 1999 06:34 Operator: SM
Sample : 38614.13 Inst : LC3
Misc : BIOS06108091FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:06 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052227.D Vial: 27
Acq On : 23 May 1999 13:52 Operator: SM
Sample : 38614.13 Inst : LC5
Misc : BIOS06108091FD Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:28 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.78	35440647	1777.3	m	A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.14	19743003	1330.6	m	A
3) A TNB	6.94	3526024	110.1	mJ	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.13	11759745	526.2	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.38	21615559	708.3	m	A
9) B 4ADNT	14.02	1210138	74.3	mJ	A
10) B 2ADNT	14.54	2998018	88.0	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

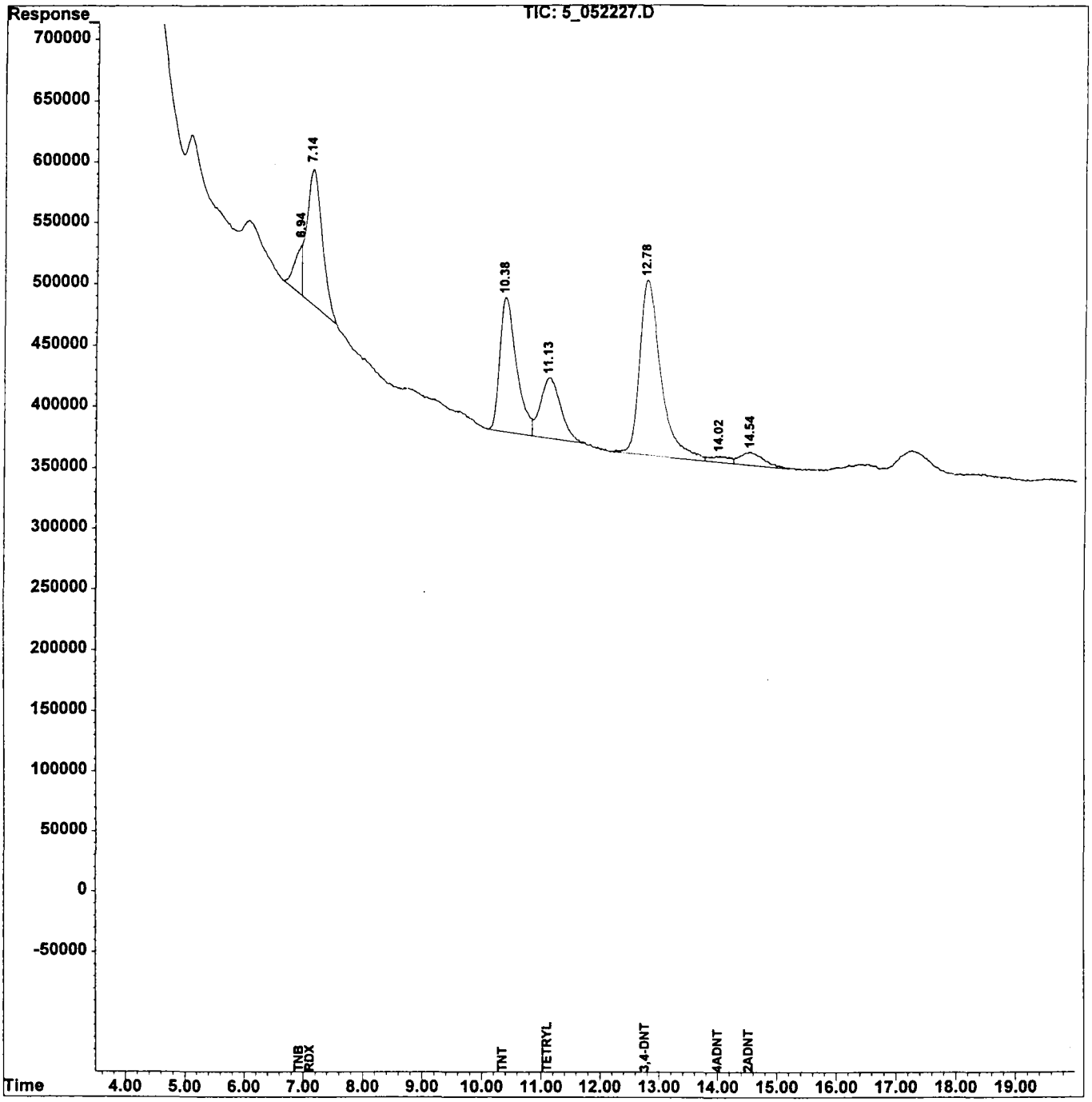
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052227.D Vial: 27
Acq On : 23 May 1999 13:52 Operator: SM
Sample : 38614.13 Inst : LC5
Misc : BIOS06108091FD Multiplr: 9.5200
IntFile : EVENTS.E
Quant Time: May 25 9:28 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108092

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.14

Sample Amt: 2.0 G % Moisture: 33 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2200	U
121-82-4	RDX	2810	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	250	U
1946-51-0	4ADNT	643	P
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052414.D Vial: 14
Acq On : 25 May 1999 07:19 Operator: SM
Sample : 38614.14 Inst : LC3
Misc : BIOS06108092 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 11:07 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

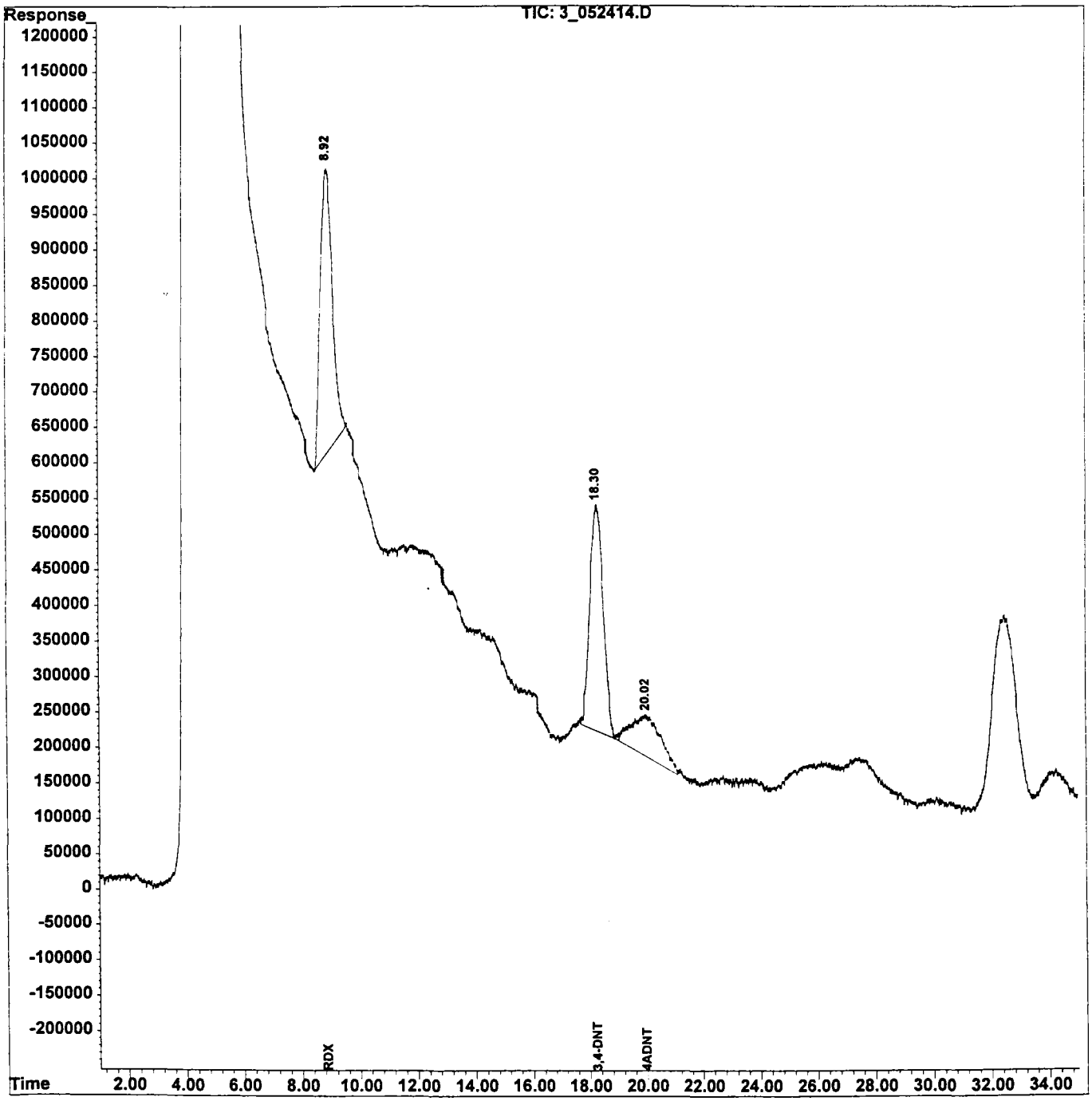
	Compound	R.T.	Response	ug/Kg		Curve
	Surrogates/System Monitoring Compounds:					
7) S	3,4-DNT	18.29	102368053	1730.9		A
	Target Compounds:					
1)	HMX	0.00	0	N.D.		A
2)	RDX	8.92	114965027	2812.7	S	A
3)	TNB	0.00	0	N.D.		A
4)	DNB	0.00	0	N.D.		A
5)	TETRYL	0.00	0	N.D.		A
6)	NB	0.00	0	N.D.		A
8)	TNT	0.00	0	N.D.		A
')	4ADNT	20.02	42467480	643.3	m	A
)	2ADNT	0.00	0	N.D.		A
11)	26DNT	0.00	0	N.D.		A
12)	24DNT	0.00	0	N.D.		A
13)	2NT	0.00	0	N.D.		A
14)	4NT	0.00	0	N.D.		A
15)	3NT	0.00	0	N.D.		A

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052414.D Vial: 14
Acq On : 25 May 1999 07:19 Operator: SM
Sample : 38614.14 Inst : LC3
Misc : BIOS06108092 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 11:07 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052228.D Vial: 28
Acq On : 23 May 1999 14:25 Operator: SM
Sample : 38614.14 Inst : LC5
Misc : BIOS06108092 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:29 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.77	39647762	2088.6	m	A
Target Compounds:					
1) A HMX	0.00	0	N.D.		A
2) B RDX	7.15	38157623	2701.4		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.04	5587639	262.6	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.75W	1833925	63.1	mJ	A
9) B 4ADNT	14.06	5427151	350.0	mJ	A
10) B 2ADNT	14.38	3444107	106.1	mJ	A
11) A 26DNT	13.23	7692707	349.1	mJ	A
12) B 24DNT	0.00	0	N.D.	d	A

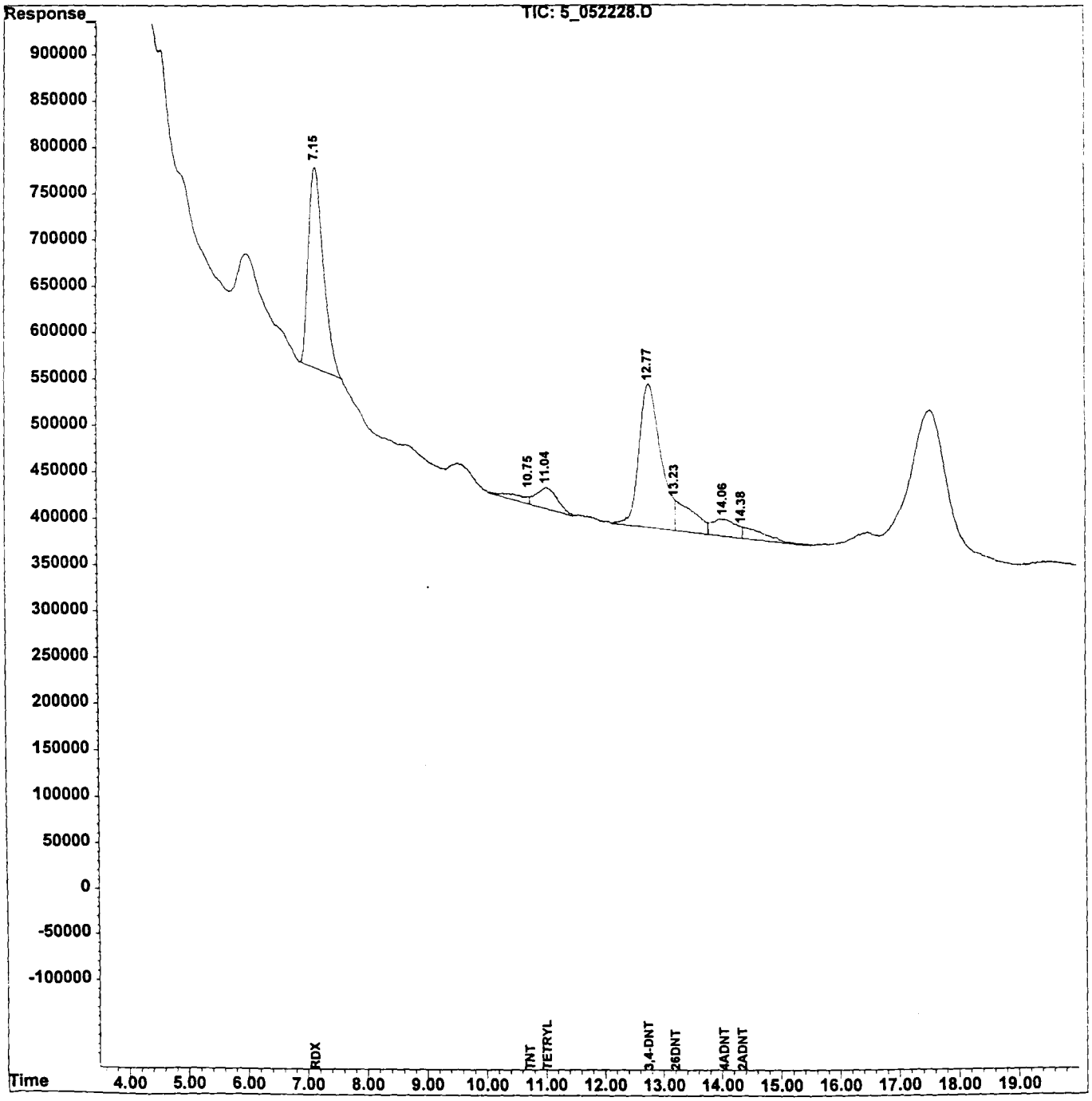
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052228.D Vial: 28
Acq On : 23 May 1999 14:25 Operator: SM
Sample : 38614.14 Inst : LC5
Misc : BIOS06108092 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 25 9:29 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108093

.b Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.15

Sample Amt: 2.1 G % Moisture: 24.6 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2100	U
121-82-4	RDX	952	U
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	238	U
1946-51-0	4ADNT	238	U
35572-78-2	2ADNT	238	U
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052415.D Vial: 15
Acq On : 25 May 1999 08:04 Operator: SM
Sample : 38614.15 Inst : LC3
Misc : BIOS06108093 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:08 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.44W	90419509	1456.0	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	0.00	0	N.D.		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

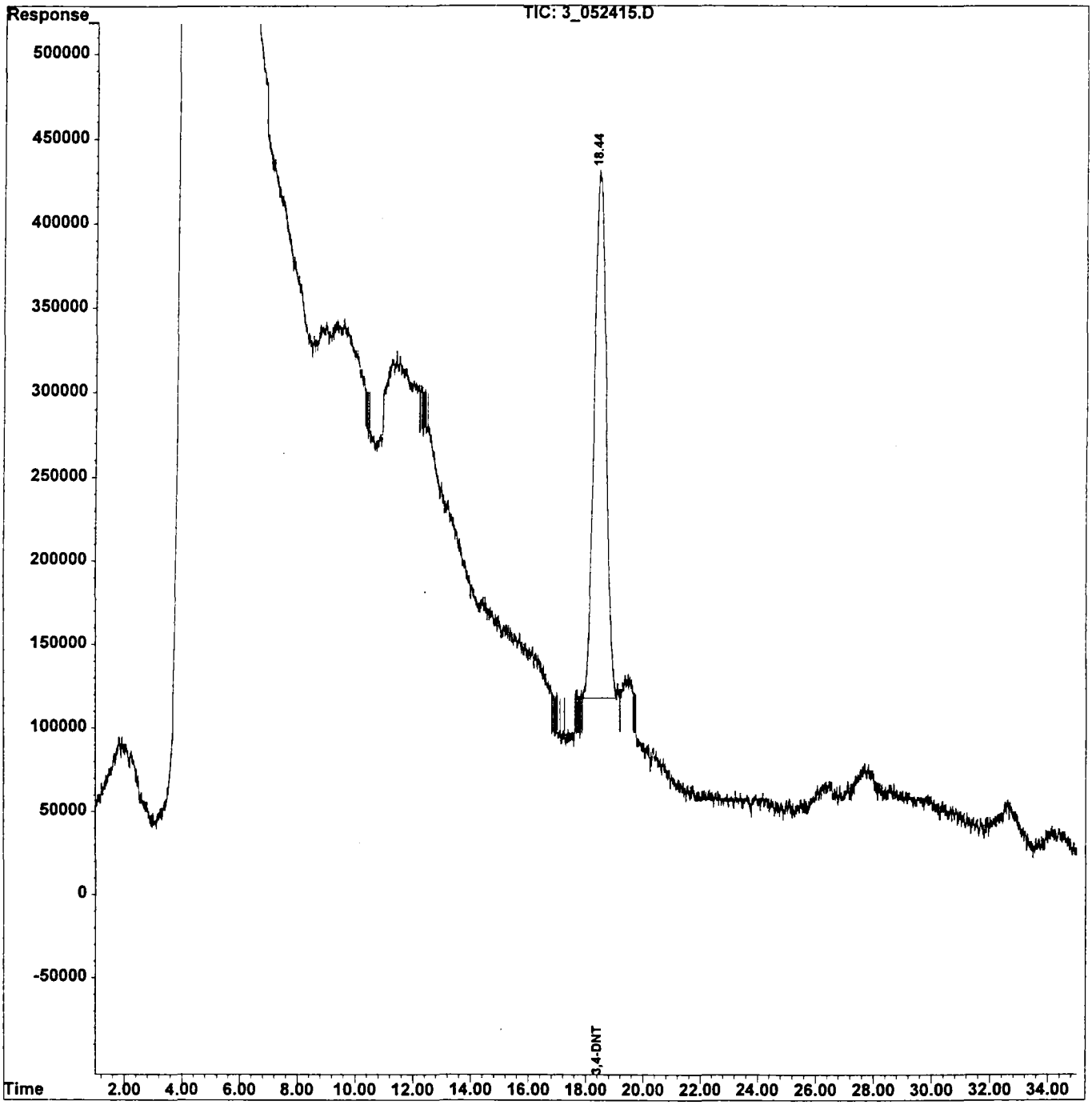
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052415.D Vial: 15
Acq On : 25 May 1999 08:04 Operator: SM
Sample : 38614.15 Inst : LC3
Misc : BIOS06108093 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:08 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108111

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.16

Sample Amt: 2.1 G % Moisture: 25.1 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2100	U
121-82-4	RDX	952	U
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	238	U
1946-51-0	4ADNT	238	U
35572-78-2	2ADNT	238	U
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052416.D Vial: 16
Acq On : 25 May 1999 08:48 Operator: SM
Sample : 38614.16 Inst : LC3
Misc : BIOS06108111 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:09 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.45W	99930180	1609.2	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	0.00	0	N.D.		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
) 4ADNT	0.00	0	N.D.		A
) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

06/04/99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

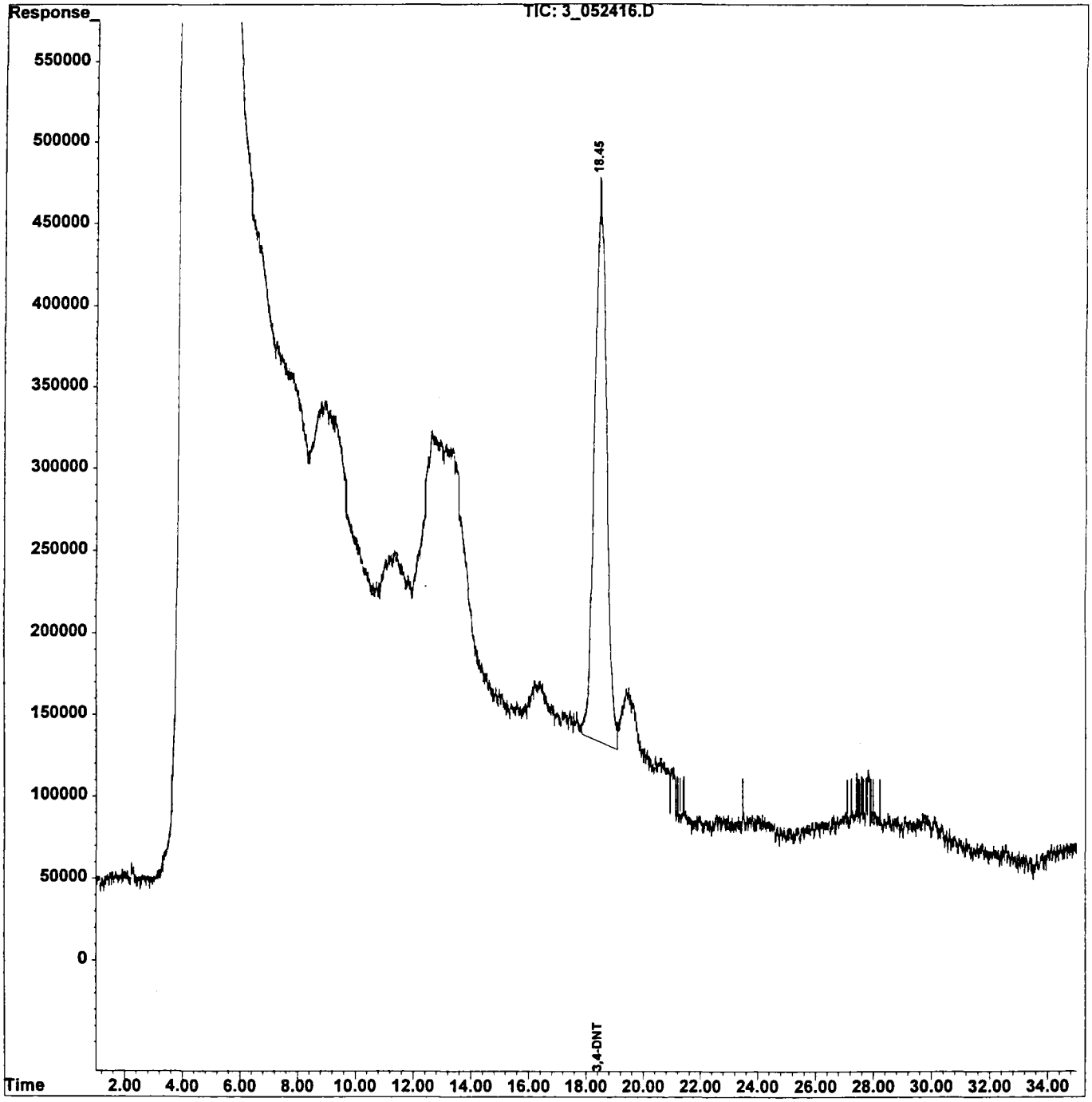
078

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052416.D Vial: 16
Acq On : 25 May 1999 08:48 Operator: SM
Sample : 38614.16 Inst : LC3
Misc : BIOS06108111 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:09 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108112

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.17

Sample Amt: 2.2 G % Moisture: 16 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2050	U
121-82-4	RDX	930	U
99-35-4	TNB	232	U
99-65-0	DNB	232	U
479-45-8	TETRYL	605	U
98-95-3	NB	242	U
118-96-7	TNT	232	U
1946-51-0	4ADNT	232	U
35572-78-2	2ADNT	232	U
606-20-2	26DNT	242	U
121-14-2	24DNT	232	U
88-72-2	2NT	232	U
99-99-0	4NT	232	U
99-08-1	3NT	232	U
Surrogate amount spiked		1860.47	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052417.D Vial: 17
Acq On : 25 May 1999 09:33 Operator: SM
Sample : 38614.17 Inst : LC3
Misc : BIOS06108112 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:11 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve	
Surrogates/System Monitoring Compounds:						
7) S 3,4-DNT	18.48W	96513700	1554.2	m	A	
Target Compounds:						
1) HMX	5.92	9416597	284.6	mJ	A	
2) RDX	8.97W	18221186	424.6	m	A	03 mu
3) TNB	0.00	0	N.D.		A	
4) DNB	0.00	0	N.D.		A	
5) TETRYL	0.00	0	N.D.		A	
6) NB	0.00	0	N.D.		A	
8) TNT	0.00	0	N.D.		A	
9) 4ADNT	20.37W	77276283	1114.9	m	A	.02 mu
10) 2ADNT	0.00	0	N.D.		A	
11) 26DNT	0.00	0	N.D.		A	
12) 24DNT	0.00	0	N.D.		A	
13) 2NT	0.00	0	N.D.		A	
14) 4NT	0.00	0	N.D.		A	
15) 3NT	0.00	0	N.D.		A	

05/25/99

05/25/99

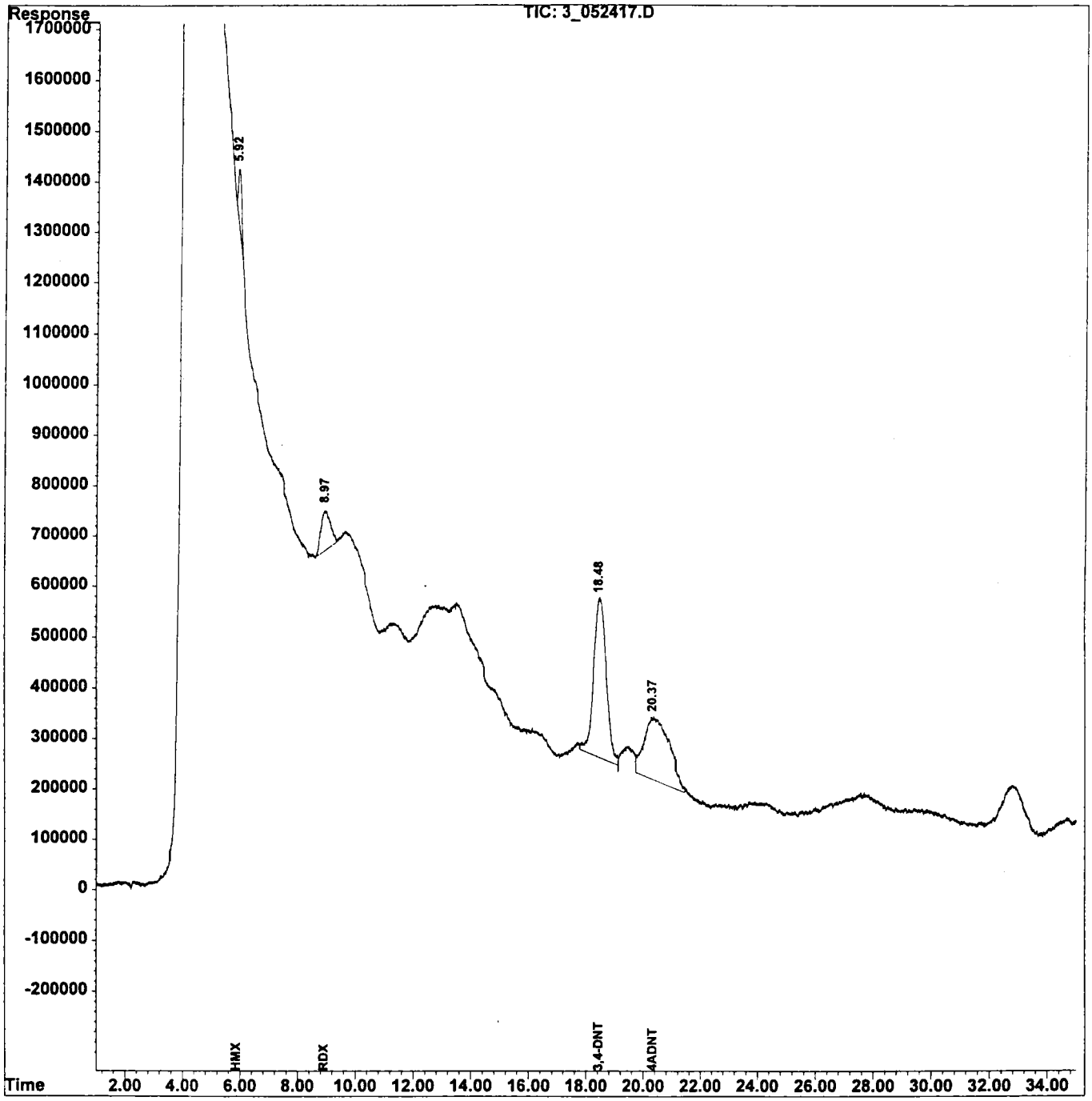
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052417.D Vial: 17
Acq On : 25 May 1999 09:33 Operator: SM
Sample : 38614.17 Inst : LC3
Misc : BIOS06108112 Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: May 25 11:11 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052231.D Vial: 31
Acq On : 23 May 1999 16:03 Operator: SM
Sample : 38614.17 Inst : LC5
Misc : BIOS06108112 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 25 9:35 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.81	31700779	1518.0	m	A
Target Compounds:					
1) A HMX	4.62	3298235	248.4	mJ	A
2) B RDX	7.17	7786757	501.1	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	11.15	4356917	186.2	mJ	A
6) B NB	0.00	0	N.D.		A
8) A TNT	0.00	0	N.D.		A
9) B 4ADNT	14.12	6820366	399.8	mJ	A
10) B 2ADNT	14.40	3937482	110.3	mJ	A
11) A 26DNT	13.42	1122066	46.3	mJ	A
12) B 24DNT	0.00	0	N.D.	d	A

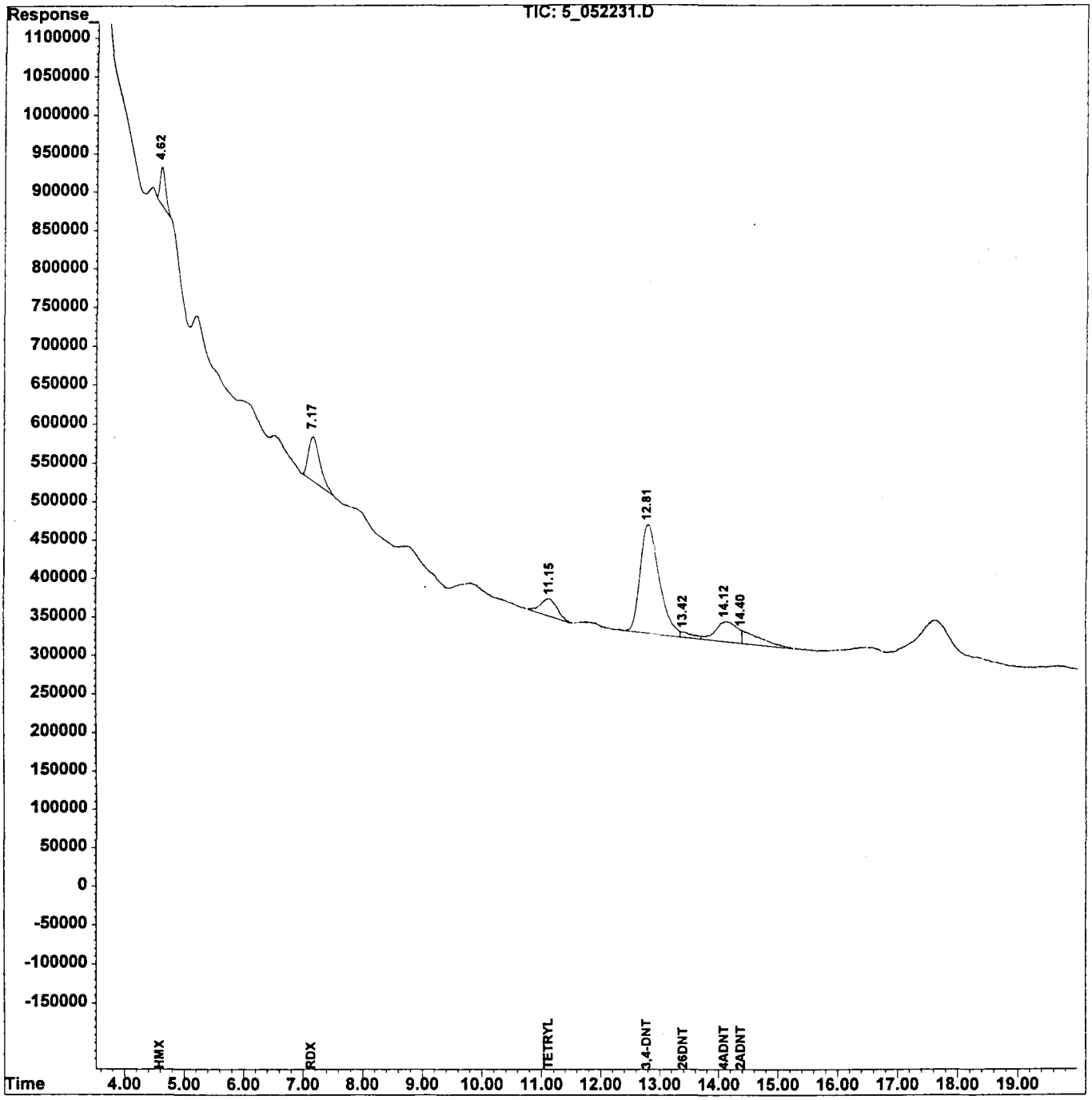
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0522\5_052231.D Vial: 31
Acq On : 23 May 1999 16:03 Operator: SM
Sample : 38614.17 Inst : LC5
Misc : BIOS06108112 Multiplr: 9.0900
IntFile : EVENTS.E
Quant Time: May 25 9:35 1999 Quant Results File: 200SE22C.RES

Method : F:\HPCHEM\LC5\DATA\5_0522\200SE22C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0522\
Last Update : Sat May 22 15:35:19 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS06108113

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

Matrix: (soil/water) SOIL Lab Sample ID: 38614.18

Sample Amt: 2.2 G % Moisture: 23.7 Date Received: 05/20/99

Extraction Volume: 10 ML Date Extracted: 05/21/99

Extraction Method: SONC Date Analyzed: 05/25/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	2040	U
121-82-4	RDX	926	U
99-35-4	TNB	231	U
99-65-0	DNB	231	U
479-45-8	TETRYL	602	U
98-95-3	NB	241	U
118-96-7	TNT	231	U
1946-51-0	4ADNT	231	U
35572-78-2	2ADNT	231	U
606-20-2	26DNT	241	U
121-14-2	24DNT	231	U
88-72-2	2NT	231	U
99-99-0	4NT	231	U
99-08-1	3NT	231	U
Surrogate amount spiked		1851.85	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052418.D Vial: 18
Acq On : 25 May 1999 10:17 Operator: SM
Sample : 38614.18 Inst : LC3
Misc : BIOS06108113 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: May 25 11:44 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.50W	86623047	1331.5	m	A
Target Compounds:					
1) HMX	0.00	0	N.D.		A
2) RDX	0.00	0	N.D.		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	0.00	0	N.D.		A
[illegible]) 4ADNT	0.00	0	N.D.		A
[illegible]) 2ADNT	0.00	0	N.D.		A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

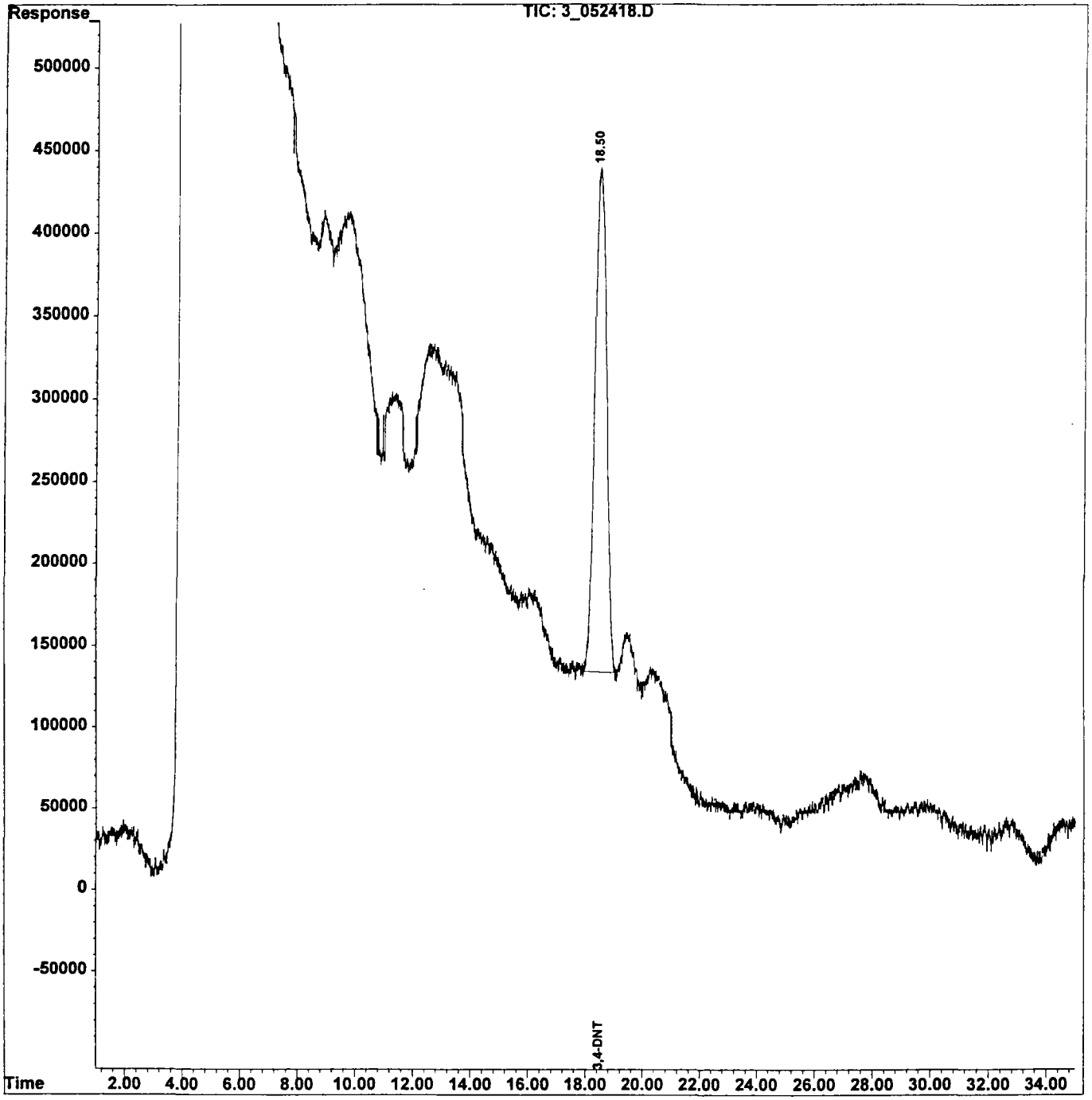
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0524\3_052418.D Vial: 18
Acq On : 25 May 1999 10:17 Operator: SM
Sample : 38614.18 Inst : LC3
Misc : BIOS06108113 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: May 25 11:44 1999 Quant Results File: 200SE22.RES

Method : F:\HPCHEM\LC3\DATA\3_0524\200SE22.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0522\
Last Update : Tue May 25 10:52:20 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



8D
EXPLOSIVES ANALYTICAL SEQUENCE

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

LC Column: CARBOSORB Init. Calib. Date(s): 05/22/99 05/23/99

Instrument ID: LC1

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 14.48

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	05/22/99	2034	0.00	*
02	EXPL1	L1 5-123	05/22/99	2204	14.50	
03	EXPL2	L2 5-57	05/22/99	2249	14.44	
04	EXPL3	L3 5-157	05/22/99	2334	14.45	
05	EXPL4	L4 5-55	05/23/99	0019	14.52	
06	EXPL5	L5 5-141	05/23/99	0104	14.49	
07	BL0521SA	BL0521SA	05/23/99	0149	14.51	
08	BIOS06108032	38614.04	05/23/99	0704	14.56	
09	BIOS06108033	38614.05	05/23/99	0834	14.53	
10	BIOS06108051	38614.06	05/23/99	0919	14.59	*
11	BIOS06108052	38614.07	05/23/99	1004	14.54	
12	BIOS06108053	38614.08	05/23/99	1049	14.56	
13	BIOS06108071	38614.09	05/23/99	1134	14.51	
14	BIOS06108072	38614.10	05/23/99	1248	14.56	
15	BIOS06108073	38614.11	05/23/99	1333	14.55	
16	BIOS06108091	38614.12	05/23/99	1418	14.53	
17	EXPL3	L3 5-157	05/23/99	1503	14.48	
18	EXPL3	L3 5-157	05/26/99	2306	14.48	
19	LC0521SA	LC0521SA	05/27/99	0121	14.52	
20	LD0521SA	LD0521SA	05/27/99	0207	14.54	
21	EXPL3	L3 5-157	05/27/99	0937	14.46	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

S1 = 3,4-DNT

QC LIMITS
(+/- 0.08 MINUTES)

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

LC Column: METASIL Init. Calib. Date(s): 05/22/99 05/23/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.82

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	05/22/99	2102	0.00	*
02	EXPL1A	L1A 4-174	05/22/99	2207	12.86	
03	EXPL2A	L2A 4-173	05/22/99	2240	12.81	
04	EXPL3A	L3A 5-155	05/22/99	2313	12.83	
05	EXPL4A	L4A 5-153	05/22/99	2346	12.84	
06	EXPL5A	L5A 5-153	05/23/99	0018	12.79	
07	EXPL1B	L1B 4-180	05/23/99	0051	0.00	*
08	EXPL2B	L2B 4-179	05/23/99	0124	0.00	*
09	EXPL3B	L3B 5-140	05/23/99	0156	0.00	*
10	EXPL4B	L4B 5-154	05/23/99	0229	0.00	*
11	EXPL5B	L5B 5-122	05/23/99	0302	0.00	*
12	BL0521SA	BL0521SA	05/23/99	0334	12.85	
13	BIOS06108031	38614.01	05/23/99	0440	12.82	
14	BIOS06108032	38614.04	05/23/99	0513	12.81	
15	BIOS06108033	38614.05	05/23/99	0545	12.81	
16	BIOS06108051	38614.06	05/23/99	0618	12.83	
17	BIOS06108052	38614.07	05/23/99	0651	12.84	
18	BIOS06108053	38614.08	05/23/99	0723	12.82	
19	EXPL3A	L3A 5-155	05/23/99	1109	12.80	
20	EXPL3B	L3B 5-140	05/23/99	1141	0.00	*
21	BIOS06108072	38614.10	05/23/99	1214	12.80	
22	BIOS06108091	38614.12	05/23/99	1320	12.82	
23	BIOS06108091FD	38614.13	05/23/99	1352	12.78	
24	BIOS06108092	38614.14	05/23/99	1425	12.76	
25	BIOS06108093	38614.15	05/23/99	1458	12.78	
26	BIOS06108111	38614.16	05/23/99	1530	12.78	
27	BIOS06108112	38614.17	05/23/99	1603	12.80	
28	BIOS06108113	38614.18	05/23/99	1636	12.80	
29	EXPL3A	L3A 5-155	05/23/99	1709	12.77	
30	EXPL3B	L3B 5-140	05/23/99	1741	0.00	*
31	EXPL3A	L3A 5-155	05/24/99	1324	12.86	
32	EXPL3B	L3B 5-140	05/24/99	1356	0.00	*

S1 = 3,4-DNT

QC LIMITS
(+/- 0.10 MINUTES)

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

LC Column: METASIL Init. Calib. Date(s): 05/22/99 05/23/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.82

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	BIOS06108071	38614.09	05/24/99	1655	12.85
02	EXPL3A	L3A 5-155	05/24/99	2148	12.84
03	EXPL3B	L3B 5-140	05/24/99	2220	0.00 *
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

S1 = 3,4-DNT

QC LIMITS
(+/- 0.10 MINUTES)

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

8D
EXPLOSIVES ANALYTICAL SEQUENCE

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614

LC Column: CARBOSORB Init. Calib. Date(s): 05/23/99 05/23/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 18.21

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	05/22/99	2235	0.00 *
02	EXPL1	L1 5-123	05/23/99	0042	18.15
03	EXPL2	L2 5-57	05/23/99	0127	18.24
04	EXPL3	L3 5-157	05/23/99	0211	18.20
05	EXPL4	L4 5-153	05/23/99	0256	18.21
06	EXPL5	L5 5-121	05/23/99	0340	18.16
07	EXPL3	L3 5-157	05/24/99	2224	18.31
08	BIOS06108031	38614.01	05/25/99	0251	18.46
09	BIOS06108031MS	38614.02MS	05/25/99	0336	18.42
10	BIOS06108031MSD	38614.03MSD	05/25/99	0421	18.49
11	EXPL3	L3 5-157	05/25/99	0550	18.32
12	BIOS06108091FD	38614.13	05/25/99	0634	18.38
13	BIOS06108092	38614.14	05/25/99	0719	18.30
14	BIOS06108093	38614.15	05/25/99	0804	18.44
15	BIOS06108111	38614.16	05/25/99	0848	18.45
16	BIOS06108112	38614.17	05/25/99	0933	18.48
17	BIOS06108113	38614.18	05/25/99	1017	18.50
18	EXPL3	L3 5-157	05/25/99	1231	18.51
19	EXPL3	L3 5-157	05/27/99	0202	18.02
20	BIOS06108031DL	38614.01DL	05/27/99	0759	18.05
21	BIOS06108071DL	38614.09DL	05/27/99	0843	17.99
22	EXPL3	L3 5-157	05/27/99	1057	17.99
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

S1 = 3,4-DNT

QC LIMITS
(+/- 0.45 MINUTES)

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 05/22/99 05/23/99

Method: 200SE22

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	64440081	80983781	74751852
RDX	62370958	96019258	88210721
TNB	205280500	233732267	214436690
DNB	257452000	303468460	283602154
TETRYL	129658909	156409027	133293312
NB	173748650	193197940	188447736
TNT	228734000	243716100	229109021
4ADNT	108682500	143214957	130949913
2ADNT	179126143	220140600	216752715
26DNT	123110333	148132967	135653816
24DNT	257139571	280049614	272186697
2NT	110164900	136143250	128190930
4NT	77997100	103463180	91117602
3NT	102738250	140807550	120631875
3,4-DNT	114408767	136003893	128048914

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	75869038	74421265	74093203	8.11
RDX	94766869	93793684	87032298	16.21
TNB	217496374	215292781	217247723	4.75
DNB	286466587	285790382	283355917	5.83
TETRYL	136257695	135838305	138291450	7.57
NB	181229475	186630294	184650819	4.03
TNT	209677302	216044093	225456103	5.85
4ADNT	139937275	133429316	131242792	10.31
2ADNT	202436634	205726373	204836493	7.89
26DNT	130276168	132232743	133881205	6.87
24DNT	274066238	274133797	271515184	3.15
2NT	135136358	134693226	128865733	8.47
4NT	98903670	98444440	93985198	10.61
3NT	124879048	124238427	122659030	11.07
3,4-DNT	122855280	124572444	125177859	6.28
MEAN RSD				7.80

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC1 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/22/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/23/99

Lab Sample ID : L3 5-157 Time Analyzed : 1503

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.72	4.69	4.75	75363260	74093203	-1.7
RDX	7.07	7.02	7.12	90173360	87032298	-3.6
TNB	9.60	9.56	9.64	218888076	217247723	-0.8
DNB	11.73	11.70	11.78	287551056	283355917	-1.5
TETRYL	12.39	12.34	12.52	127359912	138291450	7.9
NB	13.43	13.38	13.48	177467513	184650819	3.9
TNT	15.11	15.04	15.18	215913721	225456103	4.2
4ADNT	15.62	15.54	15.74	130680620	131242792	0.4
2ADNT	16.41	16.33	16.55	202102096	204836493	1.3
26DNT	17.69	17.59	17.79	132949404	133881205	0.7
24DNT	18.27	18.17	18.39	273106161	271515184	-0.6
2NT	21.69	21.55	21.85	131716515	128865733	-2.2
4NT	23.17	23.01	23.35	94582142	93985198	-0.6
3NT	24.98	24.84	25.14	124008657	122659030	-1.1
3,4-DNT	14.48	14.40	14.56	123524194	125177859	1.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC1 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/22/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/26/99

Lab Sample ID : L3 5-157 Time Analyzed : 2306

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.73	4.69	4.75	78385290	74093203	-5.8
RDX	7.10	7.02	7.12	94711765	87032298	-8.8
TNB	9.61	9.56	9.64	224797911	217247723	-3.5
DNB	11.74	11.70	11.78	299303582	283355917	-5.6
TETRYL	12.48	12.34	12.52	139169602	138291450	-0.6
NB	13.42	13.38	13.48	194819341	184650819	-5.5
TNT	15.12	15.04	15.18	225983366	225456103	-0.2
4ADNT	15.66	15.54	15.74	147914314	131242792	-12.7
2ADNT	16.49	16.33	16.55	218449477	204836493	-6.6
26DNT	17.70	17.59	17.79	126174848	133881205	5.8
24DNT	18.27	18.17	18.39	302692403	271515184	-11.5
2NT	21.68	21.55	21.85	136443724	128865733	-5.9
4NT	23.16	23.01	23.35	98451201	93985198	-4.8
3NT	24.97	24.84	25.14	124235440	122659030	-1.3
3,4-DNT	14.48	14.40	14.56	129333144	125177859	-3.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC1 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/22/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/27/99

Lab Sample ID : L3 5-157 Time Analyzed : 0937

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.72	4.69	4.75	80091225	74093203	-8.1
RDX	7.08	7.02	7.12	95669529	87032298	-9.9
TNB	9.60	9.56	9.64	230835634	217247723	-6.3
DNB	11.72	11.69	11.77	303908105	283355917	-7.3
TETRYL	12.42	12.33	12.51	139310940	138291450	-0.7
NB	13.42	13.38	13.48	197003661	184650819	-6.7
TNT	15.10	15.04	15.18	227777527	225456103	-1.0
4ADNT	15.60	15.53	15.75	146784455	131242792	-11.8
2ADNT	16.42	16.34	16.54	217525801	204836493	-6.2
26DNT	17.68	17.61	17.77	133063320	133881205	0.6
24DNT	18.26	18.19	18.37	300087078	271515184	-10.5
2NT	21.69	21.57	21.83	136508430	128865733	-5.9
4NT	23.17	23.04	23.34	96995975	93985198	-3.2
3NT	24.98	24.88	25.12	127408551	122659030	-3.9
3,4-DNT	14.46	14.40	14.56	131942009	125177859	-5.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

FORM IX

9E
EXPLOSIVES RETENTION TIME DATA TABLE

ab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 05/22/99 05/23/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.71	4.71	4.71	4.72	4.71
RDX	7.08	7.05	7.06	7.08	7.07
TNB	9.61	9.59	9.59	9.63	9.60
DNB	11.74	11.72	11.72	11.76	11.74
TETRYL	12.43	12.40	12.40	12.46	12.42
NB	13.43	13.41	13.41	13.46	13.44
TNT	15.10	15.09	15.08	15.15	15.12
4ADNT	15.68	15.62	15.60	15.69	15.66
2ADNT	16.45	16.42	16.40	16.48	16.45
26DNT	17.69	17.65	17.66	17.74	17.71
24DNT	18.32	18.25	18.24	18.32	18.30
2NT	21.77	21.65	21.66	21.75	21.73
4NT	23.28	23.16	23.14	23.24	23.22
3NT	25.04	24.99	24.95	25.06	25.04
3,4-DNT	14.50	14.44	14.45	14.52	14.49

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3
HMX	4.72	4.73	4.72
RDX	7.06	7.10	7.08
TNB	9.60	9.61	9.60
DNB	11.73	11.74	11.72
TETRYL	12.39	12.48	12.42
NB	13.43	13.42	13.42
TNT	15.11	15.12	15.10
4ADNT	15.62	15.66	15.60
2ADNT	16.40	16.49	16.42
26DNT	17.69	17.70	17.68
24DNT	18.27	18.27	18.26
2NT	21.69	21.68	21.69
4NT	23.17	23.16	23.17
3NT	24.98	24.97	24.98
3,4-DNT	14.48	14.48	14.46

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.72	0.008	0.025	4.69 - 4.74
RDX	7.07	0.016	0.048	7.02 - 7.12
TNB	9.60	0.014	0.041	9.56 - 9.64
DNB	11.73	0.015	0.044	11.69 - 11.77

FORM IX

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 05/22/99 05/23/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	12.42	0.032	0.095	12.32 - 12.51
NB	13.43	0.017	0.051	13.38 - 13.48
TNT	15.11	0.022	0.065	15.04 - 15.18
4ADNT	15.64	0.036	0.107	15.53 - 15.75
2ADNT	16.44	0.034	0.103	16.34 - 16.54
26DNT	17.69	0.028	0.085	17.60 - 17.77
24DNT	18.28	0.031	0.093	18.19 - 18.37
2NT	21.70	0.043	0.129	21.57 - 21.83
4NT	23.19	0.049	0.146	23.04 - 23.34
3NT	25.00	0.040	0.119	24.88 - 25.12
3,4-DNT	14.48	0.027	0.080	14.40 - 14.56

FORM IX

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 05/23/99 05/23/99

Method: 200SE22

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	270026960	352265381	325057249
RDX	376500542	401942367	422053517
TNB	1205930944	1104841577	985635454
DNB	1382678100	1386825600	1340989577
TETRYL	670634909	630109123	574286159
NB	946376700	916296950	929737784
TNT	1093974438	1049867055	963899098
4ADNT	676396714	617362127	699140013
2ADNT	829019857	880058744	963407951
26DNT	587534958	651664141	617584022
24DNT	1103700786	1387524241	1335368096
2NT	698438150	695550271	638728156
4NT	626324250	515568323	481970560
3NT	805247150	663396387	586769581
3,4-DNT	645242700	603950267	581838864

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	317790130	310237665	315075477	9.45
RDX	427927436	415256074	408735987	5.00
TNB	960957664	948487143	1041170556	10.66
DNB	1330237689	1304469335	1349040060	2.61
TETRYL	589039901	565353993	605884817	7.24
NB	907896826	913874459	922836544	1.67
TNT	952102173	924680733	996904699	7.19
4ADNT	665487438	642116566	660100572	4.77
2ADNT	934644256	915761848	904578531	5.74
26DNT	605423290	580898204	608620923	4.62
24DNT	1268963580	1266704899	1272452320	8.40
2NT	638911395	639452141	662216023	4.80
4NT	482240347	472050518	515630800	12.42
3NT	603715995	594015644	650628951	14.08
3,4-DNT	566841856	559229086	591420555	5.85
MEAN RSD				6.97

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/23/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/24/99

Lab Sample ID : L3 5-157 Time Analyzed : 2224

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.91	5.85	5.95	326041662	315075477	-3.5
RDX	8.90	8.75	9.01	442611969	408735987	-8.3
TNB	11.99	11.76	12.14	986191988	1041170556	5.3
DNB	14.68	14.35	14.93	1370401844	1349040060	-1.6
TETRYL	15.90	15.48	16.18	534485881	605884817	11.8
NB	16.72	16.32	16.98	933519289	922836544	-1.2
TNT	19.00	18.56	19.28	967537973	996904699	2.9
4ADNT	20.01	19.35	20.47	683528567	660100572	-3.5
2ADNT	21.08	20.38	21.58	968402597	904578531	-7.1
26DNT	22.34	21.70	22.74	604436530	608620923	0.7
24DNT	23.06	22.41	23.49	1329638860	1272452320	-4.5
2NT	27.24	26.38	27.76	645646368	662216023	2.5
4NT	29.14	28.22	29.66	484839527	515630800	6.0
3NT	31.41	30.48	31.98	604848058	650628951	7.0
3,4-DNT	18.31	17.76	18.66	580701910	591420555	1.8

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/23/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/25/99

Lab Sample ID : L3 5-157 Time Analyzed : 0550

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.91	5.85	5.95	318938440	315075477	-1.2
RDX	8.90	8.75	9.01	433858979	408735987	-6.1
TNB	12.00	11.76	12.14	980407780	1041170556	5.8
DNB	14.68	14.35	14.93	1354492778	1349040060	-0.4
TETRYL	15.92	15.48	16.18	542681914	605884817	10.4
NB	16.73	16.32	16.98	923499361	922836544	-0.1
TNT	18.99	18.56	19.28	963678291	996904699	3.3
4ADNT	20.04	19.35	20.47	677369746	660100572	-2.6
2ADNT	21.08	20.38	21.58	959575249	904578531	-6.1
26DNT	22.34	21.70	22.74	589221118	608620923	3.2
24DNT	23.06	22.41	23.49	1340503585	1272452320	-5.3
2NT	27.25	26.38	27.76	630634782	662216023	4.8
4NT	29.18	28.22	29.66	459376465	515630800	10.9
3NT	31.45	30.48	31.98	588433372	650628951	9.6
3,4-DNT	18.32	17.76	18.66	575158066	591420555	2.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/23/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/25/99

Lab Sample ID : L3 5-157 Time Analyzed : 1231

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.93	5.85	5.95	321304862	315075477	-2.0
RDX	8.96	8.75	9.01	434609037	408735987	-6.3
TNB	12.07	11.76	12.14	976806490	1041170556	6.2
DNB	14.80	14.35	14.93	1349796155	1349040060	-0.1
TETRYL	16.05	15.48	16.18	557583695	605884817	8.0
NB	16.85	16.32	16.98	924449213	922836544	-0.2
TNT	19.16	18.56	19.28	956713014	996904699	4.0
4ADNT	20.27	19.35	20.47	664223408	660100572	-0.6
2ADNT	21.35	20.38	21.58	960636494	904578531	-6.2
26DNT	22.55	21.70	22.74	608928034	608620923	-0.1
24DNT	23.29	22.41	23.49	1306267589	1272452320	-2.7
2NT	27.53	26.38	27.76	640853271	662216023	3.2
4NT	29.38	28.22	29.66	479955180	515630800	6.9
3NT	31.71	30.48	31.98	600400900	650628951	7.7
3,4-DNT	18.51	17.76	18.66	569949540	591420555	3.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/23/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/27/99

Lab Sample ID : L3 5-157 Time Analyzed : 0202

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.89	5.85	5.95	323715295	315075477	-2.7
RDX	8.83	8.75	9.01	427611922	408735987	-4.6
TNB	11.87	11.76	12.14	995342029	1041170556	4.4
DNB	14.48	14.35	14.93	1382199816	1349040060	-2.5
TETRYL	15.68	15.48	16.18	584288618	605884817	3.6
NB	16.49	16.32	16.98	946291725	922836544	-2.5
TNT	18.78	18.56	19.28	974629519	996904699	2.2
4ADNT	19.69	19.35	20.47	690675084	660100572	-4.6
2ADNT	20.71	20.38	21.58	989761170	904578531	-9.4
26DNT	21.98	21.70	22.74	596631600	608620923	2.0
24DNT	22.71	22.41	23.49	1389683475	1272452320	-9.2
2NT	26.80	26.38	27.76	650549559	662216023	1.8
4NT	28.63	28.22	29.66	454853910	515630800	11.8
3NT	30.89	30.48	31.98	620932499	650628951	4.6
3,4-DNT	18.02	17.76	18.66	594841882	591420555	-0.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC3 Method: 200SE22

LC Column: CARBOSORB Init. Calib Date(s): 05/23/99 05/23/99

Client Sample No.: EXPL3 Date Analyzed : 05/27/99

Lab Sample ID : L3 5-157 Time Analyzed : 1057

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.89	5.85	5.95	337610002	315075477	-7.2
RDX	8.81	8.75	9.01	437386620	408735987	-7.0
TNB	11.85	11.76	12.14	1002833920	1041170556	3.7
DNB	14.48	14.35	14.93	1350989970	1349040060	-0.1
TETRYL	15.64	15.48	16.18	546235459	605884817	9.8
NB	16.48	16.32	16.98	895721040	922836544	2.9
TNT	18.72	18.56	19.28	932552923	996904699	6.5
4ADNT	19.60	19.35	20.47	634099648	660100572	3.9
2ADNT	20.63	20.38	21.58	860307522	904578531	4.9
26DNT	21.95	21.70	22.74	544581497	608620923	10.5
24DNT	22.66	22.41	23.49	1327461352	1272452320	-4.3
2NT	26.74	26.38	27.76	631264472	662216023	4.7
4NT	28.59	28.22	29.66	467933654	515630800	9.3
3NT	30.86	30.48	31.98	585407477	650628951	10.0
3,4-DNT	17.99	17.76	18.66	581935714	591420555	1.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

FORM IX

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 05/23/99 05/23/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.88	5.90	5.89	5.89	5.88
RDX	8.88	8.91	8.88	8.89	8.86
TNB	11.92	11.97	11.94	11.96	11.93
DNB	14.69	14.68	14.62	14.64	14.60
TETRYL	15.84	15.86	15.82	15.83	15.79
NB	16.67	16.67	16.63	16.65	16.61
TNT	18.93	18.92	18.90	18.92	18.88
4ADNT	19.81	19.98	19.88	19.95	19.90
2ADNT	20.92	21.05	20.97	21.01	20.96
26DNT	22.24	22.24	22.16	22.22	22.17
24DNT	22.90	23.00	22.91	22.97	22.92
2NT	26.95	27.06	27.06	27.06	27.01
4NT	28.85	28.97	28.90	28.93	28.88
3NT	31.15	31.25	31.18	31.20	31.17
3,4-DNT	18.15	18.24	18.20	18.21	18.16

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	5.91	5.91	5.93	5.89	5.88
RDX	8.90	8.90	8.96	8.83	8.81
TNB	11.99	12.00	12.07	11.87	11.85
DNB	14.68	14.68	14.80	14.48	14.48
TETRYL	15.90	15.92	16.05	15.68	15.64
NB	16.72	16.73	16.85	16.49	16.48
TNT	19.00	18.99	19.16	18.78	18.72
4ADNT	20.01	20.04	20.27	19.69	19.60
2ADNT	21.08	21.08	21.35	20.71	20.63
26DNT	22.34	22.34	22.55	21.98	21.95
24DNT	23.06	23.06	23.29	22.71	22.66
2NT	27.24	27.25	27.53	26.80	26.74
4NT	29.14	29.18	29.38	28.63	28.59
3NT	31.41	31.45	31.70	30.89	30.86
3,4-DNT	18.31	18.32	18.51	18.02	17.99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.90	0.017	0.051	5.85 - 5.95
RDX	8.88	0.042	0.126	8.75 - 9.01
TNB	11.95	0.064	0.192	11.76 - 12.14
DNB	14.64	0.098	0.293	14.35 - 14.93

FORM IX

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 05/23/99 05/23/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	15.83	0.117	0.350	15.48 - 16.18
NB	16.65	0.110	0.330	16.32 - 16.98
TNT	18.92	0.120	0.361	18.56 - 19.28
4ADNT	19.91	0.188	0.564	19.34 - 20.47
2ADNT	20.98	0.201	0.602	20.38 - 21.58
26DNT	22.22	0.175	0.524	21.70 - 22.74
24DNT	22.95	0.179	0.538	22.41 - 23.49
2NT	27.07	0.229	0.688	26.38 - 27.76
4NT	28.94	0.241	0.724	28.22 - 29.66
3NT	31.23	0.251	0.754	30.48 - 31.98
3,4-DNT	18.21	0.150	0.451	17.76 - 18.66

FORM IX

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC5

LC Column: METASIL Date(s) Analyzed: 05/22/99 05/23/99

Method: 200SE22C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	124489114	108124778	119581631
RDX	147886620	144417975	145645529
TNB	319614522	277603662	308404739
DNB	446055925	436795829	421677904
TETRYL	228071678	205570698	214167595
NB	261555080	244501746	240716735
TNT	298371500	266374719	300634370
4ADNT	166361500	171114648	160845990
2ADNT	337781870	337072553	329006036
26DNT	229608660	204015556	225175879
24DNT	408630120	382043347	371629269
3,4-DNT	188368606	177921948	196120080

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	115420951	135901957	120703686	8.62
RDX	131617439	136697027	141252918	4.84
TNB	299989000	318599852	304842355	5.65
DNB	379474999	395801055	415961142	6.70
TETRYL	205870233	210031502	212742341	4.35
NB	219393308	228126762	238858726	6.77
TNT	287318631	299965707	290532986	5.01
4ADNT	137961366	138975792	155051859	10.04
2ADNT	300239325	318223036	324464564	4.83
26DNT	215744317	227204621	220349807	4.78
24DNT	331591757	346222878	368023474	8.22
3,4-DNT	188211625	198545611	189833574	4.26
MEAN RSD				6.17

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC5 Method: 200SE2.

LC Column: METASIL Init. Calib Date(s): 05/22/99 05/23/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 05/23/99 : 05/23/99

Lab Sample IDs : L3A 5-155 : L3B 5-140 Time Analyzed : 1109 : 1141

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.62	4.59	4.65	118559928	120703686	1.8
RDX	7.17	7.13	7.25	145489909	141252918	-3.0
TNB	6.94	6.91	6.97	303588665	304842355	0.4
DNB	8.92	8.86	9.02	423682712	415961142	-1.9
TETRYL	11.08	11.02	11.26	204672248	212742341	3.8
NB	10.15	10.09	10.25	249266473	238858726	-4.4
TNT	10.39	10.35	10.45	287575458	290532986	1.0
4ADNT	14.13	14.03	14.37	159111537	155051859	-2.6
2ADNT	14.55	14.44	14.82	332179906	324464564	-2.4
26DNT	13.30	13.23	13.43	218648009	220349807	0.8
24DNT	12.91	12.82	13.08	371456539	368023474	-0.9
3,4-DNT	12.80	12.72	12.92	189204981	189833574	0.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC5 Method: 200SE22C

LC Column: METASIL Init. Calib Date(s): 05/22/99 05/23/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 05/23/99 : 05/23/99

Lab Sample IDs : L3A 5-155 : L3B 5-140 Time Analyzed : 1709 : 1741

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.62	4.59	4.65	121020501	120703686	-0.3
RDX	7.22	7.13	7.25	139691545	141252918	1.1
TNB	6.94	6.91	6.97	314642423	304842355	-3.2
DNB	8.97	8.86	9.02	407344119	415961142	2.1
TETRYL	11.10	11.02	11.26	213174194	212742341	-0.2
NB	10.21	10.09	10.25	234740665	238858726	1.7
TNT	10.38	10.35	10.45	298617257	290532986	-2.8
4ADNT	14.28	14.03	14.37	150893219	155051859	2.7
2ADNT	14.71	14.44	14.82	321583653	324464564	0.9
26DNT	13.28	13.23	13.43	226944174	220349807	-3.0
24DNT	13.00	12.82	13.08	357084076	368023474	3.0
3,4-DNT	12.77	12.72	12.92	197855507	189833574	-4.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC5 Method: 200SE22C

LC Column: METASIL Init. Calib Date(s): 05/22/99 05/23/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 05/24/99 : 05/24/99

Lab Sample IDs : L3A 5-155 : L3B 5-140 Time Analyzed : 1324 : 1356

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.64	4.59	4.65	118491426	120703686	1.8
RDX	7.22	7.13	7.25	153657949	141252918	-8.8
TNB	6.96	6.91	6.97	303222653	304842355	0.5
DNB	8.96	8.86	9.02	446068427	415961142	-7.2
TETRYL	11.19	11.02	11.26	208312691	212742341	2.1
NB	10.18	10.09	10.25	258441569	238858726	-8.2
TNT	10.43	10.35	10.45	296347416	290532986	-2.0
4ADNT	14.23	14.03	14.37	174235357	155051859	-12.4
2ADNT	14.68	14.44	14.82	344331945	324464564	-6.1
26DNT	13.37	13.23	13.43	221617636	220349807	-0.6
24DNT	12.98	12.82	13.08	392961229	368023474	-6.8
3,4-DNT	12.86	12.72	12.92	192030700	189833574	-1.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38614 Inst. ID: LC5 Method: 200se22c

LC Column: METASIL Init. Calib Date(s): 05/22/99 05/23/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 05/24/99 : 05/24/99

Lab Sample IDs : L3A 5-155 : L3B 5-140 Time Analyzed : 2148 : 2220

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.64	4.59	4.65	119749090	120703686	0.8
RDX	7.21	7.13	7.25	142778668	141252918	-1.1
TNB	6.96	6.91	6.97	309627006	304842355	-1.6
DNB	8.94	8.86	9.02	414045072	415961142	0.5
TETRYL	11.18	11.02	11.26	211147145	212742341	0.7
NB	10.16	10.09	10.25	236313768	238858726	1.1
TNT	10.42	10.35	10.45	299692495	290532986	-3.2
4ADNT	14.18	14.03	14.37	157120325	155051859	-1.3
2ADNT	14.62	14.44	14.82	324463240	324464564	0.0
26DNT	13.35	13.23	13.43	224785988	220349807	-2.0
24DNT	12.94	12.82	13.08	363688551	368023474	1.2
3,4-DNT	12.84	12.72	12.92	195022285	189833574	-2.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

FORM VII

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.5[illegible]
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

FORM IX

9E
EXPLOSIVES RETENTION TIME DATA TABLE

ab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 05/22/99 05/23/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.63	4.62	4.63	4.62	4.61
RDX	7.20	7.22	7.19	7.19	7.17
TNB	6.95	6.94	6.95	6.94	6.93
DNB	8.96	8.97	8.94	8.93	8.90
TETRYL	11.17	11.14	11.15	11.15	11.10
NB	10.18	10.21	10.17	10.16	10.14
TNT	10.40	10.40	10.41	10.42	10.38
4ADNT	14.21	14.26	14.20	14.18	14.13
2ADNT	14.65	14.70	14.63	14.61	14.55
26DNT	13.36	13.32	13.34	13.35	13.30
24DNT	12.96	13.00	12.95	12.93	12.89
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.86	12.81	12.83	12.84	12.79

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	4.62	0.00	4.62	0.00	4.64
RDX	0.00	7.17	0.00	7.22	0.00
TNB	6.94	0.00	6.94	0.00	6.96
DNB	0.00	8.92	0.00	8.97	0.00
TETRYL	11.08	0.00	11.10	0.00	11.19
NB	0.00	10.15	0.00	10.21	0.00
TNT	10.39	0.00	10.38	0.00	10.43
4ADNT	0.00	14.13	0.00	14.28	0.00
2ADNT	0.00	14.55	0.00	14.71	0.00
26DNT	13.30	0.00	13.28	0.00	13.37
24DNT	0.00	12.91	0.00	13.00	0.00
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.80	0.00	12.77	0.00	12.86

COMPOUND	RT CCAL 6	RT CCAL 7	RT CCAL 8
HMX	0.00	4.64	0.00
RDX	7.22	0.00	7.21
TNB	0.00	6.96	0.00
DNB	8.96	0.00	8.94

FORM IX

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38614

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 05/22/99 05/23/99

COMPOUND	RT CCAL 6	RT CCAL 7	RT CCAL 8
TETRYL	0.00	11.18	0.00
NB	10.18	0.00	10.16
TNT	0.00	10.42	0.00
4ADNT	14.22	0.00	14.18
2ADNT	14.68	0.00	14.62
26DNT	0.00	13.34	0.00
24DNT	12.98	0.00	12.94
2NT	0.00	0.00	0.00
4NT	0.00	0.00	0.00
3NT	0.00	0.00	0.00
3,4-DNT	0.00	12.84	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.62	0.010	0.030	4.59 - 4.65
RDX	7.19	0.021	0.064	7.13 - 7.25
TNB	6.94	0.010	0.030	6.91 - 6.97
DNB	8.94	0.027	0.080	8.86 - 9.02
TETRYL	11.14	0.039	0.116	11.02 - 11.26
NB	10.17	0.028	0.084	10.09 - 10.25
TNT	10.40	0.018	0.054	10.34 - 10.45
4ADNT	14.20	0.058	0.174	14.02 - 14.37
2ADNT	14.63	0.064	0.193	14.44 - 14.82
26DNT	13.33	0.033	0.098	13.23 - 13.43
24DNT	12.95	0.042	0.127	12.82 - 13.08
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	12.82	0.033	0.099	12.72 - 12.92

FORM IX

[redacted] SV [redacted] • PCB OTHER

RUSH REEXTRACT TCLP DXIN

SAMPLE EXTRACTION L(

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

CONT EX. (3520B)
SEP-F (3510B)
SHAKER
SONC. (3550)
SOXHLET

XXXXX

BATCH: 990521SA

EXTRACT DATE: 99-05-21 13:30

000792

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED (g) • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
38614.12INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108091	S/L		27.29	1.5	2.13							10.0	N		1000		
38614.13INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108091FD	S/L		23.14	1.6	2.10							10.0	N		1000		
38614.14INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108092	S/L		33.01	1.4	2.04							10.0	N		1000		
38614.15INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108093	S/L		24.56	1.6	2.09							10.0	N		1000		
38614.16INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108111	S/L		25.09	1.6	2.10							10.0	N		1000		
38614.17INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108112	S/L		16.04	1.8	2.15							10.0	N		1000		
38614.18INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108113	S/L		23.72	1.6	2.16							10.0	N		1000		

INITIALS

WEIGHING:	GS	EXTRACTION:	GS	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	SM	VERIFIER:	GS		
MATRIX SPIKER:	SM	VERIFIER:	GS		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 5-143

MATRIX SPIKE SOLID/CONC #(s): 5-158

SOP - METHOD # : SWL-OP- 416 Rev. 4-0

COMMENTS

[redacted]M [redacted] RUSH REEXTRACT TCLP DXIN

SV • PCB OTHER

SAMPLE EXTRACTION L(

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

CONT EX. (3520B)
SEP-F (3510B)
SHAKER
SONC. (3550)
SOXHLET

XXXXX

BATCH: 990521SA

EXTRACT DATE: 99-05-21 13:30

000792

SAMPLE ID (EPISODE #)	CLIENT / CASE	DATE RECEIVED / CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED (g) • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
BL0521SA			S/L				2.11							10.0	N		1000		
BB0521SA			S/L				2.06							10.0	N		1000		
LC0521SA			S/L				2.08							10.0	N	500	1000		
LD0521SA			S/L				2.07							10.0	N	500	1000		
38614.01INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108031	S/L		11.09	1.8	2.02							10.0	N		1000		
38614.02MS GC200	TOLTEST	05/20/1999 10:42 BIOS06108031	S/L		11.09	1.8	2.00							10.0	N	500	1000		
38614.03MSD GC200	TOLTEST	05/20/1999 10:42 BIOS06108031	S/L		11.09	1.8	2.00							10.0	N	500	1000		
38614.04INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108032	S/L		22.59	1.7	2.20							10.0	N		1000		
38614.05INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108033	S/L		25.49	1.6	2.15							10.0	N		1000		
38614.06INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108051	S/L		21.99	1.6	2.02							10.0	N		1000		
38614.07INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108052	S/L		20.19	1.6	2.00							10.0	N		1000		
38614.08INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108053	S/L		19.68	1.6	2.05							10.0	N		1000		
38614.09INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108071	S/L		26.42	1.6	2.20							10.0	N		1000		
38614.10INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108072	S/L		26.86	1.6	2.12							10.0	N		1000		
38614.11INT GC200	TOLTEST	05/20/1999 10:42 BIOS06108073	S/L		26.94	1.5	2.02							10.0	N		1000		

INITIALS

WEIGHING:	GS	EXTRACTION:	GS	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	SM	VERIFIER:	GS		
MATRIX SPIKER:	SM	VERIFIER:	GS		
SUBMITTED BY:		REVIEWED BY:			

ID NUMBERS

FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #: 5-143
MATRIX SPIKE SOLID/CONC #(s): 5-158

SOP - METHOD # : SWL-OP- 416 Rev 4.0

COMMENTS

TOLTEST, INC. 1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

B10 -231

Chain of Custody Record

25834

Project No.: 37324	Client:
P.O. No.:	Project/Location: NSWC Crane Biofacility
Project Mgr.:	Sampler's Name
Phone No.	Sampler's Signature

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	Parameters							Preserved Yes/No	LAB USE ONLY Lab #
1	B10 M082 00 031	7/8/99	1300	G	Compost	Column 3 sample location 1	1	1									
2	B10 M082 00 032		1301			2											
3	B10 M082 00 033		1302			3				MS/MSD							
4	M082 00 051		1303			5 1											
5	M082 00 052		1304			2											
6	M082 00 052FD		1304			2											
7	M082 00 053		1305			3											
8	M082 00 071		1306			7 1											
9	M082 00 072		1307			2											
10	M082 00 073		1308			3											

Item No.	Relinquished By:	Date	Time	Received By:	Date	Time
	Joseph A Mol	7/8/99	1500	[illegible]	7-9-99	10:15

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 4 °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled properly for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 7/97

TOLTEST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

B10-231

Chain of Custody Record

25836

Project No.: 37324	Client:
P.O. No.:	Project/Location: NSWC Crane Biofacility
Project Mgr.:	Sampler's Name Joe Medina
Phone No.	Sampler's Signature Joe Medina

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8270	Parameters							Preserved Yes/No	LAB USE ONLY Lab #
1	B10 M082 00 091	7/8/99	1309	G	compost	column 9 sample location 1	1	✓									
2	B10 M082 00 092		1310			7											
3	B10 M082 00 093		1311			3											
4	B10 M082 00 111		1312			11 1											
5	B10 M082 00 112		1313			2											
6	B10 M082 00 113		1314			3											
7	B10 M082 00 113FD		1314			3											
8																	
9																	
10																	

Item No.	Relinquished By:	Date	Time	Received By:	Date	Time
	[signature]	7/8/99	1500	[signature]	7-9-99	09:15 ~~10:15~~

LAB USE ONLY

- Were samples delivered ☐ in person ☐ by courier
- Were samples preserved ☐ in field ☐ in lab ☐ N/A
- Temp of samples 4 °C
- Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
- Were proper containers used? ☐ yes ☐ no
- Was container labeled properly for contents? ☐ yes ☐ no
- Were samples packaged properly for type of material? ☐ yes ☐ no
- Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no

Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 7/97

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 REV 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA

PAGE ____ OF ____

RECEIVED BY (PRINT NAME): DON WILLIS

RECEIVED BY (SIGNATURE):

LOGGED IN BY (SIGNATURE):

REC'D DATE 07/09/99

TIME REC'D 09:15

LOG-IN DATE 1999-07-09 09:39

PROJECT: NSWC CRANE

EPISODE: 39322

SAMPLE DELIVERY GROUP:39322

Remarks

1. CUSTODY SEAL(S): Present/Absent
   Intact/ Broken
2. CUSTODY SEALS NOS.:
3. CHAIN-OF CUSTODY. Present/Absent
   Sealed In Plastic? Yes/ No
   Taped To Lid? Yes/ No
   Properly Filled Out (Ink, Signed, ETC.)? Yes/ No
4. AIRBILL AirBil/ Sticker Present/Absent
5. AIRBILL NO: 8116 7401 3887
6. COOLER CONDITIONS
   Enough Ice? Yes/ No
   Type of Ice? Wet
   Type of Packing? Bub
7. SAMPLE TAGS Present/Absent
8. SAMPLE CONDITION: Intact/ Broken*/ Leaking
   Bottles Sealed In Separate Plastic Bags? Yes/ No
   Correct Containers Used For Tests Indicated? Yes/ No
   Correct Preservative? Yes/ No
   Sufficient Sample? Yes/ No
   Labels Complete (I.D., Date, Time, Signature, Preservative? Yes/ No
   VOA Samples Without Bubbles? Yes/ No~
9. Does Information on Custody Records,Labels,Tags Agree? Yes/ No*
10. RAD SCREEN WITH GIEGER COUNTER? Yes/ No
11. P.O. Called? Yes/ No

Client Sample #	Sample Fraction @	Assigned LAB#	Cooler I.D.	pH Check	ACID/ BASE LOT#	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
BIOM08200031		39322.01	7/9/99	N		4 DEG C
BIOM08200032		39322.02		N		
BIOM08200033		39322.03		N		
BIOM08200033		39322.04		N		
BIOM08200033		39322.05		N		
BIOM08200051		39322.06		N		
BIOM08200052		39322.07		N		
BIOM08200052FD		39322.08		N		
BIOM08200053		39322.09		N		
BIOM08200071		39322.10		N		
BIOM08200072		39322.11		N		
BIOM08200073		39322.12		N		
BIOM08200091		39322.13		N		
BIOM08200092		39322.14		N		
BIOM08200093		39322.15		N		
BIOM08200111		39322.16		N		
BIOM08200112		39322.17		N		
BIOM08200113		39322.18		N		
BIOM08200113FD		39322.19		N		

* Contact PO and attach record of resolution

@ Sample Fractions: B=SV GC/MS, V= VOA GC/MS or GC, P=Pesticide,H=Herbicide, D=Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE
August 27, 1999

CONTRACT : TOLTEST

PROJECT : NSWC CRANE

SDG NO : 39322

EPISODE(S): 39322

EXPLOSIVE FRACTION

This SDG consisted of 17 soil samples with applicable MS and MSD for the explosive analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

CASE SUMMARY:

Blank(s): No problems.

Surrogate(s): No problems.

Matrix Spikes: HMX, RDX, Tetryl, 4ADNT and 2NT were out of the laboratory QC limits in the samples BIOM08200033MS and BIOM08200033MSD. RDX and Tetryl exceeded the RPD limits between these samples.

Laboratory Control Spikes: No problems.

HMX, RDX and TNB exceeded 15%D in the CCAL 1-081715.D. Since this was the ending CCAL, the associated samples were submitted.

4ADNT exceeded 15%D in the CCAL 2-081718.D. With the exception of MS and MSD, this analyte was not reported in any of the associated samples.

Most of the samples in this SDG were diluted further than the regular 2X dilution because of the high concentration of RDX. These dilutions were utilized as original samples for the data package.

Enviroquant software was utilized to process the above samples. The Response Factor in the standard is calculated by dividing the area of each analyte by the concentration of the respective analyte.

Multiplier = (final volume / extracted amount) * dilution.

The following is an example of the calculations for RDX in the quantitation and confirmation column of the undiluted sample BIOM08200052:

[Sample's response (area) / mean calibration factor] * Multiplier = the concentration

(156944023/279800) * 83.33 = 46741 ug/Kg

(66593672/111400) * 83.33 = 49814 ug/Kg

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

The laboratory utilizes the following flags where appropriate: "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out
of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Phuong Vo
LC Analyst

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0709SF	88	0
02	LC0709SF	113	0
03	LD0709SF	104	0
04	BIOMO8200072	92	0
05	BIOMO8200073	95	0
06	BIOMO8200091	84	0
07	BIOMO8200092	86	0
08	BIOMO8200093	70	0
09	BIOMO8200111	70	0
10	BIOMO8200112	70	0
11	BIOMO8200051	71	0
12	BIOMO8200113FD	80	0
13	BIOMO8200052	82	0
14	BIOMO8200052FD	78	0
15	BIOMO8200053	83	0
16	BIOMO8200071	72	0
17	BIOMO8200113	92	0
18	BIOMO8200033MS	61	0
19	BIOMO8200033MSD	66	0
20	BIOMO8200031	114	0
21	BIOMO8200032	96	0
22	BIOMO8200033	86	0
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

LCS Sample NO.: LC0709SF

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	9400	99	57-137
RDX	9500	9730	102	77-113
TNB	9500	9100	96	64-125
DNB	9500	9220	97	82-118
TETRYL	9500	10200	107	23-124
NB	9500	9510	100	69-143
TNT	9500	9620	101	75-118
4ADNT	9500	9630	101	60-140
2ADNT	9500	9010	95	60-140
26DNT	9500	8530	90	78-117
24DNT	9500	9400	99	74-126
2NT	9500	7820	82	78-123
4NT	9500	9350	98	79-125
3NT	9500	9380	99	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

LCS Sample NO.: LD0709SF

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	8680	91	57-137
RDX	9500	8910	94	77-113
TNB	9500	8320	88	64-125
DNB	9500	8560	90	82-118
TETRYL	9500	8920	94	23-124
NB	9500	8800	92	69-143
TNT	9500	8960	94	75-118
4ADNT	9500	8930	94	60-140
2ADNT	9500	8330	88	60-140
26DNT	9500	8380	88	78-117
24DNT	9500	8460	89	74-126
2NT	9500	7660	81	78-123
4NT	9500	8010	84	79-125
3NT	9500	8550	90	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix Spike - Client Sample NO.: BIOMO8200033

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
HMX	9050	0	11000	122	54-128
RDX	9050	21800	26400	51*	66-109
TNB	9050	0	6350	70	57-130
DNB	9050	0	7580	84	74-122
TETRYL	9050	0	0	0*	32-119
NB	9050	0	8000	88	70-135
TNT	9050	0	5780	64	44-124
4ADNT	9050	0	21300	235*	60-140
2ADNT	9050	0	8510	94	60-140
26DNT	9050	0	8080	89	58-125
24DNT	9050	0	7620	84	59-120
2NT	9050	0	6880	76*	79-124
4NT	9050	0	9100	100	74-128
3NT	9050	0	9210	102	79-121

FORM III

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix Spike - Client Sample NO.: BIOMO8200033

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	8640	13800	159 *	22	30	54-128
RDX	8640	41800	232 *	45 *	30	66-109
TNB	8640	7310	84	14	30	57-130
DNB	8640	8580	99	12	45	74-122
TETRYL	8640	109	1 *	200 *	30	32-119
NB	8640	7730	90	3	35	70-135
TNT	8640	5380	62	7	30	44-124
4ADNT	8640	20800	241 *	2	40	60-140
2ADNT	8640	8180	95	4	40	60-140
26DNT	8640	7640	88	6	35	58-125
24DNT	8640	7520	87	1	35	59-120
2NT	8640	6580	76 *	4	35	79-124
4NT	8640	8570	99	6	35	74-128
3NT	8640	8930	103	3	35	79-121

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 2 out of 14 outside limits
Spike Recovery: 9 out of 28 outside limits

Comments: _____

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0709SF

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Lab Sample ID : BL0709SF Lab File ID : 3_081249

Matrix: (soil/water) SOIL

Date Extracted : 07/09/99 Extraction Method : SONC

Date Analyzed (1): 08/14/99 Date Analyzed (2): 07/31/99

Time Analyzed (1): 1126 Time Analyzed (2): 0242

Instrument ID (1): LC3 Instrument ID (2): LC2

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	LC0709SF	LC0709SF	08/14/99	
02	LD0709SF	LD0709SF	08/14/99	
03	BIOMO8200072	39322.11	08/17/99	07/31/99
04	BIOMO8200073	39322.12	08/17/99	07/31/99
05	BIOMO8200091	39322.13	08/17/99	07/31/99
06	BIOMO8200092	39322.14	08/17/99	08/16/99
07	BIOMO8200093	39322.15	08/17/99	08/16/99
08	BIOMO8200111	39322.16	08/17/99	08/16/99
09	BIOMO8200112	39322.17	08/17/99	08/16/99
10	BIOMO8200051	39322.06	08/17/99	08/16/99
11	BIOMO8200113FD	39322.19	08/17/99	08/16/99
12	BIOMO8200052	39322.07	08/17/99	08/16/99
13	BIOMO8200052FD	39322.08	08/17/99	08/16/99
14	BIOMO8200053	39322.09	08/17/99	08/16/99
15	BIOMO8200071	39322.10	08/18/99	07/31/99
16	BIOMO8200113	39322.18	08/18/99	08/16/99
17	BIOMO8200033MS	39322.04MS	08/18/99	
18	BIOMO8200033MSD	39322.05MSD	08/18/99	
19	BIOMO8200031	39322.01	08/17/99	08/16/99
20	BIOMO8200032	39322.02	08/17/99	08/16/99
21	BIOMO8200033	39322.03	08/17/99	08/16/99
22				
23				
24				
25				
26				

Comments:

FORM IV

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOMO8200073

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix: (soil/water) SOIL Lab Sample ID: 39322.12

Sample Amt: 2.0 G % Moisture: 34.3 Date Received: 07/09/99

Extraction Volume: 10 ML Date Extracted: 07/09/99

Extraction Method: SONC Date Analyzed: 08/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	3600	
121-82-4	RDX	12200	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	1120	P
1946-51-0	4ADNT	425	
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	~~250~~	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

7/11/99 JK
25600E

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0817\3_081712.D Vial: 12
Acq On : 17 Aug 1999 18:22 Operator: TLM
Sample : 39322.12 Inst : LC3
Misc : BIOMO8200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 18 9:32 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC3\DATA\3_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0817\
Last Update : Wed Aug 18 09:17:21 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	18.34	62477254	1897.6	m	A
Target Compounds:					
1) HMX	5.96	92230441	3596.6	m	A
2) RDX	8.98	366944805	12169.6	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	19.07	55548852	1124.8	m	A
9) 4ADNT	20.43	20217071	425.0	m	A
10) 2ADNT	21.66	6733818	132.9	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	24.01	407159442	6250.1	m	A
13) 2NT	26.95	773861981	28438.5	mE	A
14) 4NT	29.85	461515936	~~25658~~.1	mE	A
15) 3NT	0.00	0	N.D.		A

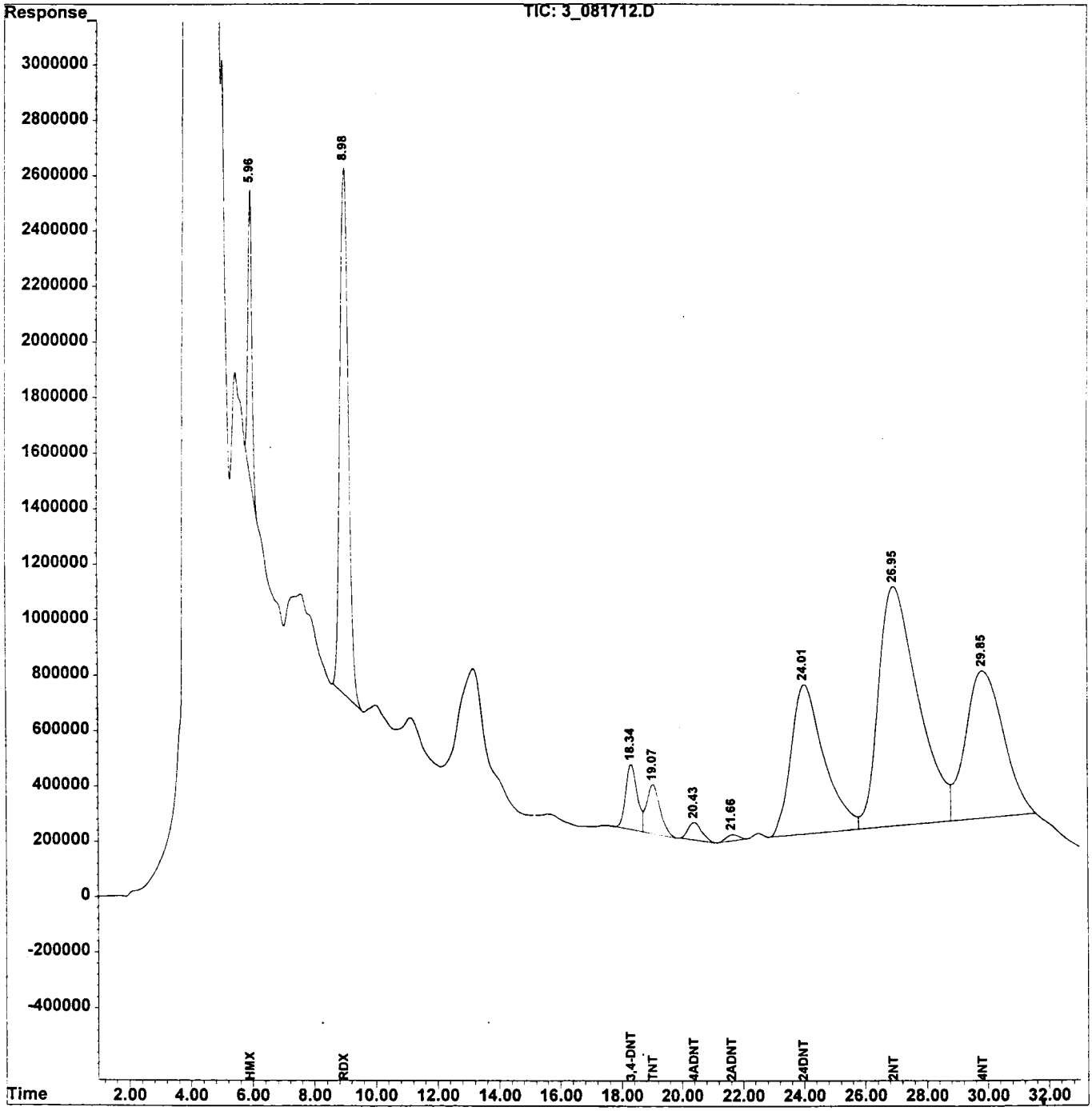
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0817\3_081712.D Vial: 12
Acq On : 17 Aug 1999 18:22 Operator: TLM
Sample : 39322.12 Inst : LC3
Misc : BIOMO8200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 18 9:32 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC3\DATA\3_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0817\
Last Update : Wed Aug 18 09:17:21 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



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Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0730\2_073045.D Vial: 45
Acq On : 31 Jul 1999 08:21 Operator: KG
Sample : 39322.12 Inst : LC2
Misc : BIOMO8200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 2 15:12 1999 Quant Results File: 200SG29C.RES

Method : F:\HPCHEM\LC2\DATA\2_0730\200SG29C.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0729\
Last Update : Sun Aug 01 11:14:08 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.94	48700469	2156.7	m	A
Target Compounds:					
1) A HMX	5.21	19339005	2160.2	m	A
2) B RDX	8.21	143253793	13860.5	m	A
3) A TNB	0.00	0	N.D.	d	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	13.85	3088143	135.2	m	A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.89	17061370	579.1	m	A
9) B 4ADNT	17.20	3614161	337.9	m	A
10) B 2ADNT	17.46	1384228	40.0	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

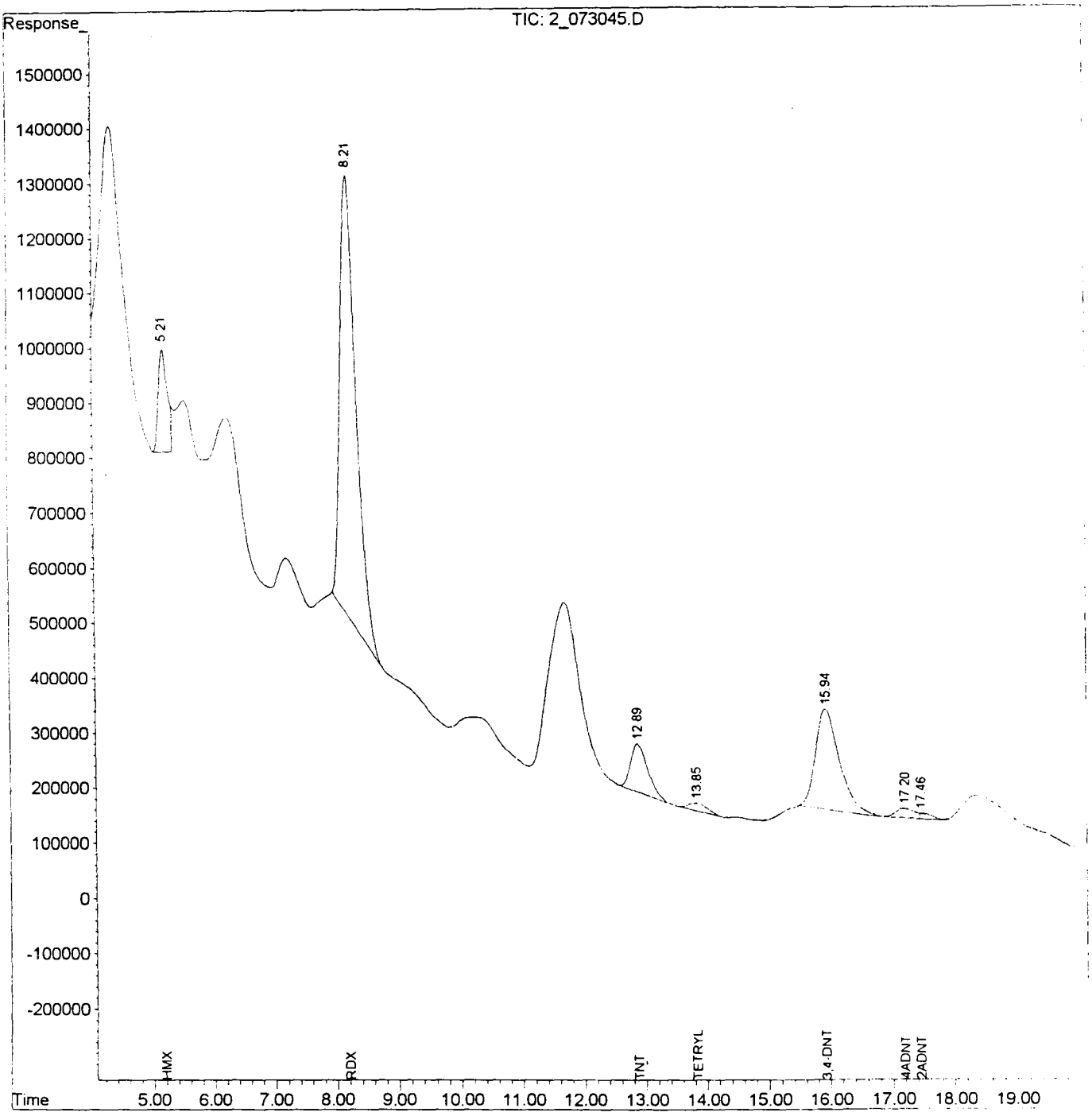
KG 8/2-99

Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0730\2_073045.D Vial: 45
Acq On : 31 Jul 1999 08:21 Operator: KG
Sample : 39322.12 Inst : LC2
Misc : BIOMO8200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 2 15:12 1999 Quant Results File: 200SG29C.RES

Method : F:\HPCHEM\LC2\DATA\2_0730\200SG29C.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0729\
Last Update : Sun Aug 01 11:14:08 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0816\4_081620.D Vial: 20
Acq On : 17-Aug-1999, 02:03:02 Operator: JF
Sample : 39322.12 Inst : LC4
Misc : BIOM08200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 17 11:00 1999 Quant Results File: 200SH16N.RES

Method : F:\HPCHEM\LC4\DATA\4_0816\200SH16N.M
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0816\
Last Update : Tue Aug 17 10:43:15 1999
Response via : Initial Calibration

Volume Inj. : 100uL
Signal Phase : METASIL

	Compound	R.T.	Response	ug/Kg		Curve
Target Compounds:						
1)	2NT	0.00	0	N.D.		A
2)	4NT	23.31	42014013	13201.7	m	A
3)	3NT	0.00	0	N.D.		A

8/17/99

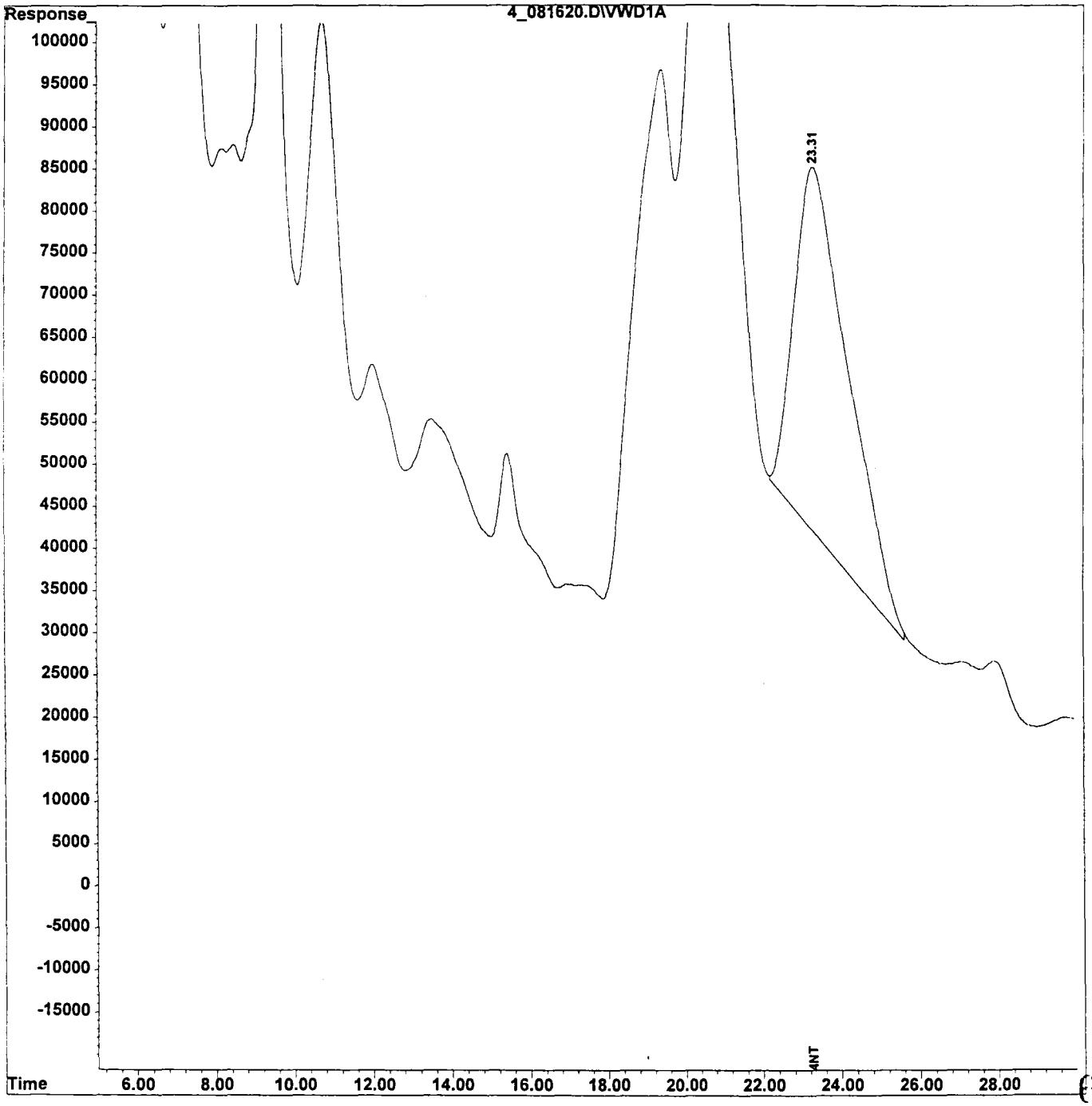
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0816\4_081620.D Vial: 20
Acq On : 17-Aug-1999, 02:03:02 Operator: JF
Sample : 39322.12 Inst : LC4
Misc : BIOM08200073 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Aug 17 11:00 1999 Quant Results File: 200SH16N.RES

Method : F:\HPCHEM\LC4\DATA\4_0816\200SH16N.M
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0816\
Last Update : Tue Aug 17 10:43:15 1999
Response via : Multiple Level Calibration

Volume Inj. : 100uL
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOMO8200052

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix: (soil/water) SOIL Lab Sample ID: 39322.07

Sample Amt: 2.4 G % Moisture: 33.6 Date Received: 07/09/99

Extraction Volume: 10 ML Date Extracted: 07/09/99

Extraction Method: SONC Date Analyzed: 08/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	10600	J
121-82-4	RDX	46700	
99-35-4	TNB	2080	U
99-65-0	DNB	2080	U
479-45-8	TETRYL	5420	U
98-95-3	NB	2170	U
118-96-7	TNT	2080	U
1946-51-0	4ADNT	2080	U
35572-78-2	2ADNT	2080	U
606-20-2	26DNT	2170	U
121-14-2	24DNT	2080	U
88-72-2	2NT	2080	U
99-99-0	4NT	2080	U
99-08-1	3NT	2080	U
Surrogate amount spiked		1666.67	

Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081711.D Vial: 11
Acq On : 17 Aug 1999 21:52 Operator: KG
Sample : 39322.07 Inst : LC2
Misc : BIOMO8200052 Multiplr: 83.3330
IntFile : EVENTS1.E
Quant Time: Aug 18 13:49 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Initial Calibration

AUG 17 1999

Volume Inj. : 200ul
Signal Phase : CARBOSORB

	Compound	R.T.	Response	ug/Kg		Curve
	Surrogates/System Monitoring Compounds:					
7) S	3,4-DNT	15.78	8751937	1373.8	m	A
	Target Compounds:					
1)	HMX	5.17	24847147	10560.5	m	A
2)	RDX	7.79W	156944023	46736.9	m	A
3)	TNB	0.00	0	N.D.		A
4)	DNB	0.00	0	N.D.		A
5)	TETRYL	0.00	0	N.D.		A
6)	NB	0.00	0	N.D.		A
8)	TNT	16.69	4877469	469.9	m	A
9)	4ADNT	16.97	2748585	705.1	m	A
10)	2ADNT	17.87	2155692	218.1	m	A
11)	26DNT	0.00	0	N.D.		A
12)	24DNT	0.00	0	N.D.		A
13)	2NT	0.00	0	N.D.		A
14)	4NT	25.23	1334269	207.0	m	A
15)	3NT	0.00	0	N.D.		A

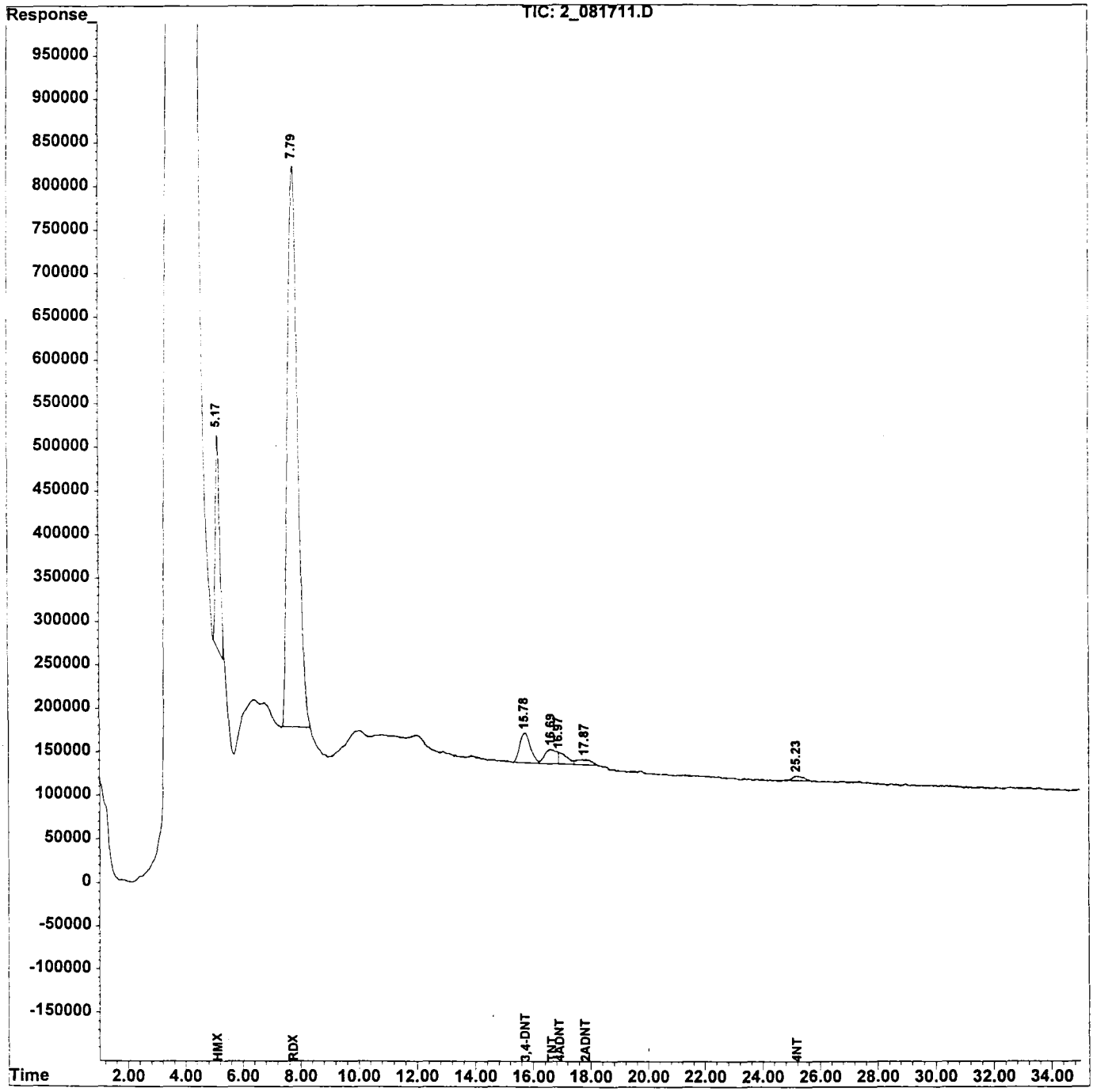
KG 8-19-99

Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081711.D Vial: 11
Acq On : 17 Aug 1999 21:52 Operator: KG
Sample : 39322.07 Inst : LC2
Misc : BIOMO8200052 Multiplr: 83.3330
IntFile : EVENTS1.E
Quant Time: Aug 18 13:49 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



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Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081516.D Vial: 16
Acq On : 16 Aug 1999 18:09 Operator: KG
Sample : 39322.07~~DL~~ Inst : LC2
Misc : BIOM08200052~~DL~~ Multiplr: 83.3330
IntFile : EVENTS.E
Quant Time: Aug 17 8:40 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Initial Calibration

AUG 17 1999

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.50	3739249	1553.0	m	A
Target Compounds:					
1) A HMX	5.13	14505436	14305.2	m	A
2) B RDX	8.05	66593672	49797.4	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.57	1191830	345.4	m	A
9) B 4ADNT	16.90	976839	655.6	m	A
0) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

KG 8-17-99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

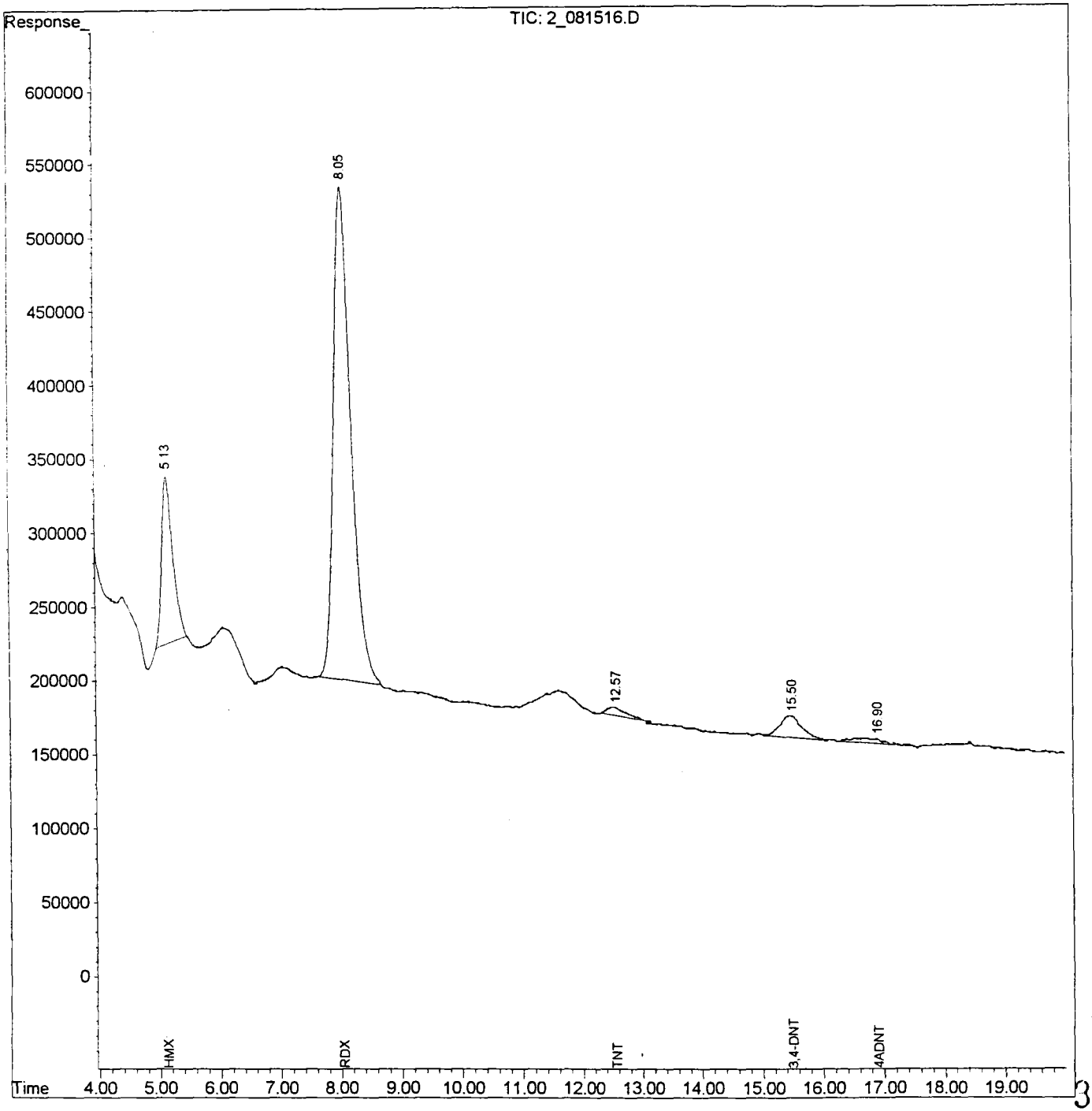
Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081516.D Vial: 16
Acq On : 16 Aug 1999 18:09 Operator: KG
Sample : 39322.07~~DL~~ Inst : LC2
Misc : BIOM08200052~~DL~~ Multiplr: 83.3330
IntFile : EVENTS.E
Quant Time: Aug 17 8:40 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Multiple Level Calibration

AUG 20 1999

Volume Inj. : 100ul
Signal Phase : METASIL



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Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0816\4_081613.D Vial: 13
Acq On : 16-Aug-1999, 22:20:21 Operator: JF
Sample : 39322.07 Inst : LC4
Misc : BIOM08200052 Multiplr: 83.3330
IntFile : EVENTS.E
Quant Time: Aug 17 10:55 1999 Quant Results File: 200SH16N.RES

Method : F:\HPCHEM\LC4\DATA\4_0816\200SH16N.M
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0816\
Last Update : Tue Aug 17 10:43:15 1999
Response via : Initial Calibration

Volume Inj. : 100uL
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Target Compounds:					
1) 2NT	0.00	0	N.D.		A
2) 4NT	0.00	0	N.D.		A
3) 3NT	25.57	758122	1831.8	m	A

8/17/99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

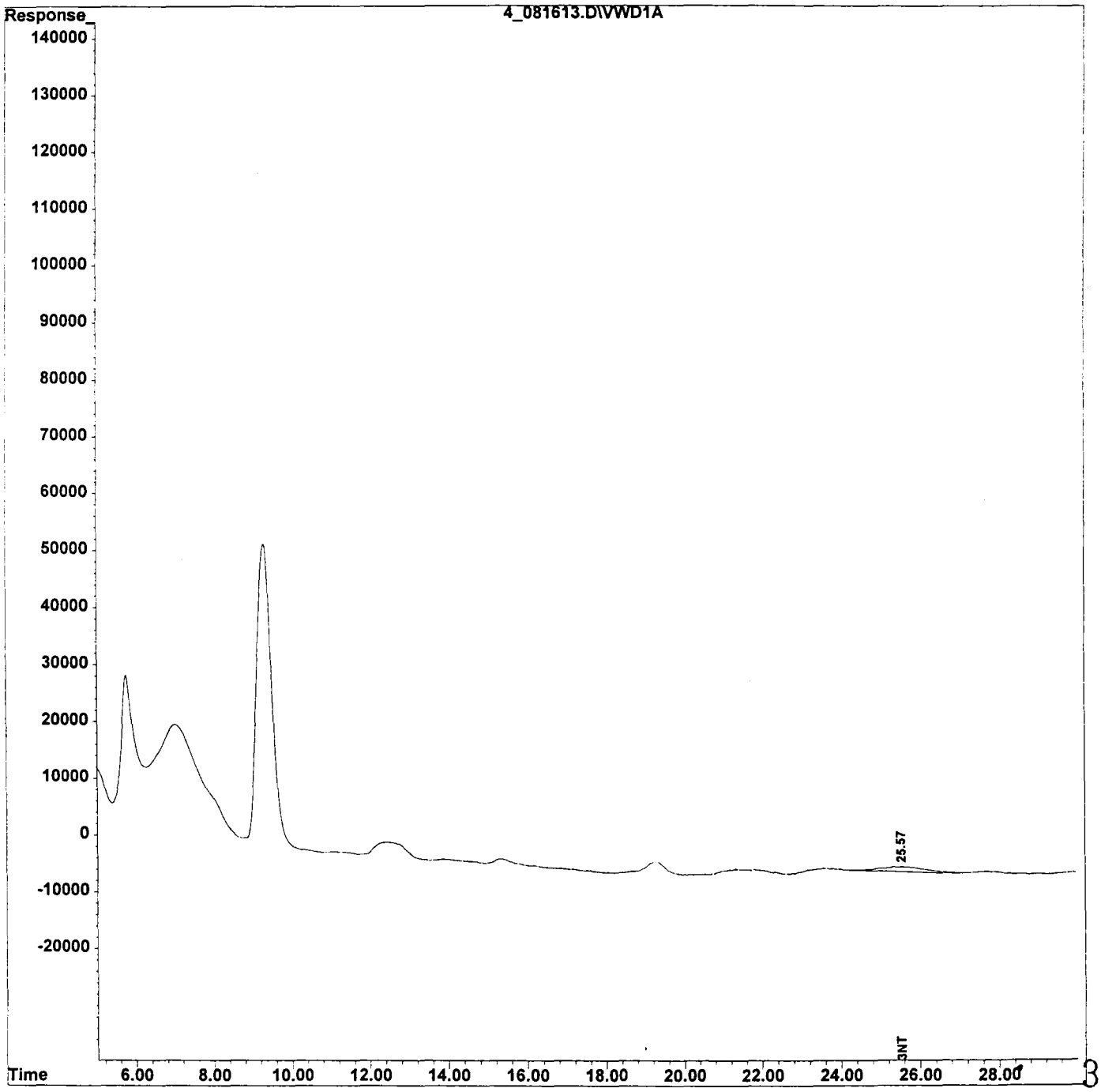
Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0816\4_081613.D Vial: 13
Acq On : 16-Aug-1999, 22:20:21 Operator: JF
Sample : 39322.07 Inst : LC4
Misc : BIOM08200052 Multiplr: 83.3330
IntFile : EVENTS.E
Quant Time: Aug 17 10:55 1999 Quant Results File: 200SH16N.RES

Method : F:\HPCHEM\LC4\DATA\4_0816\200SH16N.M
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0816\
Last Update : Tue Aug 17 10:43:15 1999
Response via : Multiple Level Calibration

AUG 17 1999

Volume Inj. : 100uL
Signal Phase : METASIL



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1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOMO8200052FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix: (soil/water) SOIL Lab Sample ID: 39322.08

Sample Amt: 2.2 G % Moisture: 30.4 Date Received: 07/09/99

Extraction Volume: 10 ML Date Extracted: 07/09/99

Extraction Method: SONC Date Analyzed: 08/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	20000	U
121-82-4	RDX	51100	
99-35-4	TNB	2270	U
99-65-0	DNB	2270	U
479-45-8	TETRYL	5910	U
98-95-3	NB	2360	U
118-96-7	TNT	2270	U
1946-51-0	4ADNT	2270	U
35572-78-2	2ADNT	2270	U
606-20-2	26DNT	2360	U
121-14-2	24DNT	2270	U
88-72-2	2NT	2270	U
99-99-0	4NT	2270	U
99-08-1	3NT	2270	U
Surrogate amount spiked		1818.18	

Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081712.D Vial: 12
Acq On : 17 Aug 1999 22:36 Operator: KG
Sample : 39322.08 Inst : LC2
Misc : BIOMO8200052FD Multiplr: 90.9090
IntFile : EVENTS1.E
Quant Time: Aug 18 13:51 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Initial Calibration

AUG 20 1999

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.86	8264436	1415.2	m	A
Target Compounds:					
1) HMX	5.18	19107374	8859.3	m	A
2) RDX	7.84	157308760	51104.4		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	16.75	5376782	565.2	m	A
9) 4ADNT	17.00	3924044	~~1098.1~~	m	A
10) 2ADNT	18.16	3524062	389.0	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	19.78	1449639	117.4	m	A
13) 2NT	0.00	0	N.D.		A
14) 4NT	25.56	1954619	330.9	m	A
15) 3NT	0.00	0	N.D.		A

08/18/99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

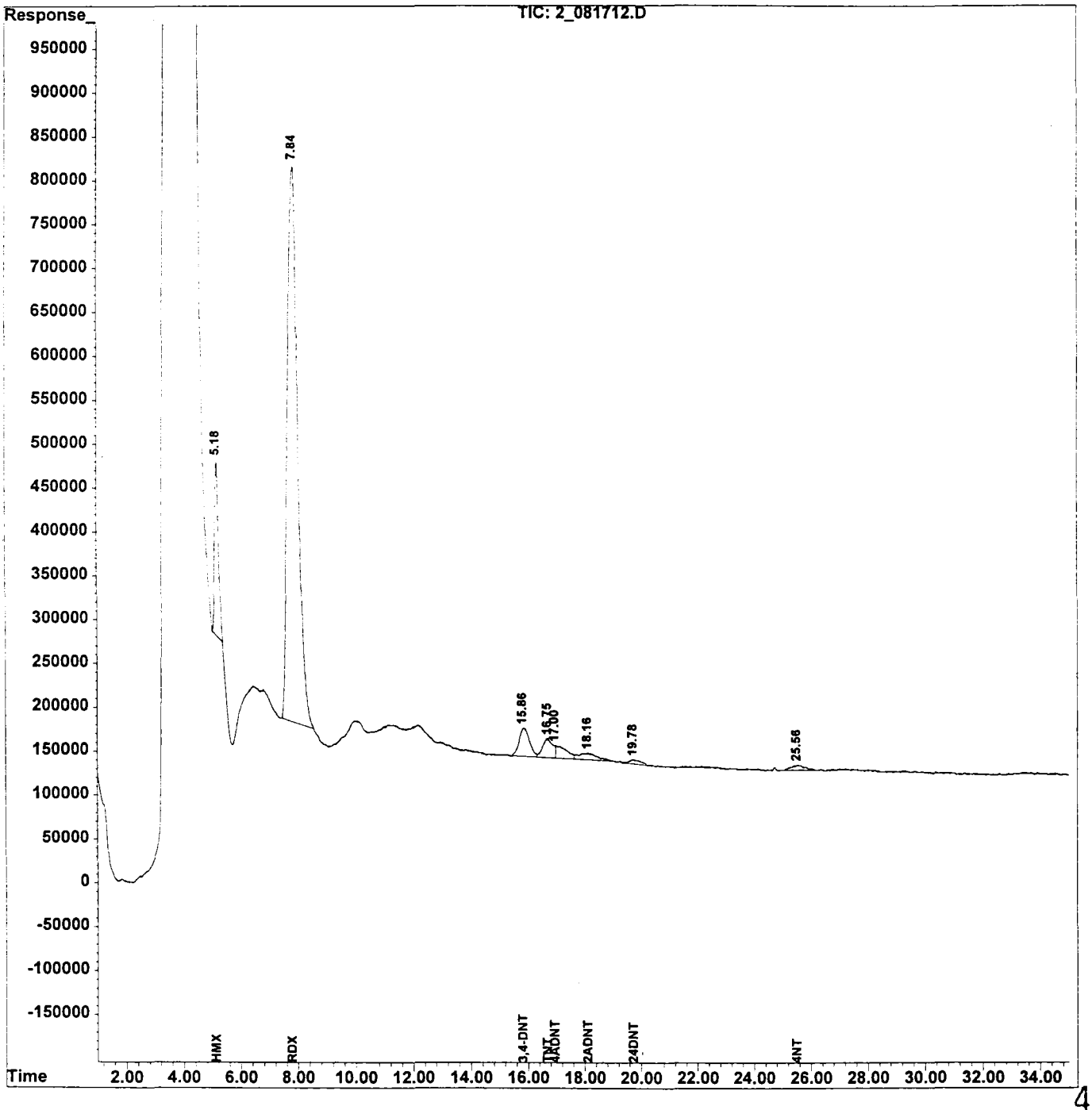
Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081712.D Vial: 12
Acq On : 17 Aug 1999 22:36 Operator: KG
Sample : 39322.08 Inst : LC2
Misc : BIOMO8200052FD Multiplr: 90.9090
IntFile : EVENTS1.E
Quant Time: Aug 18 13:51 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Multiple Level Calibration

AUG 17 1999

Volume Inj. : 200ul
Signal Phase : CARBOSORB



41

Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081517.D Vial: 17
Acq On : 16 Aug 1999 18:37 Operator: KG
Sample : 39322.08DL Inst : LC2
Misc : BIOM08200052FDDL Multiplr: 90.9090
IntFile : EVENTS.E
Quant Time: Aug 17 8:41 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Initial Calibration

AUG 17 1999

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.55	3690353	1672.1	m	A
Target Compounds:					
1) A HMX	5.12	14785359	15906.9	m	A
2) B RDX	8.03	62860092	51278.9		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.57	1790181	565.9	m	A
9) B 4ADNT	16.79	851417	623.4	m	A
0) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

VE 8-17-99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

4

Chromatographic Report

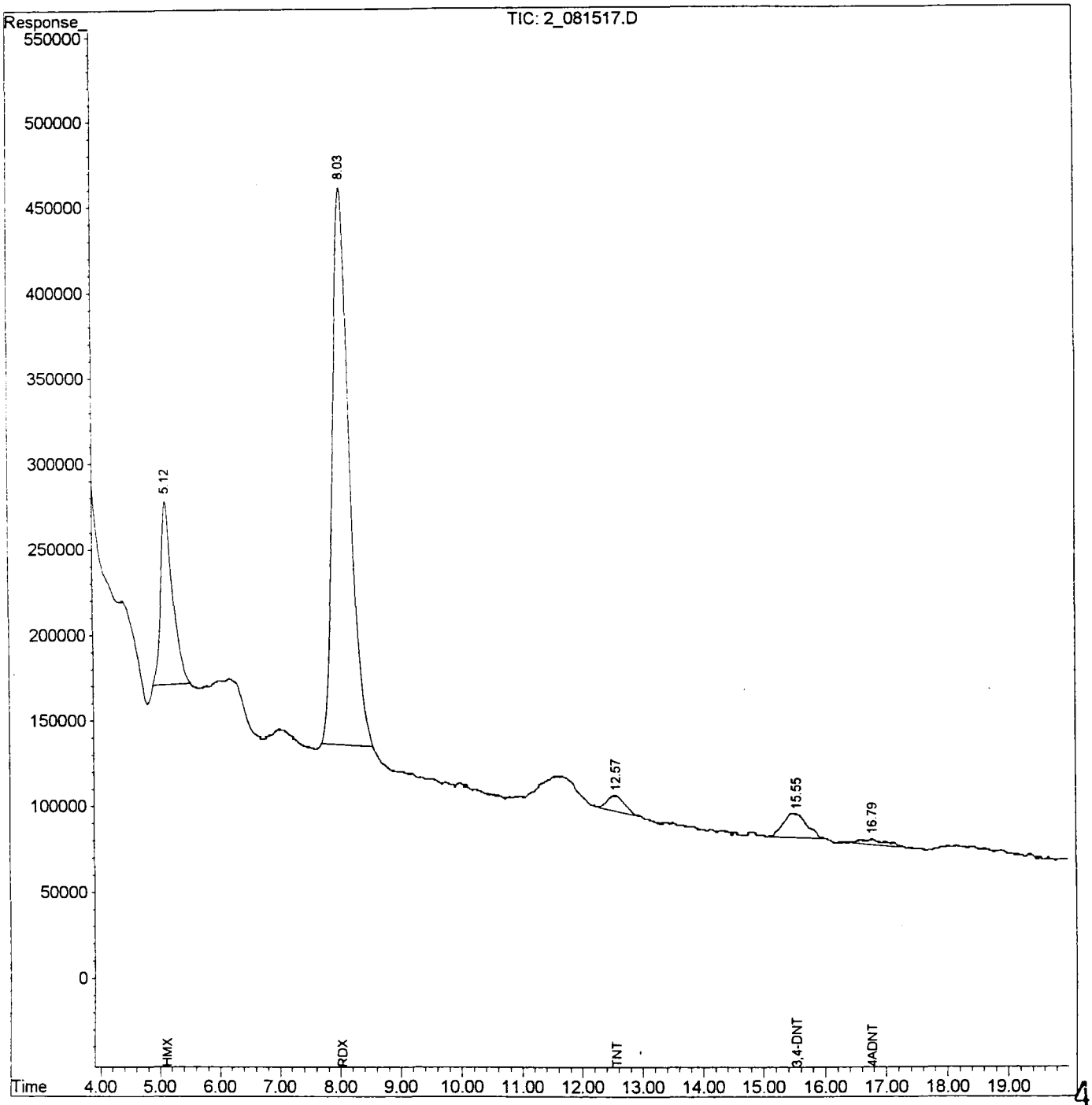
Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081517.D
Acq On : 16 Aug 1999 18:37
Sample : 39322.08DL
Misc : BIOM08200052FDDL
IntFile : EVENTS.E
Quant Time: Aug 17 8:41 1999 Quant Results File: 200H13AC.RES

Vial: 17
Operator: KG
Inst : LC2
Multiplr: 90.9090

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Multiple Level Calibration

AUG 20 1999

Volume Inj. : 100ul
Signal Phase : METASIL



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1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOMO8200113

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix: (soil/water) SOIL Lab Sample ID: 39322.18

Sample Amt: 2.3 G % Moisture: 31.9 Date Received: 07/09/99

Extraction Volume: 10 ML Date Extracted: 07/09/99

Extraction Method: SONC Date Analyzed: 08/18/99

GPC Cleanup: (Y/N) N Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	9960	PJ
121-82-4	RDX	40900	
99-35-4	TNB	2170	U
99-65-0	DNB	2170	U
479-45-8	TETRYL	5650	U
98-95-3	NB	2260	U
118-96-7	TNT	2170	U
1946-51-0	4ADNT	2170	U
35572-78-2	2ADNT	2170	U
606-20-2	26DNT	2260	U
121-14-2	24DNT	2170	U
88-72-2	2NT	2170	U
99-99-0	4NT	2170	U
99-08-1	3NT	2170	U
Surrogate amount spiked		1739.13	

Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081715.D Vial: 15
Acq On : 18 Aug 1999 00:50 Operator: KG
Sample : 39322.18 Inst : LC2
Misc : BIOMO8200113 Multiplr: 86.9560
IntFile : EVENTS1.E
Quant Time: Aug 18 13:57 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Initial Calibration

AUG 18 1999

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.94	9812289	1607.2	m	A
Target Compounds:					
1) HMX	5.18	22450122	9956.6*	m	A
2) RDX	7.85	131623170	40900.7*		A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	16.72	6110218	614.3-	m	A
9) 4ADNT	17.26	1904777	509.9-	m	A
10) 2ADNT	18.28	1153030	121.7-	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	25.74W	2710174	438.8-	m	A
15) 3NT	0.00	0	N.D.		A

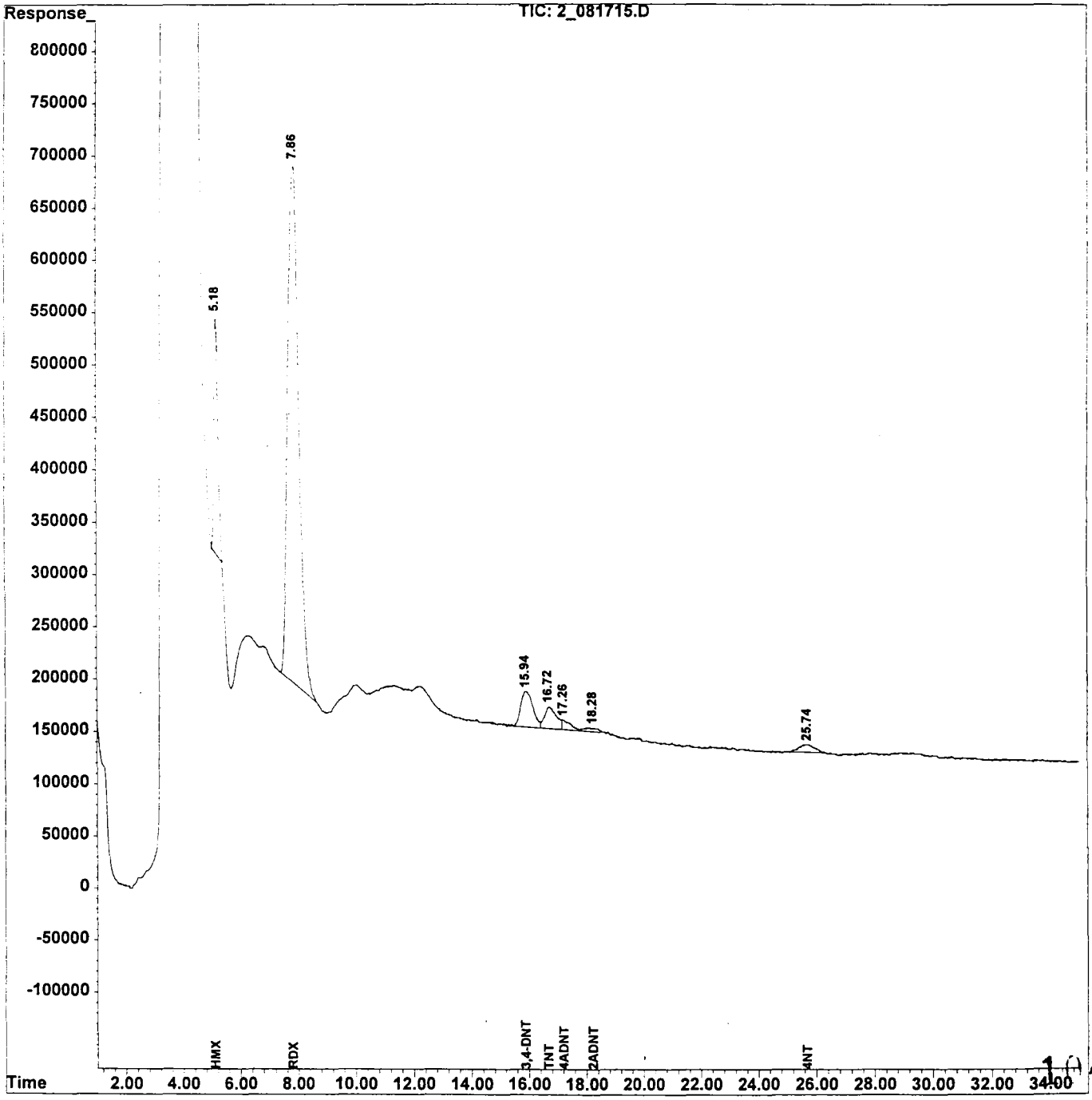
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0817\2_081715.D Vial: 15
Acq On : 18 Aug 1999 00:50 Operator: KG
Sample : 39322.18 Inst : LC2
Misc : BIOMO8200113 Multiplr: 86.9560
IntFile : EVENTS1.E
Quant Time: Aug 18 13:57 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC2\DATA\2_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0817\
Last Update : Wed Aug 18 13:41:11 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081523.D Vial: 23
Acq On : 16 Aug 1999 22:05 Operator: KG
Sample : 39322.18DL Inst : LC2
Misc : BIOM08200113DL Multiplr: 86.9560
IntFile : EVENTS.E
Quant Time: Aug 17 8:59 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Initial Calibration

AUG 18 1999

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.66	3279212	1421.2	m	A
Target Compounds:					
1) A HMX	5.15	17907929	18428.5	m	A
2) B RDX	8.08	51520302	40200.8	m	A
3) A TNB	0.00	0	N.D.	d	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.65	1443660	436.5	m	A
9) B 4ADNT	0.00	0	N.D.		A
0) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

KG 8-17-99

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Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

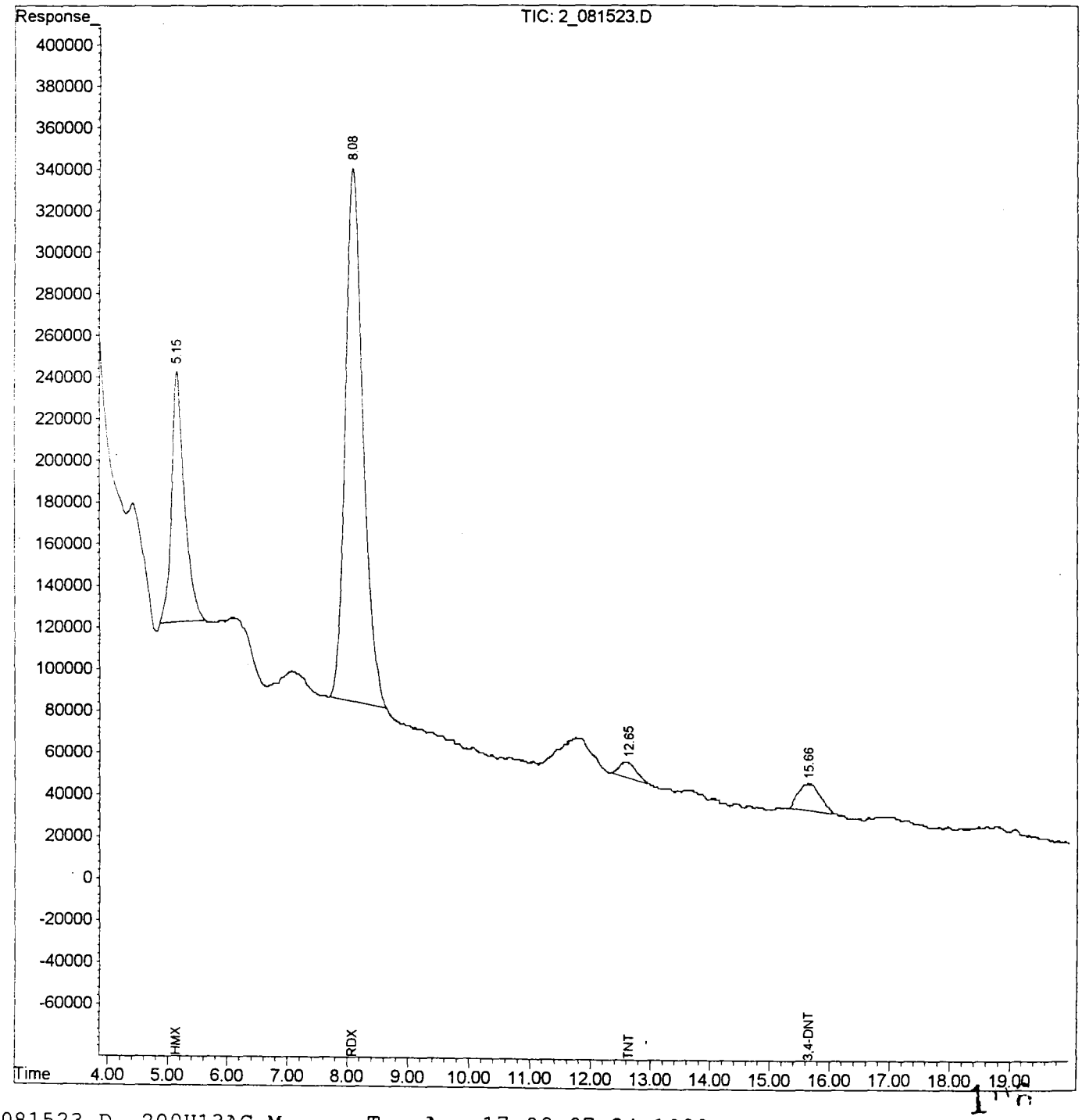
Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081523.D Vial: 23
Acq On : 16 Aug 1999 22:05 Operator: KG
Sample : 39322.18~~DL~~ Inst : LC2
Misc : BIOM08200113~~DL~~ Multiplr: 86.9560
IntFile : EVENTS.E
Quant Time: Aug 17 8:59 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Multiple Level Calibration

AUG 2 0

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOMO8200113FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

Matrix: (soil/water) SOIL Lab Sample ID: 39322.19

Sample Amt: 2.1 G % Moisture: 33 Date Received: 07/09/99

Extraction Volume: 10 ML Date Extracted: 07/09/99

Extraction Method: SONC Date Analyzed: 08/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 40.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	27500	J
121-82-4	RDX	83400	
99-35-4	TNB	4760	U
99-65-0	DNB	4760	U
479-45-8	TETRYL	12400	U
98-95-3	NB	4950	U
118-96-7	TNT	4760	U
1946-51-0	4ADNT	4760	U
35572-78-2	2ADNT	4760	U
606-20-2	26DNT	4950	U
121-14-2	24DNT	4760	U
88-72-2	2NT	4760	U
99-99-0	4NT	4760	U
99-08-1	3NT	4760	U
Surrogate amount spiked		1904.76	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0817\3_081719.D Vial: 19
Acq On : 17 Aug 1999 23:42 Operator: TLM
Sample : 39322.19 Inst : LC3
Misc : BIOMO8200113FD Multiplr: 190.4760
IntFile : EVENTS.E
Quant Time: Aug 18 10:28 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC3\DATA\3_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0817\
Last Update : Wed Aug 18 09:17:21 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

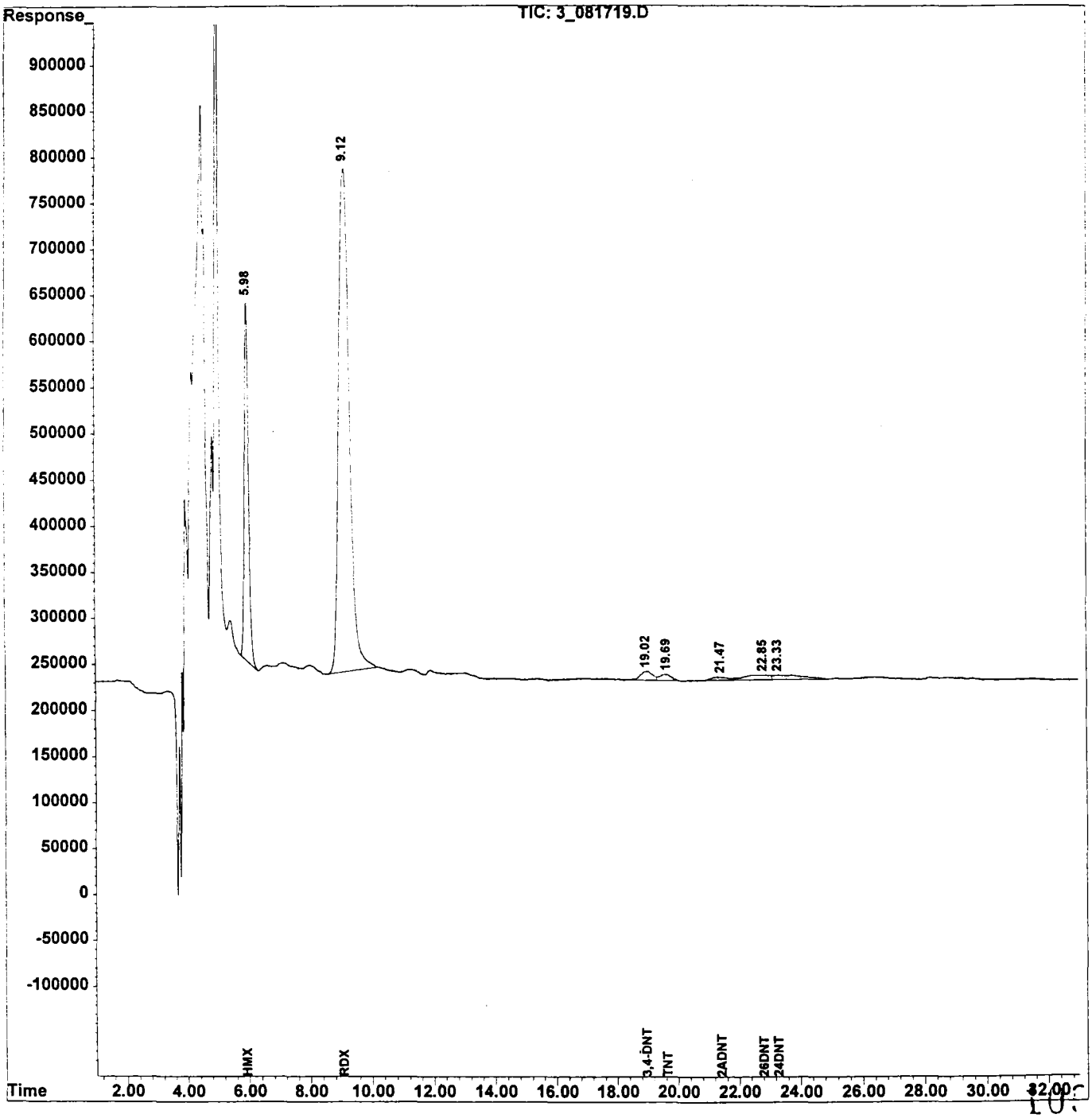
Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	19.02	2627518	1520.1	m	A
Target Compounds:					
1) HMX	5.98W	37027744	27503.2 *	m	A
2) RDX	9.12	131958600	83359.5 *	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	19.69	1740938	~~671.4~~ -	m	A
9) 4ADNT	0.00	0	N.D.		A
10) 2ADNT	21.47	1297307	~~487.6~~ -	m	A
11) 26DNT	22.85	3015501	1488.1 -	m	A
12) 24DNT	23.33	3460224	1011.7 -	m	A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0817\3_081719.D Vial: 19
Acq On : 17 Aug 1999 23:42 Operator: TLM
Sample : 39322.19 Inst : LC3
Misc : BIOMO8200113FD Multiplr: 190.4760
IntFile : EVENTS.E
Quant Time: Aug 18 10:28 1999 Quant Results File: 200SH17.RES

Method : F:\HPCHEM\LC3\DATA\3_0817\200SH17.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0817\
Last Update : Wed Aug 18 09:17:21 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081524.D Vial: 24
Acq On : 16 Aug 1999 22:34 Operator: KG
Sample : 39322.19DL Inst : LC2
Misc : BIOM08200113FDDL Multiplr: 190.4760
IntFile : EVENTS.E
Quant Time: Aug 17 9:02 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	15.64	1231253	1168.9	m	A
Target Compounds:					
1) A HMX	5.14	12643372	28500.3	m	A
2) B RDX	8.08	47428256	81065.1	m	A
3) A TNB	0.00	0	N.D.	d	A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	12.58	894042	592.2	m	A
9) B 4ADNT	0.00	0	N.D.		A
10) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

KG 8-17-99

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Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

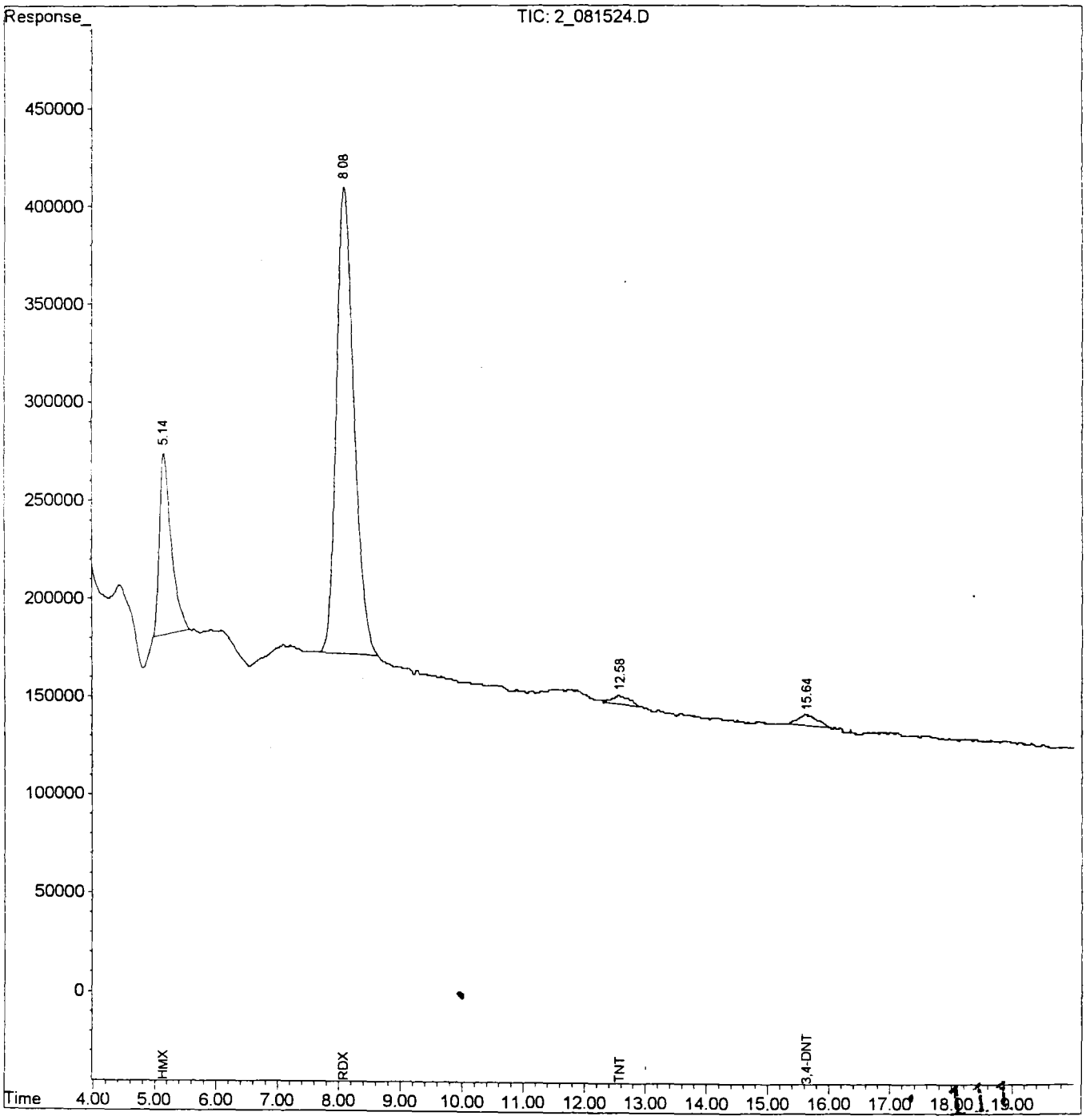
Chromatographic Report

Data File : F:\HPCHEM\LC2\DATA\2_0815\2_081524.D Vial: 24
Acq On : 16 Aug 1999 22:34 Operator: KG
Sample : 39322.19DL Inst : LC2
Misc : BIOM08200113FDDL Multiplr: 190.4760
IntFile : EVENTS.E
Quant Time: Aug 17 9:02 1999 Quant Results File: 200H13AC.RES

Method : F:\HPCHEM\LC2\DATA\2_0815\200H13AC.M
Title-Path : - F:\HPCHEM\LC2\DATA\2_0813\
Last Update : Tue Aug 17 08:26:59 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

2 0 1999



6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2

LC Column: METASIL Date(s) Analyzed: 08/13/99 08/13/99

Method: 200H13AC

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	77436343	86284815	88066351
RDX	101051580	106172042	116387347
TNB	263644130	267351064	278236297
DNB	373476475	408506920	421872129
TETRYL	207222978	216679107	219223292
NB	309587380	323934152	338194084
TNT	289072826	287499387	290059464
4ADNT	115840554	117853617	137867406
2ADNT	366097020	391915534	375314446
26DNT	195386180	201189344	208574904
24DNT	385206240	400821428	405505342
3,4-DNT	203087682	199508252	202660675

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	87074003	83636120	84499526	5.06
RDX	116015932	117576174	111440615	6.64
TNB	278732771	272278215	272048496	2.44
DNB	414488932	417064429	407081777	4.76
TETRYL	219054721	214631255	215362270	2.29
NB	337786846	336431511	329186795	3.78
TNT	291284915	279920779	287567474	1.56
4ADNT	117286603	131967371	124163110	8.10
2ADNT	393001452	376189257	380503542	3.05
26DNT	211151206	204972095	204254746	3.05
24DNT	401710681	403134930	399275724	2.02
3,4-DNT	201820718	196130871	200641640	1.43
MEAN RSD				3.68

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200H13AC

LC Column: METASIL Init. Calib Date(s): 08/13/99 08/13/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 08/16/99 : 08/16/99

Lab Sample IDs : L3A 6-158 : L3B 6-163 Time Analyzed : 1047 : 1115

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.16	5.08	5.18	83458222	84499526	1.2
RDX	8.08	7.98	8.20	113099415	111440615	-1.5
TNB	8.16	8.05	8.19	268790178	272048496	1.2
DNB	10.53	10.40	10.68	410207541	407081777	-0.8
TETRYL	13.35	12.97	13.47	210118674	215362270	2.4
NB	12.12	11.95	12.31	333779963	329186795	-1.4
TNT	12.65	12.40	12.74	283763936	287567474	1.3
4ADNT	16.90	16.45	17.31	121528177	124163110	2.1
2ADNT	17.18	16.72	17.60	373727958	380503542	1.8
26DNT	16.38	15.86	16.54	201827262	204254746	1.2
24DNT	15.69	15.39	15.97	392990509	399275724	1.6
3,4-DNT	15.70	15.17	15.87	193942930	200641640	3.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200H13AC

LC Column: METASIL Init. Calib Date(s): 08/13/99 08/13/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 08/16/99 : 08/16/99

Lab Sample IDs : L3A 6-158 : L3B 6-163 Time Analyzed : 1644 : 1713

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.11	5.08	5.18	86647659	84499526	-2.5
RDX	8.03	7.98	8.20	113644168	111440615	-2.0
TNB	8.10	8.05	8.19	269891525	272048496	0.8
DNB	10.47	10.40	10.68	414256419	407081777	-1.8
TETRYL	13.13	12.97	13.47	214323486	215362270	0.5
NB	12.03	11.95	12.31	333856168	329186795	-1.4
TNT	12.51	12.40	12.74	276426542	287567474	3.9
4ADNT	16.61	16.45	17.31	125518806	124163110	-1.1
2ADNT	16.88	16.72	17.60	380354923	380503542	0.0
26DNT	16.10	15.86	16.54	203928656	204254746	0.2
24DNT	15.52	15.39	15.97	396223998	399275724	0.8
3,4-DNT	15.42	15.17	15.87	193821915	200641640	3.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200H13AC

LC Column: METASIL Init. Calib Date(s): 08/13/99 08/13/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 08/16/99 : 08/16/99

Lab Sample IDs : L3A 6-158 : L3B 6-163 Time Analyzed : 2302 : 2330

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.15	5.08	5.18	86284417	84499526	-2.1
RDX	8.13	7.98	8.20	112534007	111440615	-1.0
TNB	8.15	8.05	8.19	270172605	272048496	0.7
DNB	10.59	10.40	10.68	416569297	407081777	-2.3
TETRYL	13.35	12.97	13.47	213114290	215362270	1.0
NB	12.18	11.95	12.31	334027620	329186795	-1.5
TNT	12.65	12.40	12.74	282749429	287567474	1.7
4ADNT	16.96	16.45	17.31	113014598	124163110	9.0
2ADNT	17.27	16.72	17.60	393853381	380503542	-3.5
26DNT	16.38	15.86	16.54	207688432	204254746	-1.7
24DNT	15.76	15.39	15.97	401855968	399275724	-0.6
3,4-DNT	15.71	15.17	15.87	194276742	200641640	3.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 08/13/99 08/13/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.14	5.12	5.13	5.13	5.12
RDX	8.06	8.09	8.11	8.13	8.12
TNB	8.12	8.10	8.12	8.14	8.09
DNB	10.49	10.56	10.56	10.60	10.58
TETRYL	13.21	13.14	13.23	13.21	13.17
NB	12.07	12.15	12.15	12.20	12.17
TNT	12.56	12.51	12.58	12.56	12.53
4ADNT	16.76	16.92	16.94	17.00	17.00
2ADNT	17.06	17.24	17.20	17.31	17.27
26DNT	16.15	16.11	16.21	16.16	16.13
24DNT	15.59	15.74	15.71	15.79	15.76
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	15.48	15.42	15.52	15.49	15.45

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	5.16	0.00	5.11	0.00	5.15
RDX	0.00	8.08	0.00	8.03	0.00
TNB	8.16	0.00	8.10	0.00	8.14
DNB	0.00	10.53	0.00	10.47	0.00
TETRYL	13.34	0.00	13.13	0.00	13.35
NB	0.00	12.12	0.00	12.03	0.00
TNT	12.65	0.00	12.51	0.00	12.65
4ADNT	0.00	16.90	0.00	16.61	0.00
2ADNT	0.00	17.18	0.00	16.88	0.00
26DNT	16.38	0.00	16.10	0.00	16.38
24DNT	0.00	15.69	0.00	15.52	0.00
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	15.70	0.00	15.42	0.00	15.71

COMPOUND	RT CCAL 6
HMX	0.00
RDX	8.13
TNB	0.00
DNB	10.59

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 08/13/99 08/13/99

COMPOUND	RT CCAL 6
TETRYL	0.00
NB	12.18
TNT	0.00
4ADNT	16.96
2ADNT	17.27
26DNT	0.00
24DNT	15.76
2NT	0.00
4NT	0.00
3NT	0.00
3,4-DNT	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.13	0.017	0.051	5.08 - 5.18
RDX	8.09	0.035	0.106	7.98 - 8.20
TNB	8.12	0.024	0.073	8.05 - 8.19
DNB	10.54	0.047	0.142	10.40 - 10.68
TETRYL	13.22	0.083	0.250	12.97 - 13.47
NB	12.13	0.059	0.177	11.95 - 12.31
TNT	12.57	0.056	0.168	12.40 - 12.74
4ADNT	16.88	0.142	0.427	16.45 - 17.31
2ADNT	17.16	0.148	0.444	16.72 - 17.60
26DNT	16.20	0.115	0.344	15.86 - 16.54
24DNT	15.68	0.097	0.292	15.39 - 15.97
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	15.52	0.117	0.351	15.17 - 15.87

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: METASIL Init. Calib. Date(s): 08/13/99 08/13/99

Instrument ID: LC2

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.52

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	08/13/99	1714	0.00	*
02	EXPL1A	L1A 6-160	08/13/99	1810	15.48	
03	EXPL2A	L2A 6-159	08/13/99	1838	15.42	
04	EXPL3A	L3A 6-158	08/13/99	1907	15.52	
05	EXPL4A	L4A 6-157	08/13/99	1935	15.49	
06	EXPL5A	L5A 6-156	08/13/99	2003	15.45	
07	EXPL1B	L1B 6-165	08/13/99	2031	0.00	*
08	EXPL2B	L2B 6-164	08/13/99	2100	0.00	*
09	EXPL3B	L3B 6-163	08/13/99	2128	0.00	*
10	EXPL4B	L4B 6-162	08/13/99	2156	0.00	*
11	EXPL5B	L5B 6-161	08/13/99	2225	0.00	*
12	EXPL3A	L3A 6-158	08/16/99	1047	15.70	
13	EXPL3B	L3B 6-163	08/16/99	1115	0.00	*
14	BIOM08200031	39322.01	08/16/99	1519	15.44	
15	BIOM08200032	39322.02	08/16/99	1548	15.46	
16	BIOM08200033	39322.03	08/16/99	1616	15.46	
17	EXPL3A	L3A 6-158	08/16/99	1644	15.42	
18	EXPL3B	L3B 6-163	08/16/99	1713	0.00	*
19	BIOM08200051	39322.06	08/16/99	1741	15.46	
20	BIOM08200052	39322.07	08/16/99	1809	15.50	
21	BIOM08200052FD	39322.08	08/16/99	1837	15.55	
22	BIOM08200053	39322.09	08/16/99	1906	15.55	
23	BIOM08200092	39322.14	08/16/99	2012	15.58	
24	BIOM08200093	39322.15	08/16/99	2041	15.62	
25	BIOM08200111	39322.16	08/16/99	2109	15.64	
26	BIOM08200112	39322.17	08/16/99	2137	15.74	
27	BIOM08200113	39322.18	08/16/99	2205	15.66	
28	BIOM08200113FD	39322.19	08/16/99	2234	15.64	
29	EXPL3A	L3A 6-158	08/16/99	2302	15.71	
30	EXPL3B	L3B 6-163	08/16/99	2330	0.00	*
31						
32						

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 08/13/99 08/13/99

Method: 200SH12

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	267473080	272992594	265762200
RDX	232342333	268558704	284282354
TNB	574550421	636538359	656377117
DNB	799886400	788914280	765345735
TETRYL	323910225	311564036	307903336
NB	406222921	375097158	379894884
TNT	550416188	536500388	531245113
4ADNT	469550929	459628943	444664960
2ADNT	550897643	540711157	585565911
26DNT	390936176	396078244	388040274
24DNT	666961087	662321304	651431954
2NT	322112576	285362121	280358653
4NT	241103200	181973550	193363301
3NT	249967350	253197930	240434761
3,4-DNT	347718741	328731524	334756249

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	262878720	261530839	266127487	1.69
RDX	286461303	287824268	271893792	8.62
TNB	656968741	650677102	635022348	5.48
DNB	760226674	760456765	774965971	2.36
TETRYL	299874512	300859915	308822405	3.15
NB	380131614	377640888	383797493	3.31
TNT	521642352	522534211	532467650	2.21
4ADNT	440882276	441549642	451255350	2.83
2ADNT	529203929	531757519	547627232	4.17
26DNT	383613465	382916061	388316844	1.40
24DNT	648821177	654795757	656866256	1.15
2NT	281103567	277667977	289320979	6.41
4NT	182262303	179616902	195663851	13.26
3NT	238738421	235693651	243606423	3.10
3,4-DNT	363767647	333356976	341666227	4.16
MEAN RSD				4.22

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC3 Method: 200SH12

LC Column: CARBOSORB Init. Calib Date(s): 08/13/99 08/13/99

Client Sample No.: EXPL3 Date Analyzed : 08/14/99

Lab Sample ID : L3 6-153 Time Analyzed : 0827

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.64	5.59	5.69	265056366	266127487	0.4
RDX	8.21	8.09	8.35	278155464	271893792	-2.3
TNB	10.99	10.84	11.18	642663412	635022348	-1.2
DNB	13.31	13.07	13.59	763997397	774965971	1.4
TETRYL	14.13	13.79	14.47	300812762	308822405	2.6
NB	15.08	14.71	15.35	383118160	383797493	0.2
TNT	17.04	16.66	17.36	510796466	532467650	4.1
4ADNT	17.73	17.06	18.28	439933653	451255350	2.5
2ADNT	18.72	18.04	19.30	519753908	547627232	5.1
26DNT	19.74	19.19	20.23	379473585	388316844	2.3
24DNT	20.46	19.87	20.97	645388228	656866256	1.7
2NT	23.86	23.21	24.45	270041498	289320979	6.7
4NT	25.47	24.75	26.13	172753941	195663851	11.7
3NT	27.43	26.71	28.13	243880552	243606423	-0.1
3,4-DNT	16.09	15.65	16.45	334315381	341666227	2.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC3 Method: 200SH12

LC Column: CARBOSORB Init. Calib Date(s): 08/13/99 08/13/99

Client Sample No.: EXPL3 Date Analyzed : 08/14/99

Lab Sample ID : L3 6-153 Time Analyzed : 1957

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.68	5.59	5.69	268748964	266127487	-1.0
RDX	8.32	8.09	8.35	303529286	271893792	-11.6
TNB	11.13	10.84	11.18	650881476	635022348	-2.5
DNB	13.51	13.07	13.59	759978127	774965971	1.9
TETRYL	14.38	13.79	14.47	267737700	308822405	13.3
NB	15.25	14.71	15.35	374583107	383797493	2.4
TNT	17.24	16.66	17.36	505525450	532467650	5.1
4ADNT	18.11	17.06	18.28	439957565	451255350	2.5
2ADNT	19.12	18.04	19.30	535771550	547627232	2.2
26DNT	20.06	19.19	20.23	386560320	388316844	0.5
24DNT	20.80	19.87	20.97	631470000	656866256	3.9
2NT	24.26	23.21	24.45	275754598	289320979	4.7
4NT	25.93	24.75	26.13	184891259	195663851	5.5
3NT	27.91	26.71	28.13	239627707	243606423	1.6
3,4-DNT	16.33	15.65	16.45	326787277	341666227	4.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/13/99 08/13/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.64	5.64	5.64	5.64	5.64
RDX	8.21	8.20	8.20	8.22	8.19
TNB	10.96	10.97	11.05	11.00	10.97
DNB	13.26	13.27	13.35	13.31	13.28
TETRYL	14.04	14.06	14.14	14.10	14.08
NB	14.93	14.97	15.04	15.00	14.97
TNT	16.91	16.91	17.01	17.02	16.93
4ADNT	17.49	17.54	17.64	17.65	17.57
2ADNT	18.52	18.53	18.63	18.64	18.56
26DNT	19.55	19.57	19.76	19.69	19.60
24DNT	20.26	20.29	20.46	20.40	20.31
2NT	23.66	23.67	23.86	23.79	23.72
4NT	25.29	25.27	25.45	25.38	25.30
3NT	27.24	27.24	27.48	27.34	27.28
3,4-DNT	15.94	15.95	16.03	16.05	15.97

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	5.64	5.68
RDX	8.21	8.32
TNB	10.99	11.12
DNB	13.31	13.51
TETRYL	14.13	14.38
NB	15.08	15.25
TNT	17.04	17.24
4ADNT	17.72	18.10
2ADNT	18.72	19.12
26DNT	19.74	20.06
24DNT	20.46	20.80
2NT	23.86	24.26
4NT	25.47	25.93
3NT	27.43	27.91
3,4-DNT	16.09	16.33

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.64	0.016	0.049	5.59 - 5.69
RDX	8.22	0.045	0.134	8.09 - 8.35
TNB	11.01	0.058	0.173	10.84 - 11.18
DNB	13.33	0.086	0.259	13.07 - 13.59

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/13/99 08/13/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	14.13	0.115	0.344	13.78 - 14.47
NB	15.03	0.107	0.322	14.71 - 15.35
TNT	17.01	0.116	0.347	16.66 - 17.36
4ADNT	17.67	0.203	0.610	17.06 - 18.28
2ADNT	18.67	0.209	0.627	18.04 - 19.30
26DNT	19.71	0.175	0.525	19.18 - 20.23
24DNT	20.42	0.184	0.551	19.87 - 20.97
2NT	23.83	0.206	0.618	23.21 - 24.45
4NT	25.44	0.229	0.688	24.75 - 26.13
3NT	27.42	0.236	0.708	26.71 - 28.13
3,4-DNT	16.05	0.135	0.404	15.64 - 16.45

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: CARBOSORB Init. Calib. Date(s): 08/13/99 08/13/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 16.05

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	08/12/99	2358	0.00 *
02	EXPL1	L1 6-166	08/13/99	0127	15.94
03	EXPL2	L2 6-134	08/13/99	0212	15.95
04	EXPL3	L3 6-153	08/13/99	0256	16.03
05	EXPL4	L4 6-147	08/13/99	0341	16.05
06	EXPL5	L5 6-131	08/13/99	0426	15.97
07	EXPL3	L3 6-153	08/14/99	0827	16.09
08	BL0709SF	BL0709SF	08/14/99	1126	16.07
09	LC0709SF	LC0709SF	08/14/99	1210	16.01
10	LD0709SF	LD0709SF	08/14/99	1255	16.06
11	EXPL3	L3 6-153	08/14/99	1957	16.33
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2

LC Column: METASIL Date(s) Analyzed: 07/28/99 07/28/99

Method: 200SG29C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	95821186	86635733	88425800
RDX	85287660	91362460	109100980
TNB	257815391	276085185	283155147
DNB	313345225	326860490	392966766
TETRYL	228497411	227257346	230582456
NB	242854120	256784573	312591143
TNT	304064217	293396902	295376739
4ADNT	112749043	95060991	110550800
2ADNT	282621840	314522860	369272065
26DNT	215249320	208664385	212274474
24DNT	314936320	322481824	382437056
3,4-DNT	208750576	208019712	208023544

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	88929893	87802555	89523034	4.05
RDX	113635892	117384067	103354212	13.73
TNB	282172392	281450417	276135706	3.84
DNB	398259757	409495367	368185521	12.10
TETRYL	229264543	226123237	228344999	0.76
NB	316639172	326873372	291148476	13.19
TNT	291356628	288905776	294620052	1.97
4ADNT	109079703	107377058	106963519	6.49
2ADNT	376079338	387372959	345973812	13.06
26DNT	208941633	209572958	210940554	1.33
24DNT	383409632	392431456	359139258	10.36
3,4-DNT	206174387	205118717	207217387	0.73
MEAN RSD				6.80

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200SG29C

LC Column: METASIL Init. Calib Date(s): 07/28/99 07/28/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/30/99 : 07/30/99

Lab Sample IDs : L3A 6-93 : L3B 6-87 Time Analyzed : 2256 : 2324

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.18	5.11	5.25	87270639	89523034	2.5
RDX	8.16	7.99	8.33	109626808	103354212	-6.1
TNB	8.22	8.15	8.31	278631047	276135706	-0.9
DNB	10.62	10.45	10.81	392050505	368185521	-6.5
TETRYL	13.52	13.21	13.83	223250729	228344999	2.2
NB	12.18	11.95	12.41	315383203	291148476	-8.3
TNT	12.80	12.62	13.00	296146037	294620052	-0.5
4ADNT	17.03	16.48	17.54	118242985	106963519	-10.5
2ADNT	17.32	16.76	17.86	359165174	345973812	-3.8
26DNT	16.47	16.04	16.86	209332823	210940554	0.8
24DNT	15.82	15.52	16.18	379631958	359139258	-5.7
3,4-DNT	15.77	15.35	16.17	206708810	207217387	0.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200SG29C

LC Column: METASIL Init. Calib Date(s): 07/28/99 07/28/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/31/99 : 07/31/99

Lab Sample IDs : L3A 6-93 : L3B 6-87 Time Analyzed : 0435 : 0503

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.22	5.11	5.25	86545665	89523034	3.3
RDX	8.27	7.99	8.33	110390844	103354212	-6.8
TNB	8.28	8.15	8.31	283376852	276135706	-2.6
DNB	10.74	10.45	10.81	393033195	368185521	-6.7
TETRYL	13.72	13.21	13.83	226245199	228344999	0.9
NB	12.33	11.95	12.41	315232092	291148476	-8.3
TNT	12.93	12.62	13.00	299374966	294620052	-1.6
4ADNT	17.38	16.48	17.54	118282235	106963519	-10.6
2ADNT	17.68	16.76	17.86	358969657	345973812	-3.8
26DNT	16.71	16.04	16.86	214694316	210940554	-1.8
24DNT	16.06	15.52	16.18	382647339	359139258	-6.5
3,4-DNT	16.02	15.35	16.17	208085214	207217387	-0.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200SG29C

LC Column: METASIL Init. Calib Date(s): 07/28/99 07/28/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/31/99 : 07/31/99

Lab Sample IDs : L3A 6-93 : L3B 6-87 Time Analyzed : 1014 : 1043

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.20	5.11	5.25	86562165	89523034	3.3
RDX	8.22	7.99	8.33	111358439	103354212	-7.7
TNB	8.25	8.15	8.31	280207303	276135706	-1.5
DNB	10.69	10.45	10.81	398762559	368185521	-8.3
TETRYL	13.62	13.21	13.83	225271105	228344999	1.3
NB	12.27	11.95	12.41	314841772	291148476	-8.1
TNT	12.87	12.62	13.00	296343094	294620052	-0.6
4ADNT	17.16	16.48	17.54	115556871	106963519	-8.0
2ADNT	17.46	16.76	17.86	367200550	345973812	-6.1
26DNT	16.59	16.04	16.86	211533578	210940554	-0.3
24DNT	15.95	15.52	16.18	384042442	359139258	-6.9
3,4-DNT	15.90	15.35	16.17	206935904	207217387	0.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 07/28/99 07/28/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.16	5.18	5.18	5.18	5.15
RDX	8.09	8.13	8.17	8.15	8.15
TNB	8.20	8.23	8.24	8.23	8.20
DNB	10.54	10.60	10.64	10.64	10.62
TETRYL	13.45	13.47	13.52	13.45	13.41
NB	12.07	12.15	12.20	12.20	12.17
TNT	12.75	12.78	12.82	12.77	12.74
4ADNT	16.81	16.95	16.98	17.02	16.92
2ADNT	17.08	17.27	17.27	17.33	17.23
26DNT	16.37	16.38	16.44	16.35	16.31
24DNT	15.69	15.82	15.86	15.89	15.82
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	15.69	15.68	15.74	15.65	15.61

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	5.18	0.00	5.22	0.00	5.20
RDX	0.00	8.16	0.00	8.27	0.00
TNB	8.22	0.00	8.28	0.00	8.25
DNB	0.00	10.62	0.00	10.74	0.00
TETRYL	13.52	0.00	13.72	0.00	13.62
NB	0.00	12.18	0.00	12.33	0.00
TNT	12.80	0.00	12.93	0.00	12.87
4ADNT	0.00	17.02	0.00	17.38	0.00
2ADNT	0.00	17.32	0.00	17.68	0.00
26DNT	16.47	0.00	16.71	0.00	16.59
24DNT	0.00	15.82	0.00	16.06	0.00
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	15.77	0.00	16.02	0.00	15.90

COMPOUND	RT CCAL 6
HMX	0.00
RDX	8.22
TNB	0.00
DNB	10.69

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: METASIL Date(s) ICAL Analyzed: 07/28/99 07/28/99

COMPOUND	RT CCAL 6
TETRYL	0.00
NB	12.26
TNT	0.00
4ADNT	17.16
2ADNT	17.46
26DNT	0.00
24DNT	15.95
2NT	0.00
4NT	0.00
3NT	0.00
3,4-DNT	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.18	0.022	0.065	5.11 - 5.24
RDX	8.16	0.055	0.165	7.99 - 8.32
TNB	8.23	0.026	0.079	8.15 - 8.31
DNB	10.63	0.060	0.180	10.45 - 10.81
TETRYL	13.52	0.103	0.309	13.21 - 13.83
NB	12.18	0.078	0.234	11.95 - 12.41
TNT	12.81	0.065	0.194	12.62 - 13.00
4ADNT	17.01	0.178	0.533	16.48 - 17.54
2ADNT	17.31	0.183	0.548	16.76 - 17.86
26DNT	16.45	0.136	0.407	16.04 - 16.86
24DNT	15.85	0.111	0.333	15.52 - 16.18
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	15.76	0.138	0.414	15.34 - 16.17

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: METASIL Init. Calib. Date(s): 07/28/99 07/28/99

Instrument ID: LC2

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.76

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	07/28/99	1242	0.00	*
02	EXPL1A	L1A 6-95	07/28/99	1338	15.69	
03	EXPL2A	L2A 6-94	07/28/99	1406	15.68	
04	EXPL3A	L3A 6-93	07/28/99	1435	15.74	
05	EXPL4A	L4A 6-92	07/28/99	1503	15.65	
06	EXPL5A	L5A 6-91	07/28/99	1531	15.61	
07	EXPL1B	L1B 6-85	07/28/99	1600	0.00	*
08	EXPL2B	L2B 6-86	07/28/99	1628	0.00	*
09	EXPL3B	L3B 6-87	07/28/99	1656	0.00	*
10	EXPL4B	L4B 6-88	07/28/99	1724	0.00	*
11	EXPL5B	L5B 6-89	07/28/99	1753	0.00	*
12	EXPL3A	L3A 6-93	07/30/99	2256	15.77	
13	EXPL3B	L3B 6-87	07/30/99	2324	0.00	*
14	BL0709SF	BL0709SF	07/31/99	0242	15.96	
15	EXPL3A	L3A 6-93	07/31/99	0435	16.02	
16	EXPL3B	L3B 6-87	07/31/99	0503	0.00	*
17	BIOMO8200071	39322.10	07/31/99	0725	15.93	
18	BIOMO8200072	39322.11	07/31/99	0753	15.95	
19	BIOMO8200073	39322.12	07/31/99	0821	15.94	
20	BIOMO8200091	39322.13	07/31/99	0850	15.83	
21	EXPL3A	L3A 6-93	07/31/99	1014	15.90	
22	EXPL3B	L3B 6-87	07/31/99	1043	0.00	*
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 08/17/99 08/17/99

Method: 200SH17

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	73752029	70202078	72067609
RDX	67497833	81703167	88301010
TNB	180416789	214274032	206428313
DNB	321937900	286949080	287433506
TETRYL	141201577	133202892	111603623
NB	210997030	206658901	189070193
TNT	196457125	186040413	178925187
4ADNT	160166214	174056000	143835420
2ADNT	215595429	220486114	202725561
26DNT	150988571	136158395	136387136
24DNT	301208188	267863652	267039951
2NT	130075303	123760152	132816554
4NT	111069600	109994440	96429946
3NT	126351950	122617080	122817523
3,4-DNT	149543537	138692041	131291499

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	68677931	68039640	70547858	3.36
RDX	85924936	86289974	81943384	10.28
TNB	197666724	196873393	199131850	6.35
DNB	266580760	267129425	286006134	7.87
TETRYL	103234493	103045372	118457591	14.93
NB	176332499	175895478	191790820	8.60
TNT	171383520	170575057	180676260	5.99
4ADNT	131040146	131402536	148100063	12.67
2ADNT	188744676	189922424	203494841	7.11
26DNT	127229102	128064088	135765458	7.03
24DNT	254042487	256517662	269334388	7.00
2NT	128358418	130253157	129052717	2.60
4NT	92736283	95839688	101213991	8.53
3NT	119286055	121064124	122427346	2.13
3,4-DNT	120598407	120376547	132100406	9.41
MEAN RSD				7.59

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC1 Method: 200SH17

LC Column: CARBOSORB Init. Calib Date(s): 08/17/99 08/17/99

Client Sample No.: EXPL3 Date Analyzed : 08/18/99

Lab Sample ID : L3 6-176 Time Analyzed : 0006

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.89	4.83	4.91	84075787	70547858	-19.2*
RDX	7.54	7.37	7.59	102230406	81943384	-24.8*
TNB	10.32	10.16	10.36	240202231	199131850	-20.6*
DNB	12.70	12.48	12.76	317480515	286006134	-11.0
TETRYL	13.75	13.51	13.81	120788127	118457591	-2.0
NB	14.64	14.41	14.69	200831850	191790820	-4.7
TNT	16.62	16.41	16.67	207678387	180676260	-14.9
4ADNT	17.42	17.00	17.50	161901639	148100063	-9.3
2ADNT	18.23	17.77	18.33	227504355	203494841	-11.8
26DNT	19.63	19.32	19.70	155821469	135765458	-14.8
24DNT	20.21	19.90	20.28	303977382	269334388	-12.9
2NT	24.16	23.88	24.22	146697768	129052717	-13.7
4NT	25.83	25.46	25.94	106224814	101213991	-5.0
3NT	27.85	27.54	27.94	134996164	122427346	-10.3
3,4-DNT	16.11	15.83	16.17	146123511	132100406	-10.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.88	4.88	4.87	4.86	4.86
RDX	7.49	7.48	7.46	7.44	7.45
TNB	10.28	10.26	10.25	10.22	10.24
DNB	12.64	12.60	12.60	12.57	12.60
TETRYL	13.67	13.66	13.66	13.60	13.64
NB	14.54	14.52	14.55	14.51	14.54
TNT	16.53	16.52	16.54	16.49	16.54
4ADNT	17.21	17.21	17.24	17.19	17.24
2ADNT	18.06	17.98	18.03	17.98	18.03
26DNT	19.47	19.47	19.51	19.46	19.51
24DNT	20.07	20.05	20.08	20.03	20.08
2NT	24.04	24.00	24.05	24.01	24.05
4NT	25.60	25.64	25.73	25.67	25.72
3NT	27.69	27.66	27.77	27.72	27.77
3,4-DNT	15.99	15.97	16.01	15.95	16.00

COMPOUND	RT CCAL 1
HMX	4.89
RDX	7.54
TNB	10.32
DNB	12.70
TETRYL	13.75
NB	14.64
TNT	16.62
4ADNT	17.42
2ADNT	18.23
26DNT	19.63
24DNT	20.21
2NT	24.16
4NT	25.83
3NT	27.85
3,4-DNT	16.11

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.87	0.013	0.038	4.83 - 4.91
RDX	7.48	0.036	0.109	7.37 - 7.59
TNB	10.26	0.035	0.105	10.16 - 10.36
DNB	12.62	0.046	0.137	12.48 - 12.76

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.66	0.049	0.148	13.51 - 13.81
NB	14.55	0.046	0.139	14.41 - 14.69
TNT	16.54	0.043	0.130	16.41 - 16.67
4ADNT	17.25	0.085	0.254	17.00 - 17.50
2ADNT	18.05	0.093	0.279	17.77 - 18.33
26DNT	19.51	0.063	0.190	19.32 - 19.70
24DNT	20.09	0.064	0.191	19.90 - 20.28
2NT	24.05	0.057	0.171	23.88 - 24.22
4NT	25.70	0.081	0.243	25.46 - 25.94
3NT	27.74	0.068	0.204	27.54 - 27.94
3,4-DNT	16.00	0.056	0.168	15.83 - 16.17

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: CARBOSORB Init. Calib. Date(s): 08/17/99 08/17/99

Instrument ID: LC1

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 16.00

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	08/17/99	1511	0.00 *
02	EXPL1	L1 6-178	08/17/99	1641	15.99
03	EXPL2	L2 6-177	08/17/99	1739	15.97
04	EXPL3	L3 6-176	08/17/99	1824	16.01
05	EXPL4	L4 6-175	08/17/99	2023	15.95
06	EXPL5	L5 6-174	08/17/99	2107	16.00
07	BIOMO8200031	39322.01	08/17/99	2152	16.03
08	BIOMO8200032	39322.02	08/17/99	2237	16.05
09	BIOMO8200033	39322.03	08/17/99	2322	16.00
10	EXPL3	L3 6-176	08/18/99	0006	16.11
11					
12					
13					
14					
15					
16					
17					
18					
19					
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32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2

LC Column: CARBOSORB Date(s) Analyzed: 08/17/99 08/17/99

Method: 200SH17

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	168893166	190983497	206802854
RDX	224212333	279269933	296966888
TNB	620451947	642985473	696400645
DNB	1034721800	1024505780	1040337582
TETRYL	373198559	376578892	385765962
NB	878327030	863272990	873408775
TNT	937152750	808228963	863815724
4ADNT	323703857	370716429	304255526
2ADNT	878377429	785346986	815511946
26DNT	465055882	451372134	453699686
24DNT	1111091159	1086157551	1140447465
2NT	619857424	606942832	624486847
4NT	534648500	525422336	544946167
3NT	575718850	609959955	635397926
3,4-DNT	538000952	520533497	530468549

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	205641356	208020311	196068237	8.51
RDX	292050511	306674074	279834748	11.66
TNB	686523221	706851369	670642531	5.53
DNB	1027527851	1070240846	1039466772	1.76
TETRYL	378573122	399732076	382769722	2.75
NB	865577721	902592527	876635809	1.79
TNT	855327546	859934476	864891892	5.35
4ADNT	299994467	325640776	324862211	8.63
2ADNT	806260739	832645855	823628591	4.25
26DNT	443843045	464788998	455751949	2.00
24DNT	1124783642	1150825695	1122661102	2.26
2NT	617088174	630705881	619816232	1.43
4NT	533816148	546846087	537135848	1.64
3NT	620762671	643343629	617036606	4.29
3,4-DNT	524670357	540763114	530887294	1.62
MEAN RSD				4.23

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC2 Method: 200SH17

LC Column: CARBOSORB Init. Calib Date(s): 08/17/99 08/17/99

Client Sample No.: EXPL3 Date Analyzed : 08/18/99

Lab Sample ID : L3 6-178 Time Analyzed : 0304

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.19	5.12	5.54	207075811	196068237	-5.6
RDX	7.85	7.78	8.06	301126454	279834748	-7.6
TNB	10.70	10.59	10.77	709424751	670642531	-5.8
DNB	13.03	12.81	13.15	1061989223	1039466772	-2.2
TETRYL	13.91	13.64	14.06	396949175	382769722	-3.7
NB	14.83	14.60	14.94	893207042	876635809	-1.9
TNT	16.77	16.55	16.89	758245495	864891892	12.3
4ADNT	17.14	16.79	17.33	467340551	324862211	-43.9*
2ADNT	18.29	17.53	18.51	833444550	823628591	-1.2
26DNT	19.53	19.03	19.73	466793312	455751949	-2.4
24DNT	20.22	19.63	20.43	1151974154	1122661102	-2.6
2NT	23.84	23.27	24.03	625726134	619816232	-1.0
4NT	25.49	24.75	25.71	535530219	537135848	0.3
3NT	27.50	26.67	27.75	630522640	617036606	-2.2
3,4-DNT	15.95	15.60	16.14	536651531	530887294	-1.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.36	5.37	5.35	5.35	5.37
RDX	7.98	7.95	7.91	7.90	7.90
TNB	10.70	10.71	10.67	10.64	10.65
DNB	13.02	13.02	12.96	12.91	12.91
TETRYL	13.90	13.91	13.82	13.78	13.76
NB	14.82	14.82	14.74	14.72	14.70
TNT	16.76	16.79	16.70	16.66	16.66
4ADNT	17.16	17.11	17.04	16.97	16.95
2ADNT	18.10	18.07	17.95	17.88	17.85
26DNT	19.46	19.44	19.33	19.26	19.24
24DNT	20.10	20.10	19.98	19.90	19.88
2NT	23.67	23.73	23.61	23.52	23.52
4NT	25.27	25.31	25.18	25.07	25.07
3NT	27.27	27.29	27.15	27.03	27.03
3,4-DNT	15.94	15.95	15.82	15.78	15.76

COMPOUND	RT CCAL 1
HMX	5.19
RDX	7.85
TNB	10.70
DNB	13.03
TETRYL	13.91
NB	14.83
TNT	16.77
4ADNT	17.14
2ADNT	18.29
26DNT	19.53
24DNT	20.22
2NT	23.84
4NT	25.49
3NT	27.50
3,4-DNT	15.95

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.33	0.070	0.210	5.12 - 5.54
RDX	7.92	0.045	0.136	7.78 - 8.06
TNB	10.68	0.029	0.088	10.59 - 10.77
DNB	12.98	0.056	0.169	12.81 - 13.15

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC2

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.85	0.069	0.206	13.64 - 14.06
NB	14.77	0.058	0.174	14.60 - 14.94
TNT	16.72	0.058	0.173	16.55 - 16.89
4ADNT	17.06	0.089	0.267	16.79 - 17.33
2ADNT	18.02	0.164	0.493	17.53 - 18.51
26DNT	19.38	0.117	0.352	19.03 - 19.73
24DNT	20.03	0.133	0.398	19.63 - 20.43
2NT	23.65	0.125	0.375	23.27 - 24.02
4NT	25.23	0.161	0.482	24.75 - 25.71
3NT	27.21	0.180	0.541	26.67 - 27.75
3,4-DNT	15.87	0.090	0.270	15.60 - 16.14

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: CARBOSORB Init. Calib. Date(s): 08/17/99 08/17/99

Instrument ID: LC2

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.87

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	08/17/99	1400	0.00 *
02	EXPL1	L1 6-178	08/17/99	1516	15.94
03	EXPL2	L2 6-177	08/17/99	1553	15.95
04	EXPL3	L3 6-178	08/17/99	1631	15.82
05	EXPL4	L4 6-175	08/17/99	1709	15.78
06	EXPL5	L5 6-174	08/17/99	2107	15.76
07	BIOMO8200052	39322.07	08/17/99	2152	15.78
08	BIOMO8200052FD	39322.08	08/17/99	2236	15.86
09	BIOMO8200053	39322.09	08/17/99	2321	15.98
10	BIOMO8200071	39322.10	08/18/99	0006	16.08
11	BIOMO8200113	39322.18	08/18/99	0050	15.94
12	BIOMO8200033MS	39322.04MS	08/18/99	0135	16.05
13	BIOMO8200033MSD	39322.05MSD	08/18/99	0219	15.99
14	EXPL3	L3 6-178	08/18/99	0304	15.95
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC4

LC Column: METASIL Date(s) Analyzed: 08/16/99 08/16/99

Method: 200SH16N

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	0	0	0
RDX	0	0	0
TNB	0	0	0
DNB	0	0	0
TETRYL	0	0	0
NB	0	0	0
TNT	0	0	0
4ADNT	0	0	0
2ADNT	0	0	0
26DNT	0	0	0
24DNT	0	0	0
2NT	29633860	26062704	26747099
4NT	27820960	31370012	31386634
3NT	32483280	32646424	33291572
3,4-DNT	0	0	0

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	0	0	0	0.00
RDX	0	0	0	0.00
TNB	0	0	0	0.00
DNB	0	0	0	0.00
TETRYL	0	0	0	0.00
NB	0	0	0	0.00
TNT	0	0	0	0.00
4ADNT	0	0	0	0.00
2ADNT	0	0	0	0.00
26DNT	0	0	0	0.00
24DNT	0	0	0	0.00
2NT	31533559	29899425	28775329	7.98
4NT	33584733	34961540	31824776	8.51
3NT	37175758	36846748	34488756	6.74
3,4-DNT	0	0	34488756	0.00
MEAN RSD				7.74

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC4 Method: 200SH16N

LC Column: METASIL Init. Calib Date(s): 08/16/99 08/16/99

Client Sample No.: EXPL3NT Date Analyzed : 08/17/99

Lab Sample ID : L3 6-181 Time Analyzed : 0059

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
2NT	23.61	21.90	24.26	28109888	28775329	2.3
4NT	24.06	22.21	24.73	33588941	31824776	-5.5
3NT	26.10	24.12	26.84	34883805	34488756	-1.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC4 Method: 200SH16N

LC Column: METASIL Init. Calib Date(s): 08/16/99 08/16/99

Client Sample No.: EXPL3NT Date Analyzed : 08/17/99

Lab Sample ID : L3 6-181 Time Analyzed : 0721

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
2NT	23.67	21.90	24.26	28441384	28775329	1.2
4NT	24.09	22.21	24.73	28554048	31824776	10.3
3NT	26.16	24.12	26.84	32684574	34488756	5.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

8D

EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: METASIL Init. Calib. Date(s): 08/16/99 08/16/99

Instrument ID: LC4

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 0.00

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	08/16/99	1558	0.00
02	EXPL1NT	L1 6-179	08/16/99	1629	0.00
03	EXPL2NT	L2 6-180	08/16/99	1733	0.00
04	EXPL3NT	L3 6-181	08/16/99	1805	0.00
05	EXPL4NT	L4 6-182	08/16/99	1837	0.00
06	EXPL5NT	L5 6-183	08/16/99	1909	0.00
07	BL0709SF	BL0709SF	08/16/99	1941	0.00
08	BIOM08200051	39322.06	08/16/99	2148	0.00
09	BIOM08200052	39322.07	08/16/99	2220	0.00
10	BIOM08200072	39322.11	08/17/99	0027	0.00
11	EXPL3NT	L3 6-181	08/17/99	0059	0.00
12	BIOM08200073	39322.12	08/17/99	0203	0.00
13	BIOM08200091	39322.13	08/17/99	0234	0.00
14	BIOM08200092	39322.14	08/17/99	0306	0.00
15	BIOM08200093	39322.15	08/17/99	0338	0.00
16	BIOM08200111	39322.16	08/17/99	0410	0.00
17	BIOM08200112	39322.17	08/17/99	0442	0.00
18	EXPL3NT	L3 6-181	08/17/99	0721	0.00
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC4

LC Column: METASIL Date(s) ICAL Analyzed: 08/16/99 08/16/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.00	0.00	0.00	0.00	0.00
RDX	0.00	0.00	0.00	0.00	0.00
TNB	0.00	0.00	0.00	0.00	0.00
DNB	0.00	0.00	0.00	0.00	0.00
TETRYL	0.00	0.00	0.00	0.00	0.00
NB	0.00	0.00	0.00	0.00	0.00
TNT	0.00	0.00	0.00	0.00	0.00
4ADNT	0.00	0.00	0.00	0.00	0.00
2ADNT	0.00	0.00	0.00	0.00	0.00
26DNT	0.00	0.00	0.00	0.00	0.00
24DNT	0.00	0.00	0.00	0.00	0.00
2NT	22.74	22.80	22.86	22.86	23.02
4NT	23.13	23.16	23.24	23.25	23.36
3NT	25.11	25.14	25.22	25.24	25.39
3,4-DNT	0.00	0.00	0.00	0.00	0.00

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	0.00	0.00
RDX	0.00	0.00
TNB	0.00	0.00
DNB	0.00	0.00
TETRYL	0.00	0.00
NB	0.00	0.00
TNT	0.00	0.00
4ADNT	0.00	0.00
2ADNT	0.00	0.00
26DNT	0.00	0.00
24DNT	0.00	0.00
2NT	23.61	23.67
4NT	24.06	24.09
3NT	26.10	26.16
3,4-DNT	0.00	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	0.00	0.000	0.000	0.00 - 0.00
RDX	0.00	0.000	0.000	0.00 - 0.00
TNB	0.00	0.000	0.000	0.00 - 0.00
DNB	0.00	0.000	0.000	0.00 - 0.00

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC4

LC Column: METASIL Date(s) ICAL Analyzed: 08/16/99 08/16/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	0.00	0.000	0.000	0.00 - 0.00
NB	0.00	0.000	0.000	0.00 - 0.00
TNT	0.00	0.000	0.000	0.00 - 0.00
4ADNT	0.00	0.000	0.000	0.00 - 0.00
2ADNT	0.00	0.000	0.000	0.00 - 0.00
26DNT	0.00	0.000	0.000	0.00 - 0.00
24DNT	0.00	0.000	0.000	0.00 - 0.00
2NT	23.08	0.392	1.177	21.90 - 24.26
4NT	23.47	0.420	1.260	22.21 - 24.73
3NT	25.48	0.453	1.360	24.12 - 26.84
3,4-DNT	0.00	0.000	0.000	0.00 - 0.00

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 08/17/99 08/17/99

Method: 200SH17

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	237839265	255394930	264419045
RDX	309835583	319545367	300036651
TNB	593678789	609171042	645175687
DNB	688498200	765773060	750407873
TETRYL	302473739	321758414	312930294
NB	389088812	402357683	379602592
TNT	500393250	500422925	484870251
4ADNT	505560357	474185714	468668392
2ADNT	497756000	514398943	507495934
26DNT	392819664	382401689	385172904
24DNT	612586087	690418971	651674410
2NT	251936313	277874909	275375325
4NT	175921850	186439600	176684715
3NT	275493850	238934500	235329625
3,4-DNT	311699184	343644891	333807929

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	263912462	260628141	256438769	4.29
RDX	290371521	287834905	301524805	4.41
TNB	640391630	640570879	625797606	3.67
DNB	794406596	753655025	750548151	5.17
TETRYL	308497837	307579329	310647923	2.33
NB	380777292	381226286	386610533	2.48
TNT	491098967	492569985	493871076	1.34
4ADNT	465347943	464884032	475729288	3.59
2ADNT	508822326	505209744	506736589	1.19
26DNT	384761101	384761729	385983418	1.03
24DNT	650368274	652149708	651439490	4.23
2NT	277383656	278017166	272117474	4.16
4NT	180416636	180076458	179907852	2.31
3NT	237771940	235260135	244558010	7.10
3,4-DNT	329552952	327472516	329235494	3.53
MEAN RSD				3.39

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39322 Inst. ID: LC3 Method: 200SH1/

LC Column: CARBOSORB Init. Calib Date(s): 08/17/99 08/17/99

Client Sample No.: EXPL3 Date Analyzed : 08/18/99

Lab Sample ID : L3 6-176 Time Analyzed : 0026

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.91	5.78	5.96	261373456	256438769	-1.9
RDX	9.03	8.67	9.21	297989009	301524805	1.2
TNB	12.16	11.73	12.25	622377236	625797606	0.5
DNB	15.05	14.34	15.20	739763960	750548151	1.4
TETRYL	16.43	15.43	16.63	298238695	310647923	4.0
NB	17.07	16.30	17.24	370683529	386610533	4.1
TNT	19.48	18.51	19.71	487909704	493871076	1.2
4ADNT	21.19	19.47	21.57	457515290	475729288	3.8
2ADNT	22.41	20.45	22.83	458643236	506736589	9.5
26DNT	23.09	21.67	23.41	418441869	385983418	-8.4
24DNT	23.95	22.39	24.29	647135320	651439490	0.7
2NT	28.13	26.39	28.55	264090251	272117474	2.9
4NT	30.16	28.26	30.64	171063607	179907852	4.9
3NT	32.54	30.47	33.01	223619563	244558010	8.6
3,4-DNT	18.89	17.68	19.16	327171075	329235494	0.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.308	1.54	3.08	6.16
RDX	0.024	0.120	0.598	1.20	2.39
TNB	0.019	0.095	0.450	0.900	1.80
DNB	0.010	0.050	0.251	0.502	1.00
TETRYL	0.022	0.111	0.554	1.11	2.21
NB	0.020	0.101	0.503	1.01	2.01
TNT	0.016	0.080	0.402	0.804	1.61
4ADNT	0.014	0.070	0.352	0.704	1.41
2ADNT	0.014	0.070	0.351	0.701	1.40
26DNT	0.024	0.119	0.596	1.19	2.38
24DNT	0.014	0.069	0.344	0.687	1.37
2NT	0.020	0.099	0.495	0.990	1.98
4NT	0.020	0.100	0.499	0.997	2.00
3NT	0.020	0.100	0.499	0.998	2.00
3,4-DNT	0.029	0.147	0.736	1.47	2.94

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.86	5.85	5.85	5.85	5.91
RDX	9.08	8.89	8.87	8.89	8.88
TNB	12.00	11.93	11.94	11.95	11.95
DNB	14.75	14.71	14.67	14.75	14.68
TETRYL	16.00	15.94	15.90	15.99	15.92
NB	16.79	16.69	16.65	16.74	16.67
TNT	19.19	19.01	18.95	19.04	18.98
4ADNT	20.61	20.38	20.29	20.35	20.30
2ADNT	21.74	21.48	21.37	21.46	21.40
26DNT	22.62	22.39	22.34	22.42	22.36
24DNT	23.42	23.24	23.11	23.20	23.13
2NT	27.65	27.29	27.27	27.30	27.20
4NT	29.68	29.26	29.21	29.23	29.15
3NT	31.87	31.54	31.50	31.52	31.44
3,4-DNT	18.52	18.31	18.24	18.32	18.26

COMPOUND	RT CCAL 1
HMX	5.91
RDX	9.03
TNB	12.16
DNB	15.05
TETRYL	16.43
NB	17.07
TNT	19.48
4ADNT	21.19
2ADNT	22.41
26DNT	23.09
24DNT	23.95
2NT	28.13
4NT	30.16
3NT	32.54
3,4-DNT	18.88

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.87	0.030	0.090	5.78 - 5.96
RDX	8.94	0.091	0.272	8.67 - 9.21
TNB	11.99	0.088	0.263	11.73 - 12.25
DNB	14.77	0.142	0.426	14.34 - 15.20

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39322

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/17/99 08/17/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	16.03	0.200	0.599	15.43 - 16.63
NB	16.77	0.156	0.469	16.30 - 17.24
TNT	19.11	0.200	0.601	18.51 - 19.71
4ADNT	20.52	0.348	1.045	19.47 - 21.56
2ADNT	21.64	0.398	1.194	20.45 - 22.83
26DNT	22.54	0.289	0.868	21.67 - 23.41
24DNT	23.34	0.318	0.954	22.39 - 24.29
2NT	27.47	0.358	1.075	26.39 - 28.54
4NT	29.45	0.397	1.192	28.26 - 30.64
3NT	31.74	0.423	1.268	30.47 - 33.01
3,4-DNT	18.42	0.246	0.737	17.68 - 19.16

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39322

LC Column: CARBOSORB Init. Calib. Date(s): 08/17/99 08/17/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 18.42

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	08/17/99	0954	0.00	*
02	EXPL1	L1 6-178	08/17/99	1159	18.52	
03	EXPL2	L2 6-177	08/17/99	1439	18.31	
04	EXPL3	L3 6-176	08/17/99	1524	18.24	
05	EXPL4	L4 6-175	08/17/99	1608	18.32	
06	EXPL5	L5 6-174	08/17/99	1653	18.26	
07	BIOMO8200072	39322.11	08/17/99	1737	18.42	
08	BIOMO8200073	39322.12	08/17/99	1822	18.34	
09	BIOMO8200091	39322.13	08/17/99	1906	18.50	
10	BIOMO8200092	39322.14	08/17/99	1951	18.42	
11	BIOMO8200093	39322.15	08/17/99	2043	18.60	
12	BIOMO8200111	39322.16	08/17/99	2128	18.70	
13	BIOMO8200112	39322.17	08/17/99	2212	18.83	
14	BIOMO8200051	39322.06	08/17/99	2257	18.98	
15	BIOMO8200113FD	39322.19	08/17/99	2342	19.02	
16	EXPL3	L3 6-176	08/18/99	0026	18.88	
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP OXIN

SAMPLE EXTRACTION L

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990709SF

EXTRACT DATE 1999-07-09 13:42

000087
Page: 1 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
BL0709SF			S/L				2.00	10.0						10.0	N		1000		
BB0709SF			S/L				2.02	10.0						10.0	N		1000		
LC0709SF			S/L				2.04	10.0						10.0	N	500	1000		
LD0709SF			S/L				2.02	10.0						10.0	N	500	1000		
39322.01 GC200	TOLTEST	07/09/1999 09:39 BIOM08200031	S/L		26.91	1.5	2.04	10.0						10.0	N		1000		
39322.02 GC200	TOLTEST	07/09/1999 09:39 BIOM08200032	S/L		38.01	1.2	2.01	10.0						10.0	N		1000		
39322.03 GC200	TOLTEST	07/09/1999 09:39 BIOM08200033	S/L		31.22	1.6	2.35	10.0						10.0	N		1000		
39322.04MS GC200	TOLTEST	07/09/1999 09:39 BIOM08200033	S/L				2.06	10.0						10.0	N	500	1000		
39322.05MSD GC200	TOLTEST	07/09/1999 09:39 BIOM08200033	S/L				2.20	10.0						10.0	N	500	1000		
39322.06 GC200	TOLTEST	07/09/1999 09:39 BIOM08200051	S/L		36.37	1.4	2.18	10.0						10.0	N		1000		
39322.07 GC200	TOLTEST	07/09/1999 09:39 BIOM08200052	S/L		33.64	1.6	2.41	10.0						10.0	N		1000		
39322.08 GC200	TOLTEST	07/09/1999 09:39 BIOM08200052FD	S/L		30.45	1.5	2.16	10.0						10.0	N		1000		
39322.09 GC200	TOLTEST	07/09/1999 09:39 BIOM08200053	S/L		35.52	1.3	2.03	10.0						10.0	N		1000		
39322.10 GC200	TOLTEST	07/09/1999 09:39 BIOM08200071	S/L		32.76	1.4	2.05	10.0						10.0	N		1000		
39322.11 GC200	TOLTEST	07/09/1999 09:39 BIOM08200072	S/L		36.90	1.5	2.33	10.0						10.0	N		1000		

INITIALS

WEIGHING: GS	EXTRACTION: GS	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER: JR	VERIFIER: JM	
MATRIX SPIKER: JR	VERIFIER: JM	
SUBMITTED BY: GS	REVIEWED BY:	

7/12/99

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 6-68

MATRIX SPIKE SOLID/CONC #(s): 6-75

SOP - METHOD # : SWL-OP- 200 Rev. 4.0

COMMENTS

	SV	PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)	•		
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP ☐ DIOXIN

SAMPLE EXTRACTION LOG

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990709SF

EXTRACT DATE: 1999-07-09 13:42

000087
Page: 2 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
39322.12 GC200	TOLTEST	07/09/1999 09:39 BIOM08200073	S/L		34.32	1.3	2.03	10.0						10.0	N		1000		
39322.13 GC200	TOLTEST	07/09/1999 09:39 BIOM08200091	S/L		35.32	1.5	2.31	10.0						10.0	N		1000		
39322.14 GC200	TOLTEST	07/09/1999 09:39 BIOM08200092	S/L		30.84	1.5	2.19	10.0						10.0	N		1000		
39322.15 GC200	TOLTEST	07/09/1999 09:39 BIOM08200093	S/L		34.30	1.6	2.45	10.0						10.0	N		1000		
39322.16 GC200	TOLTEST	07/09/1999 09:39 BIOM08200111	S/L		38.28	1.5	2.37	10.0						10.0	N		1000		
39322.17 GC200	TOLTEST	07/09/1999 09:39 BIOM08200112	S/L		39.29	1.2	2.02	10.0						10.0	N		1000		
39322.18 GC200	TOLTEST	07/09/1999 09:39 BIOM08200113	S/L		31.89	1.5	2.27	10.0						10.0	N		1000		
39322.19 GC200	TOLTEST	07/09/1999 09:39 BIOM08200113FD	S/L		33.02	1.4	2.09	10.0						10.0	N		1000		

INITIALS

WEIGHING: GS	EXTRACTION: GS	FLORISIL:
CLEANUP:	KD:	
BLOWDOWN:	TV:	
SURROG. SPIKER: JR	VERIFIER: JM	
MATRIX SPIKER: JR	VERIFIER: JM	
SUBMITTED BY: GS	REVIEWED BY:	

7/12/99

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 6-68

MATRIX SPIKE SOLID/CONC #(s): 6-75

SOP - METHOD # : SWL-OP-200 Rev 4.0

COMMENTS

TOLTEST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259 BIO-223
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

Chain of Custody Record

25812

Project No.: 37324
Client:
P.O. No.:
Project/Location: NSWC Crane Biofacility
Project Mgr.:
Sampler's Name: Shayne Newsome
Phone No.
Sampler's Signature: Shayne Newsome

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	Parameters							Preserved Yes/No	LAB USE ONLY Lab #
1	BIO N-078 06 031	7/1/99	1300	G	Compost	column 3 sample location 1	1	✓									
2	BIO N078 06 032		1301			2											
3	BIO N078 06 033		1302			3											
4	BIO N078 06 051		1303			5 1											
5	BIO N078 06 052		1304			2											
6	BIO N078 06 053		1305			3											
7	BIO N078 06 053D		1305			3											
8																	
9																	
10																	

Item No.	Relinquished By:	Date	Time	Received By:	Date	Time
	Shayne Newsome	7/1/99	1500	E. Maenbacq	7/2/99	10:25

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 5 °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled properly for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 7/97

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2.WB1) / SWL-GA-115 REV 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): E.MAIMBOURG

RECEIVED BY (SIGNATURE): E. Maimbourg

LOGGED IN BY (SIGNATURE): E. Maimbourg

REC'D DATE 07/02/99

TIME REC'D 10:25

LOG-IN DATE 1999-07-02 10:52

PROJECT: NSWC CRANE

EPISODE: 39244

SAMPLE DELIVERY GROUP: 39244

Client Sample #	Sample Fraction @	Assigned LAB#	Cooler I.D.	pH Check	ACID/ BASE LOT#	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
BION07806031	GC	39244.01	07/02/99-1	N		5.0 C
BION07806032		39244.02		N		
BION07806033		39244.03		N		
BION07806051		39244.04		N		
BION07806052		39244.05		N		
BION07806053		39244.06		N		
BION07806053FD		39244.07		N		

Remarks

1. CUSTODY SEAL(S): Present/Absent
   Intact/ Broken
2. CUSTODY SEALS NOS.: NA
3. CHAIN-OF CUSTODY. Present/Absent
   Sealed In Plastic? Yes/ No
   Taped To Lid? Yes/ No
   Properly Filled Out (Ink, Signed, ETC.)? Yes/ No
4. AIRBILL AirBill/ Sticker
   Present/Absent
5. AIRBILL NO: 811674013795
6. COOLER CONDITIONS
   Enough Ice? Yes/ No
   Type of Ice? Wet
   Type of Packing? Bub
7. SAMPLE TAGS Present/Absent
8. SAMPLE CONDITION: Intact/ Broken*/ Leaking
   Bottles Sealed In Separate Plastic Bags? Yes/ No
   Correct Containers Used For Tests Indicated? Yes/ No
   Correct Preservative? Yes/ No
   Sufficient Sample? Yes/ No
   Labels Complete (I.D., Date, Time, Signature, Preservative? Yes/ No
   VOA Samples Without Bubbles? Yes/ No~
9. Does Information on Custody Records, Labels, Tags Agree? Yes/ No*
10. RAD SCREEN WITH GIEGER COUNTER? Yes/ No
11. P.O. Called? Yes/ No

* Contact PO and attach record of resolution

@ Sample Fractions: B=SV GC/MS, V= VOA GC/MS or GC, P=Pesticide, H=Herbicide, D=Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE
August 20, 1999

CONTRACT : TOLTEST

PROJECT : NSWC CRANE

SDG NO : 39244

EPISODE(S): 39244

EXPLOSIVE FRACTION

This SDG consisted of 7 soil samples with applicable MS and MSD for the explosives analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

CASE SUMMARY:

Blanks: No problems.

Surrogate(s): The surrogate was out of the laboratory QC limits in the samples BION08706052MS and BION08706052MSD.

8/25 JL Calc. wrong Only 1 Sout.

Matrix Spikes: RDX was out of the laboratory QC limits in the samples BION07806031MS and BION07806031MSD.

Laboratory Control Spikes: No problems.

The slope of the line for all of the analytes in the ICAL 200SG07.M was utilized to calculate the concentrations of the associated samples since they exceeded 20%RSD. Tetryl had less than 0.99 correlation coefficient but this analyte was not reported in any of the associated samples.

The correlation coefficients for RDX, Tetryl, 4ADNT and 2ADNT were utilized to calculate the concentrations of the associated samples in the ICAL 200SH07.M since they exceeded 20% RSD.

Enviroquant software was utilized to process the above samples. The Response Factor in the standard is calculated by dividing the area of each analyte by the concentration of the respective analyte.

Multiplier = (final volume / extracted amount) * dilution.

The following is an example of the calculations for TNT in the quantitation and confirmation of the undiluted sample BION07806053FD:

[Sample's response (area) / mean calibration factor] * Multiplier = the concentration

(19766268/ 192800) * 9.5238 = 976 ug/Kg

(23184998/ 237300) * 9.5238 = 931 ug/Kg

SOUTHWEST LABORATORY OF OKLAHOMA
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918-251-2858

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

The laboratory utilizes the following flags where appropriate: "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out
of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Phuong Vo
Analyst

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0702SD	83	0
02	BION07806032	128	0
03	BION07806033	131	0
04	BION07806051	135	0
05	BION07806052	134	0
06	BION07806053	133	0
07	BION07806031	122	0
08	BION07806031MS	77	0
09	BION07806031MSD	71	0
10	LC0702SD	128	0
11	LD0702SD	120	0
12	BION07806053FD	87	0
13			
14			
15			
16			
17			
18			
19			
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21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Matrix Spike - Client Sample NO.: BION07806031

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
HMX	8640	~~0~~ 2990	~~8~~750	74% 101	54-128
RDX	8640	~~0~~ 3010	15200	130% ~~176~~*	66-109
TNB	8640	0	7570	88	57-130
DNB	8640	0	8760	101	74-122
TETRYL	8640	0	5810	67	32-119
NB	8640	0	8070	93	70-135
TNT	8640	924	8180	84	44-124
4ADNT	8640	511	8920	97	60-140
2ADNT	8640	0	7440	86	60-140
26DNT	8640	0	7390	86	58-125
24DNT	8640	0	8140	94	59-120
2NT	8640	0	7090	82	79-124
4NT	8640	0	7580	88	74-128
3NT	8640	0	7650	88	79-121

FORM III

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Matrix Spike - Client Sample NO.: BION07806031

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	8640	8670	12% ~~100~~	1	30	54-128
RDX	8640	12500	107% ~~145~~ *	20	30	66-109
TNB	8640	7540	87	0	30	57-130
DNB	8640	8710	101	1	45	74-122
TETRYL	8640	5960	69	2	30	32-119
NB	8640	8070	93	0	35	70-135
TNT	8640	8260	85	1	30	44-124
4ADNT	8640	8650	94	3	40	60-140
2ADNT	8640	7450	86	0	40	60-140
26DNT	8640	7520	87	2	35	58-125
24DNT	8640	8150	94	0	35	59-120
2NT	8640	6950	80	2	35	79-124
4NT	8640	7700	89	2	35	74-128
3NT	8640	7790	90	2	35	79-121

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 2 out of 28 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

LCS Sample NO.: LC0702SD

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	9120	96	57-137
RDX	9500	9240	97	77-113
TNB	9500	8720	92	64-125
DNB	9500	8780	92	82-118
TETRYL	9500	8700	92	23-124
NB	9500	9230	97	69-143
TNT	9500	8790	92	75-118
4ADNT	9500	9910	104	60-140
2ADNT	9500	8880	93	60-140
26DNT	9500	8350	88	78-117
24DNT	9500	9510	100	74-126
2NT	9500	7790	82	78-123
4NT	9500	8260	87	79-125
3NT	9500	8750	92	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

LCS Sample NO.: LD0702SD

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9050	8780	97	57-137
RDX	9050	8800	97	77-113
TNB	9050	8460	93	64-125
DNB	9050	8450	93	82-118
TETRYL	9050	8410	93	23-124
NB	9050	8820	97	69-143
TNT	9050	8330	92	75-118
4ADNT	9050	9590	106	60-140
2ADNT	9050	8470	94	60-140
26DNT	9050	7980	88	78-117
24DNT	9050	9070	100	74-126
2NT	9050	7500	83	78-123
4NT	9050	7970	88	79-125
3NT	9050	8510	94	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0702SD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Lab Sample ID : BL0702SD Lab File ID : 1_070661

Matrix: (soil/water) SOIL

Date Extracted : 07/02/99 Extraction Method : SONC

Date Analyzed (1): 07/08/99 Date Analyzed (2): 07/07/99

Time Analyzed (1): 0906 Time Analyzed (2): 1943

Instrument ID (1): LC1 Instrument ID (2): LC5

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	BION07806032	39244.02	07/08/99	07/07/99
02	BION07806033	39244.03	07/08/99	07/07/99
03	BION07806051	39244.04	07/08/99	07/07/99
04	BION07806052	39244.05	07/08/99	07/07/99
05	BION07806053	39244.06	07/08/99	07/07/99
06	BION07806031	39244.01	07/08/99	07/07/99
07	BION07806031MS	39244.08MS	07/08/99	
08	BION07806031MSD	39244.09MSD	07/08/99	
09	LC0702SD	LC0702SD	07/08/99	
10	LD0702SD	LD0702SD	07/08/99	
11	BION07806053FD	39244.07	08/08/99	07/07/99
12				
13				
14				
15				
16				
17				
18				
19				
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21				
22				
23				
24				
25				
26				

Comments:

FORM IV

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BION07806051

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Matrix: (soil/water) SOIL Lab Sample ID: 39244.04

Sample Amt: 2.2 G % Moisture: 23.1 Date Received: 07/02/99

Extraction Volume: 10 ML Date Extracted: 07/02/99

Extraction Method: SONC Date Analyzed: 07/08/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	8030	
121-82-4	RDX	32700	E
99-35-4	TNB	227	U
99-65-0	DNB	227	U
479-45-8	TETRYL	591	U
98-95-3	NB	236	U
118-96-7	TNT	227	U
1946-51-0	4ADNT	1090	
35572-78-2	2ADNT	520	P
606-20-2	26DNT	236	U
121-14-2	24DNT	227	U
88-72-2	2NT	227	U
99-99-0	4NT	227	U
99-08-1	3NT	227	U
Surrogate amount spiked		1818.18	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0707\3_070725.D Vial: 25
Acq On : 08 Jul 1999 10:49 Operator: SM
Sample : 39244.04 Inst : LC3
Misc : BION07806051 Multiplr: 9.0909
IntFile : EVENTS1.E
Quant Time: Jul 8 15:02 1999 Quant Results File: 200SG07.RES

08/11/99

Method : F:\HPCHEM\LC3\DATA\3_0707\200SG07.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0707\
Last Update : Thu Jul 08 10:37:00 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.43	45876915	2458.9	m	L
Target Compounds:					
1) HMX	5.02	164369166	8026.4	m *	L
2) RDX	7.57	881059444	32731.5	E *	L
3) TNB	0.00	0	N.D.		L
4) DNB	0.00	0	N.D.		L
5) TETRYL	0.00	0	N.D.		L
6) NB	0.00	0	N.D.		L
8) TNT	16.19W	28090336	976.5	m	L
9) 4ADNT	17.14	32981418	1090.1	m *	L
) 2ADNT	18.11	8863459	520.5	m *P	L
) 26DNT	0.00	0	N.D.		L
12) 24DNT	0.00	0	N.D.		L
13) 2NT	0.00	0	N.D.		L
14) 4NT	0.00	0	N.D.		L
15) 3NT	0.00	0	N.D.		L

SM
7-9-99

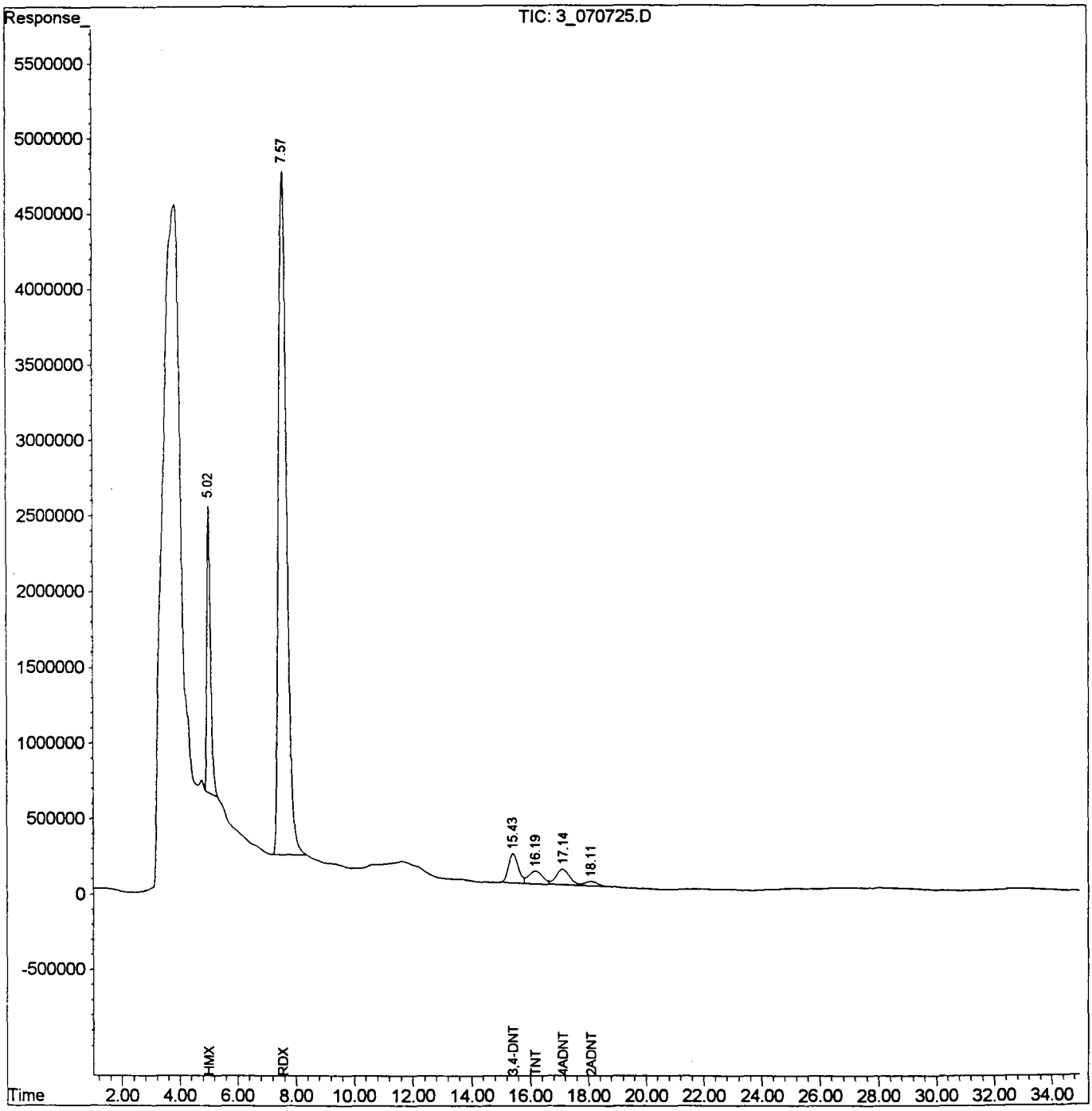
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.
3_070725.D 200SG07.M Thu Jul 08 15:08:41 1999

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0707\3_070725.D Vial: 25
Acq On : 08 Jul 1999 10:49 Operator: SM
Sample : 39244.04 Inst : LC3
Misc : BION07806051 Multiplr: 9.0909
IntFile : EVENTS1.E
Quant Time: Jul 8 15:02 1999 Quant Results File: 200SG07.RES

Method : F:\HPCHEM\LC3\DATA\3_0707\200SG07.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0707\
Last Update : Thu Jul 08 10:37:00 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070707.D Vial: 7
Acq On : 07 Jul 1999 21:53 Operator: SM
Sample : 39244.04 Inst : LC5
Misc : BION07806051 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jul 8 13:53 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.10	31565288	2368.1	m	A
Target Compounds:					
1) A HMX	4.51	78964536	6296.2	m	A
2) B RDX	6.88	453299167	31535.5	mE	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	0.00	0	N.D.		A
9) B 4ADNT	13.19	11317837	752.7	m	A
10) B 2ADNT	13.39	7976139	223.7	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

Jm 070849

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

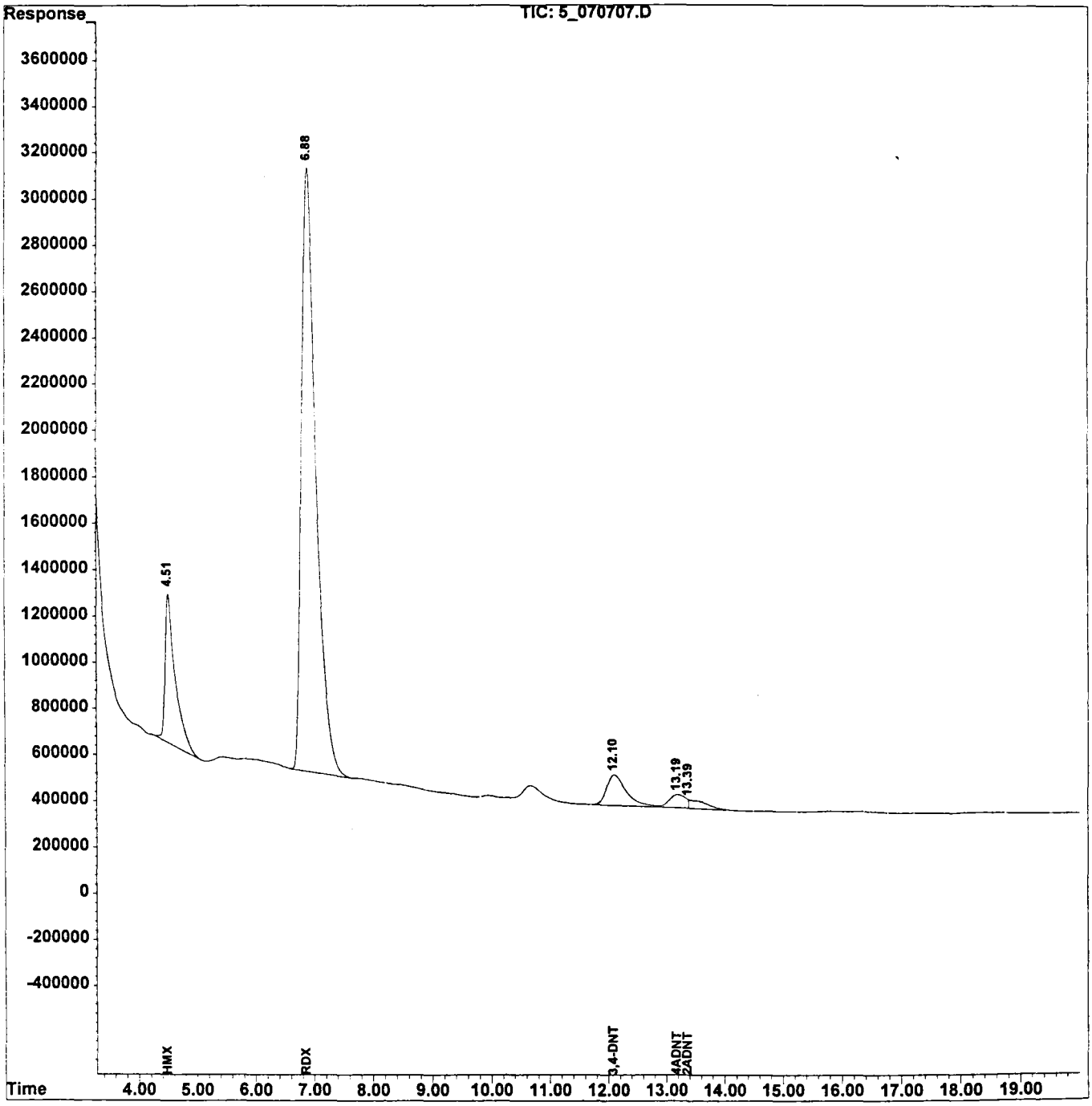
Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070707.D Vial: 7
Acq On : 07 Jul 1999 21:53 Operator: SM
Sample : 39244.04 Inst : LC5
Misc : BION07806051 Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jul 8 13:53 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Multiple Level Calibration

08/11/99

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BION07806053

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Matrix: (soil/water) SOIL Lab Sample ID: 39244.06

Sample Amt: 2.0 G % Moisture: 26.1 Date Received: 07/02/99

Extraction Volume: 10 ML Date Extracted: 07/02/99

Extraction Method: SONC Date Analyzed: 07/08/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	3900	P
121-82-4	RDX	3400	
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	1320	P
1946-51-0	4ADNT	1000	P
35572-78-2	2ADNT	250	U
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0707\3_070727.D Vial: 27
Acq On : 08 Jul 1999 12:18 Operator: SM
Sample : 39244.06 Inst : LC3
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jul 8 15:06 1999 Quant Results File: 200SG07.RES

Method : F:\HPCHEM\LC3\DATA\3_0707\200SG07.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0707\
Last Update : Thu Jul 08 10:37:00 1999
Response via : Initial Calibration

08/11/99

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.38	44770259	2666.4	m	L
Target Compounds:					
1) HMX	5.02	47421059	3895.3 * P	m	L
2) RDX	7.57	68851309	3397.7 *		L
3) TNB	0.00	0	N.D.		L
4) DNB	0.00	0	N.D.		L
5) TETRYL	0.00	0	N.D.		L
6) NB	0.00	0	N.D.		L
8) TNT	15.92	39452840	1316.3 * P	m	L
9) 4ADNT	17.08	25242439	1003.9 * P	m	L
10) 2ADNT	0.00	0	N.D.		L
11) 26DNT	0.00	0	N.D.		L
12) 24DNT	0.00	0	N.D.		L
13) 2NT	0.00	0	N.D.		L
14) 4NT	0.00	0	N.D.		L
15) 3NT	~~26.44~~	~~24771217~~	~~1786.0~~	~~m *~~	~~L~~

SM
7-9-99

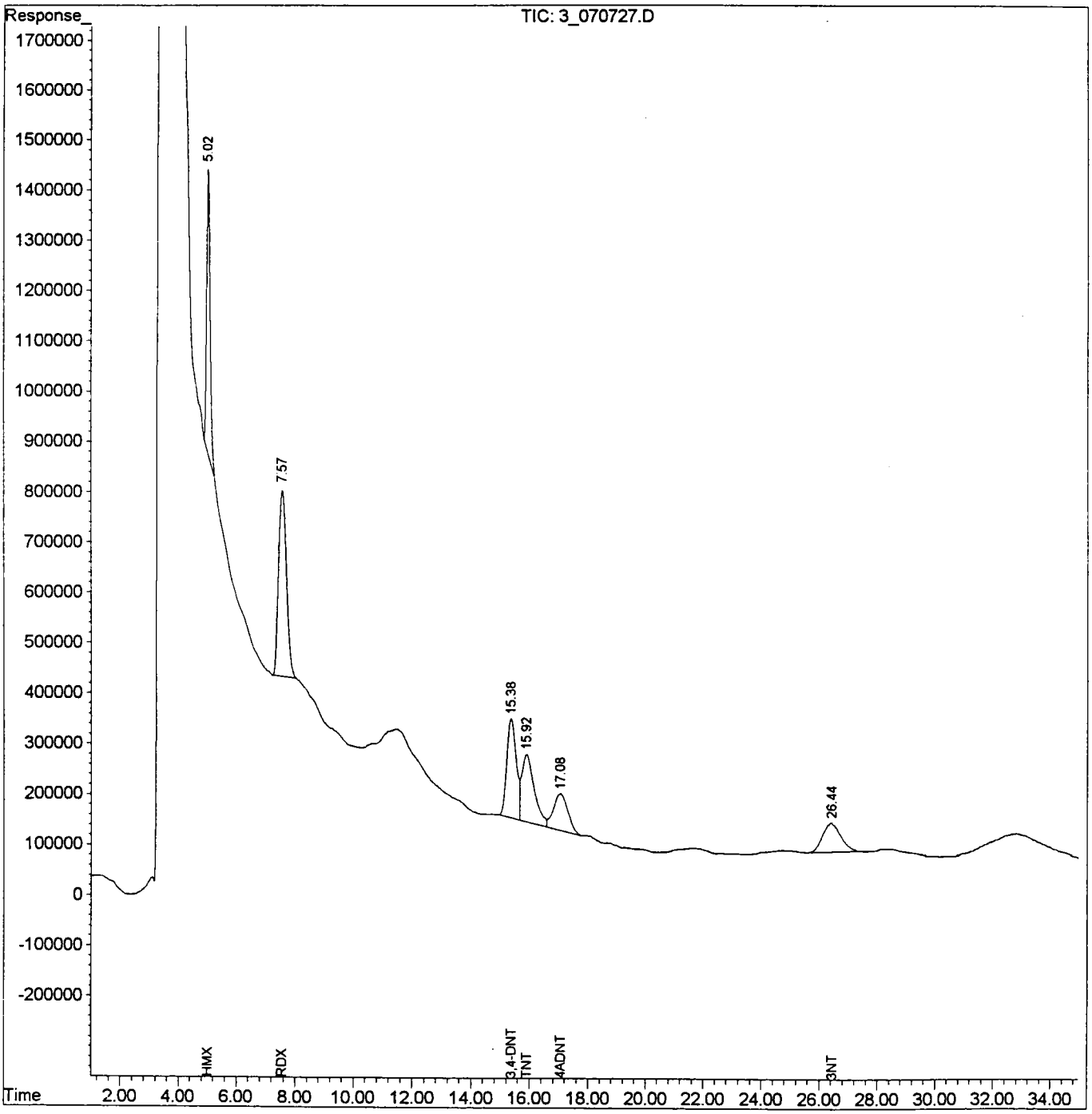
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0707\3_070727.D Vial: 27
Acq On : 08 Jul 1999 12:18 Operator: SM
Sample : 39244.06 Inst : LC3
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS1.E
Quant Time: Jul 8 15:06 1999 Quant Results File: 200SG07.RES

Method : F:\HPCHEM\LC3\DATA\3_0707\200SG07.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0707\
Last Update : Thu Jul 08 10:37:00 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070709.D Vial: 9
Acq On : 07 Jul 1999 22:58 Operator: SM
Sample : 39244.06 Inst : LC5
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 8 14:02 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.23	27964754	2307.8		A
Target Compounds:					
1) A HMX	4.52	20768532	1821.6 *P	m	A
2) B RDX	6.93	36785601	2815.0 *		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	10.79	3515445	179.8	m	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.05	14501103	611.2 *P	m	A
9) B 4ADNT	13.33	5131076	375.4	m	A
10) B 2ADNT	0.00	0	N.D.		A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

3 corrected 07/08/99

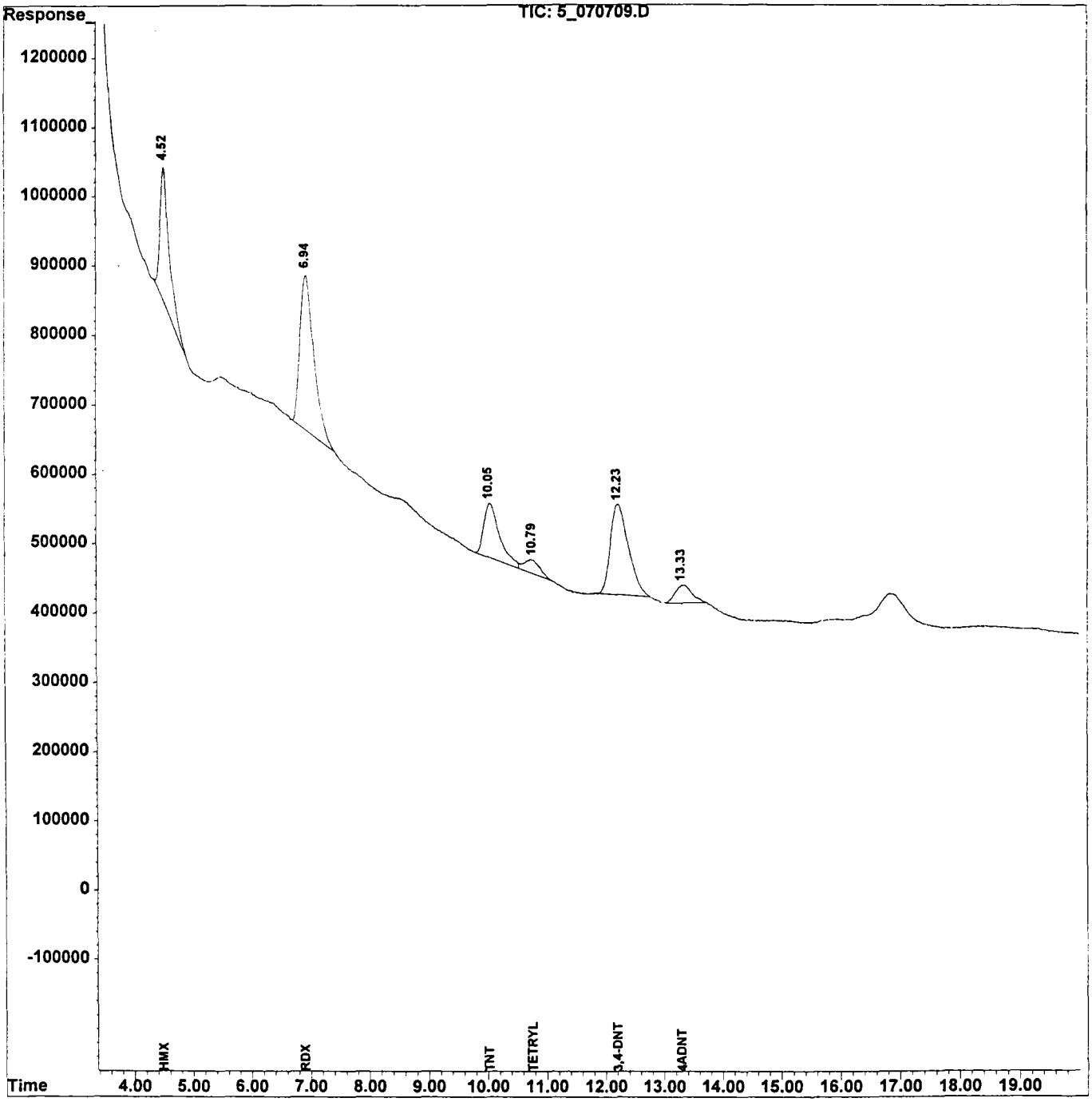
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070709.D Vial: 9
Acq On : 07 Jul 1999 22:58 Operator: SM
Sample : 39244.06 Inst : LC5
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 8 14:02 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



Quantitation Report

Data File : F:\HPCHEM\LC4\DATA\4_0717\4_071734.D Vial: 34
Acq On : 18-Jul-1999, 12:55 Operator: SM/JF
Sample : 39244.06 Inst : LC4
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 19 10:49 1999 Quant Results File: 200sg16n.RES

Method : f:\hpchem\lc4\data\4_0717\200sg16n.m
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0716\
Last Update : Sat Jul 17 14:47:11 1999
Response via : Initial Calibration

Volume Inj. : 100uL
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg	Curve
Target Compounds:				
1) 2NT	0.00	0	N.D.	A
2) 4NT	0.00	0	N.D.	A
3) 3NT	0.00	0	N.D.	A

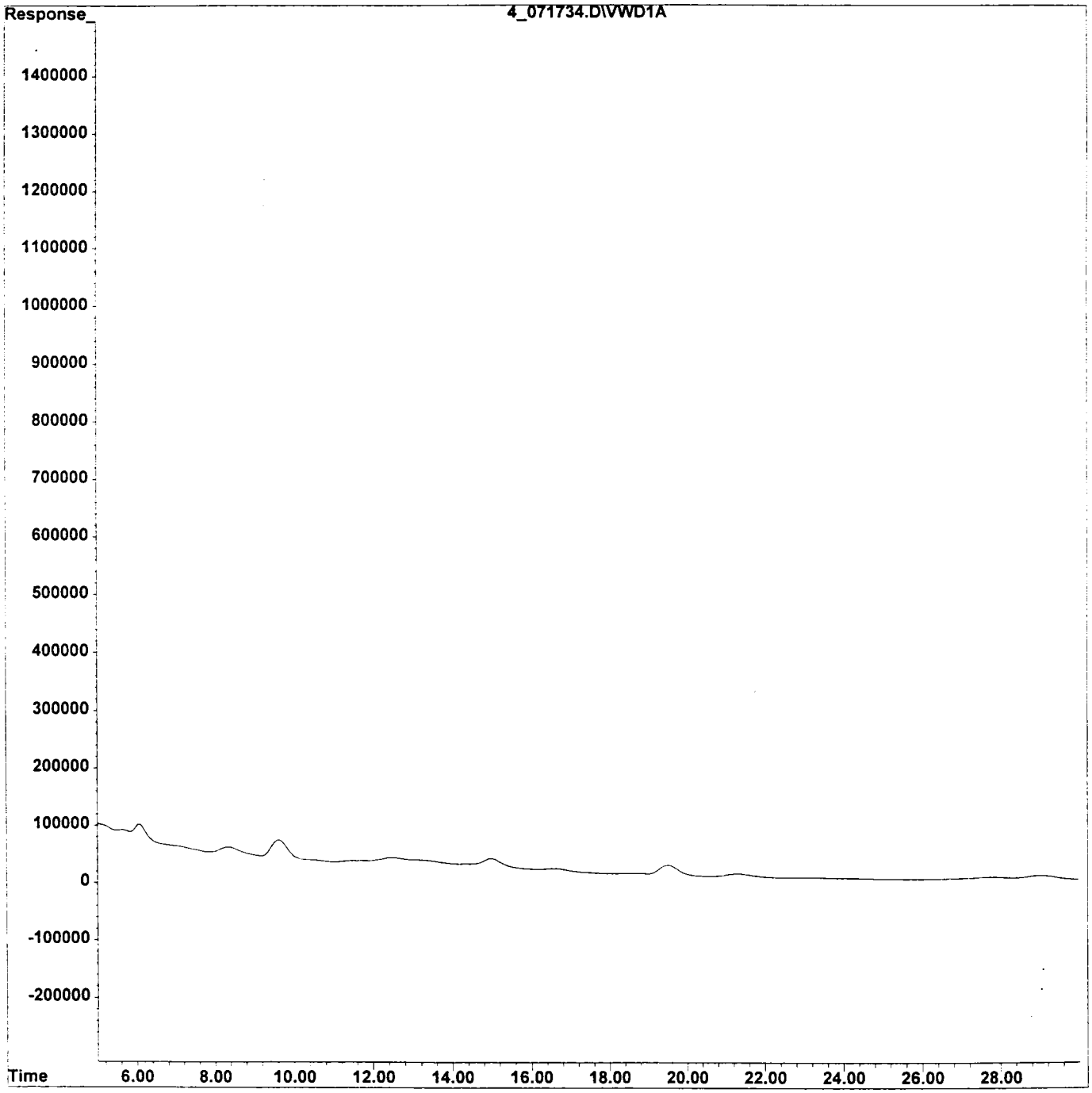
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC4\DATA\4_0717\4_071734.D Vial: 34
Acq On : 18-Jul-1999, 12:55 Operator: SM/JF
Sample : 39244.06 Inst : LC4
Misc : BION07806053 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jul 19 10:49 1999 Quant Results File: 200sg16n.RES

Method : f:\hpchem\lc4\data\4_0717\200sg16n.m
Title-Path : GC200 CALIBRATION - F:\HPCHEM\LC4\DATA\4_0716\
Last Update : Sat Jul 17 14:47:11 1999
Response via : Multiple Level Calibration

Volume Inj. : 100uL
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BION07806053FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

Matrix: (soil/water) SOIL Lab Sample ID: 39244.07

Sample Amt: 2.1 G % Moisture: 30.8 Date Received: 07/02/99

Extraction Volume: 10 ML Date Extracted: 07/02/99

Extraction Method: SONC Date Analyzed: 08/08/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	1500	J
121-82-4	RDX	3720	
99-35-4	TNB	238	U
99-65-0	DNB	238	U
479-45-8	TETRYL	619	U
98-95-3	NB	248	U
118-96-7	TNT	977	
1946-51-0	4ADNT	700	
35572-78-2	2ADNT	307	
606-20-2	26DNT	248	U
121-14-2	24DNT	238	U
88-72-2	2NT	238	U
99-99-0	4NT	238	U
99-08-1	3NT	238	U
Surrogate amount spiked		1904.76	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0808\1_080810.D Vial: 10
Acq On : 08 Aug 1999 22:04 Operator: SM
Sample : 39244.07 Inst : LC1
Misc : BION07806053FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: Aug 9 12:13 1999 Quant Results File: 200SH07.RES

Method : F:\HPCHEM\LC1\DATA\1_0808\200SH07.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0807\
Last Update : Mon Aug 09 09:18:33 1999
Response via : Initial Calibration

08/11/99

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.30	21245719	1659.5	m	A
Target Compounds:					
1) HMX	4.93	12224189	1505.0 ✓J	m	A
2) RDX	7.43	36814388	3718.9 ✓		L
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		L
6) NB	0.00	0	N.D.		A
8) TNT	15.86	19769268	976.7 ✓	m	A
9) 4ADNT	16.64	12553789	700.1 ✓	m	L
0) 2ADNT	17.51	9575582	306.8 ✓	m	L
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

Sum 080999

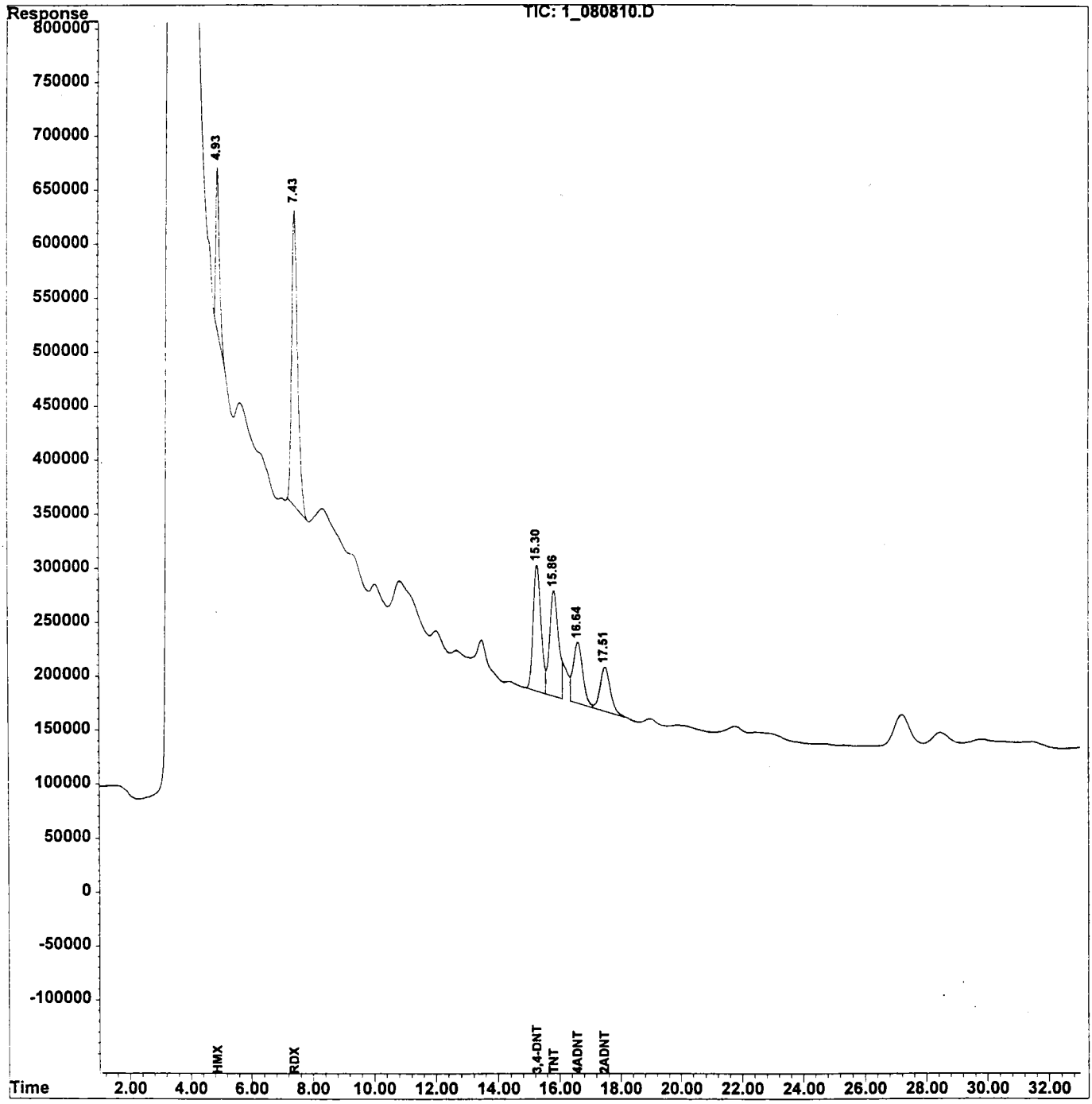
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0808\1_080810.D Vial: 10
Acq On : 08 Aug 1999 22:04 Operator: SM
Sample : 39244.07 Inst : LC1
Misc : BION07806053FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: Aug 9 12:13 1999 Quant Results File: 200SH07.RES

Method : F:\HPCHEM\LC1\DATA\1_0808\200SH07.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0807\
Last Update : Mon Aug 09 09:18:33 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070710.D Vial: 10
Acq On : 07 Jul 1999 23:31 Operator: SM
Sample : 39244.07 Inst : LC5
Misc : BION07806053FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: Jul 8 14:02 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.21	26162546	2056.2		A
Target Compounds:					
1) A HMX	4.51	18283321	1527.2	m	A
2) B RDX	6.90	44847829	3268.6		A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	10.70	10662566	519.3	m	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.04	23184998	930.7	m	A
9) B 4ADNT	13.33	10207207	711.2	m	A
10) B 2ADNT	13.71	10895067	320.1	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

Sam 070854

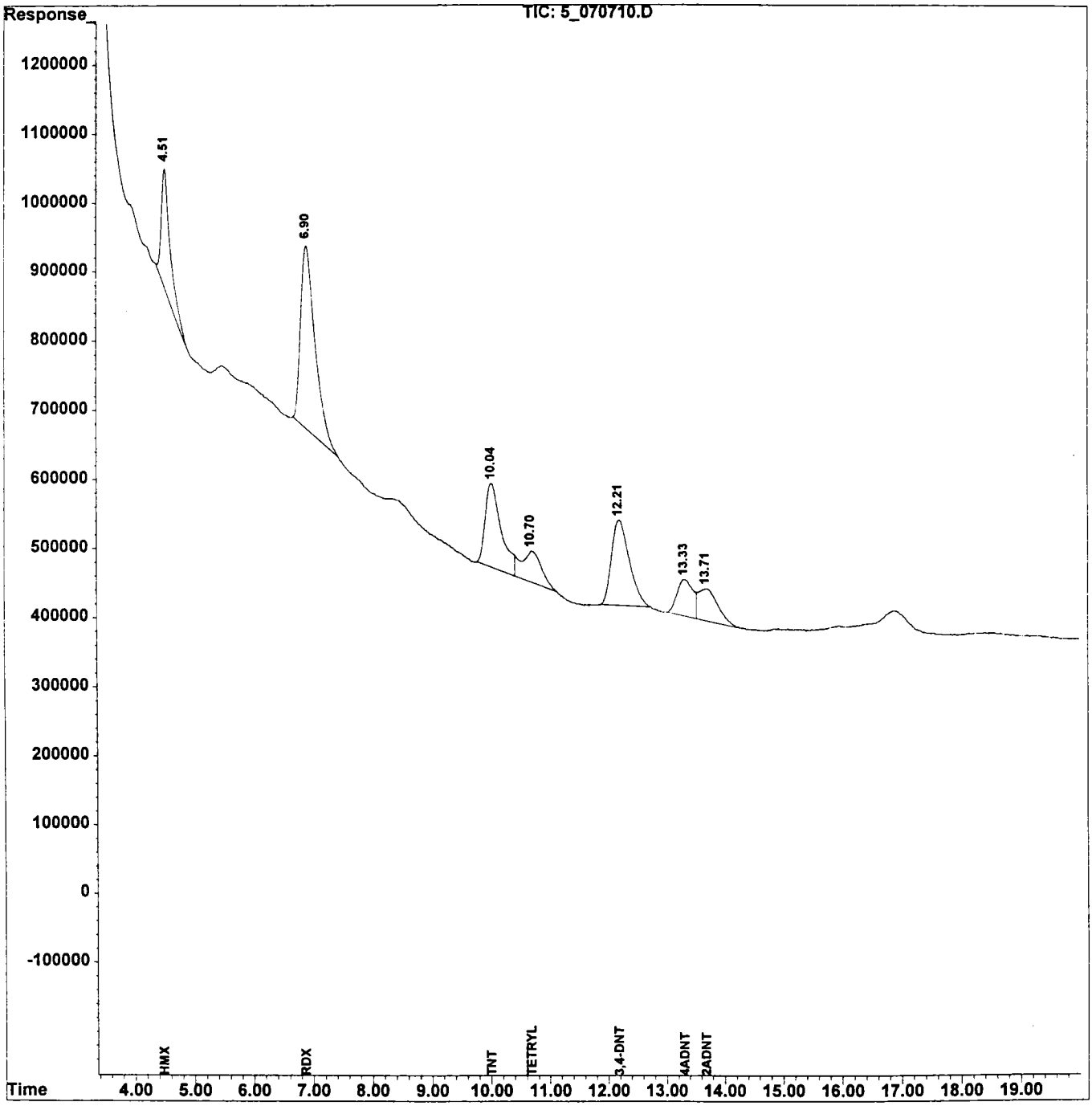
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.
5_070710.D 200SG02C.M Thu Jul 08 14:36:27 1999

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0707\5_070710.D Vial: 10
Acq On : 07 Jul 1999 23:31 Operator: SM
Sample : 39244.07 Inst : LC5
Misc : BION07806053FD Multiplr: 9.5238
IntFile : EVENTS.E
Quant Time: Jul 8 14:02 1999 Quant Results File: 200SG02C.RES

Method : F:\HPCHEM\LC5\DATA\5_0707\200SG02C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0702\
Last Update : Thu Jul 08 13:20:41 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 07/07/99 07/07/99

Method: 200SG07

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	154556790	158918655	181154643
RDX	174872833	180765350	201398322
TNB	415801833	397660922	437923622
DNB	434969600	461095640	508338017
TETRYL	226811591	204232309	214894355
NB	219720000	237782140	263153446
TNT	303199750	324012288	363535657
4ADNT	280862214	287562929	316924405
2ADNT	279424071	318269529	343121079
26DNT	220110750	234646683	257078983
24DNT	385740857	401609986	449452368
2NT	162351050	160970900	182722996
4NT	136745450	113248500	119212990
3NT	157877250	138307640	157051966
3,4-DNT	177282567	191224880	207843065

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	204622853	235721835	186994955	18.06
RDX	216865542	248402717	204460953	14.53
TNB	489629131	558950675	459993237	14.17
DNB	567686198	657429966	525903884	16.96
TETRYL	248764878	335674531	246075533	21.44 ←
NB	292874410	340055928	270717185	17.56
TNT	404721601	467104131	372514685	17.61
4ADNT	348789639	394924894	325812816	14.45
2ADNT	375430801	426167819	348482660	16.02
26DNT	295045952	348868251	271150124	19.12
24DNT	474456126	563971069	455046081	15.51
2NT	205121388	232823557	188797978	16.14
4NT	127437535	146454959	128619887	10.36
3NT	167443316	189665160	162069066	11.53
3,4-DNT	234835063	287432437	219723602	19.80
MEAN RSD				16.22

EXPLOSIVES INITIAL CALIBRATION : LINEAR REGRESSION SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 07/07/99 07/07/99

Method: 200SG07

L1 = 3_070704.D L2 = 3_070705.D L3 = 3_070706.D
L4 = 3_070707.D L5 = 3_070708.D

COMPOUND	SLOPE	INTERCEPT	R2	#
HMX	237034	-44910501.69	0.994	
RDX	249091	-15783461.76	0.995	
TNB	561414	-28394041.75	0.995	
DNB	660200	-19840122.51	0.994	
TETRYL	335400	-35557951.00	0.980	*
NB	341445	-20659254.09	0.994	
TNT	469233	-22313599.95	0.994	
4ADNT	396557	-14568590.74	0.996	
2ADNT	427720	-15624521.64	0.996	
26DNT	350522	-28728415.74	0.992	
24DNT	564259	-23466574.68	0.993	
2NT	234127	-13213361.21	0.995	
4NT	146459	-7233689.192	0.995	
3NT	190109	-9181387.096	0.996	
3,4-DNT	288172	-32067623.52	0.990	

= Column used to flag R2 values that fail. * = R2 value < 0.99

7E

SOIL EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

ab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC3 Method: 200SG07

LC Column: CARBOSORB Init. Calib Date(s): 07/07/99 07/07/99

Client Sample No.: EXPL3 Date Analyzed : 07/08/99

Lab Sample ID : L3 6-52 Time Analyzed : 0643

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
HMX	5.06	4.85	5.17	1631	1550	5.2
RDX	7.59	7.35	7.69	659	600	9.9
TNB	10.12	9.87	10.21	480	450	6.7
DNB	12.47	12.15	12.57	263	250	5.4
TETRYL	13.40	12.96	13.52	508	550	-7.7
NB	14.12	13.81	14.21	541	500	8.2
TNT	15.95	15.52	16.06	437	400	9.3
4ADNT	17.16	16.41	17.31	372	350	6.2
2ADNT	18.16	17.39	18.29	355	350	1.5
26DNT	18.85	18.24	18.96	643	600	7.2
24DNT	19.55	18.90	19.68	382	350	9.2
2NT	22.90	22.17	23.05	512	500	2.3
4NT	24.53	23.75	24.67	502	500	0.4
3NT	26.42	25.60	26.58	507	500	1.3
3,4-DNT	15.46	14.91	15.59	749	750	-0.2

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

7E

SOIL EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC3 Method: 200SG07

LC Column: CARBOSORB Init. Calib Date(s): 07/07/99 07/07/99

Client Sample No.: EXPL3 Date Analyzed : 07/08/99

Lab Sample ID : L3 6-52 Time Analyzed : 1601

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
HMX	4.95	4.85	5.17	1353	1550	-12.7
RDX	7.47	7.35	7.69	544	600	-9.3
TNB	9.99	9.87	10.21	400	450	-11.1
DNB	12.38	12.15	12.57	221	250	-11.8
TETRYL	13.28	12.96	13.52	444	550	-19.3*
NB	14.05	13.81	14.21	456	500	-8.8
TNT	15.85	15.52	16.06	358	400	-10.5
4ADNT	16.91	16.41	17.31	317	350	-9.4
2ADNT	17.87	17.39	18.29	318	350	-9.1
26DNT	18.66	18.24	18.96	527	600	-12.1
24DNT	19.36	18.90	19.68	313	350	-10.6
2NT	22.68	22.17	23.05	441	500	-11.9
4NT	24.27	23.75	24.67	446	500	-10.8
3NT	26.16	25.60	26.58	442	500	-11.7
3,4-DNT	15.30	14.91	15.59	645	750	-14.0

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 07/07/99 07/07/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.98	4.98	5.01	5.11	5.00
RDX	7.47	7.48	7.51	7.60	7.50
TNB	9.98	10.04	10.04	10.11	10.00
DNB	12.26	12.32	12.34	12.41	12.32
TETRYL	13.11	13.19	13.22	13.30	13.21
NB	13.93	13.97	13.99	14.06	13.96
TNT	15.68	15.74	15.76	15.84	15.74
4ADNT	16.71	16.75	16.78	16.88	16.82
2ADNT	17.74	17.72	17.75	17.85	17.79
26DNT	18.50	18.53	18.54	18.63	18.54
24DNT	19.18	19.18	19.23	19.31	19.24
2NT	22.46	22.52	22.54	22.63	22.56
4NT	24.10	24.09	24.11	24.22	24.15
3NT	25.95	25.98	25.99	26.10	26.03
3,4-DNT	15.12	15.18	15.20	15.28	15.19

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	5.06	4.95
RDX	7.59	7.47
TNB	10.12	9.99
DNB	12.47	12.38
TETRYL	13.40	13.28
NB	14.12	14.05
TNT	15.95	15.84
4ADNT	17.16	16.91
2ADNT	18.16	17.86
26DNT	18.84	18.66
24DNT	19.55	19.36
2NT	22.90	22.68
4NT	24.52	24.27
3NT	26.42	26.16
3,4-DNT	15.46	15.30

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.01	0.055	0.164	4.84 - 5.17
RDX	7.52	0.055	0.166	7.35 - 7.69
TNB	10.04	0.056	0.169	9.87 - 10.21
DNB	12.36	0.069	0.207	12.15 - 12.57

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 07/07/99 07/07/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.24	0.093	0.278	12.96 - 13.52
NB	14.01	0.067	0.202	13.81 - 14.21
TNT	15.79	0.090	0.270	15.52 - 16.06
4ADNT	16.86	0.150	0.451	16.41 - 17.31
2ADNT	17.84	0.152	0.455	17.38 - 18.29
26DNT	18.60	0.118	0.355	18.24 - 18.96
24DNT	19.29	0.131	0.393	18.90 - 19.68
2NT	22.61	0.146	0.437	22.17 - 23.05
4NT	24.21	0.153	0.458	23.75 - 24.67
3NT	26.09	0.163	0.489	25.60 - 26.58
3,4-DNT	15.25	0.112	0.336	14.91 - 15.59

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column: CARBOSORB Init. Calib. Date(s): 07/07/99 07/07/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.25

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	07/07/99	1720	0.00 *
02	EXPL1	L1 6-54	07/07/99	1850	15.12
03	EXPL2	L2 6-53	07/07/99	1934	15.18
04	EXPL3	L3 6-52	07/07/99	2019	15.20
05	EXPL4	L4 6-51	07/07/99	2103	15.28
06	EXPL5	L5 6-50	07/07/99	2148	15.19
07	EXPL3	L3 6-52	07/08/99	0643	15.46
08	BION07806032	39244.02	07/08/99	0919	15.47
09	BION07806033	39244.03	07/08/99	1004	15.54
10	BION07806051	39244.04	07/08/99	1049	15.43
11	BION07806052	39244.05	07/08/99	1133	15.40
12	BION07806053	39244.06	07/08/99	1218	15.38
13	BION07806031	39244.01	07/08/99	1432	15.37
14	EXPL3	L3 6-52	07/08/99	1601	15.30
15					
16					
17					
18					
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32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC5

LC Column: METASIL Date(s) Analyzed: 07/02/99 07/03/99

Method: 200SG02C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	125442729	117769727	110502270
RDX	125431520	132869416	128999147
TNB	273680826	287034430	280960770
DNB	371457425	379150674	379019958
TETRYL	198425700	198640340	192134748
NB	215677340	217474954	220707675
TNT	232046500	242250088	243335729
4ADNT	136921522	139071922	136349583
2ADNT	320428080	323021786	322320038
26DNT	176236960	195046464	194415797
24DNT	347649900	344741412	343201971
3,4-DNT	113265455	126816597	123205299

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	110738093	105623682	114015300	6.77
RDX	131228083	134846764	130674986	2.78
TNB	282821004	273862853	279671977	2.08
DNB	380912043	389054504	379918921	1.65
TETRYL	198700556	189869102	195554089	2.16
NB	223126423	225721283	220541535	1.85
TNT	239032764	229629853	237258987	2.58
4ADNT	132199846	138913302	136691235	2.03
2ADNT	325369880	329567456	324141448	1.08
26DNT	197028451	191085645	190762663	4.40
24DNT	343957392	348462640	345602663	0.67
3,4-DNT	123932692	118665641	121177137	4.37
MEAN RSD				2.70

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC5 Method: 200SG02C

LC Column: METASIL Init. Calib Date(s): 07/02/99 07/03/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/07/99 : 07/07/99

Lab Sample IDs : L3A 6-71 : L3B 6-59 Time Analyzed : 1838 : 1910

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.51	4.48	4.52	105580018	114015300	7.4
RDX	6.86	6.84	6.96	129159265	130674986	1.2
TNB	6.76	6.74	6.78	265331339	279671977	5.1
DNB	8.56	8.53	8.67	377916580	379918921	0.5
TETRYL	10.50	10.47	10.61	185507194	195554089	5.1
NB	9.70	9.66	9.86	219136563	220541535	0.6
TNT	9.95	9.93	10.03	224442995	237258987	5.4
4ADNT	13.20	13.13	13.45	128243946	136691235	6.2
2ADNT	13.54	13.48	13.82	323971002	324141448	0.1
26DNT	12.55	12.50	12.74	185361002	190762663	2.8
24DNT	12.25	12.19	12.45	337851453	345602663	2.2
3,4-DNT	12.04	11.99	12.21	117474226	121177137	3.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 07/02/99 07/03/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.51	4.50	4.50	4.51	4.50
RDX	6.89	6.89	6.91	6.90	6.92
TNB	6.75	6.76	6.76	6.77	6.76
DNB	8.60	8.60	8.61	8.61	8.63
TETRYL	10.53	10.54	10.56	10.56	10.55
NB	9.77	9.75	9.77	9.77	9.80
TNT	9.97	9.98	9.99	10.00	9.98
4ADNT	13.28	13.28	13.31	13.32	13.36
2ADNT	13.66	13.64	13.66	13.68	13.71
26DNT	12.59	12.62	12.65	12.65	12.64
24DNT	12.32	12.30	12.33	12.34	12.36
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.09	12.10	12.13	12.13	12.13

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	4.51	0.00
RDX	0.00	6.86
TNB	6.76	0.00
DNB	0.00	8.56
TETRYL	10.50	0.00
NB	0.00	9.70
TNT	9.95	0.00
4ADNT	0.00	13.20
2ADNT	0.00	13.54
26DNT	12.55	0.00
24DNT	0.00	12.24
2NT	0.00	0.00
4NT	0.00	0.00
3NT	0.00	0.00
3,4-DNT	12.04	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.50	0.008	0.023	4.48 - 4.52
RDX	6.90	0.021	0.064	6.84 - 6.96
TNB	6.76	0.006	0.019	6.74 - 6.78
DNB	8.60	0.023	0.070	8.53 - 8.67

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 07/02/99 07/03/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	10.54	0.023	0.068	10.47 - 10.61
NB	9.76	0.033	0.100	9.66 - 9.86
TNT	9.98	0.017	0.052	9.93 - 10.03
4ADNT	13.29	0.054	0.162	13.13 - 13.45
2ADNT	13.65	0.058	0.174	13.48 - 13.82
26DNT	12.62	0.040	0.120	12.50 - 12.74
24DNT	12.32	0.042	0.127	12.19 - 12.45
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	12.10	0.036	0.107	11.99 - 12.21

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column: METASIL Init. Calib. Date(s): 07/02/99 07/03/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.10

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	07/02/99	1852	0.00	*
02	EXPL1A	L1A 5-186	07/02/99	1957	12.09	
03	EXPL2A	L2A 5-185	07/02/99	2030	12.10	
04	EXPL3A	L3A 6-55	07/02/99	2102	12.13	
05	EXPL4A	L4A 5-183	07/02/99	2135	12.13	
06	EXPL5A	L5A 5-184	07/02/99	2207	12.13	
07	EXPL1B	L1B 6-61	07/02/99	2241	0.00	*
08	EXPL2B	L2B 6-60	07/02/99	2314	0.00	*
09	EXPL3B	L3B 6-59	07/02/99	2347	0.00	*
10	EXPL4B	L4B 6-58	07/03/99	0019	0.00	*
11	EXPL5B	L5B 6-57	07/03/99	0052	0.00	*
12	EXPL3A	L3A 6-71	07/07/99	1838	12.04	
13	EXPL3B	L3B 6-59	07/07/99	1910	0.00	*
14	BL0702SD	BL0702SD	07/07/99	1943	12.15	
15	BION07806031	39244.01	07/07/99	2016	12.16	
16	BION07806032	39244.02	07/07/99	2048	12.16	
17	BION07806033	39244.03	07/07/99	2121	12.12	
18	BION07806051	39244.04	07/07/99	2153	12.10	
19	BION07806052	39244.05	07/07/99	2226	12.17	
20	BION07806053	39244.06	07/07/99	2258	12.23	*
21	BION07806053FD	39244.07	07/07/99	2331	12.21	*
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 08/07/99 08/07/99

Method: 200SH07

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	94920016	69446595	80759156
RDX	182530958	82140158	101049205
TNB	252242278	208241133	236241909
DNB	287962700	281870740	305553590
TETRYL	180153409	107378245	107156826
NB	161032050	178228380	180222640
TNT	216911625	186965325	203738005
4ADNT	252446214	153025043	162275375
2ADNT	367152714	205849143	218831826
26DNT	123950250	137472475	149760588
24DNT	245389214	257163500	286860599
2NT	121315550	130723000	132143886
4NT	76818600	95332230	97974107
3NT	88763050	121547200	124497284
3,4-DNT	111209767	120969040	136656554

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	69998281	69257654	76876340	14.56
RDX	88131736	88356973	108441806	38.72
TNB	203365516	202212143	220460596	10.23
DNB	269112969	270705170	283041034	5.24
TETRYL	100206960	101422320	119263552	28.67
NB	173751576	174633171	173573563	4.31
TNT	174577359	184465413	193331545	8.71
4ADNT	137748254	142503897	169599757	27.88
2ADNT	188582051	191862576	234455662	32.05
26DNT	128571677	127747719	133500542	7.76
24DNT	249133475	251031911	257915740	6.49
2NT	126477633	125826068	127297227	3.38
4NT	91756331	91942802	90764814	9.05
3NT	117355657	115972016	113627041	12.59
3,4-DNT	116339974	112785424	119592152	8.57
MEAN RSD				14.55

EXPLOSIVES INITIAL CALIBRATION : LINEAR REGRESSION SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 08/07/99 08/07/99

Method: 200SH07

L1 = 1_080703.D L2 = 1_080704.D L3 = 1_080705.D
L4 = 1_080706.D L5 = 1_080707.D

COMPOUND	SLOPE	INTERCEPT	R2 #
RDX	87740	2553474	0.998
TETRYL	99868	1555735	1.000
4ADNT	139513	2298683	0.998
2ADNT	188846	3492840	0.999

= Column used to flag R2 values that fail. * = R2 value < 0.99

7E

SOIL EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SH07

LC Column: CARBOSORB Init. Calib Date(s): 08/07/99 08/07/99

Client Sample No.: EXPL3 Date Analyzed : 08/08/99

Lab Sample ID : L3 6-148 Time Analyzed : 1736

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
RDX	7.47	7.37	7.57	547	600	-8.9
TETRYL	13.25	13.08	13.48	523	550	-4.9
4ADNT	16.73	16.59	16.99	324	350	-7.4
2ADNT	17.58	17.44	17.90	321	350	-8.3

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SH07

LC Column: CARBOSORB Init. Calib Date(s): 08/07/99 08/07/99

Client Sample No.: EXPL3 Date Analyzed : 08/08/99

Lab Sample ID : L3 6-148 Time Analyzed : 1736

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.94	4.89	4.99	68286463	76876340	11.2
TNB	10.09	10.00	10.16	196863889	220460596	10.7
DNB	12.37	12.29	12.51	262925329	283041034	7.1
NB	14.16	14.07	14.29	168541110	173573563	2.9
TNT	15.97	15.85	16.15	171181291	193331545	11.5
26DNT	18.77	18.66	19.04	123451013	133500542	7.5
24DNT	19.40	19.27	19.71	244080104	257915740	5.4
2NT	22.94	22.80	23.34	122565256	127297227	3.7
4NT	24.51	24.38	24.96	90006450	90764814	0.8
3NT	26.41	26.27	26.93	114180939	113627041	-0.5
3,4-DNT	15.43	15.30	15.64	113099120	119592152	5.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

SOIL EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SH07

LC Column: CARBOSORB Init. Calib Date(s): 08/07/99 08/07/99

Client Sample No.: EXPL3 Date Analyzed : 08/09/99

Lab Sample ID : L3 6-148 Time Analyzed : 0233

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. AMOUNT	NOMINAL AMOUNT	%D #
RDX	7.42	7.37	7.57	554	600	-7.6
TETRYL	13.18	13.08	13.48	514	550	-6.5
4ADNT	16.76	16.59	16.99	327	350	-6.5
2ADNT	17.62	17.44	17.90	329	350	-5.9

QC LIMITS: % Drift of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SH07

LC Column: CARBOSORB Init. Calib Date(s): 08/07/99 08/07/99

Client Sample No.: EXPL3 Date Analyzed : 08/09/99

Lab Sample ID : L3 6-148 Time Analyzed : 0233

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.92	4.89	4.99	69266946	76876340	9.9
TNB	10.06	10.00	10.16	200401082	220460596	9.1
DNB	12.36	12.29	12.51	268300183	283041034	5.2
NB	14.17	14.07	14.29	173125736	173573563	0.3
TNT	15.96	15.85	16.15	176823290	193331545	8.5
26DNT	18.83	18.66	19.04	125717768	133500542	5.8
24DNT	19.47	19.27	19.71	246797036	257915740	4.3
2NT	23.11	22.80	23.34	124939213	127297227	1.9
4NT	24.73	24.38	24.96	92025527	90764814	-1.4
3NT	26.66	26.27	26.93	115449123	113627041	-1.6
3,4-DNT	15.45	15.30	15.64	115023951	119592152	3.8

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/07/99 08/07/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.95	4.96	4.95	4.96	4.93
RDX	7.48	7.49	7.50	7.49	7.42
TNB	10.07	10.09	10.13	10.11	10.06
DNB	12.39	12.40	12.46	12.43	12.37
TETRYL	13.30	13.31	13.38	13.33	13.25
NB	14.16	14.18	14.25	14.22	14.15
TNT	15.97	16.01	16.08	16.06	15.95
4ADNT	16.77	16.80	16.90	16.85	16.72
2ADNT	17.69	17.70	17.79	17.74	17.60
26DNT	18.85	18.84	18.94	18.92	18.78
24DNT	19.49	19.50	19.60	19.57	19.42
2NT	23.02	23.08	23.19	23.17	23.01
4NT	24.65	24.67	24.79	24.76	24.60
3NT	26.58	26.64	26.73	26.69	26.53
3,4-DNT	15.44	15.47	15.56	15.53	15.41

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	4.94	4.92
RDX	7.47	7.42
TNB	10.08	10.06
DNB	12.37	12.36
TETRYL	13.24	13.18
NB	14.16	14.17
TNT	15.97	15.96
4ADNT	16.73	16.76
2ADNT	17.58	17.62
26DNT	18.77	18.83
24DNT	19.40	19.47
2NT	22.94	23.11
4NT	24.51	24.73
3NT	26.41	26.66
3,4-DNT	15.43	15.45

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.94	0.016	0.047	4.89 - 4.99
RDX	7.47	0.034	0.101	7.37 - 7.57
TNB	10.08	0.027	0.081	10.00 - 10.16
DNB	12.40	0.037	0.110	12.29 - 12.51

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 08/07/99 08/07/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.28	0.066	0.199	13.08 - 13.48
NB	14.18	0.037	0.112	14.07 - 14.29
TNT	16.00	0.052	0.155	15.84 - 16.15
4ADNT	16.79	0.065	0.196	16.59 - 16.99
2ADNT	17.67	0.078	0.233	17.44 - 17.90
26DNT	18.85	0.064	0.193	18.66 - 19.04
24DNT	19.49	0.073	0.219	19.27 - 19.71
2NT	23.07	0.090	0.271	22.80 - 23.34
4NT	24.67	0.097	0.292	24.38 - 24.96
3NT	26.60	0.109	0.328	26.27 - 26.93
3,4-DNT	15.47	0.055	0.165	15.30 - 15.64

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column: CARBOSORB Init. Calib. Date(s): 07/08/99 07/08/99

Instrument ID: LC1A

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.03

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	BL0702SD	BL0702SD	07/08/99	0906	15.13
02	LC0702SD	LC0702SD	07/08/99	0951	15.10
03	LD0702SD	LD0702SD	07/08/99	1035	15.01
04					
05					
06					
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 07/08/99 07/08/99

Method: 200SG07

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	65334887	65725923	67175482
RDX	63671833	68119108	77268738
TNB	199461889	189928478	193977551
DNB	278547400	259850820	261510913
TETRYL	129307136	103720191	99276662
NB	184452250	178638580	170785395
TNT	206938375	187948488	176999009
4ADNT	140298286	150871086	128738818
2ADNT	202708571	218385900	181822337
26DNT	133751042	137452808	123476366
24DNT	254169786	250268571	240222122
2NT	133850100	123149190	117720385
4NT	116618850	92838690	84932681
3NT	154337150	110876560	110989258
3,4-DNT	132264433	127938873	116872424

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	72720040	74140460	69019358	5.96
RDX	88380451	87518181	76991662	14.47
TNB	209750132	212177047	201059020	4.82
DNB	281643976	284032459	273117114	4.22
TETRYL	110268286	130440008	114602457	12.64
NB	183068818	180003633	179389735	2.98
TNT	193086465	205366436	194067754	6.43
4ADNT	136905453	140873743	139537477	5.71
2ADNT	199556441	202968038	201088257	6.48
26DNT	137209679	135128498	133403679	4.31
24DNT	255334536	261419316	252282866	3.11
2NT	130871721	128457773	126809834	5.06
4NT	95908659	93894020	96838580	12.20
3NT	121379677	118418072	123200143	14.61
3,4-DNT	123951824	124433733	125092257	4.54
MEAN RSD				7.17

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SG07

LC Column: CARBOSORB Init. Calib Date(s): 07/08/99 07/08/99

Client Sample No.: EXPL3 Date Analyzed : 07/08/99

Lab Sample ID : L3 6-52 Time Analyzed : 1312

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.78	4.69	4.79	69043843	69019358	-0.0
RDX	7.25	7.03	7.33	79282200	76991662	-3.0
TNB	9.84	9.63	10.01	194407604	201059020	3.3
DNB	12.02	11.77	12.29	258977263	273117114	5.2
TETRYL	12.83	12.51	13.23	100575674	114602457	12.2
NB	13.80	13.51	14.15	160479973	179389735	10.5
TNT	15.61	15.21	16.09	173445027	194067754	10.6
4ADNT	16.17	15.69	16.75	126817320	139537477	9.1
2ADNT	16.96	16.47	17.55	181539684	201088257	9.7
26DNT	18.36	17.78	19.02	124460303	133403679	6.7
24DNT	18.93	18.40	19.56	241349333	252282866	4.3
2NT	22.70	21.84	23.54	121000668	126809834	4.6
4NT	24.33	23.33	25.19	89705442	96838580	7.4
3NT	26.37	25.14	27.28	113690272	123200143	7.7
3,4-DNT	14.99	14.54	15.52	112086469	125092257	10.4

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC1 Method: 200SG07

LC Column: CARBOSORB Init. Calib Date(s): 07/08/99 07/08/99

Client Sample No.: EXPL3 Date Analyzed : 07/08/99

Lab Sample ID : L3 6-52 Time Analyzed : 2225

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.73	4.69	4.79	76434267	69019358	-10.7
RDX	7.14	7.03	7.33	88402924	76991662	-14.8
TNB	9.77	9.63	10.01	221845798	201059020	-10.3
DNB	11.95	11.77	12.29	296925097	273117114	-8.7
TETRYL	12.76	12.51	13.23	114854264	114602457	-0.2
NB	13.72	13.51	14.15	193362556	179389735	-7.8
TNT	15.50	15.21	16.09	210763877	194067754	-8.6
4ADNT	16.00	15.69	16.75	138488726	139537477	0.8
2ADNT	16.80	16.47	17.55	207641929	201088257	-3.3
26DNT	18.17	17.78	19.02	139020098	133403679	-4.2
24DNT	18.74	18.40	19.56	273285456	252282866	-8.3
2NT	22.28	21.84	23.54	138275928	126809834	-9.0
4NT	23.77	23.33	25.19	102485570	96838580	-5.8
3NT	25.61	25.14	27.28	129976962	123200143	-5.5
3,4-DNT	14.87	14.54	15.52	131645580	125092257	-5.2

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 07/08/99 07/08/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.73	4.75	4.73	4.74	4.74
RDX	7.14	7.24	7.13	7.17	7.20
TNB	9.78	9.91	9.74	9.82	9.88
DNB	11.97	12.15	11.94	12.07	12.13
TETRYL	12.79	13.03	12.74	12.93	13.02
NB	13.75	13.96	13.72	13.90	13.96
TNT	15.50	15.83	15.54	15.75	15.81
4ADNT	16.07	16.43	16.10	16.34	16.42
2ADNT	16.83	17.22	16.92	17.14	17.22
26DNT	18.16	18.64	18.32	18.55	18.64
24DNT	18.78	19.20	18.90	19.12	19.21
2NT	22.37	22.96	22.64	22.88	23.00
4NT	23.93	24.54	24.24	24.46	24.59
3NT	25.85	26.49	26.19	26.42	26.56
3,4-DNT	14.89	15.25	14.90	15.14	15.21

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	4.78	4.73
RDX	7.25	7.14
TNB	9.84	9.76
DNB	12.02	11.95
TETRYL	12.83	12.76
NB	13.80	13.72
TNT	15.61	15.50
4ADNT	16.17	16.00
2ADNT	16.96	16.80
26DNT	18.36	18.17
24DNT	18.93	18.74
2NT	22.70	22.28
4NT	24.33	23.77
3NT	26.37	25.61
3,4-DNT	14.99	14.86

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.74	0.018	0.055	4.68 - 4.79
RDX	7.18	0.049	0.148	7.03 - 7.33
TNB	9.82	0.063	0.189	9.63 - 10.01
DNB	12.03	0.086	0.257	11.77 - 12.29

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 07/08/99 07/08/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	12.87	0.122	0.365	12.50 - 13.23
NB	13.83	0.108	0.324	13.50 - 14.15
TNT	15.65	0.145	0.436	15.21 - 16.08
4ADNT	16.22	0.176	0.529	15.69 - 16.75
2ADNT	17.01	0.179	0.537	16.47 - 17.55
26DNT	18.40	0.207	0.620	17.78 - 19.02
24DNT	18.98	0.195	0.584	18.40 - 19.56
2NT	22.69	0.282	0.847	21.84 - 23.54
4NT	24.26	0.311	0.934	23.33 - 25.19
3NT	26.21	0.356	1.068	25.14 - 27.28
3,4-DNT	15.03	0.163	0.490	14.54 - 15.52

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column: CARBOSORB Init. Calib. Date(s): 07/08/99 07/08/99

Instrument ID: LC1

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.03

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	07/07/99	2239	0.00 *
02	EXPL1	L1 6-54	07/08/99	0008	14.89
03	EXPL2	L2 6-53	07/08/99	0053	15.25
04	EXPL3	L3 6-52	07/08/99	0138	14.90
05	EXPL4	L4 6-51	07/08/99	0223	15.14
06	EXPL5	L5 6-50	07/08/99	0307	15.21
07	EXPL3	L3 6-52	07/08/99	1312	14.99
08	BION07806031MS	39244.08MS	07/08/99	1533	14.92
09	BION07806031MSD	39244.09MSD	07/08/99	1618	15.14
10	EXPL3	L3 6-52	07/08/99	2225	14.86
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12					
13					
14					
15					
16					
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC4

LC Column: METASIL Date(s) Analyzed: 07/16/99 07/16/99

Method: 200SG16N

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	0	0	0
RDX	0	0	0
TNB	0	0	0
DNB	0	0	0
TETRYL	0	0	0
NB	0	0	0
TNT	0	0	0
4ADNT	0	0	0
2ADNT	0	0	0
26DNT	0	0	0
24DNT	0	0	0
2NT	28267720	28034316	29297821
4NT	32548260	32584704	32295210
3NT	34741230	34885848	35237262
3,4-DNT	0	0	0

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	0	0	0	0.00
RDX	0	0	0	0.00
TNB	0	0	0	0.00
DNB	0	0	0	0.00
TETRYL	0	0	0	0.00
NB	0	0	0	0.00
TNT	0	0	0	0.00
4ADNT	0	0	0	0.00
2ADNT	0	0	0	0.00
26DNT	0	0	0	0.00
24DNT	0	0	0	0.00
2NT	27773778	25010362	27676799	5.78
4NT	31404423	33405032	32447526	2.21
3NT	33680453	33366432	34382245	2.36
3,4-DNT	0	0	34382245	0.00
MEAN RSD				3.45

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC4 Method: 200sg16n

LC Column: METASIL Init. Calib Date(s): 07/16/99 07/16/99

Client Sample No.: EXPL3NT Date Analyzed : 07/18/99

Lab Sample ID : L3 6-102 Time Analyzed : 0841

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
2NT	22.72	21.21	23.15	29115531	27676799	-5.2
4NT	23.15	21.55	23.59	33560064	32447526	-3.4
3NT	25.10	23.38	25.56	35800933	34382245	-4.1

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 39244 Inst. ID: LC4 Method: 200sg16n

LC Column: METASIL Init. Calib Date(s): 07/16/99 07/16/99

Client Sample No.: EXPL3NT Date Analyzed : 07/18/99

Lab Sample ID : L3 6-102 Time Analyzed : 1503

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
2NT	22.52	21.21	23.15	29260734	27676799	-5.7
4NT	22.96	21.55	23.59	33813370	32447526	-4.2
3NT	24.89	23.38	25.56	35660029	34382245	-3.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC4

LC Column: METASIL Date(s) ICAL Analyzed: 07/16/99 07/16/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.00	0.00	0.00	0.00	0.00
RDX	0.00	0.00	0.00	0.00	0.00
TNB	0.00	0.00	0.00	0.00	0.00
DNB	0.00	0.00	0.00	0.00	0.00
TETRYL	0.00	0.00	0.00	0.00	0.00
NB	0.00	0.00	0.00	0.00	0.00
TNT	0.00	0.00	0.00	0.00	0.00
4ADNT	0.00	0.00	0.00	0.00	0.00
2ADNT	0.00	0.00	0.00	0.00	0.00
26DNT	0.00	0.00	0.00	0.00	0.00
24DNT	0.00	0.00	0.00	0.00	0.00
2NT	21.86	22.01	21.99	21.95	22.20
4NT	22.34	22.42	22.40	22.30	22.40
3NT	24.20	24.30	24.28	24.20	24.35
3,4-DNT	0.00	0.00	0.00	0.00	0.00

COMPOUND	RT CCAL 1	RT CCAL 2
HMX	0.00	0.00
RDX	0.00	0.00
TNB	0.00	0.00
DNB	0.00	0.00
TETRYL	0.00	0.00
NB	0.00	0.00
TNT	0.00	0.00
4ADNT	0.00	0.00
2ADNT	0.00	0.00
26DNT	0.00	0.00
24DNT	0.00	0.00
2NT	22.72	22.52
4NT	23.15	22.96
3NT	25.10	24.88
3,4-DNT	0.00	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	0.00	0.000	0.000	0.00 - 0.00
RDX	0.00	0.000	0.000	0.00 - 0.00
TNB	0.00	0.000	0.000	0.00 - 0.00
DNB	0.00	0.000	0.000	0.00 - 0.00

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 39244

Lab Code: SWOK Instrument ID: LC4

LC Column: METASIL Date(s) ICAL Analyzed: 07/16/99 07/16/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	0.00	0.000	0.000	0.00 - 0.00
NB	0.00	0.000	0.000	0.00 - 0.00
TNT	0.00	0.000	0.000	0.00 - 0.00
4ADNT	0.00	0.000	0.000	0.00 - 0.00
2ADNT	0.00	0.000	0.000	0.00 - 0.00
26DNT	0.00	0.000	0.000	0.00 - 0.00
24DNT	0.00	0.000	0.000	0.00 - 0.00
2NT	22.18	0.323	0.970	21.21 - 23.15
4NT	22.57	0.340	1.021	21.55 - 23.59
3NT	24.47	0.363	1.089	23.38 - 25.56
3,4-DNT	0.00	0.000	0.000	0.00 - 0.00

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 39244

LC Column: METASIL Init. Calib. Date(s): 07/16/99 07/16/99

Instrument ID: LC4

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 0.00

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	07/16/99	2032	0.00
02	EXPL1NT	L1 6-104	07/16/99	2136	0.00
03	EXPL2NT	L2 6-103	07/16/99	2208	0.00
04	EXPL3NT	L3 6-102	07/16/99	2240	0.00
05	EXPL4NT	L4 6-101	07/16/99	2311	0.00
06	EXPL5NT	L5 6-100	07/16/99	2343	0.00
07	EXPL3NT	L3 6-102	07/18/99	0841	0.00
08	BLO702SD	BL0702SD	07/18/99	1048	0.00
09	BION07806032	39244.02	07/18/99	1120	0.00
10	BION07806033	39244.03	07/18/99	1152	0.00
11	BION07806052	39244.05	07/18/99	1224	0.00
12	BION07806053	39244.06	07/18/99	1255	0.00
13	EXPL3NT	L3 6-102	07/18/99	1503	0.00
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

	M SV	• PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

☐ RUSH ☐ REEXTRACT ☐ TCLP ☐ DXIN

SAMPLE EXTRACTION LO

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990702SD

EXTRACT DATE 1999-07-02 12:32

000059
Page: 1 of 1

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0702SD			S/L				2.04	10.00						10.0	N		1000		
BB0702SD			S/L				2.09	10.00						10.0	N		1000		
LC0702SD			S/L				2.00	10.00						10.0	N	500	1000		
LD0702SD			S/L				2.06	10.00						10.0	N	500	1000		
39244.01 GC200	TOLTEST	07/02/1999 10:52 BION07806031	S/L		21.75	1.6	2.04	10.00						10.0	N		1000		
39244.02 GC200	TOLTEST	07/02/1999 10:52 BION07806032	S/L		28.95	1.4	2.00	10.00						10.0	N		1000		
39244.03 GC200	TOLTEST	07/02/1999 10:52 BION07806033	S/L		33.44	1.3	2.01	10.00						10.0	N		1000		
39244.04 GC200	TOLTEST	07/02/1999 10:52 BION07806051	S/L		23.11	1.7	2.18	10.00						10.0	N		1000		
39244.05 GC200	TOLTEST	07/02/1999 10:52 BION07806052	S/L		22.18	1.7	2.24	10.00						10.0	N		1000		
39244.06 GC200	TOLTEST	07/02/1999 10:52 BION07806053	S/L		26.13	1.5	2.00	10.00						10.0	N		1000		
39244.07 GC200	TOLTEST	07/02/1999 10:52 BION07806053FD	S/L		30.85	1.4	2.07	10.00						10.0	N		1000		
39244.08MS GC200	TOLTEST	07/02/1999 10:52 BION07806031			30.85	1.5	2.18	10.00						10.0	N	500	1000		
39244.09MSD GC200	TOLTEST	07/02/1999 10:52 BION07806031			30.85	1.5	2.21	10.00						10.0	N	500	1000		

INITIALS

WEIGHING:	GS	EXTRACTION:	GS	FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:		TV:			
SURROG. SPIKER:	GS	VERIFIER:	GP		

ID NUMBERS

FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #: 6-7
MATRIX SPIKE SOLID/CONC #(s): 6-45

COMMENTS

227

TOLTESI, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

BIO-210

Chain of Custo Record

25776

Page 1 of 2

Project No.: 37324	Client:
P.O. No.:	Project/Location: NSWC Crane Biofacility
Project Mgr.:	Sampler's Name: Peter J Chevalier
Phone No.	Sampler's Signature: [signature]

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	8330	Parameters							Preserved Yes/No	LAB USE ONLY Lab #
1	BIO 5073 OU 031	6/12/99	0936	G	compost	column 3 sample location 1	1	✓									
2	BIO 5073 OU 032		0937			2						MS/MSD					
3	BIO 5073 OU 033		0935			3											
4	BIO 5073 OU 051		0939			5 1											
5	BIO 5073 OU 052		0940			2											
6	BIO 5073 OU 053		0938			3											
7	BIO 5073 OU 071		0942			7 1											
8	BIO 5073 OU 072		0943			2											
9	BIO 5073 OU 073		0941			3											
10	BIO 5073 OU 091		0945			9 1											

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
1	[signature]	6/14/99 1500	J. Hodson	6/15/99 1000

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 3 °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled properly for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 7/97

TOLTEST, INC.

1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259 B10-210
Ship To Address: ATTN: RECEIVING LAB, 1810 N. 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
Sent From: ☐ Corporate ☐ Plymouth ☐ Monroe ☐ Pittsburgh ☐ Other _____

Chain of Custody Record

25775

Project No.: 37324
Client:
P.O. No.:
Project/Location: NSWC Crane Biofacility
Project Mgr.:
Sampler's Name Peter J. Chevalier
Phone No.
Sampler's Signature Peter Chevalier

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Parameters	Preserved Yes/No	LAB USE ONLY Lab #
1	B10S073 00 09 1 F-2	6/17/99	0945	G	compost	column 9 sample location 1				
2	B10S073 00 09 2		0946			2				
3	B10S073 00 09 3		0944			3				
4	B10S073 00 11 1		0948			11 1				
5	B10S073 00 11 2		0949			2				
6	B10S073 00 11 3		0947			3				
7										
8										
9										
10										

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
1	Peter J. Chevalier	6/14/99 1500	J. Hedson	6/15/99 1000
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☐ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Temp of samples 3 °C
Did samples arrive intact and sealed? ☐ yes ☐ no ☐ N/A
Were proper containers used? ☐ yes ☐ no
Was container labeled properly for contents? ☐ yes ☐ no
Were samples packaged properly for type of material? ☐ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Comments: _____

TAT

Distribution: Original Lab copy accompanies shipment (white and yellow); copy to coordinator field ... (pink)

Rev. 7/97

COOLER RECEIPT / SAMPLE LOG-IN SHEET

COOLER RECEIPT / SAMPLE LOG-IN SHEET (115-ATT2 WB1) / SWL-GA-115 REV 5.0 / GA-115-CRLOGIN-F

LAB NAME: SOUTHWEST LABORATORY OF OKLAHOMA

PAGE 1 OF 1

RECEIVED BY (PRINT NAME): SARAH HODSON

RECEIVED BY (SIGNATURE): S. Hodson

LOGGED IN BY (SIGNATURE): S. Hodson

REC'D DATE 06/15/99

TIME REC'D 10.00

LOG-IN DATE 1999-06-15 10:41

PROJECT: NSWC CRANE

EPISODE: 38999

SAMPLE DELIVERY GROUP: 38999

Client Sample #	Sample Fraction @	Assigned LAB#	Cooler I.D.	pH Check	ACID/ BASE LOT#	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
BIOS07300031	gc	38999.01	06/15/99-1	N		3.0 C
BIOS07300032		38999.02		N		
BIOS07300032		38999.03		N		
BIOS07300032		38999.04		N		
BIOS07300033		38999.05		N		
BIOS07300051		38999.06		N		
BIOS07300052		38999.07		N		
BIOS07300053		38999.08		N		
BIOS07300071		38999.09		N		
BIOS07300072		38999.10		N		
BIOS07300073		38999.11		N		
BIOS07300091		38999.12		N		
BIOS07300091FD		38999.13		N		
BIOS07300092		38999.14		N		
BIOS07300093		38999.15		N		
BIOS07300111		38999.16		N		
BIOS07300112		38999.17		N		
BIOS07300113		38999.18		N		

Remarks

1. CUSTODY SEAL(S): Present/Absent
   Intact/ Broken
2. CUSTODY SEALS NOS.: NA
3. CHAIN-OF CUSTODY. Present/Absent
   Sealed In Plastic? Yes/ No
   Taped To Lid? Yes/ No
   Properly Filled Out (Ink, Signed, ETC.)? Yes/ No
4. AIRBILL AirBill/ Sticker
   Present/Absent
5. AIRBILL NO: 811674014243
6. COOLER CONDITIONS
   Enough Ice? Yes/ No
   Type of Ice? WET
   Type of Packing? BUB
7. SAMPLE TAGS Present/Absent
8. SAMPLE CONDITION: Intact/ Broken*/ Leaking
   Bottles Sealed In Separate Plastic Bags? Yes/ No
   Correct Containers Used For Tests Indicated? Yes/ No
   Correct Preservative? Yes/ No
   Sufficient Sample? Yes/ No
   Labels Complete (I.D., Date, Time, Signature, Preservative? Yes/ No
   VOA Samples Without Bubbles? Yes/ No~
9. Does Information on Custody Records, Labels, Tags Agree? Yes/ No*
10. RAD SCREEN WITH GIEGER COUNTER? Yes/ No
11. P.O. Called? Yes/ No

* Contact PO and attach record of resolution

@ Sample Fractions: B=SV GC/MS, V= VOA GC/MS or GC, P=Pesticide, H=Herbicide, D=Dioxin, A=Air, I=Inorganics, C=Cyanide, M=Metals, R=Radiochemistry

~ Note samples with bubbles under remarks section.

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE
August 3, 1999

CONTRACT : TOLTEST

PROJECT : NSWC CRANE

SDG NO : 38999

EPISODE(S): 38999

EXPLOSIVE FRACTION

This SDG consisted of 16 soil samples with applicable MS and MSD for the explosive analysis. The samples, blanks and spikes were extracted and analyzed according to EPA protocol, SW-846, method 8330, REV. 0, 1994.

For soil samples, the percent moisture is determined by drying them at 105° C at the time of receipt. Additional portion of the samples is air-dried prior to analysis. The results are reported on the basis of the air-dried samples. For high-level water samples, direct injection method is used. For low-level water samples, salting out method is used. All of the extracts are diluted by a factor of two prior to analysis according to method 8330. The extracts are diluted in order to be the same consistency as the Mobile Phase.

"P" flags were used when the appropriate compound with sufficient response exceeded 40% deviation, possibly due to interference in the quantitation or confirmation columns.

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

ıb Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BL0615SE	72	0
02	LC0615SE	78	0
03	LD0615SE	87	0
04	BIOS07300031	69	0
05	BIOS07300032	64	0
06	BIOS07300032MS	82	0
07	BIOS07300032MSD	93	0
08	BIOS07300033	54*	1
09	BIOS07300051	47*	1
10	BIOS07300052	67	0
11	BIOS07300053	65	0
12	BIOS07300071	64	0
13	BIOS07300072	67	0
14	BIOS07300073	59*	1
15	BIOS07300091	54*	1
16	BIOS07300091FD	67	0
17	BIOS07300092	66	0
18	BIOS07300093	161*	1
19	BIOS07300111	85	0
20	BIOS07300112	60	0
21	BIOS07300113	33*	1
22	BIOS07300031DL	8*	1
23	BIOS07300032DL	70	0
24	BIOS07300051DL	77	0
25	BIOS07300071DL	75	0
26	BIOS07300072DL	67	0
27	BIOS07300073DL	66	0
28	BIOS07300091DL	71	0
29	BIOS07300091FDDL	62	0
30	BIOS07300092DL	79	0

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

2F
SOIL EXPLOSIVES SURROGATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column(1): CARBOSORB

	CLIENT SAMPLE NO.	S1 1 %REC #	TOT OUT
01	BIOS07300111DL	77	0
02	BIOS07300112DL	73	0
03	BIOS07300112	52*	1
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

S1 = 3,4-DNT

QC LIMITS
(60-140)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted

FORM II

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

CASE SUMMARY:

Blanks: No problems

Surrogate(s): The surrogate was out of the QC limits in some of the samples of the above SDG due to high concentration of the TNT peaks or dilution of the samples.

Matrix Spikes: TNB and DNB were slightly out of the QC limits in the MS. RDX and DNB were slightly out of the QC limits in the MSD. These analytes were within the QC limits in the LC0615SE and LD0615SE.

Laboratory Control Spikes: No problems

Due to matrix interference, RDX was "EP" flagged in the original of some of the samples.

Tetryl slightly exceeded 15% deviation in the continuing calibration standards 1-062978 and 1-062989.

	Example calculation					
sample #	38999.01					
analyte	RDX					
As=area of analyte in sample			=	1.115E+09		
V(f)=final volume of extract (ml)			=	10		
D=dilution factor			=	2		
CF=mean calibration factor (1/ng/ml)			=	225022.6		
W(V)=weight of sample extracted (g)			=	2		
conc (ug/kg) =	As	V(f)	D		ml	ng
	CF	W(V)			ml	g
=	1.115E+09	10	2			
	225022.6	2				
=	49535.8					

The explosives referred to in the data package by the abbreviations found in method 8330 are as follows: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine), RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), TNB (1,3,5-Trinitrobenzene), DNB (1,3-Dinitrobenzene), Tetryl (Methyl-2,4,6-trinitrophenylnitramine), NB (Nitrobenzene), TNT (2,4,6- Trinitrotoluene), 24DNT (2,4-Dinitrotoluene), 26DNT (2,6-Dinitrotoluene), 2NT (o-Nitrotoluene), 3NT

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

m-Nitrotoluene), 4NT (p-Nitrotoluene) , PETN (Pentaerythritol tetranitrate), 2ADNT (2-Amino-4,6-dinitrotoluene), 4ADNT (4-Amino-2,6-dinitrotoluene).

The laboratory utilizes the following flags where appropriate: "J" - indicates a quantitated result, which is below the quantitation limit, but above the detection limit and has been confirmed by the second column. "E"- indicates an out of range value, i.e., a peak that is off-scale or out of the linear calibration range of the detector. The value reported is not to be used. The sample must be diluted and re-run. "D" - indicates a value derived from a secondary dilution. "U" - indicates the compound that is undetected above the quantitation limit. "X" - indicates a comment that is explained in the case narrative.

Shahriar Shahreza
LC Supervisor

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ıb Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix Spike - Client Sample NO.: BIOS07300032

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
HMX	9050	6850	15500	96	54-128
RDX	9050	46200	55000	97	66-109
TNB	9050	0	11900	132*	57-130
DNB	9050	0	12000	133*	74-122
TETRYL	9050	0	6160	68	32-119
NB	9050	0	8730	96	70-135
TNT	9050	9920	16800	75	44-124
4ADNT	9050	1580	10600	100	60-140
2ADNT	9050	872	9240	92	60-140
26DNT	9050	0	8470	94	58-125
24DNT	9050	0	8800	97	59-120
2NT	9050	0	7850	87	79-124
4NT	9050	0	9140	101	74-128
3NT	9050	0	9180	101	79-121

3F

SOIL EXPLOSIVES MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix Spike - Client Sample NO.: BIOS07300032

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	8640	15500	100	0	30	54-128
RDX	8640	50900	54 *	8	30	66-109
TNB	8640	10400	121	13	30	57-130
DNB	8640	11000	128 *	9	45	74-122
TETRYL	8640	5850	68	5	30	32-119
NB	8640	8470	98	3	35	70-135
TNT	8640	16800	79	0	30	44-124
4ADNT	8640	10200	100	4	40	60-140
2ADNT	8640	9140	96	1	40	60-140
26DNT	8640	7990	92	6	35	58-125
24DNT	8640	8700	101	1	35	59-120
2NT	8640	7730	89	2	35	79-124
4NT	8640	8820	102	4	35	74-128
3NT	8640	8900	103	3	35	79-121

Column to be used to flag recovery values

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 4 out of 28 outside limits

Comments:

FORM III

3H
SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

ab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

LCS Sample NO.: LC0615SE

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	9500	9510	100	57-137
RDX	9500	9950	105	77-113
TNB	9500	9260	97	64-125
DNB	9500	9380	99	82-118
TETRYL	9500	9330	98	23-124
NB	9500	9230	97	69-143
TNT	9500	9230	97	75-118
4ADNT	9500	9040	95	60-140
2ADNT	9500	9490	100	60-140
26DNT	9500	8120	85	78-117
24DNT	9500	9550	100	74-126
2NT	9500	8140	86	78-123
4NT	9500	9850	104	79-125
3NT	9500	9870	104	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

3H

SOIL EXPLOSIVES LABORATORY CONTROL SPIKE RECOVERY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

LCS Sample NO.: LD0615SE

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	8640	8840	102	57-137
RDX	8640	9220	107	77-113
TNB	8640	8660	100	64-125
DNB	8640	8790	102	82-118
TETRYL	8640	8820	102	23-124
NB	8640	8630	100	69-143
TNT	8640	8500	98	75-118
4ADNT	8640	8470	98	60-140
2ADNT	8640	8650	100	60-140
26DNT	8640	7930	92	78-117
24DNT	8640	8660	100	74-126
2NT	8640	7650	88	78-123
4NT	8640	9310	108	79-125
3NT	8640	9310	108	78-121

Column to be used to flag recovery values

* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0615SE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Lab Sample ID : BL0615SE Lab File ID : 3_062103

Matrix: (soil/water) SOIL

Date Extracted : 06/15/99 Extraction Method : SONC

Date Analyzed (1): 06/22/99 Date Analyzed (2): 06/22/99

Time Analyzed (1): 0128 Time Analyzed (2): 1230

Instrument ID (1): LC3 Instrument ID (2): LC5

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	LC0615SE	LC0615SE	06/22/99	
02	LD0615SE	LD0615SE	06/22/99	
03	BIOS07300031	38999.01	06/22/99	06/22/99
04	BIOS07300032	38999.02	06/22/99	06/22/99
05	BIOS07300032MS	38999.03MS	06/22/99	
06	BIOS07300032MSD	38999.04MSD	06/22/99	
07	BIOS07300033	38999.05	06/22/99	06/22/99
08	BIOS07300051	38999.06	06/22/99	06/22/99
09	BIOS07300052	38999.07	06/22/99	06/22/99
10	BIOS07300053	38999.08	06/22/99	06/22/99
11	BIOS07300071	38999.09	06/22/99	06/22/99
12	BIOS07300072	38999.10	06/22/99	06/22/99
13	BIOS07300073	38999.11	06/22/99	06/22/99
14	BIOS07300091	38999.12	06/22/99	06/22/99
15	BIOS07300091FD	38999.13	06/22/99	07/01/99
16	BIOS07300092	38999.14	06/22/99	07/01/99
17	BIOS07300093	38999.15	06/23/99	07/01/99
18	BIOS07300111	38999.16	06/23/99	06/22/99
19	BIOS07300112	38999.17	06/23/99	07/01/99
20	BIOS07300113	38999.18	06/23/99	
21	BIOS07300031DL	38999.01DL	07/01/99	06/22/99
22	BIOS07300032DL	38999.02DL	07/01/99	06/22/99
23	BIOS07300051DL	38999.06DL	07/01/99	06/22/99
24	BIOS07300071DL	38999.09DL	07/01/99	06/22/99
25	BIOS07300072DL	38999.10DL	07/01/99	06/22/99
26	BIOS07300073DL	38999.11DL	07/01/99	06/22/99

Comments:

FORM IV

4C

EXPLOSIVES METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BL0615SE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Lab Sample ID : BL0615SE Lab File ID : 3_062103

Matrix: (soil/water) SOIL

Date Extracted : 06/15/99 Extraction Method : SONC

Date Analyzed (1): 06/22/99 Date Analyzed (2): 06/22/99

Time Analyzed (1): 0128 Time Analyzed (2): 1230

Instrument ID (1): LC3 Instrument ID (2): LC5

LC Column ID (1): CARBOSORB LC Column ID (2): METASIL

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC'S:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	BIOS07300091DL	38999.12DL	07/01/99	06/22/99
02	BIOS07300091FDDL	38999.13DL	07/01/99	07/01/99
03	BIOS07300092DL	38999.14DL	07/01/99	07/01/99
04	BIOS07300111DL	38999.16DL	07/01/99	06/22/99
05	BIOS07300112DL	38999.17DL	07/01/99	07/01/99
06	BIOS07300112	38999.17	07/02/99	
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

Comments:

FORM IV

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS07300033

Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix: (soil/water) SOIL Lab Sample ID: 38999.05

Sample Amt: 2.0 G % Moisture: 48.6 Date Received: 06/15/99

Extraction Volume: 10 ML Date Extracted: 06/15/99

Extraction Method: SONC Date Analyzed: 06/22/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	5590	
121-82-4	RDX	1000	U 30,300 PE
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	2690	
1946-51-0	4ADNT	1340	
35572-78-2	2ADNT	620	
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062111.D Vial: 11
Acq On : 22 Jun 1999 07:25 Operator: BW
Sample : 38999.05 Inst : LC3
Misc : BIOS07300033 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 22 12:58 1999 Quant Results File: 200SF19.RES

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Initial Calibration

06/26/99

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.51	29871754	1071.6	m	A
Target Compounds:					
1) HMX	5.13	128363402	5591.8	m	A
2) RDX	7.62	682808925	30344.0	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	16.04	136040077	2691.1	m	A
9) 4ADNT	17.04	55977345	1343.6	m	A
10) 2ADNT	18.01	29049990	619.8	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

6-22-99

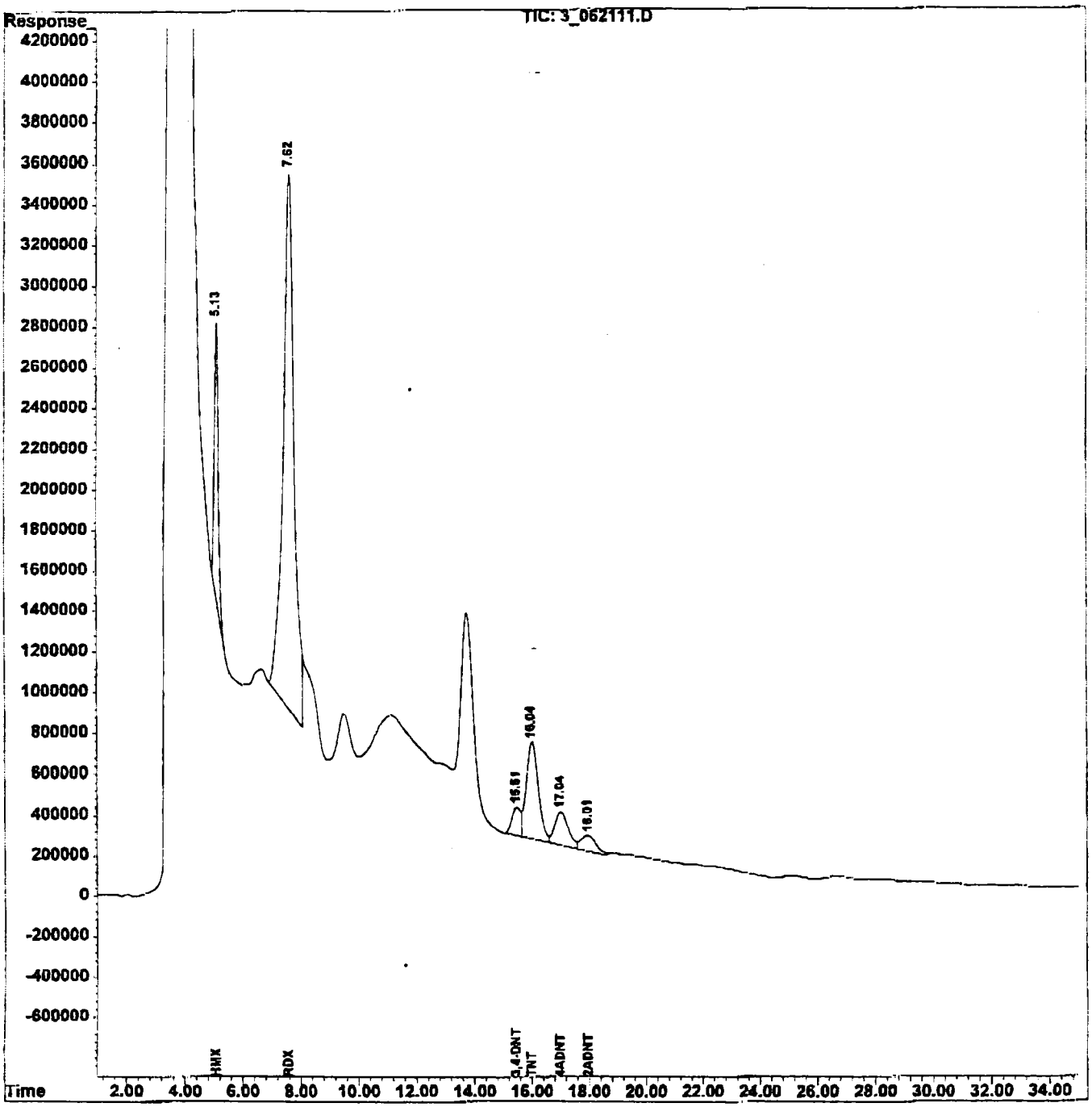
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062111.D
Acq On : 22 Jun 1999 07:25
Sample : 38999.05
Misc : BIOS07300033
IntFile : EVENTS.E
Quant Time: Jun 22 12:58 1999 Quant Results File: 200SF19.RES

Vial: 11
Operator: BW
Inst : LC3
Multiplr: 10.0000

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Data File : F:\HPCHEM\LC5\DATA\5_0621\5_062129.D Vial: 29
Acq On : 22 Jun 1999 14:40 Operator: BW
Sample : 38999.05 Inst : LC5
Misc : BIOS07300033 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 14:44 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0621\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Wed Jun 23 13:17:57 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.31	27559245	2328.4	m	A
Target Compounds:					
1) A HMX	4.54	60030676	5728.8	m	A
2) B RDX	6.96	212263213	19384.0	m	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	10.54	197199192	10417.2	m	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.11	63769626	2744.1	m	A
9) B 4ADNT	13.44	17863145	1559.7	m	A
) B 2ADNT	13.62	13733842	519.3	mJ	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

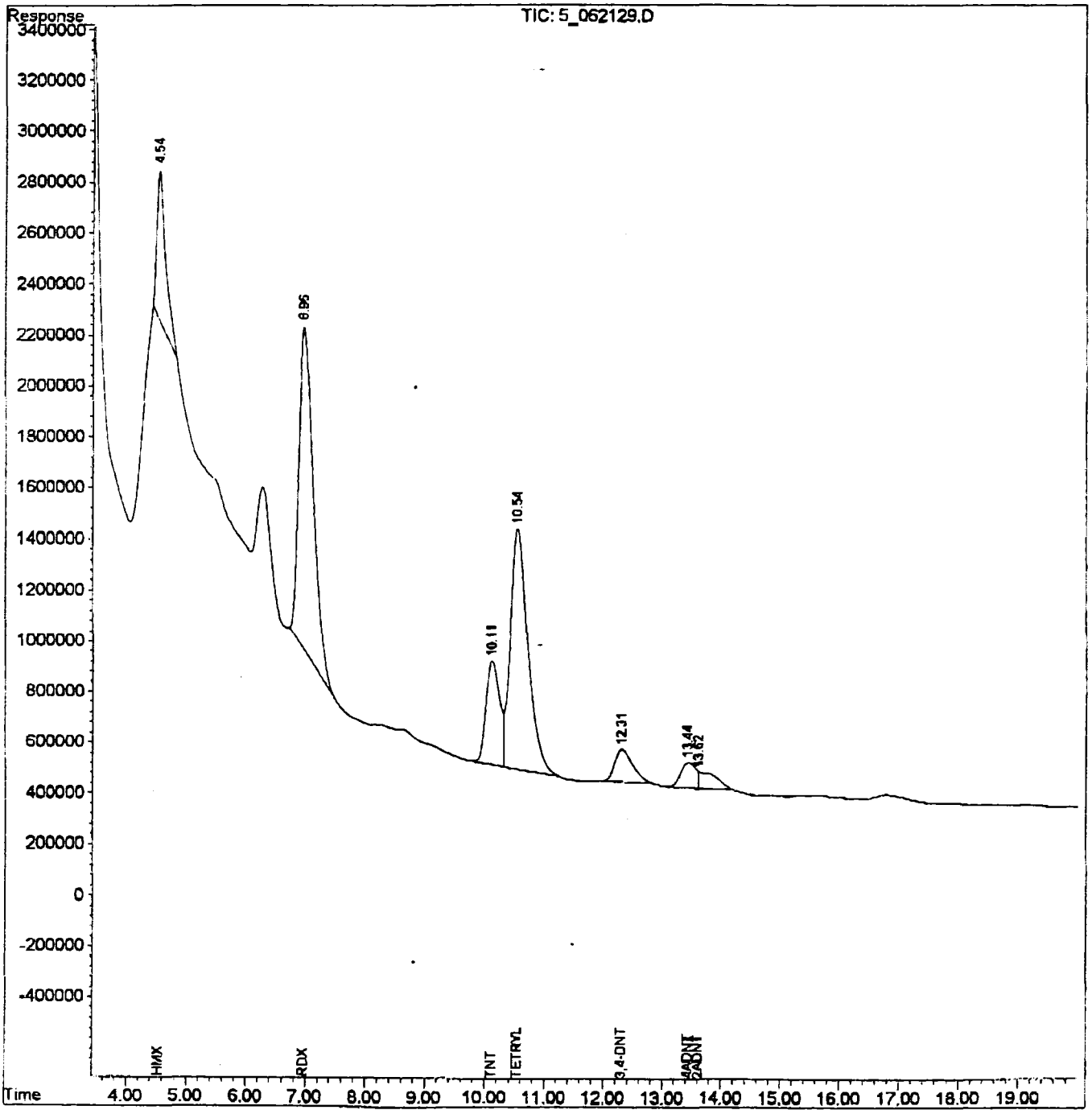
6/23/99

Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Data File : F:\HPCHEM\LC5\DATA\5_0621\5_062129.D Vial: 29
Acq On : 22 Jun 1999 14:40 Operator: BW
Sample : 38999.05 Inst : LC5
Misc : BIOS07300033 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 14:44 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0621\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Wed Jun 23 13:17:57 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS07300091

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix: (soil/water) SOIL Lab Sample ID: 38999.12

Sample Amt: 2.0 G % Moisture: 24.6 Date Received: 06/15/99

Extraction Volume: 10 ML Date Extracted: 06/15/99

Extraction Method: SONC Date Analyzed: 06/22/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	7460	
121-82-4	RDX	41000	E
99-35-4	TNB	250	U
99-65-0	DNB	250	U
479-45-8	TETRYL	650	U
98-95-3	NB	260	U
118-96-7	TNT	11800	
1946-51-0	4ADNT	1850	P
35572-78-2	2ADNT	1040	
606-20-2	26DNT	260	U
121-14-2	24DNT	250	U
88-72-2	2NT	250	U
99-99-0	4NT	250	U
99-08-1	3NT	250	U
Surrogate amount spiked		2000.00	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062120.D Vial: 20
Acq On : 22 Jun 1999 14:06 Operator: BW
Sample : 38999.12 Inst : LC3
Misc : BIOS07300091 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 16:00 1999 Quant Results File: 200SF19.RES

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

	Compound	R.T.	Response	ug/Kg		Curve
	Surrogates/System Monitoring Compounds:					
7) S	3,4-DNT	15.29	29987968	1075.8	m	A
	Target Compounds:					
1)	HMX	5.10	171208186	7458.3		A
2)	RDX	7.52	922282966	40986.2	mE	A
3)	TNB	10.08	3169827	58.8	mJ	A
4)	DNB	0.00	0	N.D.		A
5)	TETRYL	13.52	10424504	314.4-	m	A
6)	NB	0.00	0	N.D.		A
8)	TNT	15.81	598559176	11840.6	m	A
9)	4ADNT	16.59	76963679	1847.3	m	A
10)	2ADNT	17.47	48560202	1036.1	m	A
11)	26DNT	0.00	0	N.D.		A
12)	24DNT	0.00	0	N.D.		A
13)	2NT	0.00	0	N.D.		A
14)	4NT	0.00	0	N.D.		A
15)	3NT	0.00	0	N.D.		A

6-23-99

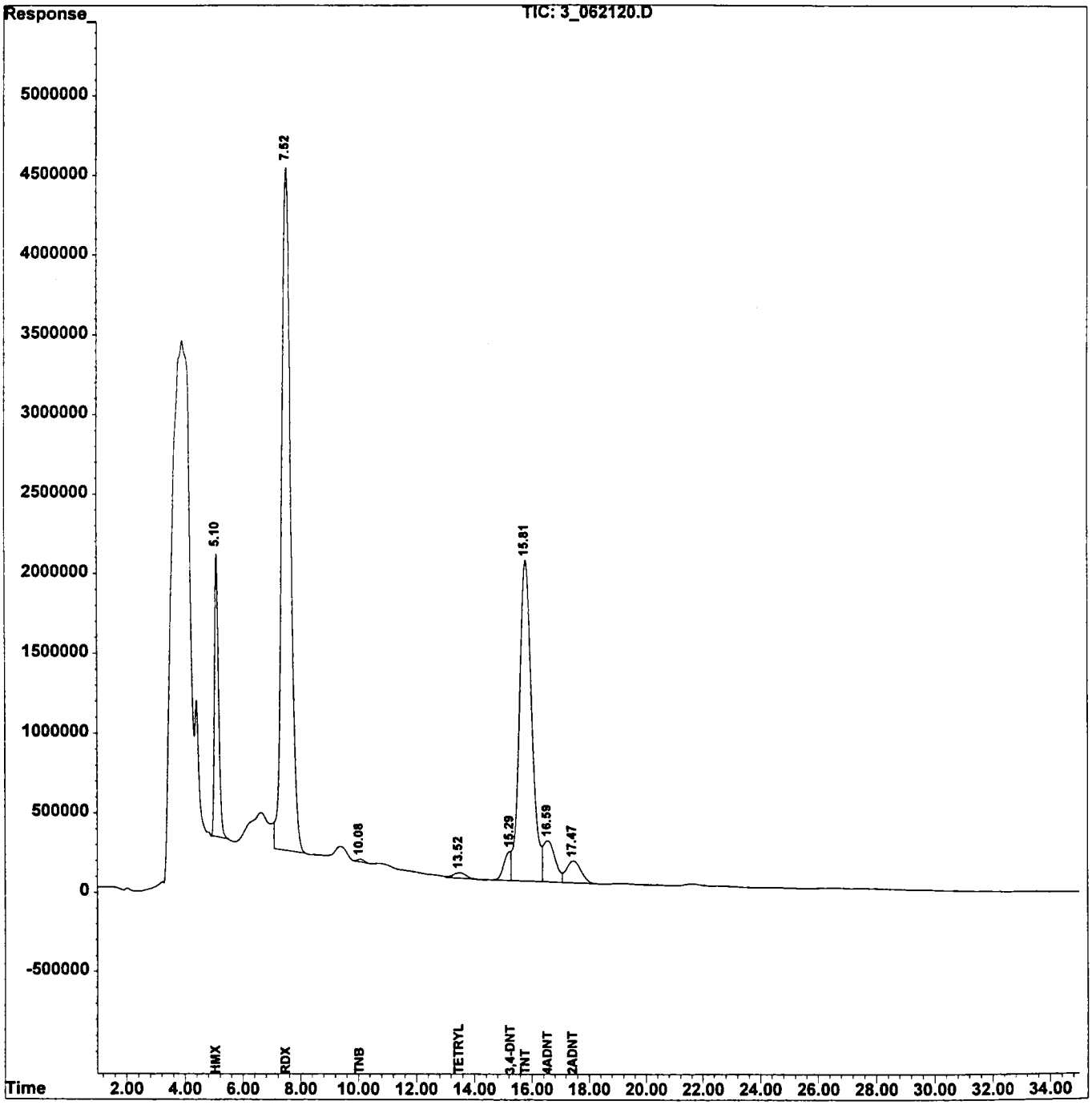
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062120.D Vial: 20
Acq On : 22 Jun 1999 14:06 Operator: BW
Sample : 38999.12 Inst : LC3
Misc : BIOS07300091 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 16:00 1999 Quant Results File: 200SF19.RES

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0621\5_062138.D Vial: 38
Acq On : 22 Jun 1999 19:33 Operator: BW
Sample : 38999.12 Inst : LC5
Misc : BIOS07300091 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 17:07 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0621\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Wed Jun 23 13:17:57 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.28	29893929	2525.7	m	A
Target Compounds:					
1) A HMX	4.53	85453098	8154.9	m	A
2) B RDX	6.94	468476911	42781.7	E	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	0.00	0	N.D.		A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.08	323337225	13913.8	m	A
9) B 4ADNT	13.40	33521337	2927.0	m	A
) B 2ADNT	13.73	31039869	1173.7	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.		A

6/23/99

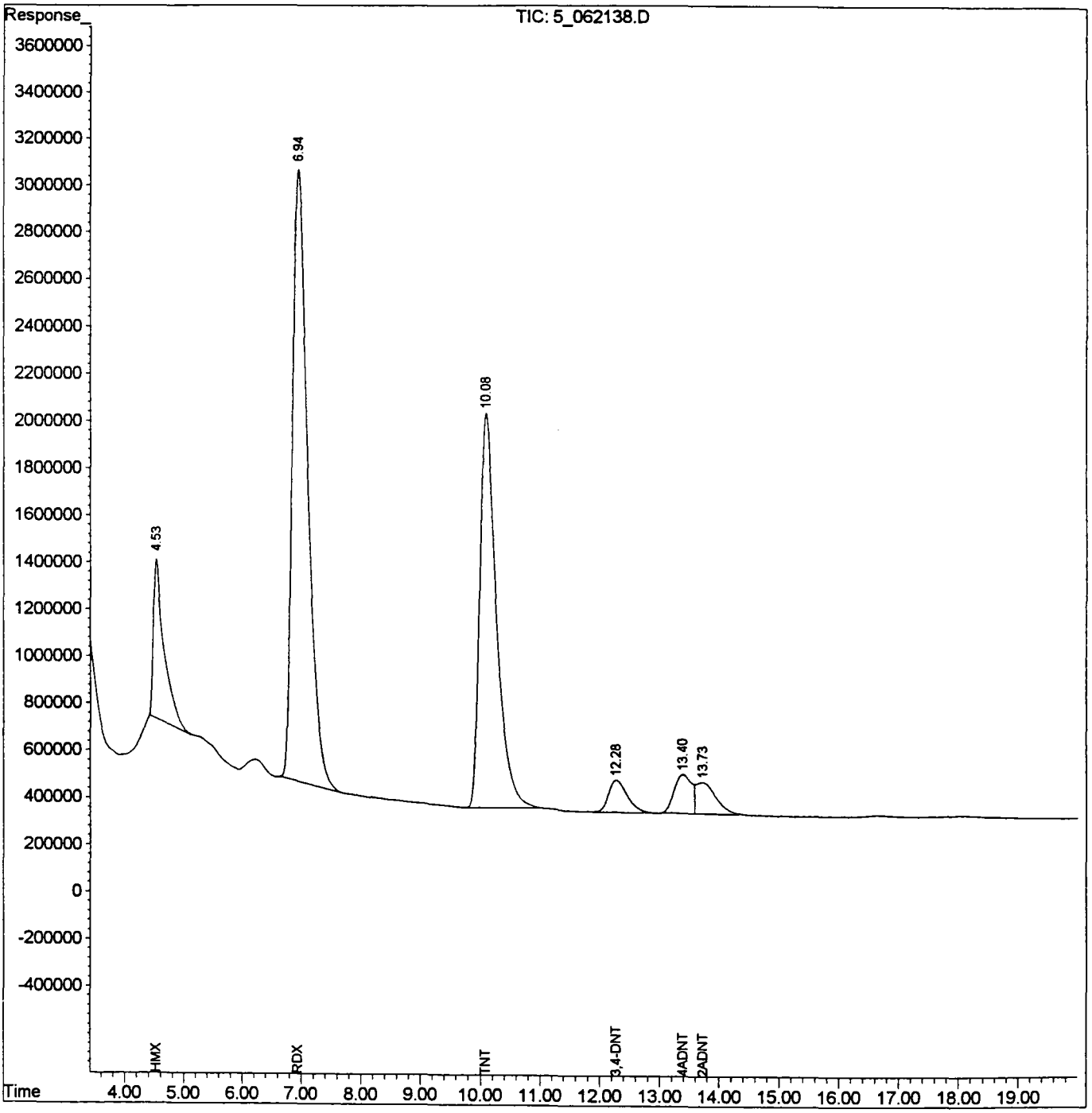
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0621\5_062138.D Vial: 38
Acq On : 22 Jun 1999 19:33 Operator: BW
Sample : 38999.12 Inst : LC5
Misc : BIOS07300091 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: Jun 23 17:07 1999 Quant Results File: 200SF20C.RES

Method : F:\HPCHEM\LC5\DATA\5_0621\200SF20C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0620\
Last Update : Wed Jun 23 13:17:57 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

TOLTEST, INC.
1915 N 12TH STREET
TOLEDO, OH 43603-218

Attn: Rick Grant

REPORT : 38999.12

REPORTED : 08/04/99

PROJECT : NSWC CRANE
LAB# : 38999.12
SAMPLE #: BIOS07300091
LOCATION: C9-SL1

SAMPLED : 06/12/99
SUBMITTED: 06/15/99

MATRIX : Soil

%MOISTURE: 24.6

MISCELLANEOUS

PARAMETER	RESULTS	UNITS	DATE PREPARED	DATE ANALYZED	REFERENCE METHOD
% MOISTURE	24.6	%		06/17/99	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS07300091DL

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix: (soil/water) SOIL Lab Sample ID: 38999.12DL

Sample Amt: 2.0 G % Moisture: 24.6 Date Received: 06/15/99

Extraction Volume: 10 ML Date Extracted: 06/15/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	7280	DJ
121-82-4	RDX	35900	D
99-35-4	TNB	2500	U
99-65-0	DNB	2500	U
479-45-8	TETRYL	6500	U
98-95-3	NB	2600	U
118-96-7	TNT	12000	D
1946-51-0	4ADNT	1620	DPJ
35572-78-2	2ADNT	1140	DJ
606-20-2	26DNT	2600	U
121-14-2	24DNT	2500	U
88-72-2	2NT	2500	U
99-99-0	4NT	2500	U
99-08-1	3NT	2500	U
Surrogate amount spiked		2000.00	

FORM I

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0629\1_062972.D Vial: 72
Acq On : 01 Jul 1999 19:19 Operator: SM
Sample : 38999.12DL Inst : LC1
Misc : BIOS07300091DL Multiplr: 100.0000
IntFile : EVENTS.E
Quant Time: Jul 7 19:48 1999 Quant Results File: 200SF29.RES

Method : F:\HPCHEM\LC1\DATA\1_0629\200SF29.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0629\
Last Update : Mon Jul 05 14:16:07 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	14.63	1803103	1426.4	m	A
Target Compounds:					
1) HMX	4.72	5165800	7277.1	m	A
2) RDX	7.09	31361888	35892.1	m	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	0.00	0	N.D.		A
6) NB	0.00	0	N.D.		A
8) TNT	15.26	24526793	12029.1	m	A
9) 4ADNT	15.68	2127793	1621.6	m	A
) 2ADNT	16.50	2292417	1141.5	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

Jm 070799

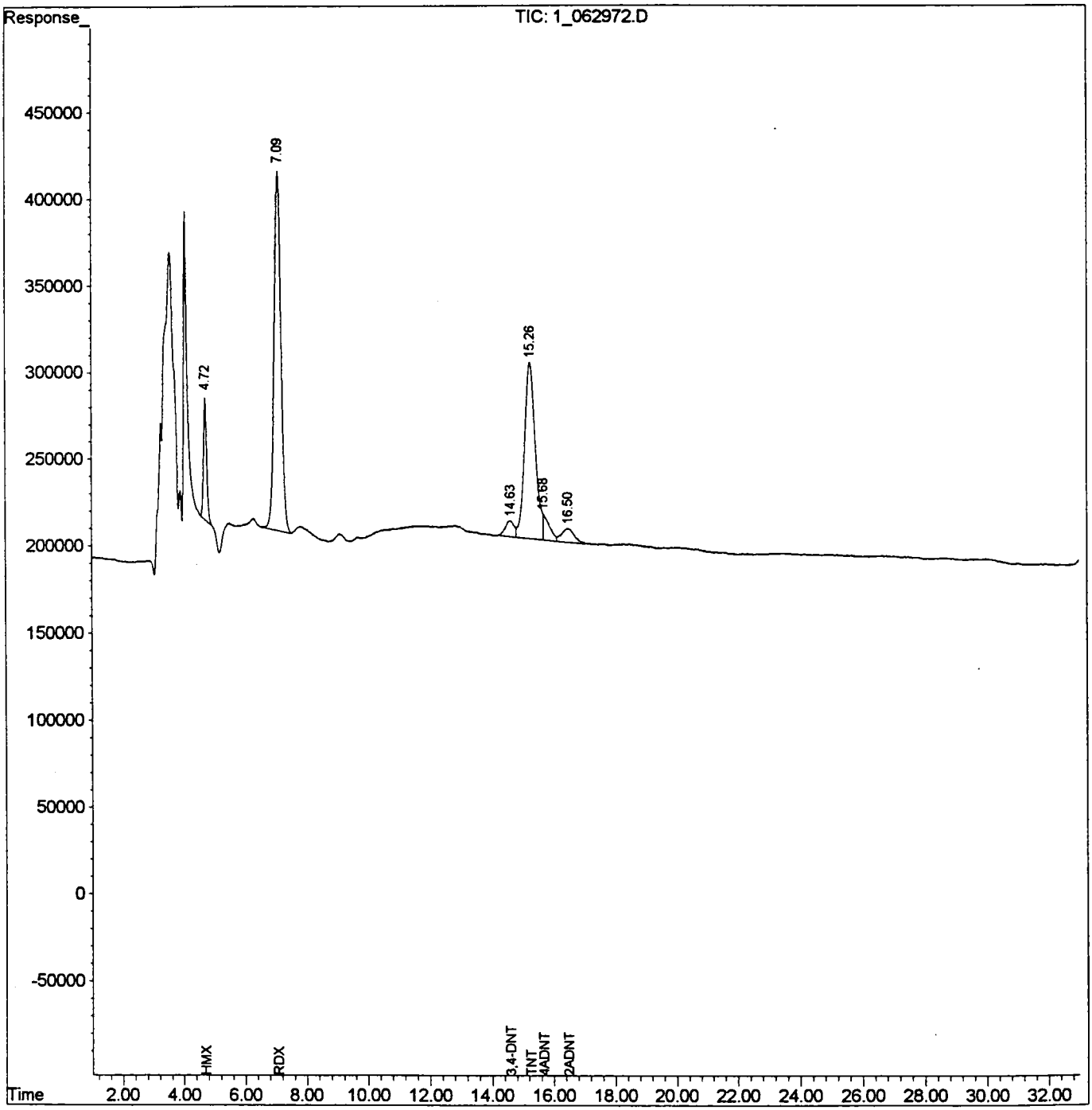
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0629\1_062972.D Vial: 72
Acq On : 01 Jul 1999 19:19 Operator: SM
Sample : 38999.12DL Inst : LC1
Misc : BIOS07300091DL Multiplr: 100.0000
IntFile : EVENTS.E'
Quant Time: Jul 7 19:48 1999 Quant Results File: 200SF29.RES

Method : F:\HPCHEM\LC1\DATA\1_0629\200SF29.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0629\
Last Update : Mon Jul 05 14:16:07 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS07300091FD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix: (soil/water) SOIL Lab Sample ID: 38999.13

Sample Amt: 2.2 G % Moisture: 28.5 Date Received: 06/15/99

Extraction Volume: 10 ML Date Extracted: 06/15/99

Extraction Method: SONC Date Analyzed: 06/22/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	6040	
121-82-4	RDX	36000	E
99-35-4	TNB	227	U
99-65-0	DNB	227	U
479-45-8	TETRYL	1130	P
98-95-3	NB	236	U
118-96-7	TNT	10700	
1946-51-0	4ADNT	1520	P
35572-78-2	2ADNT	866	
606-20-2	26DNT	236	U
121-14-2	24DNT	227	U
88-72-2	2NT	227	U
99-99-0	4NT	227	U
99-08-1	3NT	227	U
Surrogate amount spiked		1818.18	

Quantitation Report

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062121.D Vial: 21
Acq On : 22 Jun 1999 14:51 Operator: BW
Sample : 38999.13 Inst : LC3
Misc : BIOS07300091FD Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jun 23 16:02 1999 Quant Results File: 200SF19.RES

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) S 3,4-DNT	15.35	37617309	1226.8	m	A
Target Compounds:					
1) HMX	5.10	152541829	6041.0	m	A
2) RDX	7.52	890255177	35966.3	E	A
3) TNB	0.00	0	N.D.		A
4) DNB	0.00	0	N.D.		A
5) TETRYL	13.50	41302277	1132.2	m	A
6) NB	0.00	0	N.D.		A
8) TNT	15.80	596539361	10727.8	m	A
9) 4ADNT	16.55	69594328	1518.6	m	A
10) 2ADNT	17.47	44650179	866.1	m	A
11) 26DNT	0.00	0	N.D.		A
12) 24DNT	0.00	0	N.D.		A
13) 2NT	0.00	0	N.D.		A
14) 4NT	0.00	0	N.D.		A
15) 3NT	0.00	0	N.D.		A

JM
6-23-99

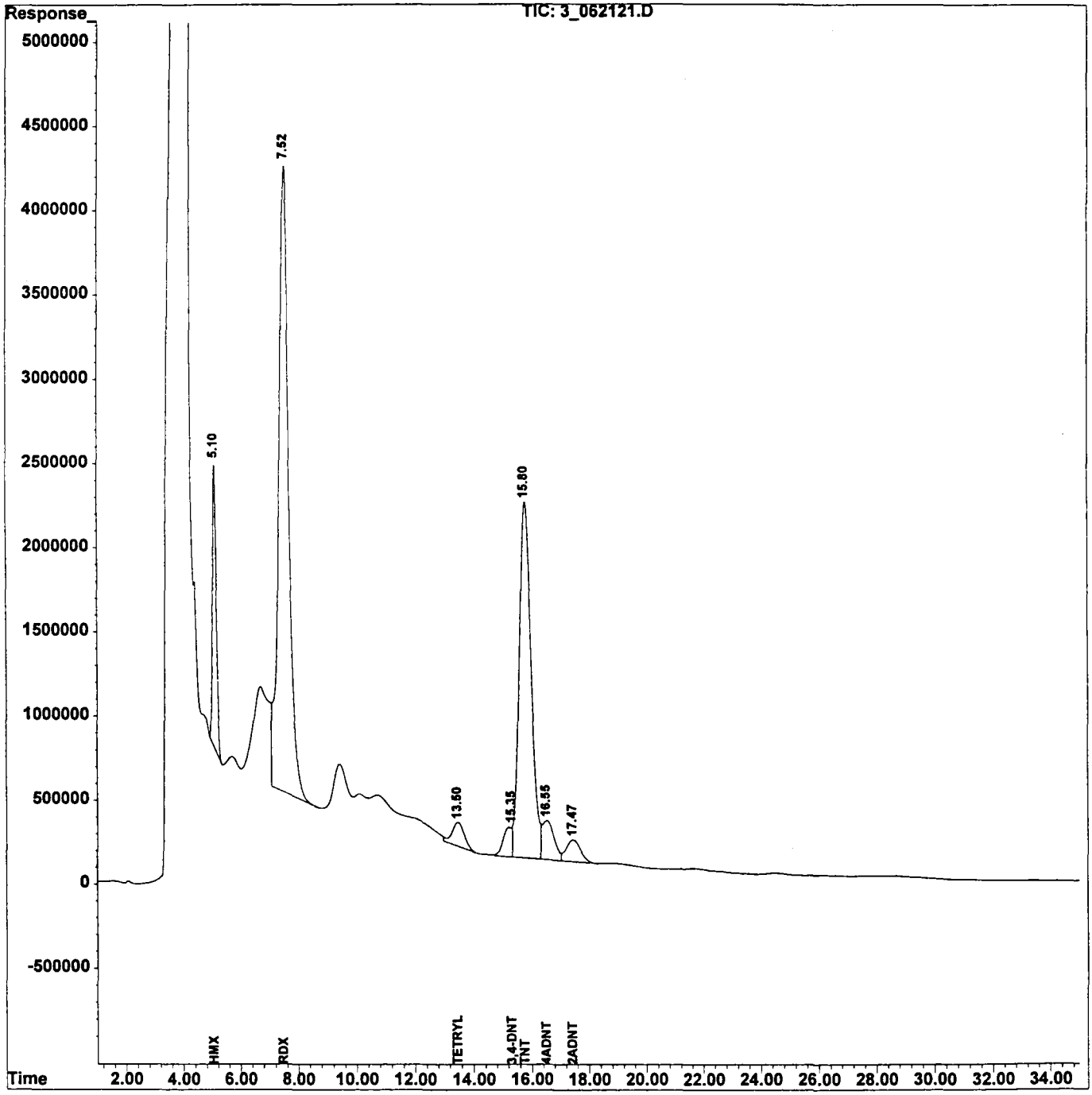
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC3\DATA\3_0621\3_062121.D Vial: 21
Acq On : 22 Jun 1999 14:51 Operator: BW
Sample : 38999.13 Inst : LC3
Misc : BIOS07300091FD Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jun 23 16:02 1999 Quant Results File: 200SF19.RES

Method : F:\HPCHEM\LC3\DATA\3_0621\200SF19.M
Title-Path : - F:\HPCHEM\LC3\DATA\3_0619\
Last Update : Tue Jun 22 11:18:32 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



Quantitation Report

Data File : F:\HPCHEM\LC5\DATA\5_0630\5_063037.D Vial: 37
Acq On : 01 Jul 1999 07:54 Operator: SM
Sample : 38999.13 Inst : LC5
Misc : BIOS07300091FD Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jul 5 10:40 1999 Quant Results File: 200SF29C.RES

Method : F:\HPCHEM\LC5\DATA\5_0630\200SF29C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0630\
Last Update : Mon Jul 05 11:35:23 1999
Response via : Initial Calibration

Volume Inj. : 100ul
Signal Phase : METASIL

Compound	R.T.	Response	ug/Kg		Curve
Surrogates/System Monitoring Compounds:					
7) SA 3,4-DNT	12.36	32827701	2573.2	m	A
Target Compounds:					
1) A HMX	4.55	75427299	6531.7	m	A
2) B RDX	6.99	355583721	25330.0	mE	A
3) A TNB	0.00	0	N.D.		A
4) B DNB	0.00	0	N.D.		A
5) A TETRYL	10.50	42903949	2102.2	m	A
6) B NB	0.00	0	N.D.		A
8) A TNT	10.15	314948428	12286.7	m	A
9) B 4ADNT	13.50	30883389	2142.0	m	A
10) B 2ADNT	13.86	27106280	780.9	m	A
11) A 26DNT	0.00	0	N.D.		A
12) B 24DNT	0.00	0	N.D.	d	A

Jm 070599

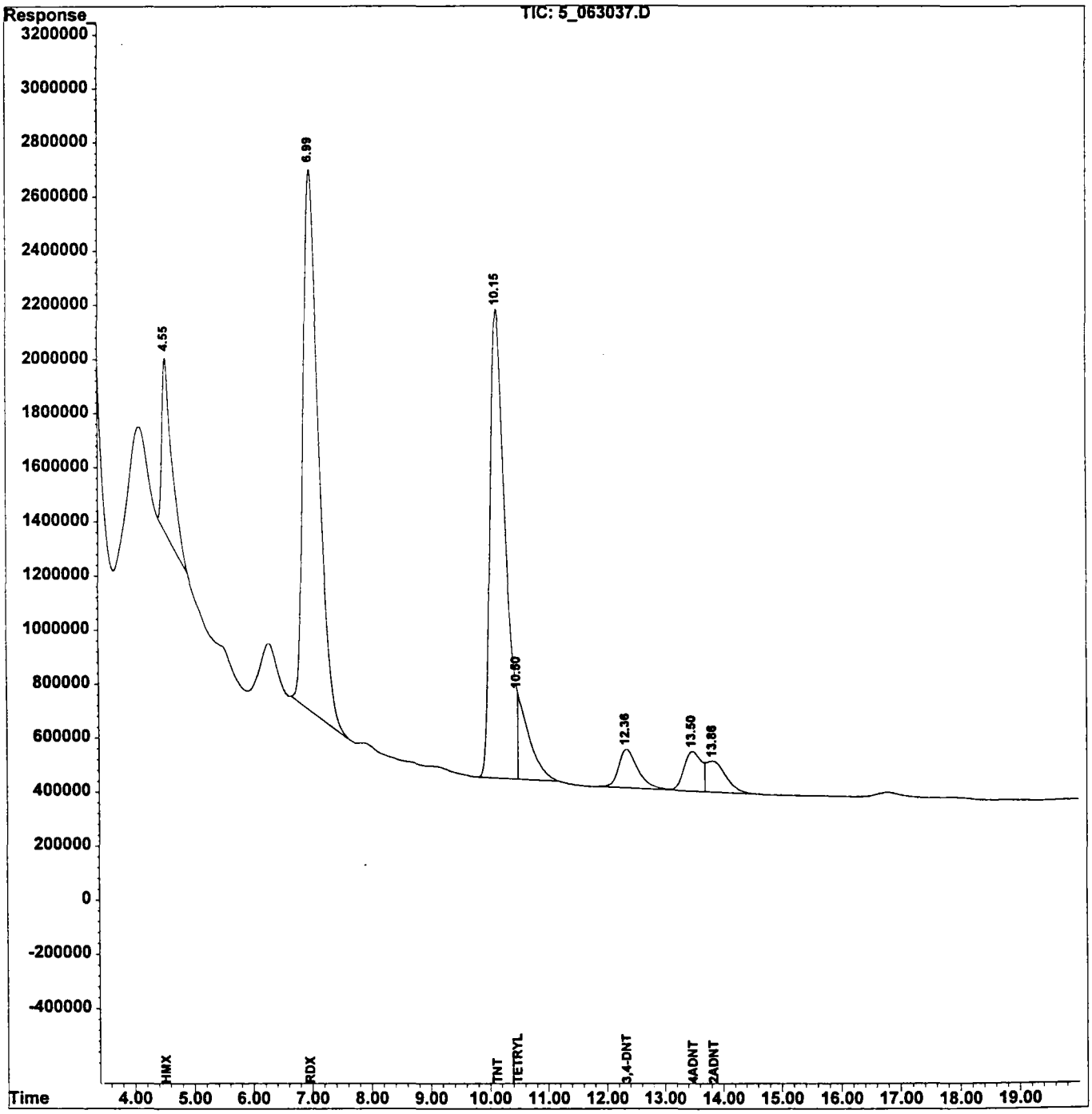
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0630\5_063037.D Vial: 37
Acq On : 01 Jul 1999 07:54 Operator: SM
Sample : 38999.13 Inst : LC5
Misc : BIOS07300091FD Multiplr: 9.0909
IntFile : EVENTS.E
Quant Time: Jul 5 10:40 1999 Quant Results File: 200SF29C.RES

Method : F:\HPCHEM\LC5\DATA\5_0630\200SF29C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0630\
Last Update : Mon Jul 05 11:35:23 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

TOLTEST, INC.
1915 N 12TH STREET
TOLEDO, OH 43603-218

Attn: Rick Grant

REPORT : 38999.13

REPORTED : 08/04/99

PROJECT : NSWC CRANE
LAB# : 38999.13
SAMPLE #: BIOS07300091FD
LOCATION: C9-SL1

SAMPLED : 06/12/99
SUBMITTED: 06/15/99

MATRIX : Soil

%MOISTURE: 28.5

MISCELLANEOUS

PARAMETER	RESULTS	UNITS	DATE PREPARED	DATE ANALYZED	REFERENCE METHOD
% MOISTURE	28.5	%		06/17/99	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BIOS07300091FDDL

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

Matrix: (soil/water) SOIL Lab Sample ID: 38999.13DL

Sample Amt: 2.2 G % Moisture: 28.5 Date Received: 06/15/99

Extraction Volume: 10 ML Date Extracted: 06/15/99

Extraction Method: SONC Date Analyzed: 07/01/99

GPC Cleanup: (Y/N) N Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/KG	Q
2691-41-0	HMX	6200	DJ
121-82-4	RDX	24900	D
99-35-4	TNB	2270	U
99-65-0	DNB	2270	U
479-45-8	TETRYL	5910	U
98-95-3	NB	2360	U
118-96-7	TNT	10600	D
1946-51-0	4ADNT	1370	DPJ
35572-78-2	2ADNT	705	DJ
606-20-2	26DNT	2360	U
121-14-2	24DNT	2270	U
88-72-2	2NT	2270	U
99-99-0	4NT	2270	U
99-08-1	3NT	2270	U
Surrogate amount spiked		1818.18	

Quantitation Report

Data File : F:\HPCHEM\LC1\DATA\1_0629\1_062973.D Vial: 73
Acq On : 01 Jul 1999 20:04 Operator: SM
Sample : 38999.13DL Inst : LC1
Misc : BIOS07300091FDDL Multiplr: 90.9091
IntFile : EVENTS.E
Quant Time: Jul 7 19:49 1999 Quant Results File: 200SF29.RES

Method : F:\HPCHEM\LC1\DATA\1_0629\200SF29.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0629\
Last Update : Mon Jul 05 14:16:07 1999
Response via : Initial Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB

Compound	R.T.	Response	ug/Kg	Curve
Surrogates/System Monitoring Compounds:				
7) S 3,4-DNT	14.67	1556792	1119.6 m	A
Target Compounds:				
1) HMX	4.71	4840918	6199.4 * m	A
2) RDX	7.09	23920425	24887.0 * m	A
3) TNB	0.00	0	N.D.	A
4) DNB	0.00	0	N.D.	A
5) TETRYL	0.00	0	N.D.	A
6) NB	0.00	0	N.D.	A
8) TNT	15.32	23870784	10643.1 * m	A
9) 4ADNT	15.71	1972148	1366.3 * m	A
) 2ADNT	16.59	1557405	705.0 * m	A
11) 26DNT	0.00	0	N.D.	A
12) 24DNT	0.00	0	N.D.	A
13) 2NT	0.00	0	N.D.	A
14) 4NT	0.00	0	N.D.	A
15) 3NT	0.00	0	N.D.	A

JW 070799

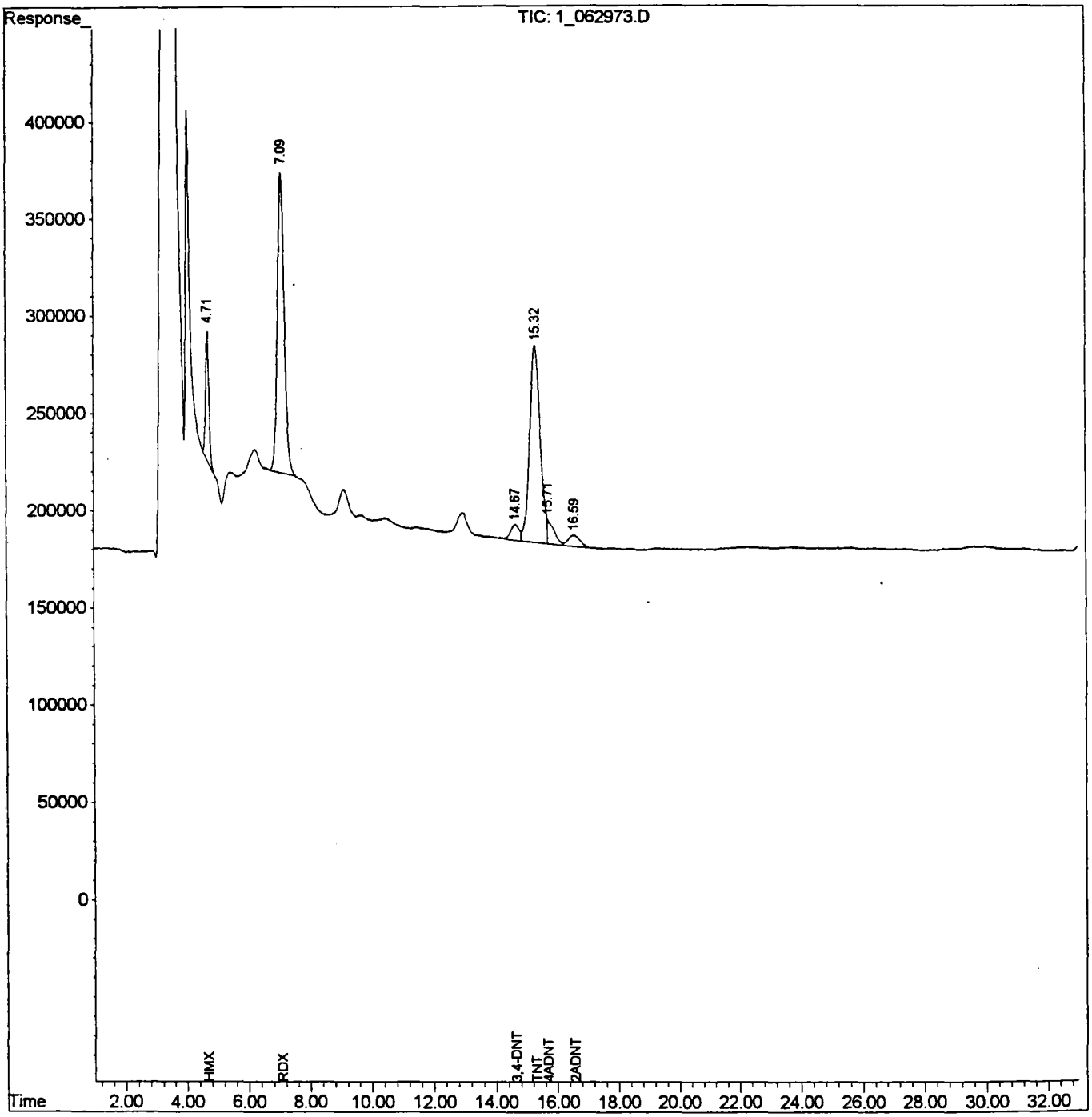
Curve Types : A=Average L=Linear P=Power Q=Quadratic/
(W)= Outside RT Window (E)= > High cal. std. (m)=manual int.

Chromatographic Report

Data File : F:\HPCHEM\LC1\DATA\1_0629\1_062973.D Vial: 73
Acq On : 01 Jul 1999 20:04 Operator: SM
Sample : 38999.13DL Inst : LC1
Misc : BIOS07300091FDDL Multiplr: 90.9091
IntFile : EVENTS.E
Quant Time: Jul 7 19:49 1999 Quant Results File: 200SF29.RES

Method : F:\HPCHEM\LC1\DATA\1_0629\200SF29.M
Title-Path : - F:\HPCHEM\LC1\DATA\1_0629\
Last Update : Mon Jul 05 14:16:07 1999
Response via : Multiple Level Calibration

Volume Inj. : 200ul
Signal Phase : CARBOSORB



6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 06/19/99 06/20/99

Method: 200SF19

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	226518127	240896528	227053726
RDX	160502629	231440344	240351008
TNB	477988511	568076651	549724929
DNB	677145000	678105500	646937922
TETRYL	354160909	322479545	336113270
NB	409859050	342516280	329062811
TNT	556889938	499669900	492887354
4ADNT	490495286	410022729	395370639
2ADNT	543410214	462387614	444931166
26DNT	371812125	347749375	331843716
24DNT	673969786	596170086	566638097
2NT	280212425	236690465	239351409
4NT	132387530	154584040	157784405
3NT	189058035	202815469	208118880
3,4-DNT	302254700	284838353	269645571

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	218395532	234911153	229555014	3.76
RDX	235267830	257551166	225022595	16.63
TNB	530739807	571004236	539506827	7.04
DNB	627809392	678413934	661682350	3.51
TETRYL	325839976	319499264	331618593	4.24
NB	318024623	345175412	348927635	10.25
TNT	473308414	504822010	505515523	6.15
4ADNT	378037849	409186339	416622568	10.39
2ADNT	427994799	464638242	468672407	9.46
26DNT	321710320	343496589	343322425	5.51
24DNT	548254521	589752231	594956944	8.08
2NT	233037137	250963815	248051050	7.74
4NT	153282462	165660570	152739801	8.09
3NT	201163872	216618167	203554884	4.96
3,4-DNT	258914407	278147409	278760088	5.86
MEAN RSD				7.44

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3 Method: 200SF19

LC Column: CARBOSORB Init. Calib Date(s): 06/19/99 06/20/99

Client Sample No.: EXPL3 Date Analyzed : 06/22/99

Lab Sample ID : L3 6-04 Time Analyzed : 0043

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.08	5.06	5.16	222084309	229555014	3.3
RDX	7.47	7.40	7.72	234499168	225022595	-4.2
TNB	10.04	9.98	10.26	537274722	539506827	0.4
DNB	12.27	12.14	12.66	620913740	661682350	6.2
TETRYL	12.99	12.83	13.61	329927238	331618593	0.5
NB	14.00	13.85	14.31	319359686	348927635	8.5
TNT	15.67	15.55	16.11	498305350	505515523	1.4
4ADNT	16.43	16.13	17.35	367180377	416622568	11.9
2ADNT	17.31	16.93	18.39	459219760	468672407	2.0
26DNT	18.39	18.16	19.04	297386348	343322425	13.4
24DNT	19.02	18.77	19.77	589408729	594956944	0.9
2NT	22.48	22.19	23.09	233177056	248051050	6.0
4NT	24.05	23.72	24.76	155591411	152739801	-1.9
3NT	25.90	25.57	26.67	202502706	203554884	0.5
3,4-DNT	15.13	14.93	15.65	253751279	278760088	9.0

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3 Method: 200SF19

LC Column: CARBOSORB Init. Calib Date(s): 06/19/99 06/20/99

Client Sample No.: EXPL3 Date Analyzed : 06/22/99

Lab Sample ID : L3 6-04 Time Analyzed : 0809

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.12	5.06	5.16	221790644	229555014	3.4
RDX	7.58	7.40	7.72	236048374	225022595	-4.9
TNB	10.18	9.98	10.26	538453432	539506827	0.2
DNB	12.49	12.14	12.66	637271646	661682350	3.7
TETRYL	13.30	12.83	13.61	326407956	331618593	1.6
NB	14.22	13.85	14.31	321493219	348927635	7.9
TNT	15.95	15.55	16.11	488143311	505515523	3.4
4ADNT	16.91	16.13	17.35	382870525	416622568	8.1
2ADNT	17.83	16.93	18.39	447833475	468672407	4.4
26DNT	18.80	18.16	19.04	316196705	343322425	7.9
24DNT	19.47	18.77	19.77	562293295	594956944	5.5
2NT	22.94	22.19	23.09	231139159	248051050	6.8
4NT	24.56	23.72	24.76	151514111	152739801	0.8
3NT	26.46	25.57	26.67	198342328	203554884	2.6
3,4-DNT	15.45	14.93	15.65	259912209	278760088	6.8

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3 Method: 200SF19

LC Column: CARBOSORB Init. Calib Date(s): 06/19/99 06/20/99

Client Sample No.: EXPL3 Date Analyzed : 06/22/99

Lab Sample ID : L3 6-04 Time Analyzed : 1621

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.09	5.06	5.16	226853268	229555014	1.2
RDX	7.47	7.40	7.72	239901288	225022595	-6.6
TNB	10.05	9.98	10.26	541757376	539506827	-0.4
DNB	12.26	12.14	12.66	656024684	661682350	0.9
TETRYL	13.02	12.83	13.61	309367800	331618593	6.7
NB	13.97	13.85	14.31	329063682	348927635	5.7
TNT	15.70	15.55	16.11	497879095	505515523	1.5
4ADNT	16.40	16.13	17.35	382346240	416622568	8.2
2ADNT	17.24	16.93	18.39	468783946	468672407	-0.0
26DNT	18.38	18.16	19.04	315720312	343322425	8.0
24DNT	19.00	18.77	19.77	576998514	594956944	3.0
2NT	22.45	22.19	23.09	233981437	248051050	5.7
4NT	23.99	23.72	24.76	153607119	152739801	-0.6
3NT	25.86	25.57	26.67	196791218	203554884	3.3
3,4-DNT	15.11	14.93	15.65	269651519	278760088	3.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.12	5.12	5.12	5.11	5.11
RDX	7.59	7.59	7.58	7.58	7.58
TNB	10.14	10.14	10.14	10.13	10.13
DNB	12.46	12.44	12.44	12.43	12.42
TETRYL	13.31	13.29	13.28	13.27	13.27
NB	14.08	14.12	14.10	14.10	14.09
TNT	15.87	15.86	15.86	15.85	15.85
4ADNT	16.87	16.84	16.83	16.83	16.82
2ADNT	17.80	17.79	17.79	17.78	17.78
26DNT	18.67	18.68	18.64	18.64	18.64
24DNT	19.35	19.35	19.33	19.33	19.32
2NT	22.61	22.67	22.67	22.67	22.66
4NT	24.31	24.27	24.26	24.26	24.25
3NT	26.19	26.13	26.13	26.14	26.13
3,4-DNT	15.37	15.33	15.32	15.31	15.30

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3
HMX	5.08	5.12	5.09
RDX	7.47	7.58	7.47
TNB	10.04	10.18	10.05
DNB	12.27	12.49	12.26
TETRYL	12.99	13.30	13.02
NB	14.00	14.22	13.97
TNT	15.67	15.95	15.70
4ADNT	16.43	16.91	16.40
2ADNT	17.30	17.83	17.24
26DNT	18.39	18.80	18.38
24DNT	19.02	19.47	19.00
2NT	22.48	22.94	22.45
4NT	24.04	24.56	23.99
3NT	25.90	26.46	25.86
3,4-DNT	15.12	15.45	15.10

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.11	0.016	0.047	5.06 - 5.16
RDX	7.56	0.053	0.159	7.40 - 7.72
TNB	10.12	0.048	0.145	9.98 - 10.26
DNB	12.40	0.087	0.260	12.14 - 12.66

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

ab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	13.22	0.131	0.394	12.82 - 13.61
NB	14.08	0.076	0.228	13.85 - 14.31
TNT	15.83	0.093	0.280	15.55 - 16.11
4ADNT	16.74	0.204	0.611	16.13 - 17.35
2ADNT	17.66	0.244	0.732	16.93 - 18.39
26DNT	18.60	0.146	0.437	18.16 - 19.04
24DNT	19.27	0.168	0.504	18.76 - 19.77
2NT	22.64	0.149	0.447	22.19 - 23.09
4NT	24.24	0.174	0.522	23.72 - 24.76
3NT	26.12	0.184	0.552	25.57 - 26.67
3,4-DNT	15.29	0.120	0.359	14.93 - 15.65

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column: CARBOSORB Init. Calib. Date(s): 06/19/99 06/20/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 15.29

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT #
01	INSTRUMENT BLANK	INSTRUMENT B	06/19/99	1952	0.00 *
02	EXPL1	L1 5-190A	06/19/99	2122	15.37
03	EXPL2	L2 5-173	06/19/99	2206	15.33
04	EXPL3	L3 6-04	06/19/99	2251	15.32
05	EXPL4	L4 5-192	06/19/99	2335	15.31
06	EXPL5	L5 5-141	06/20/99	0020	15.30
07	EXPL3	L3 6-04	06/22/99	0043	15.12
08	BL0615SE	BL0615SE	06/22/99	0128	15.18
09	LC0615SE	LC0615SE	06/22/99	0257	15.36
10	LD0615SE	LD0615SE	06/22/99	0342	15.43
11	BIOS07300031	38999.01	06/22/99	0426	15.52
12	BIOS07300032	38999.02	06/22/99	0511	15.51
13	BIOS07300032MS	38999.03MS	06/22/99	0555	15.60
14	BIOS07300032MSD	38999.04MSD	06/22/99	0640	15.62
15	BIOS07300033	38999.05	06/22/99	0725	15.51
16	EXPL3	L3 6-04	06/22/99	0809	15.45
17	BIOS07300051	38999.06	06/22/99	0939	15.48
18	BIOS07300052	38999.07	06/22/99	1023	15.47
19	BIOS07300053	38999.08	06/22/99	1108	15.44
20	BIOS07300071	38999.09	06/22/99	1152	15.40
21	BIOS07300072	38999.10	06/22/99	1237	15.47
22	BIOS07300073	38999.11	06/22/99	1322	15.32
23	BIOS07300091	38999.12	06/22/99	1406	15.29
24	BIOS07300091FD	38999.13	06/22/99	1451	15.35
25	BIOS07300092	38999.14	06/22/99	1535	15.16
26	EXPL3	L3 6-04	06/22/99	1621	15.10
27					
28					
29					
30					
31					
32					

Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5

LC Column: METASIL Date(s) Analyzed: 06/19/99 06/20/99

Method: 200SF20C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	108359800	102092123	102502243
RDX	120375094	118843624	73077464
TNB	269686230	267786110	260374311
DNB	349134098	348293020	218653427
TETRYL	190919200	189131558	181389930
NB	201299354	202510475	127696286
TNT	233380109	234497561	228731722
4ADNT	125541935	128291073	87966911
2ADNT	278317850	288051016	174021845
26DNT	187688740	190451718	180372404
24DNT	303463400	314634241	197079188
3,4-DNT	121686803	117621208	113818210

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	109077659	101904299	104787225	3.44
RDX	118738881	116485547	109504122	18.64
TNB	278700386	261806101	267670628	2.73
DNB	343834737	338416490	319666354	17.71
TETRYL	198002068	187066981	189301947	3.19
NB	199469812	197664769	185728139	17.49
TNT	239373627	225944765	232385557	2.25
4ADNT	116196613	114633923	114526091	13.94
2ADNT	292975394	288946239	264462469	19.23
26DNT	194607072	184421065	187508200	2.92
24DNT	306998726	301461572	284727425	17.30
3,4-DNT	121474799	117194462	118359096	2.78
MEAN RSD				10.13

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5 Method: 200SF20C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/22/99 : 06/22/99

Lab Sample IDs : L3A 6-5 : L3B 6-3 Time Analyzed : 1125 : 1157

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.55	4.51	4.57	103125899	104787225	1.6
RDX	6.98	6.91	7.01	118820241	109504122	-8.5
TNB	6.85	6.76	6.88	260063178	267670628	2.8
DNB	8.70	8.60	8.74	350168592	319666354	-9.5
TETRYL	10.78	10.61	10.85	180358971	189301947	4.7
NB	9.88	9.77	9.93	201862924	185728139	-8.7
TNT	10.16	10.01	10.23	228433949	232385557	1.7
4ADNT	13.52	13.34	13.58	118584185	114526091	-3.5
2ADNT	13.88	13.68	13.96	299637245	264462469	-13.3
26DNT	12.90	12.65	13.01	182032633	187508200	2.9
24DNT	12.50	12.34	12.56	313268322	284727425	-10.0
3,4-DNT	12.39	12.13	12.49	114079374	118359096	3.6

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5 Method: 200SF20C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/22/99 : 06/22/99

Lab Sample IDs : L3A 6-05 : L3B 6-03 Time Analyzed : 1755 : 1828

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.55	4.51	4.57	101538528	104787225	3.1
RDX	6.97	6.91	7.01	120054649	109504122	-9.6
TNB	6.83	6.76	6.88	255553599	267670628	4.5
DNB	8.69	8.60	8.74	351244506	319666354	-9.9
TETRYL	10.74	10.61	10.85	172537260	189301947	8.9
NB	9.88	9.77	9.93	200621830	185728139	-8.0
TNT	10.14	10.01	10.23	224403790	232385557	3.4
4ADNT	13.50	13.34	13.58	119174303	114526091	-4.1
2ADNT	13.86	13.68	13.96	299597040	264462469	-13.3
26DNT	12.87	12.65	13.01	179179747	187508200	4.4
24DNT	12.49	12.34	12.56	312331639	284727425	-9.7
3,4-DNT	12.35	12.13	12.49	112844293	118359096	4.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5 Method: 200SF20C

LC Column: METASIL Init. Calib Date(s): 06/19/99 06/20/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 06/22/99 : 06/23/99

Lab Sample IDs : L3A 6-05 : L3B 6-03 Time Analyzed : 2336 : 0009

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.55	4.51	4.57	101380157	104787225	3.3
RDX	6.99	6.91	7.01	119264166	109504122	-8.9
TNB	6.85	6.76	6.88	256467407	267670628	4.2
DNB	8.71	8.60	8.74	353361015	319666354	-10.5
TETRYL	10.79	10.61	10.85	173143631	189301947	8.5
NB	9.89	9.77	9.93	202582241	185728139	-9.1
TNT	10.16	10.01	10.23	226065851	232385557	2.7
4ADNT	13.57	13.34	13.58	121631773	114526091	-6.2
2ADNT	13.94	13.68	13.96	298104794	264462469	-12.7
26DNT	12.92	12.65	13.01	181048934	187508200	3.4
24DNT	12.53	12.34	12.56	315155175	284727425	-10.7
3,4-DNT	12.40	12.13	12.49	112510739	118359096	4.9

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.54	4.53	4.54	4.53	4.52
RDX	6.96	6.94	6.97	6.97	6.94
TNB	6.81	6.81	6.83	6.81	6.80
DNB	8.66	8.65	8.68	8.68	8.64
TETRYL	10.72	10.70	10.74	10.68	10.69
NB	9.83	9.82	9.86	9.85	9.81
TNT	10.08	10.09	10.12	10.08	10.09
4ADNT	13.42	13.42	13.47	13.47	13.42
2ADNT	13.78	13.80	13.87	13.83	13.76
26DNT	12.79	12.78	12.82	12.76	12.78
24DNT	12.44	12.42	12.47	12.46	12.40
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.27	12.27	12.31	12.25	12.27

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4	RT CCAL 5
HMX	4.55	0.00	4.54	0.00	4.55
RDX	0.00	6.98	0.00	6.97	0.00
TNB	6.85	0.00	6.83	0.00	6.85
DNB	0.00	8.70	0.00	8.69	0.00
TETRYL	10.78	0.00	10.74	0.00	10.79
NB	0.00	9.88	0.00	9.88	0.00
TNT	10.16	0.00	10.14	0.00	10.16
4ADNT	0.00	13.52	0.00	13.50	0.00
2ADNT	0.00	13.88	0.00	13.86	0.00
26DNT	12.90	0.00	12.87	0.00	12.92
24DNT	0.00	12.50	0.00	12.49	0.00
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.39	0.00	12.35	0.00	12.40

COMPOUND	RT CCAL 6
HMX	0.00
RDX	6.99
TNB	0.00
DNB	8.71

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

ıb Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/19/99 06/20/99

COMPOUND	RT CCAL 6
TETRYL	0.00
NB	9.89
TNT	0.00
4ADNT	13.57
2ADNT	13.94
26DNT	0.00
24DNT	12.53
2NT	0.00
4NT	0.00
3NT	0.00
3,4-DNT	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.54	0.011	0.032	4.51 - 4.57
RDX	6.96	0.016	0.047	6.91 - 7.01
TNB	6.82	0.020	0.059	6.76 - 6.88
DNB	8.67	0.022	0.066	8.60 - 8.74
TETRYL	10.73	0.040	0.121	10.61 - 10.85
NB	9.85	0.028	0.085	9.76 - 9.93
TNT	10.12	0.035	0.105	10.01 - 10.22
4ADNT	13.46	0.041	0.124	13.34 - 13.58
2ADNT	13.82	0.047	0.142	13.68 - 13.96
26DNT	12.83	0.061	0.184	12.65 - 13.01
24DNT	12.45	0.037	0.110	12.34 - 12.56
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	12.31	0.059	0.177	12.13 - 12.49

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column: METASIL Init. Calib. Date(s): 06/19/99 06/20/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.31

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/19/99	2044	0.00	*
02	EXPL1A	L1A 5-186	06/19/99	2149	12.27	
03	EXPL2A	L2A 5-185	06/19/99	2221	12.27	
04	EXPL3A	L3A 6-5	06/19/99	2254	12.31	
05	EXPL4A	L4A 5-183	06/19/99	2326	12.25	
06	EXPL5A	L5A 5-184	06/19/99	2359	12.27	
07	EXPL1B	L1B 5-191	06/20/99	0031	0.00	*
08	EXPL2B	L2B 5-190	06/20/99	0104	0.00	*
09	EXPL3B	L3B 6-3	06/20/99	0137	0.00	*
10	EXPL4B	L4B 5-188	06/20/99	0209	0.00	*
11	EXPL5B	L5B 5-205	06/20/99	0242	0.00	*
12	EXPL3A	L3A 6-5	06/22/99	1125	12.39	
13	EXPL3B	L3B 6-3	06/22/99	1157	0.00	*
14	BL0615SE	BL0615SE	06/22/99	1230	12.34	
15	BIOS07300031	38999.01	06/22/99	1335	12.25	
16	BIOS07300032	38999.02	06/22/99	1407	12.25	
17	BIOS07300033	38999.05	06/22/99	1440	12.31	
18	BIOS07300051	38999.06	06/22/99	1512	12.29	
19	BIOS07300052	38999.07	06/22/99	1545	12.31	
20	BIOS07300053	38999.08	06/22/99	1617	12.32	
21	BIOS07300071	38999.09	06/22/99	1650	12.28	
22	BIOS07300072	38999.10	06/22/99	1722	12.36	
23	EXPL3A	L3A 6-05	06/22/99	1755	12.35	
24	EXPL3B	L3B 6-03	06/22/99	1828	0.00	*
25	BIOS07300073	38999.11	06/22/99	1900	12.35	
26	BIOS07300091	38999.12	06/22/99	1933	12.28	
27	BIOS07300111	38999.16	06/22/99	2159	12.42	
28	EXPL3A	L3A 6-05	06/22/99	2336	12.40	
29	EXPL3B	L3B 6-03	06/23/99	0009	0.00	*
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

ıb Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3

LC Column: CARBOSORB Date(s) Analyzed: 06/22/99 06/23/99

Method: 200SF22

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	210447726	236977319	220737165
RDX	234725000	266838100	243311807
TNB	575129222	615765844	550458449
DNB	625169800	677376400	621261393
TETRYL	304681591	331779064	332832957
NB	300096400	353606360	323108138
TNT	517231938	512533563	492221228
4ADNT	358671857	399864000	374328806
2ADNT	466218429	497578871	445583244
26DNT	301858167	326771733	302822633
24DNT	575102286	648328000	598954605
2NT	240648750	250261640	236634561
4NT	167433550	172157780	157982083
3NT	242389450	226186690	203547760
3,4-DNT	241394300	295801913	255150197

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	218885866	235324153	224474446	5.06
RDX	240125658	258441813	248688476	5.40
TNB	542466571	576522380	572068493	5.01
DNB	619677414	672554919	643207985	4.53
TETRYL	327786241	316679562	322751883	3.70
NB	321984594	346369057	329032910	6.49
TNT	487002317	517229025	505243614	2.87
4ADNT	371949218	404381771	381839130	5.11
2ADNT	437787191	471866704	463806888	5.08
26DNT	304444464	329505326	313080464	4.41
24DNT	586301516	629805775	607698436	5.03
2NT	233745552	249799097	242217920	3.11
4NT	156103950	166498503	164035173	4.12
3NT	202794832	217748491	218533445	7.59
3,4-DNT	252782771	271901030	263406042	8.02
MEAN RSD				5.04

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC3 Method: 200SF22

LC Column: CARBOSORB Init. Calib Date(s): 06/22/99 06/23/99

Client Sample No.: EXPL3 Date Analyzed : 06/23/99

Lab Sample ID : L3 6-34 Time Analyzed : 0906

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	5.11	5.03	5.13	220031693	224474446	2.0
RDX	7.57	7.33	7.63	246691203	248688476	0.8
TNB	10.12	9.81	10.19	551784258	572068493	3.5
DNB	12.40	11.91	12.53	625771708	643207985	2.7
TETRYL	13.24	12.53	13.45	323884538	322751883	-0.4
NB	14.08	13.47	14.25	325429894	329032910	1.1
TNT	15.82	15.15	15.99	481430858	505243614	4.7
4ADNT	16.80	15.64	17.12	381694460	381839130	0.0
2ADNT	17.77	16.44	18.14	429611963	463806888	7.4
26DNT	18.62	17.55	18.93	309485685	313080464	1.1
24DNT	19.28	18.19	19.57	579874291	607698436	4.6
2NT	22.64	21.44	22.96	230990703	242217920	4.6
4NT	24.23	22.82	24.62	151063116	164035173	7.9
3NT	26.10	24.70	26.46	196631935	218533445	10.0
3,4-DNT	15.28	14.46	15.50	261371829	263406042	0.8

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

ab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/22/99 06/23/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	5.06	5.06	5.07	5.08	5.08
RDX	7.43	7.44	7.45	7.47	7.49
TNB	9.95	9.95	9.97	10.00	10.02
DNB	12.11	12.14	12.17	12.22	12.25
TETRYL	12.80	12.88	12.94	13.00	13.06
NB	13.70	13.78	13.81	13.86	13.90
TNT	15.44	15.45	15.51	15.57	15.62
4ADNT	16.11	16.20	16.28	16.40	16.48
2ADNT	16.96	17.09	17.19	17.31	17.40
26DNT	17.95	18.09	18.17	18.26	18.33
24DNT	18.64	18.71	18.78	18.88	18.96
2NT	21.93	22.02	22.10	22.21	22.29
4NT	23.37	23.51	23.62	23.74	23.83
3NT	25.31	25.35	25.44	25.57	25.68
3,4-DNT	14.79	14.86	14.91	14.98	15.03

COMPOUND	RT CCAL 1
HMX	5.10
RDX	7.57
TNB	10.12
DNB	12.40
TETRYL	13.24
NB	14.08
TNT	15.82
4ADNT	16.80
2ADNT	17.77
26DNT	18.62
24DNT	19.28
2NT	22.64
4NT	24.23
3NT	26.10
3,4-DNT	15.28

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	5.08	0.016	0.048	5.03 - 5.13
RDX	7.48	0.052	0.155	7.32 - 7.63
TNB	10.00	0.064	0.193	9.81 - 10.19
DNB	12.22	0.104	0.313	11.91 - 12.53

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

.b Code: SWOK Instrument ID: LC3

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/22/99 06/23/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	12.99	0.154	0.461	12.53 - 13.45
NB	13.86	0.130	0.390	13.47 - 14.25
TNT	15.57	0.141	0.424	15.14 - 15.99
4ADNT	16.38	0.246	0.737	15.64 - 17.12
2ADNT	17.29	0.283	0.850	16.44 - 18.14
26DNT	18.24	0.230	0.690	17.55 - 18.93
24DNT	18.88	0.229	0.688	18.19 - 19.57
2NT	22.20	0.252	0.755	21.44 - 22.96
4NT	23.72	0.300	0.899	22.82 - 24.62
3NT	25.58	0.292	0.876	24.70 - 26.46
3,4-DNT	14.98	0.172	0.516	14.46 - 15.50

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column: CARBOSORB Init. Calib. Date(s): 06/22/99 06/23/99

Instrument ID: LC3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 14.98

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/22/99	1943	0.00	*
02	EXPL1	L1 5-190A	06/22/99	2112	14.79	
03	EXPL2	L2 5-173	06/22/99	2157	14.86	
04	EXPL3	L3 6-34	06/22/99	2241	14.91	
05	EXPL4	L4 5-192	06/22/99	2326	14.98	
06	EXPL5	L5 5-141	06/23/99	0011	15.03	
07	BIOS07300093	38999.15	06/23/99	0055	15.14	
08	BIOS07300111	38999.16	06/23/99	0140	15.24	
09	BIOS07300112	38999.17	06/23/99	0224	15.17	
10	BIOS07300113	38999.18	06/23/99	0309	15.39	
11	EXPL3	L3 6-34	06/23/99	0906	15.28	
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

`ab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC1

LC Column: CARBOSORB Date(s) Analyzed: 06/29/99 06/29/99

Method: 200SF29

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	71189194	65825487	72600327
RDX	86283500	81190350	88319667
TNB	210261167	194885111	205857348
DNB	291695500	261751900	278298120
TETRYL	150556273	104131500	111647604
NB	212436300	173657420	182902264
TNT	221785000	193511688	194544723
4ADNT	153538071	121001386	129385780
2ADNT	224969500	190823286	195285186
26DNT	150481708	128583758	138925523
24DNT	247012071	236531457	243309537
2NT	157866600	120586570	130336560
4NT	118709350	86368640	95005516
3NT	135845700	109558670	119365922
3,4-DNT	135485233	119883707	125562231

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	72838745	72483948	70987540	4.16
RDX	89920488	91176888	87378179	4.48
TNB	208805329	209560650	205873921	3.09
DNB	280076006	280547184	278473742	3.86
TETRYL	111170805	131688774	121838991	15.64
NB	184415319	183494366	187381134	7.83
TNT	199997615	209635978	203895001	5.82
4ADNT	127278544	124885989	131217954	9.80
2ADNT	193810260	199201829	200818012	6.89
26DNT	137030850	138568858	138718140	5.63
24DNT	247929801	250545443	245065662	2.22
2NT	131681361	130107132	134115645	10.43
4NT	97962880	95396795	98688636	12.18
3NT	123377523	120266500	121682863	7.77
3,4-DNT	124887205	126229900	126409655	4.48
MEAN RSD				6.95

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC1 Method: 200SF25

LC Column: CARBOSORB Init. Calib Date(s): 06/29/99 06/29/99

Client Sample No.: EXPL3 Date Analyzed : 07/01/99

Lab Sample ID : L3 6-52 Time Analyzed : 0544

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.73	4.69	4.77	72658281	70987540	-2.4
RDX	7.16	7.05	7.19	88356298	87378179	-1.1
TNB	9.75	9.60	9.86	206410763	205873921	-0.3
DNB	11.91	11.73	12.07	273209453	278473742	1.9
TETRYL	12.69	12.46	12.86	111567812	121838991	8.4
NB	13.66	13.46	13.82	177953636	187381134	5.0
TNT	15.42	15.17	15.61	190003723	203895001	6.8
4ADNT	15.95	15.61	16.17	129245697	131217954	1.5
2ADNT	16.74	16.41	16.95	188161638	200818012	6.3
26DNT	18.07	17.73	18.31	131974099	138718140	4.9
24DNT	18.65	18.32	18.88	248649351	245065662	-1.5
2NT	22.16	21.74	22.50	126521635	134115645	5.7
4NT	23.67	23.23	24.01	91569504	98688636	7.2
3NT	25.53	25.06	25.90	119313256	121682863	1.9
3,4-DNT	14.78	14.49	15.01	120999102	126409655	4.3

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC1 Method: 200SF29

LC Column: CARBOSORB Init. Calib Date(s): 06/29/99 06/29/99

Client Sample No.: EXPL3 Date Analyzed : 07/01/99

Lab Sample ID : L3 6-52 Time Analyzed : 1449

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.71	4.69	4.77	71208420	70987540	-0.3
RDX	7.08	7.05	7.19	86713971	87378179	0.8
TNB	9.67	9.60	9.86	205984866	205873921	-0.1
DNB	11.82	11.73	12.07	277046184	278473742	0.5
TETRYL	12.55	12.46	12.86	108376775	121838991	11.0
NB	13.55	13.46	13.82	182669850	187381134	2.5
TNT	15.29	15.17	15.61	199912359	203895001	2.0
4ADNT	15.74	15.61	16.17	123832334	131217954	5.6
2ADNT	16.53	16.41	16.95	192425584	200818012	4.2
26DNT	17.88	17.73	18.31	131887560	138718140	4.9
24DNT	18.46	18.32	18.88	249397774	245065662	-1.8
2NT	21.93	21.74	22.50	126504967	134115645	5.7
4NT	23.43	23.23	24.01	91651051	98688636	7.1
3NT	25.29	25.06	25.90	119139668	121682863	2.1
3,4-DNT	14.62	14.49	15.01	124183824	126409655	1.8

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC1 Method: 200SF29

LC Column: CARBOSORB Init. Calib Date(s): 06/29/99 06/29/99

Client Sample No.: EXPL3 Date Analyzed : 07/01/99

Lab Sample ID : L3 6-52 Time Analyzed : 2348

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.71	4.69	4.77	69501224	70987540	2.1
RDX	7.11	7.05	7.19	85751307	87378179	1.9
TNB	9.70	9.60	9.86	201985436	205873921	1.9
DNB	11.86	11.73	12.07	268764115	278473742	3.5
TETRYL	12.63	12.46	12.86	103307472	121838991	15.2*
NB	13.61	13.46	13.82	177482352	187381134	5.3
TNT	15.37	15.17	15.61	186787575	203895001	8.4
4ADNT	15.88	15.61	16.17	129006323	131217954	1.7
2ADNT	16.68	16.41	16.95	186833093	200818012	7.0
26DNT	18.02	17.73	18.31	129731921	138718140	6.5
24DNT	18.60	18.32	18.88	244053915	245065662	0.4
2NT	22.15	21.74	22.50	124759436	134115645	7.0
4NT	23.66	23.23	24.01	89431447	98688636	9.4
3NT	25.53	25.06	25.90	116425365	121682863	4.3
3,4-DNT	14.73	14.49	15.01	120693968	126409655	4.5

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC1 Method: 200SF29

LC Column: CARBOSORB Init. Calib Date(s): 06/29/99 06/29/99

Client Sample No.: EXPL3 Date Analyzed : 07/02/99

Lab Sample ID : L3 6-52 Time Analyzed : 0800

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.72	4.69	4.77	71492767	70987540	-0.7
RDX	7.10	7.05	7.19	87903694	87378179	-0.6
TNB	9.69	9.60	9.86	207051653	205873921	-0.6
DNB	11.84	11.73	12.07	276275604	278473742	0.8
TETRYL	12.57	12.46	12.86	103275925	121838991	15.2*
NB	13.56	13.46	13.82	179833037	187381134	4.0
TNT	15.29	15.17	15.61	195896406	203895001	3.9
4ADNT	15.77	15.61	16.17	123655633	131217954	5.8
2ADNT	16.57	16.41	16.95	190098082	200818012	5.3
26DNT	17.88	17.73	18.31	132049176	138718140	4.8
24DNT	18.45	18.32	18.88	250252424	245065662	-2.1
2NT	21.90	21.74	22.50	127633348	134115645	4.8
4NT	23.39	23.23	24.01	91602646	98688636	7.2
3NT	25.22	25.06	25.90	119513180	121682863	1.8
3,4-DNT	14.63	14.49	15.01	122001300	126409655	3.5

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E
EXPLOSIVES RETENTION TIME DATA TABLE

b Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/29/99 06/29/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.75	4.74	4.73	4.74	4.73
RDX	7.14	7.14	7.12	7.14	7.13
TNB	9.80	9.77	9.72	9.74	9.74
DNB	12.01	11.93	11.90	11.89	11.90
TETRYL	12.76	12.72	12.68	12.66	12.68
NB	13.74	13.69	13.65	13.64	13.65
TNT	15.50	15.47	15.40	15.39	15.42
4ADNT	16.04	15.97	15.91	15.88	15.91
2ADNT	16.82	16.75	16.69	16.66	16.70
26DNT	18.18	18.10	18.03	18.02	18.05
24DNT	18.74	18.67	18.61	18.59	18.63
2NT	22.30	22.19	22.13	22.13	22.17
4NT	23.80	23.70	23.65	23.64	23.67
3NT	25.67	25.54	25.50	25.50	25.56
3,4-DNT	14.89	14.83	14.77	14.75	14.78

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4
HMX	4.73	4.71	4.71	4.72
RDX	7.16	7.08	7.11	7.10
TNB	9.75	9.66	9.70	9.69
DNB	11.91	11.82	11.86	11.84
TETRYL	12.69	12.55	12.63	12.57
NB	13.66	13.55	13.61	13.56
TNT	15.42	15.28	15.37	15.29
4ADNT	15.94	15.74	15.88	15.77
2ADNT	16.74	16.53	16.68	16.57
26DNT	18.07	17.88	18.02	17.88
24DNT	18.65	18.46	18.60	18.45
2NT	22.16	21.93	22.15	21.90
4NT	23.66	23.43	23.66	23.39
3NT	25.53	25.29	25.53	25.22
3,4-DNT	14.78	14.62	14.73	14.63

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.73	0.014	0.041	4.69 - 4.77
RDX	7.12	0.025	0.075	7.04 - 7.20
TNB	9.73	0.043	0.128	9.60 - 9.86
DNB	11.90	0.056	0.167	11.73 - 12.07

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC1

LC Column: CARBOSORB Date(s) ICAL Analyzed: 06/29/99 06/29/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	12.66	0.067	0.202	12.46 - 12.86
NB	13.64	0.060	0.179	13.46 - 13.82
TNT	15.39	0.073	0.220	15.17 - 15.61
4ADNT	15.89	0.093	0.279	15.61 - 16.17
2ADNT	16.68	0.089	0.267	16.41 - 16.95
26DNT	18.02	0.097	0.290	17.73 - 18.31
24DNT	18.60	0.094	0.281	18.32 - 18.88
2NT	22.12	0.126	0.378	21.74 - 22.50
4NT	23.62	0.130	0.389	23.23 - 24.01
3NT	25.48	0.139	0.418	25.06 - 25.90
3,4-DNT	14.75	0.087	0.260	14.49 - 15.01

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column: CARBOSORB Init. Calib. Date(s): 06/29/99 06/29/99

Instrument ID: LC1

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 14.75

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/29/99	1241	0.00	*
02	EXPL1	L1 6-54	06/29/99	1410	14.89	
03	EXPL2	L2 6-53	06/29/99	1455	14.83	
04	EXPL3	L3 6-52	06/29/99	1539	14.77	
05	EXPL4	L4 6-51	06/29/99	1624	14.75	
06	EXPL5	L5 6-50	06/29/99	1709	14.78	
07	EXPL3	L3 6-52	07/01/99	0544	14.78	
08	BIOS07300031DL	38999.01DL	07/01/99	1320	14.60	
09	BIOS07300032DL	38999.02DL	07/01/99	1404	14.58	
10	EXPL3	L3 6-52	07/01/99	1449	14.62	
11	BIOS07300051DL	38999.06DL	07/01/99	1619	14.66	
12	BIOS07300071DL	38999.09DL	07/01/99	1703	14.61	
13	BIOS07300072DL	38999.10DL	07/01/99	1748	14.63	
14	BIOS07300073DL	38999.11DL	07/01/99	1833	14.64	
15	BIOS07300091DL	38999.12DL	07/01/99	1919	14.62	
16	BIOS07300091FDDL	38999.13DL	07/01/99	2004	14.66	
17	BIOS07300092DL	38999.14DL	07/01/99	2049	14.59	
18	BIOS07300111DL	38999.16DL	07/01/99	2133	14.62	
19	BIOS07300112DL	38999.17DL	07/01/99	2218	14.81	
20	EXPL3	L3 6-52	07/01/99	2348	14.73	
21	BIOS07300112	38999.17	07/02/99	0715	14.73	
22	EXPL3	L3 6-52	07/02/99	0800	14.63	
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

6E

SOIL EXPLOSIVES INITIAL CALIBRATION : CALIBRATION FACTOR SUMMARY

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5

LC Column: METASIL Date(s) Analyzed: 06/30/99 06/30/99

Method: 200SF29C

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3
HMX	112552000	99488910	102937318
RDX	133802700	118034816	129944358
TNB	268207674	260192545	264024978
DNB	379375875	360468880	381961888
TETRYL	190614978	179742415	182690999
NB	211645500	205359330	217608526
TNT	234423283	227173617	235522166
4ADNT	125716402	136328015	141750534
2ADNT	321298940	304470704	317378676
26DNT	186035040	183033326	189594655
24DNT	340002720	330731520	341135826
3,4-DNT	120970758	112953834	112745023

COMPOUND	CALIBRATION FACTORS LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	107282278	102638798	104979861	4.82
RDX	128045003	128265368	127618449	4.57
TNB	274385879	264353734	266232962	2.02
DNB	371135688	372210089	373030484	2.25
TETRYL	190530755	184106425	185537114	2.62
NB	212542490	213669363	212165042	2.09
TNT	238805747	229223543	233029671	2.04
4ADNT	128611207	122964271	131074086	5.94
2ADNT	312221398	322336485	315541241	2.33
26DNT	195629939	189221009	188702794	2.49
24DNT	332872802	331409713	335230516	1.48
3,4-DNT	118024233	115202357	115979241	3.03
MEAN RSD				2.97

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5 Method: 200SF29C

LC Column: METASIL Init. Calib Date(s): 06/30/99 06/30/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/01/99 : 07/01/99

Lab Sample IDs : L3A 6-55 : L3B 6-59 Time Analyzed : 0406 : 0439

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.54	4.49	4.65	107717449	104979861	-2.6
RDX	6.98	6.84	7.14	120959215	127618449	5.2
TNB	6.83	6.75	6.97	272223925	266232962	-2.3
DNB	8.71	8.55	8.87	355485129	373030484	4.7
TETRYL	10.72	10.48	11.24	182736165	185537114	1.5
NB	9.89	9.70	10.06	206396346	212165042	2.7
TNT	10.12	9.95	10.47	238556898	233029671	-2.4
4ADNT	13.51	13.29	13.77	128757607	131074086	1.8
2ADNT	13.87	13.62	14.20	300884096	315541241	4.6
26DNT	12.85	12.51	13.53	189343692	188702794	-0.3
24DNT	12.49	12.28	12.72	321534268	335230516	4.1
3,4-DNT	12.33	12.01	13.01	119336630	115979241	-2.9

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

7E

EXPLOSIVES CALIBRATION VERIFICATION SUMMARY

Lab Name: SWL-TULSA Lab Code: SWOK

Case No.: TOLTEST SDG No.: 38999 Inst. ID: LC5 Method: 200SF29C

LC Column: METASIL Init. Calib Date(s): 06/30/99 06/30/99

Client Sample Nos.: EXPL3A : EXPL3B Date Analyzed : 07/01/99 : 07/01/99

Lab Sample IDs : L3A 6-55 : L3B 6-59 Time Analyzed : 1157 : 1229

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CAL. FACTOR	MEAN CAL. FACTOR	%D #
HMX	4.52	4.49	4.65	107270678	104979861	-2.2
RDX	6.93	6.84	7.14	129272852	127618449	-1.3
TNB	6.79	6.75	6.97	272927978	266232962	-2.5
DNB	8.64	8.55	8.87	377773624	373030484	-1.3
TETRYL	10.64	10.48	11.24	188217194	185537114	-1.4
NB	9.80	9.70	10.06	218877574	212165042	-3.2
TNT	10.05	9.95	10.47	239491010	233029671	-2.8
4ADNT	13.41	13.29	13.77	132294454	131074086	-0.9
2ADNT	13.78	13.62	14.20	319832220	315541241	-1.4
26DNT	12.72	12.51	13.53	188575066	188702794	0.1
24DNT	12.40	12.28	12.72	340157611	335230516	-1.5
3,4-DNT	12.21	12.01	13.01	117946185	115979241	-1.7

QC LIMITS: RPD of amounts must be less than or equal to 15.0%.

9D

SOIL EXPLOSIVES CALIBRATION STANDARD CONCENTRATION SUMMARY

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Injection volume = 200uL Amount Units = ug/mL

COMPOUND	SPIKE AMOUNTS COLUMN 1 Level 1	Level 2	Level 3	Level 4	Level 5
HMX	0.062	0.310	1.55	3.10	6.20
RDX	0.024	0.120	0.600	1.20	2.40
TNB	0.018	0.090	0.450	0.900	1.80
DNB	0.010	0.050	0.250	0.500	1.00
TETRYL	0.022	0.110	0.550	1.10	2.20
NB	0.020	0.100	0.500	1.00	2.00
TNT	0.016	0.080	0.400	0.800	1.60
4ADNT	0.014	0.070	0.350	0.700	1.40
2ADNT	0.014	0.070	0.350	0.700	1.40
26DNT	0.024	0.120	0.600	1.20	2.40
24DNT	0.014	0.070	0.350	0.700	1.40
2NT	0.020	0.100	0.500	1.00	2.00
4NT	0.020	0.100	0.500	1.00	2.00
3NT	0.020	0.100	0.500	1.00	2.00
3,4-DNT	0.030	0.150	0.750	1.50	3.00

COMPOUND	SPIKE AMOUNTS COLUMN 2 Level 1	Level 2	Level 3	Level 4	Level 5
HMX#2	0.070	0.350	0.875	1.75	3.50
RDX#2	0.050	0.250	0.625	1.25	2.50
TNB#2	0.046	0.230	0.575	1.15	2.30
DNB#2	0.040	0.200	0.500	1.00	2.00
TETRYL#2	0.090	0.450	1.13	2.25	4.50
NB#2	0.050	0.250	0.625	1.25	2.50
TNT#2	0.046	0.230	0.575	1.15	2.30
4ADNT#2	0.092	0.460	1.15	2.30	4.60
2ADNT#2	0.100	0.500	1.25	2.50	5.00
26DNT#2	0.050	0.250	0.625	1.25	2.50
24DNT#2	0.050	0.250	0.625	1.25	2.50
2NT#2	0.050	0.250	0.625	1.25	2.50
4NT#2	0.050	0.250	0.625	1.25	2.50
3NT#2	0.100	0.500	1.25	2.50	5.00
3,4-DNT#2	0.066	0.330	0.825	1.65	3.30

9E
EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/30/99 06/30/99

COMPOUND	RT OF ICAL STANDARDS Level 1	Level 2	Level 3	Level 4	Level 5
HMX	4.59	4.58	4.58	4.59	4.57
RDX	7.09	7.00	7.01	6.97	6.96
TNB	6.89	6.88	6.88	6.89	6.87
DNB	8.81	8.72	8.73	8.69	8.67
TETRYL	10.95	10.93	10.92	10.95	10.90
NB	9.99	9.89	9.90	9.86	9.84
TNT	10.27	10.25	10.25	10.27	10.24
4ADNT	13.68	13.54	13.57	13.50	13.53
2ADNT	14.08	13.94	13.96	13.88	13.84
26DNT	13.14	13.12	13.09	13.14	13.09
24DNT	12.63	12.52	12.53	12.48	12.45
2NT	0.00	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00	0.00
3,4-DNT	12.61	12.61	12.59	12.63	12.58

COMPOUND	RT CCAL 1	RT CCAL 2	RT CCAL 3	RT CCAL 4
HMX	4.54	0.00	4.52	0.00
RDX	0.00	6.98	0.00	6.93
TNB	6.83	0.00	6.79	0.00
DNB	0.00	8.71	0.00	8.64
TETRYL	10.72	0.00	10.64	0.00
NB	0.00	9.89	0.00	9.80
TNT	10.12	0.00	10.05	0.00
4ADNT	0.00	13.51	0.00	13.41
2ADNT	0.00	13.87	0.00	13.78
26DNT	12.84	0.00	12.72	0.00
24DNT	0.00	12.49	0.00	12.40
2NT	0.00	0.00	0.00	0.00
4NT	0.00	0.00	0.00	0.00
3NT	0.00	0.00	0.00	0.00
3,4-DNT	12.33	0.00	12.21	0.00

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
HMX	4.57	0.027	0.081	4.49 - 4.65
RDX	6.99	0.051	0.152	6.84 - 7.14
TNB	6.86	0.038	0.113	6.75 - 6.97
DNB	8.71	0.054	0.162	8.55 - 8.87

9E

EXPLOSIVES RETENTION TIME DATA TABLE

Lab Name: SWL-TULSA Case No.: TOLTEST SDG No.: 38999

Lab Code: SWOK Instrument ID: LC5

LC Column: METASIL Date(s) ICAL Analyzed: 06/30/99 06/30/99

COMPOUND	AVG RT	STD_DEV	3X STD	RT WINDOW
TETRYL	10.86	0.125	0.376	10.48 - 11.24
NB	9.88	0.059	0.178	9.70 - 10.06
TNT	10.21	0.087	0.260	9.95 - 10.47
4ADNT	13.53	0.082	0.245	13.28 - 13.77
2ADNT	13.91	0.097	0.291	13.62 - 14.20
26DNT	13.02	0.169	0.506	12.51 - 13.53
24DNT	12.50	0.072	0.216	12.28 - 12.72
2NT	0.00	0.000	0.000	0.00 - 0.00
4NT	0.00	0.000	0.000	0.00 - 0.00
3NT	0.00	0.000	0.000	0.00 - 0.00
3,4-DNT	12.51	0.167	0.502	12.01 - 13.01

8D
EXPLOSIVES ANALYTICAL SEQUENCE

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 38999

LC Column: METASIL Init. Calib. Date(s): 06/30/99 06/30/99

Instrument ID: LC5

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
S1 : 12.51

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	S1 RT	#
01	INSTRUMENT BLANK	INSTRUMENT B	06/29/99	2343	0.00	*
02	EXPL1A	L1A 5-186	06/30/99	0048	12.61	
03	EXPL2A	L2A 5-185	06/30/99	0121	12.61	
04	EXPL3A	L3A 6-55	06/30/99	0153	12.59	
05	EXPL4A	L4A 5-183	06/30/99	0226	12.63	
06	EXPL5A	L5A 5-184	06/30/99	0258	12.58	
07	EXPL1B	L1B 6-61	06/30/99	1255	0.00	*
08	EXPL2B	L2B 6-60	06/30/99	1327	0.00	*
09	EXPL3B	L3B 6-59	06/30/99	1400	0.00	*
10	EXPL4B	L4B 6-58	06/30/99	1432	0.00	*
11	EXPL5B	L5B 6-57	06/30/99	1505	0.00	*
12	EXPL3A	L3A 6-55	07/01/99	0406	12.33	
13	EXPL3B	L3B 6-59	07/01/99	0439	0.00	*
14	BIOS07300091FD	38999.13	07/01/99	0754	12.36	
15	BIOS07300092	38999.14	07/01/99	0826	12.33	
16	BIOS07300093	38999.15	07/01/99	1052	12.22	
17	BIOS07300112	38999.17	07/01/99	1125	12.24	
18	EXPL3A	L3A 6-55	07/01/99	1157	12.21	
19	EXPL3B	L3B 6-59	07/01/99	1229	0.00	*
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Column to be used to flag retention time values with an asterisk.
* Values outside of QC limits

FORM VIII

	SV	OD T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH [ ] REEXTRACT [ ] TCLP [ ] OXIN

SAMPLE EXTRACTION I

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990615SE

EXTRACT DATE: 1999-06-15 13:49

000932
Page: 1 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIXLEVEL	SAMPLE pH	% MOISTURE	DRY WEIGHT	AMOUNT EXTRACTED	EXTRACTED VOLUME	GPC VOLUME	GPC ELUTE VOL	FLORISIL VOL CONC	FLORISIL FIN VOL CONC	VOL SV - P	FIN PROCESS VOLUME	SCREEN Y/N	MS SV - P	SURR SV - P	BASE pH CONFIRMATION	ACID pH CONFIRMATION
					%	g	g • ml	ml	ml	ml	ml	ml	ml	ml	Y/N	µL	µL		
BL0615SE			S/L				2.13	10.0						10.0	N		1000		
BB0615SE			S/L				2.37	10.0						10.0	N		1000		
LC0615SE			S/L				2.02	10.0						10.0	N	500	1000		
LD0615SE			S/L				2.21	10.0						10.0	N	500	1000		
38999.01 GC200	TOLTEST	06/15/1999 10:41 BIOS07300031	S/L		22.15	1.6	2.01	10.0						10.0	N		1000		
38999.02 GC200	TOLTEST	06/15/1999 10:41 BIOS07300032	S/L		37.18	1.3	2.00	10.0						10.0	N		1000		
38999.03MS GC200	TOLTEST	06/15/1999 10:41 BIOS07300032	S/L		37.18	1.3	2.13	10.0						10.0	N	500	1000		
38999.04MSD GC200	TOLTEST	06/15/1999 10:41 BIOS07300032	S/L		37.18	1.4	2.22	10.0						10.0	N	500	1000		
38999.05 GC200	TOLTEST	06/15/1999 10:41 BIOS07300033	S/L		48.57	1.0	2.03	10.0						10.0	N		1000		
38999.06 GC200	TOLTEST	06/15/1999 10:41 BIOS07300051	S/L		48.55	1.0	2.01	10.0						10.0	N		1000		
38999.07 GC200	TOLTEST	06/15/1999 10:41 BIOS07300052	S/L		46.08	1.2	2.15	10.0						10.0	N		1000		
38999.08 GC200	TOLTEST	06/15/1999 10:41 BIOS07300053	S/L		40.40	1.2	2.07	10.0						10.0	N		1000		
38999.09 GC200	TOLTEST	06/15/1999 10:41 BIOS07300071	S/L		42.10	1.2	2.01	10.0						10.0	N		1000		
38999.10 GC200	TOLTEST	06/15/1999 10:41 BIOS07300072	S/L		28.54	1.6	2.29	10.0						10.0	N		1000		
38999.11 GC200	TOLTEST	06/15/1999 10:41 BIOS07300073	S/L		39.05	1.2	2.00	10.0						10.0	N		1000		

INITIALS

WEIGHING:	GS	EXTRACTION:		FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:	330	TV:			
SURROG. SPIKER:	GS	VERIFIER:	JM		
MATRIX SPIKER:	GS	VERIFIER:	JM		
SUBMITTED BY:	GS	REVIEWED BY:	08/02/99		

ID NUMBERS

FLORISIL CARTRIDGE #:
GPC COLUMN #:
SURROGATES ID CONC #: 6-7
MATRIX SPIKE SOLID/CONC #(s): 6-6
SOP - METHOD # : SWL-OP-CL 300 Rev. 4.0

COMMENTS

	M OD		
	SV	T • PCB	OTHER
CONT EX. (3520B)			
SEP-F (3510B)			
SHAKER			
SONC. (3550)			XXXXX
SOXHLET			

[X] RUSH ☐ REEXTRACT ☐ TCLP ☐ OXIN

SAMPLE EXTRACTION LC

SWLO
SOUTHWEST LABORATORY OF OKLAHOMA, INC.

BATCH: 990615SE

EXTRACT DATE: 1999-06-15 13:49

000932
Page: 2 of 2

SAMPLE ID (EPISODE #)	CLIENT CASE	DATE RECEIVED CLIENT SAMPLE ID	MATRIX/LEVEL	SAMPLE pH	% MOISTURE %	DRY WEIGHT g	AMOUNT EXTRACTED g • ml	EXTRACTED VOLUME ml	GPC VOLUME ml	GPC ELUTE VOL ml	FLORISIL VOL CONC ml	FLORISIL FIN VOL CONC ml	VOL SV - P ml	FIN PROCESS VOLUME ml	SCREEN Y/N Y/N	MS SV - P µL	SURR SV - P µL	BASE pH CONFIRMATION	ACID pH CONFIRMATION
38999.12 GC200	TOLTEST	06/15/1999 10:41 BIOS07300091	S/L		24.58	1.5	2.03	10.0						10.0	N		1000		
38999.13 GC200	TOLTEST	06/15/1999 10:41 BIOS07300091FD	S/L		28.47	1.6	2.21	10.0						10.0	N		1000		
38999.14 GC200	TOLTEST	06/15/1999 10:41 BIOS07300092	S/L		36.53	1.3	2.02	10.0						10.0	N		1000		
38999.15 GC200	TOLTEST	06/15/1999 10:41 BIOS07300093	S/L		47.64	1.1	2.02	10.0						10.0	N		1000		
38999.16 GC200	TOLTEST	06/15/1999 10:41 BIOS07300111	S/L		24.03	1.7	2.22	10.0						10.0	N		1000		
38999.17 GC200	TOLTEST	06/15/1999 10:41 BIOS07300112	S/L		40.28	1.2	2.01	10.0						10.0	N		1000		
38999.18 GC200	TOLTEST	06/15/1999 10:41 BIOS07300113	S/L		43.83	1.2	2.12	10.0						10.0	N		1000		

INITIALS

WEIGHING:	GS	EXTRACTION:		FLORISIL:	
CLEANUP:		KD:			
BLOWDOWN:	331	TV:			
SURROG. SPIKER:	GS	VERIFIER:	JM		
MATRIX SPIKER:	GS	VERIFIER:	JM		
SUBMITTED BY:	GS	REVIEWED BY:		05/02/99	

ID NUMBERS

FLORISIL CARTRIDGE #:

GPC COLUMN #:

SURROGATES ID CONC #: 6-7

MATRIX SPIKE SOLID/CONC #(s): 6-6

SOP - METHOD # : SWL-~~OP~~ CL 200 Rev. 1.0

COMMENTS

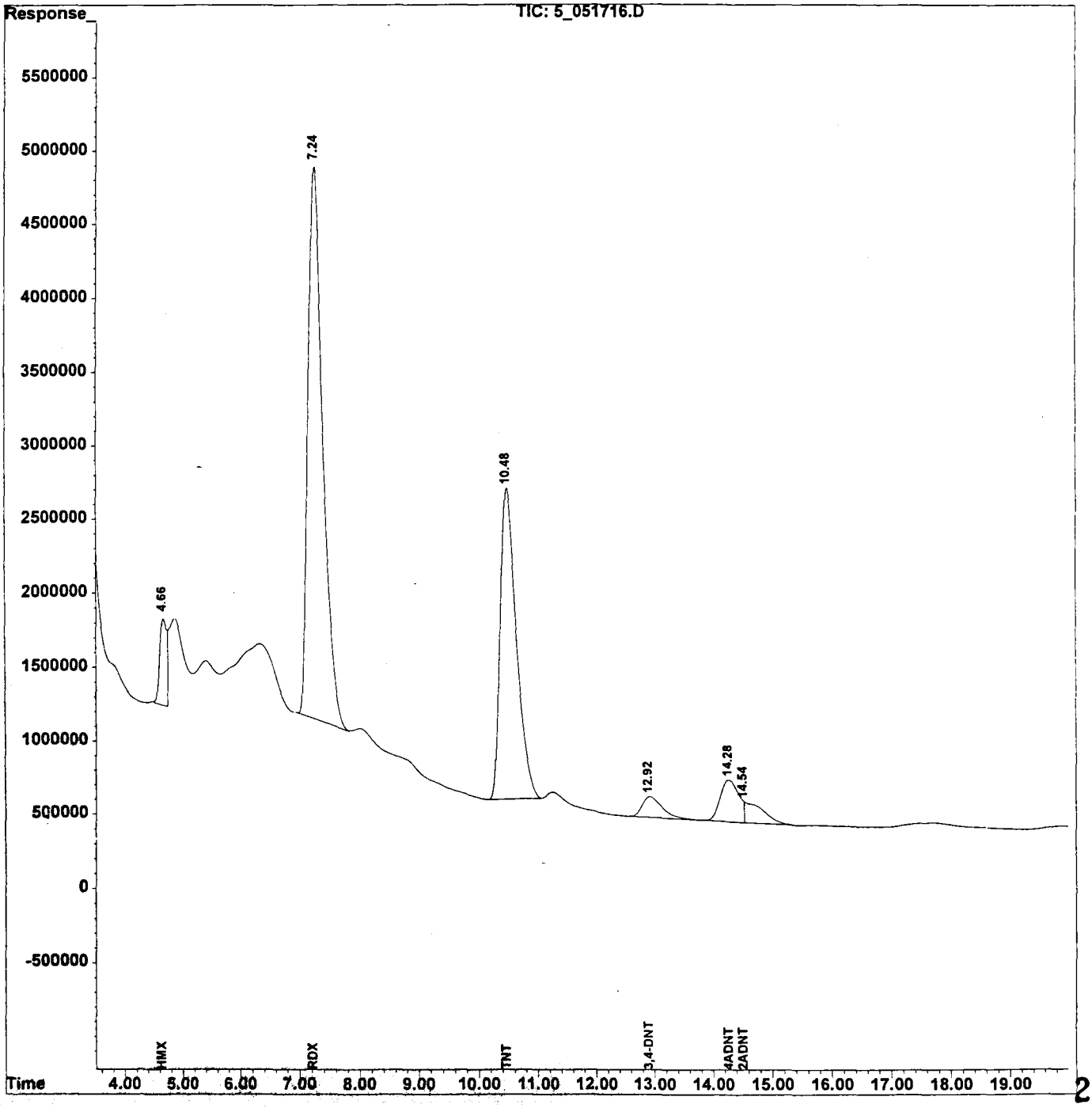
ATTACHMENT 3

Chromatographic Report

Data File : F:\HPCHEM\LC5\DATA\5_0517\5_051716.D Vial: 16
Acq On : 18 May 1999 02:19 Operator: MM
Sample : 38531.02 Inst : LC5
Misc : BIOS06100032 Multiplr: 10.0000
IntFile : EVENTS.E
Quant Time: May 18 12:22 1999 Quant Results File: 200SE17C.RES

Method : F:\HPCHEM\LC5\DATA\5_0517\200SE17C.M
Title-Path : - F:\HPCHEM\LC5\DATA\5_0517\
Last Update : Tue May 18 09:08:32 1999
Response via : Multiple Level Calibration

Volume Inj. : 100ul
Signal Phase : METASIL



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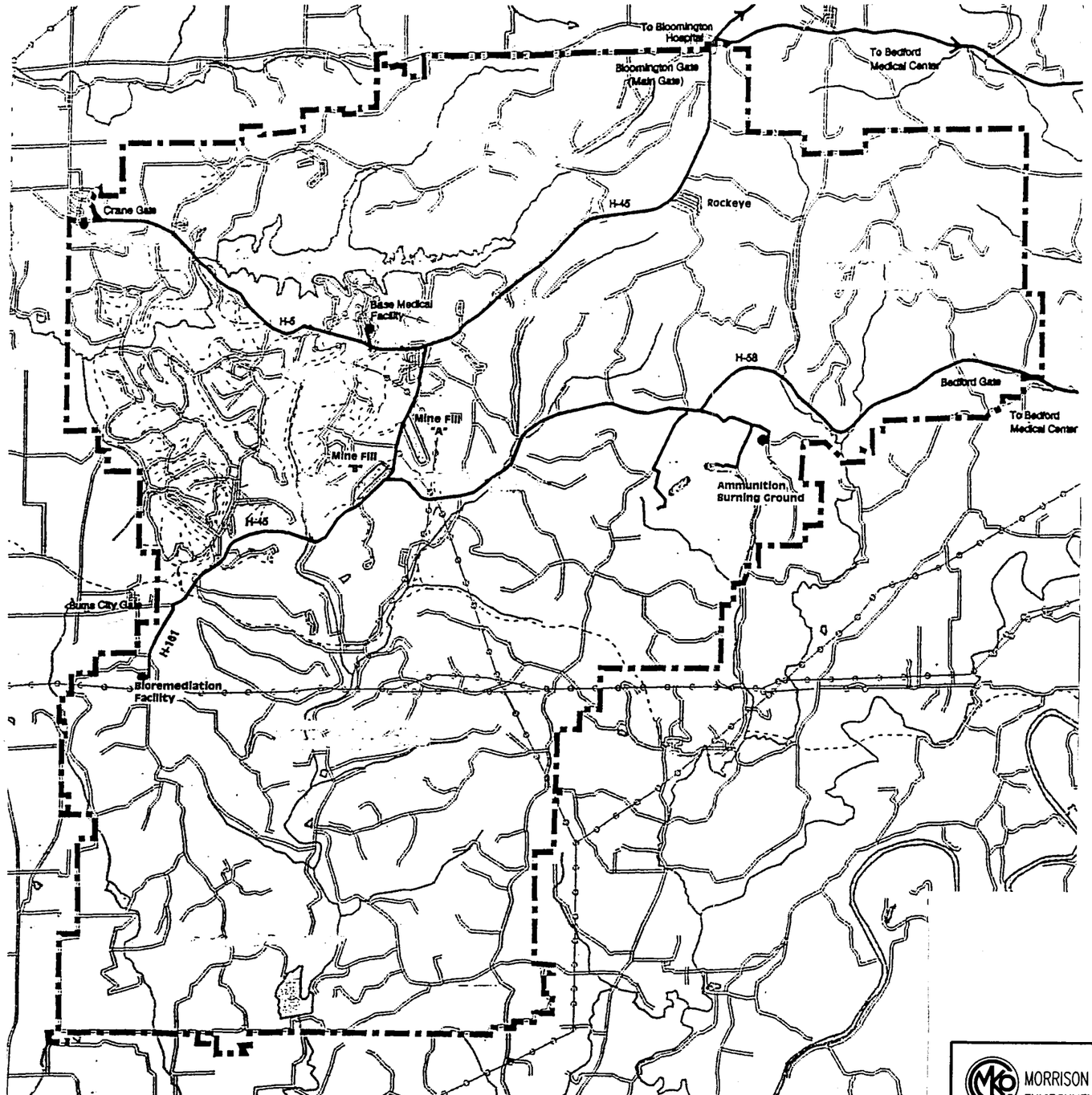


SWMU 03/10: AMMUNITION BURNING GROUND
SWMU 10/15: ROCKEYE
SWMU 12/16: MINE FILL A
SWMU 13/16: MINE FILL B
SWMU 33/00: BIOREMEDIATION FACILITY

NSWC CRANE BOUNDARY

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

PILOT SCALE
TREATABILITY TEST REPORT
NSWC CRANE
CRANE, IN

FIGURE 1-1
VICINITY MAP

DRAWING DATE: 02/10/98 | FILE NAME: F:\PHCHARVAT\ACAD\CRANE\FIG1-1.DWG

0 20 40 60 80 FEET

SCALE

LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- NO EXCAVATION REQUIRED. MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED. MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- EXCAVATION REQUIRED
- EXCAVATION PERFORMED BEFORE CHARACTERIZATION

NOTES:

1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
2. GRID CHARACTERIZATION IS BASED ON RESULTS OF POST-EXCAVATION SAMPLES IN AREAS WHERE EXCAVATION WAS PERFORMED OR ON INITIAL CHARACTERIZATION SAMPLES IN AREAS NOT EXCAVATED.

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE C1
INITIAL CHARACTERIZATION
SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 153/154

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/24/00 | FILE NAME: MFAB1-1.DWG

LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- L.V. LIGHTNING MAST
- MAN HOLE
- #9 GRID NUMBER
- CONVEYOR HOUSING AND WALKWAY
- NO EXCAVATION REQUIRED, MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED, MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- EXCAVATION REQUIRED

NOTES:

1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE 02
INITIAL CHARACTERIZATION SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 158/159

DWG DATE: 4/24/00 | FILE NAME: MFAB2-1.DWG

LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- NO EXCAVATION REQUIRED. MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED. MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- EXCAVATION REQUIRED

0 20 40 60 80 FEET

SCALE

NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE C3
INITIAL CHARACTERIZATION SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 152

DWG DATE: 4/24/00 | FILE NAME: NFAB3-1.DWG

LEGEND

- BUILDING
- CONVEYOR HOUSING AND WALKWAY
- MAN HOLE
- #9 GRID NUMBER
- RAILROAD
- STEAM LINE
- L.M. LIGHTNING MAST
- SWALE/DITCH
- GRID BOUNDARY
- NO EXCAVATION REQUIRED, MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED, MEETS RESIDENTIAL CLEAN UP OBJECTIVES
- REQUIRES EXCAVATION

NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

0 20 40 60 80 FEET

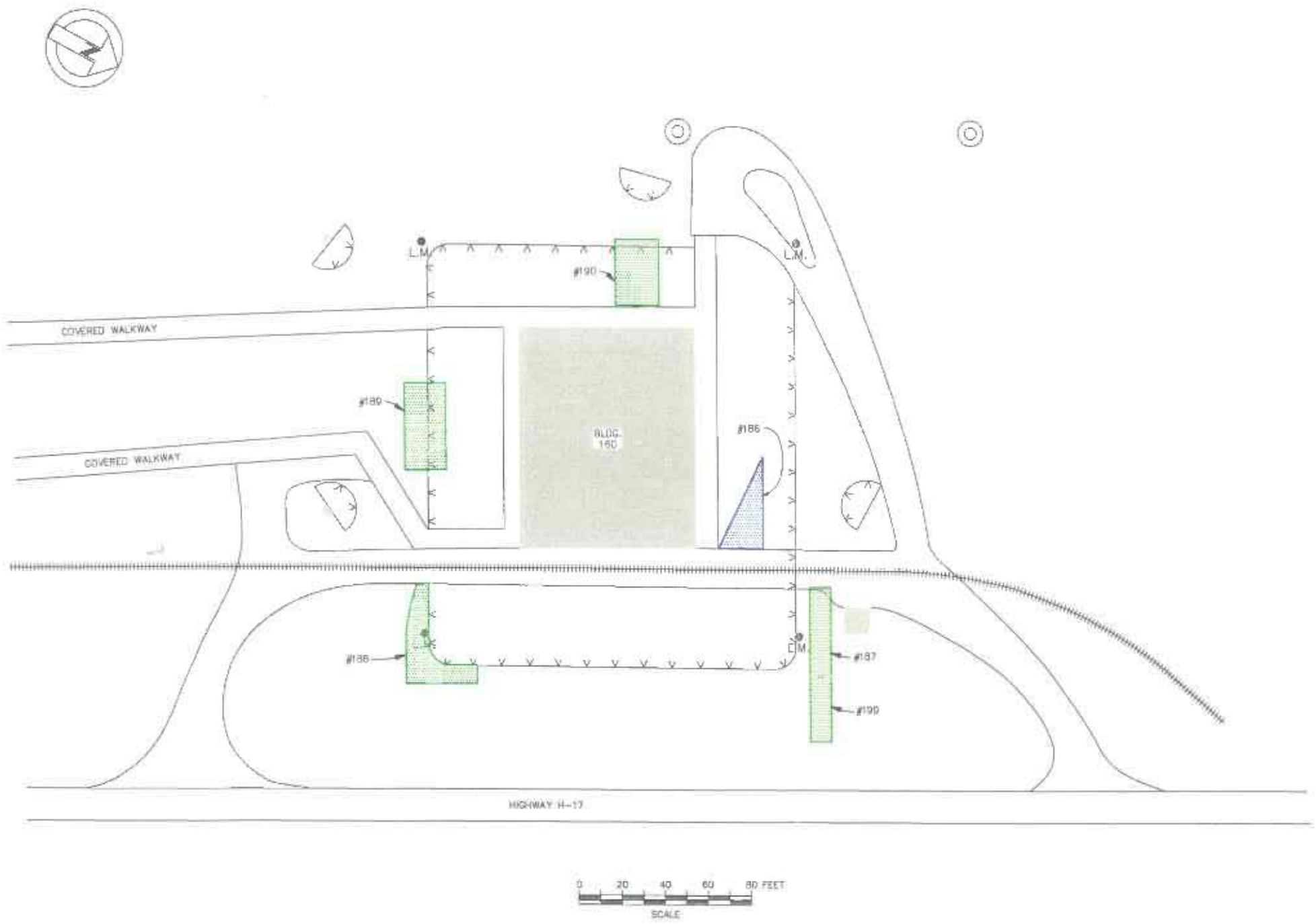
SCALE

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE C4
INITIAL CHARACTERIZATION SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 157

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/24/00 | FILE NAME: MKA84-1.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- EDGE OF BERM
- L.M. LIGHTNING MAST
- MAN HOLE
- #9 GRID NUMBER
- CONVEYOR HOUSING AND WALKWAY
- NO EXCAVATION REQUIRED, MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED, MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- EXCAVATION REQUIRED

NOTES:

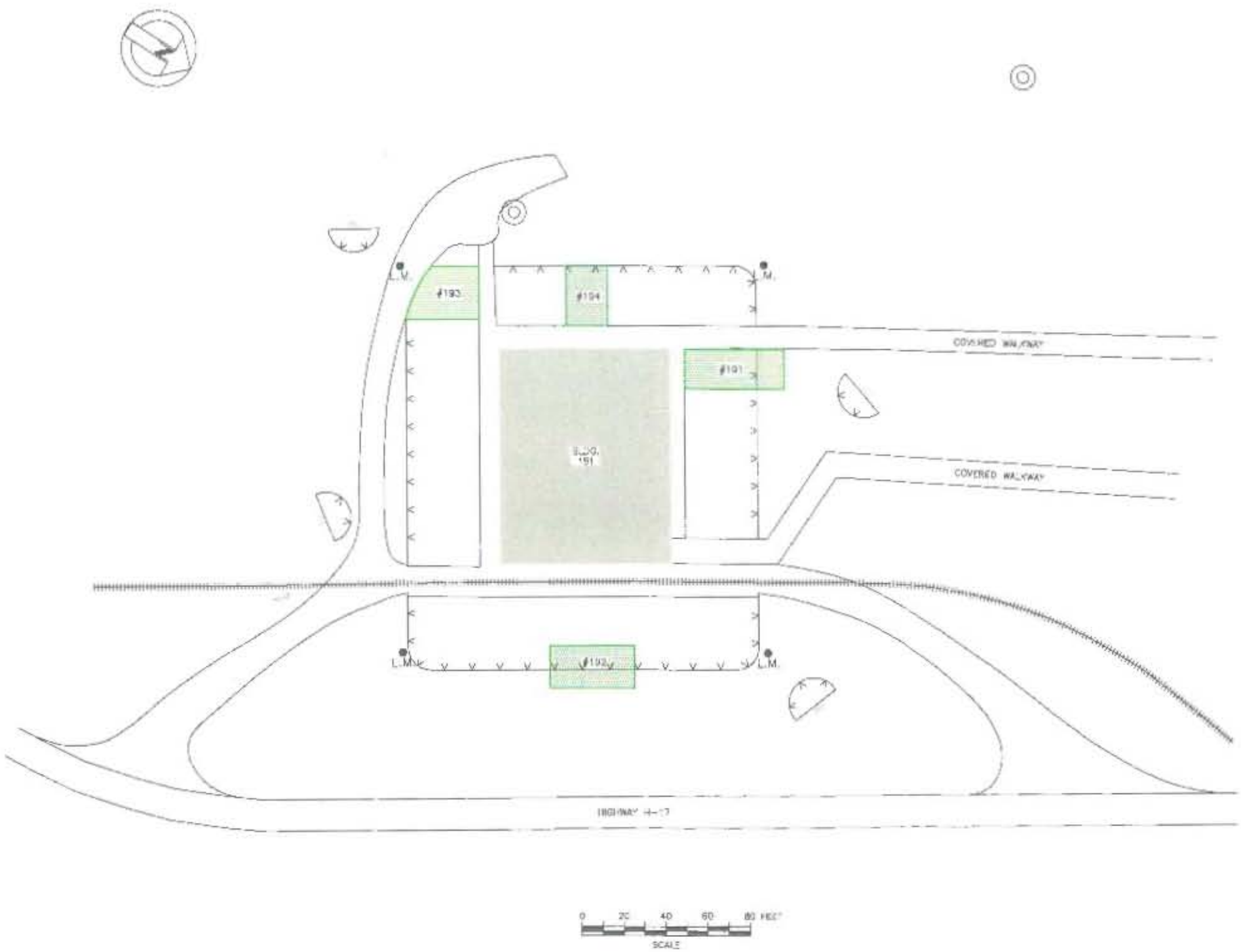
1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE C5
INITIAL CHARACTERIZATION
SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 160

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/24/00 | FILE NAME: MFAB5-1.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- EDGE OF BERM
- L.M. LIGHTNING MAST
- MAN HOLE
- #9 GRID NUMBER
- CONVEYOR HOUSING AND WALKWAY
- NO EXCAVATION REQUIRED. MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- NO EXCAVATION REQUIRED. MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- EXCAVATION REQUIRED

NOTES:

1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE C6
INITIAL CHARACTERIZATION
SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 151

DWG DATE: 4/24/00 | FILE NAME: MFA06-1.DWG

0 20 40 60 80 FEET

SCALE

LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- DOES NOT ACHIEVE CLEAN-UP OBJECTIVES. TABLE 3-2 IN THE INTERIM MEASURES REPORT PROVIDES EXPLANATION FOR WHY THESE AREAS DID NOT MEET CLEAN-UP OBJECTIVES
- MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- ARSENIC VALUES EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET INDUSTRIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. PETN NOT DETECTED AT REPORTING LIMIT ABOVE CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. PETN NOT DETECTED AT REPORTING LIMIT ABOVE CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET INDUSTRIAL CLEAN-UP OBJECTIVES.

NOTES:

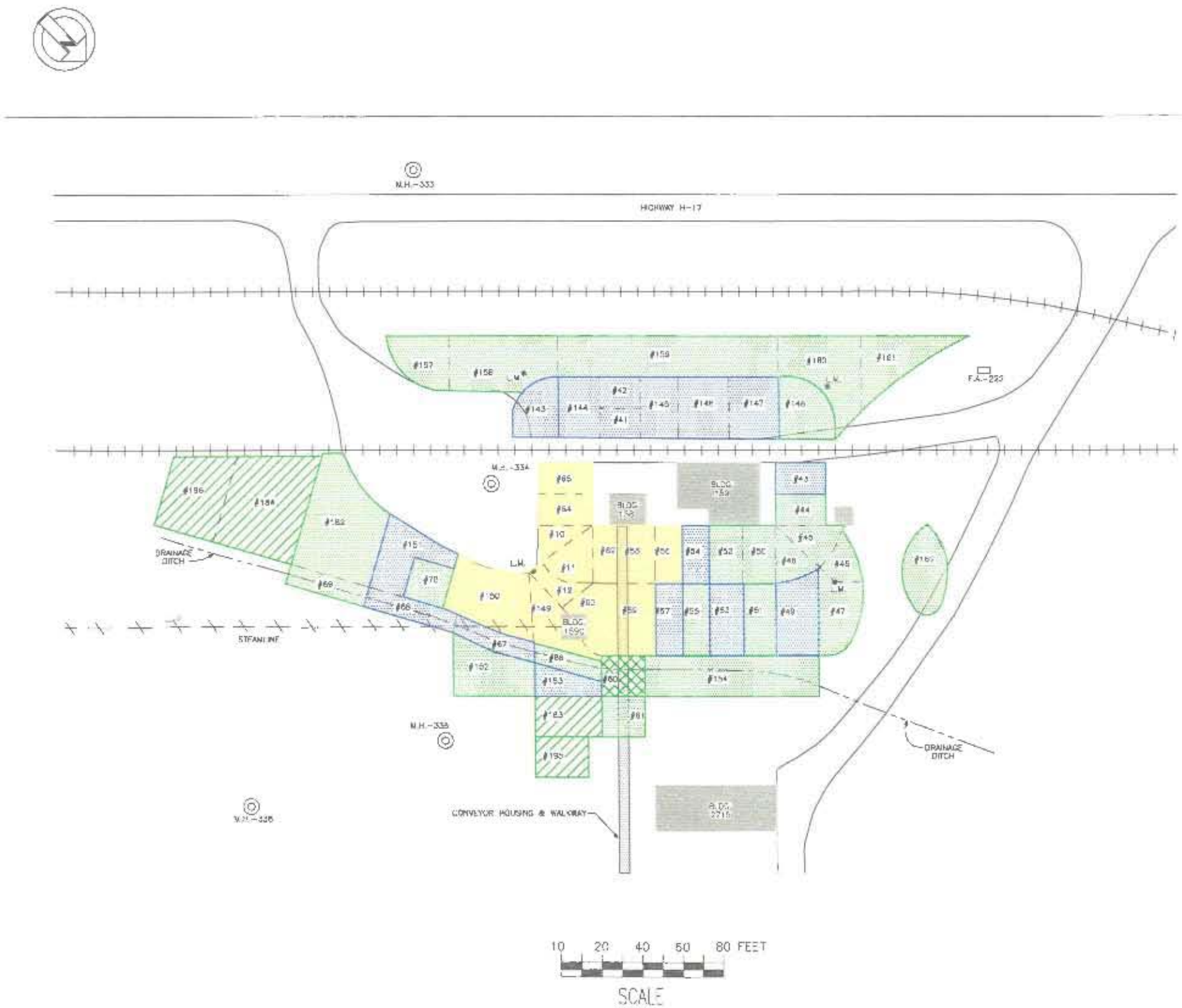
1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
2. GRID CHARACTERIZATION IS BASED ON RESULTS OF POST-EXCAVATION SAMPLES IN AREAS WHERE EXCAVATION WAS PERFORMED OR ON INITIAL CHARACTERIZATION SAMPLES IN AREAS NOT EXCAVATED.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE G1
POST EXCAVATION
SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 153/154

DWG DATE 4/26/00 | FILE NAME MFA1-1.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- L.M. LIGHTNING MAST
- MAN HOLE
- #9 GRID NUMBER
- CONVEYOR HOUSING AND WALKWAY
- DOES NOT ACHIEVE CLEAN-UP OBJECTIVES. TABLE 3-2 IN THE INTERIM MEASURES REPORT PROVIDES EXPLANATION FOR WHY THESE AREAS DID NOT MEET CLEAN-UP OBJECTIVES
- MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- ARSENIC VALUES EXCEED CLEAN-UP OBJECTIVES. PETN NOT DETECTED AT REPORTING LIMIT ABOVE CLEAN-UP OBJECTIVE. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.

NOTES:

1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE G2
POST EXCAVATION
SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 158/159

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAF2-1.DWG

LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- DOES NOT ACHIEVE CLEAN-UP OBJECTIVES. TABLE 3-2 IN THE INTERIM MEASURES REPORT PROVIDES EXPLANATION FOR WHY THESE AREAS DID NOT MEET CLEAN-UP OBJECTIVES
- MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- ARSENIC VALUES EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET INDUSTRIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.

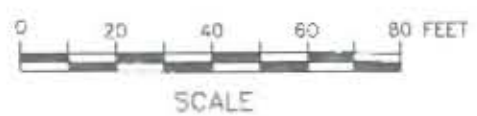
NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE G3
POST EXCAVATION SOIL SAMPLING RESULTS
MINE FILL A, BUILDING 152

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAF3-1.DWG



LEGEND

- BUILDING
- CONVEYOR HOUSING AND WALKWAY
- MAN HOLE
- #9 GRID NUMBER
- RAILROAD
- STEAM LINE
- L.M. LIGHTNING MAST
- SWALE/DITCH
- GRID BOUNDARY
- DOES NOT ACHIEVE CLEAN-UP OBJECTIVES. TABLE 3-2 IN THE INTERIM MEASURES REPORT PROVIDES EXPLANATION FOR WHY THESE AREAS DID NOT MEET CLEAN-UP OBJECTIVES
- MEETS INDUSTRIAL CLEAN-UP OBJECTIVES
- MEETS RESIDENTIAL CLEAN-UP OBJECTIVES
- ARSENIC VALUES EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET INDUSTRIAL CLEAN-UP OBJECTIVES.
- ARSENIC VALUE EXCEED CLEAN-UP OBJECTIVES. ALL OTHER COMPOUNDS MEET RESIDENTIAL CLEAN-UP OBJECTIVES.

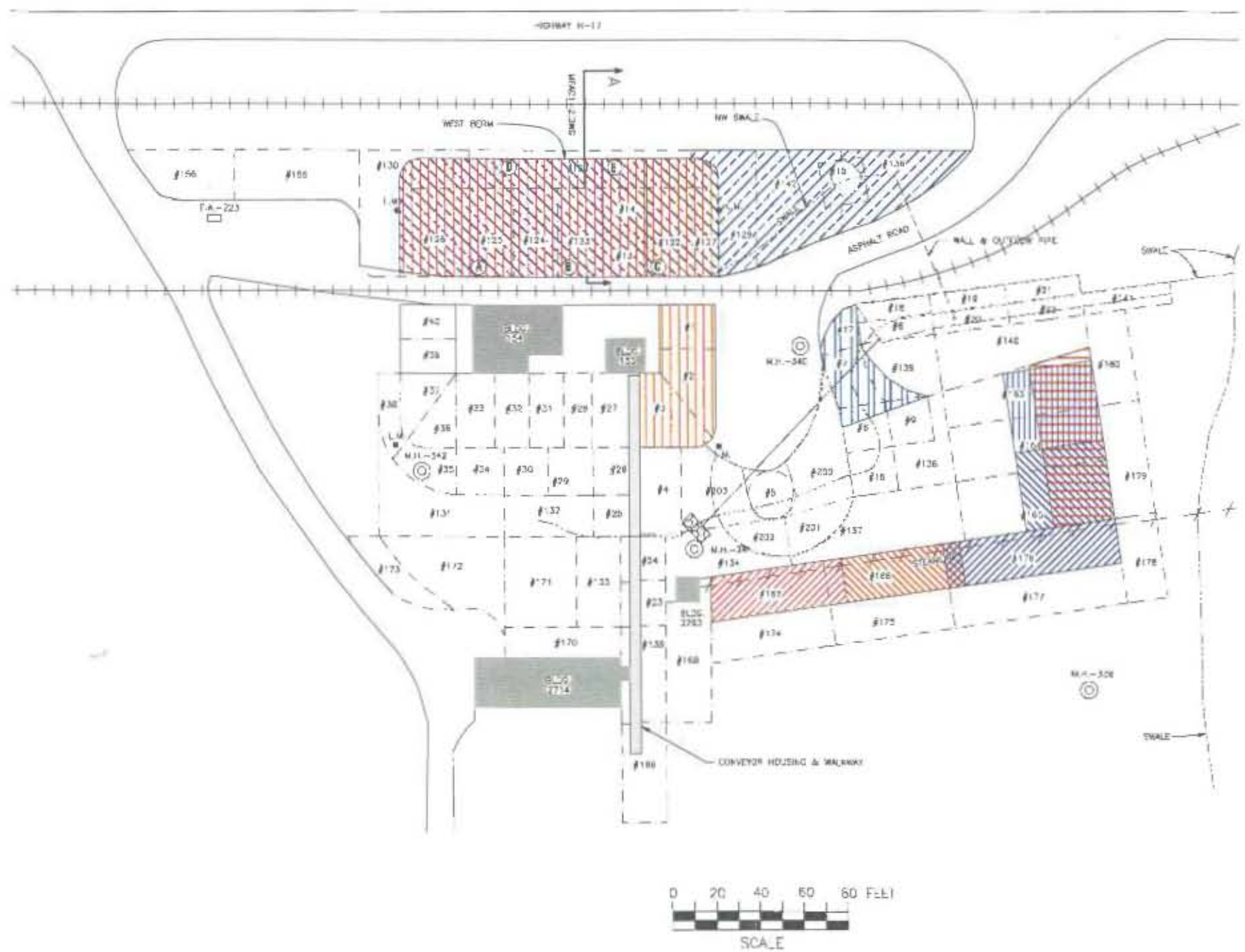
NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE C4
POST EXCAVATION SOIL SAMPLING RESULTS
VINE HILL A, BUILDING 157

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFN4-[illegible]



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE
- MAN HOLE
- #9 GRID NUMBER
- LM LIGHTNING MAST
- (A) WINDROW DIMENSION LOCATION
- CONVEYOR HOUSING AND WALKWAY
- UNIFORM GABION (RIPRAP)
- #2 (12") STONE
- WINDROW #36 (BOTTOM LAYER) 1/14/99 WINDROW #9 (TOP LAYER) 2/17/99
- WINDROW #37 1/24/99 (12" DEEP)
- WINDROW #25 1/15/99
- WINDROW #26 1/19/99 (3' DEEP)
- WINDROW #20 1/20/99 TOP LAYER (2' DEEP)
- WINDROW #25 1/15/99 (3' DEEP)
- WINDROW #17
- WINDROW #15
- WINDROW #32 1/15/99 BOTTOM LAYER (2' DEEP)
- WINDROW #97 (2.5' DEEP) FOR GRIDS #1, 2 & 3. A THIN LAYER WAS SPREAD ON TOP OF WINDROW #37 FOR GRIDS #13 & 14 AND GRIDS 122 THROUGH 127.

NOTES:

1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
2. WINDROW #36 FILLED NW SWALE TO LEVEL OF 24" BELOW SURROUNDING TOPOGRAPHY

AS OF 3/26/99

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE J1
BACKFILL LOCATIONS
MINE FILL A BUILDING 153/154
PAGE 1 OF 4

DWG DATE: 10/27/00 | FILE NAME: MFAC1-1.DWG

LEGEND

BUILDING

STEAM LINE

RAILROAD

GRID BOUNDARY

SWALE

MAN HOLE

#3 GRID NUMBER

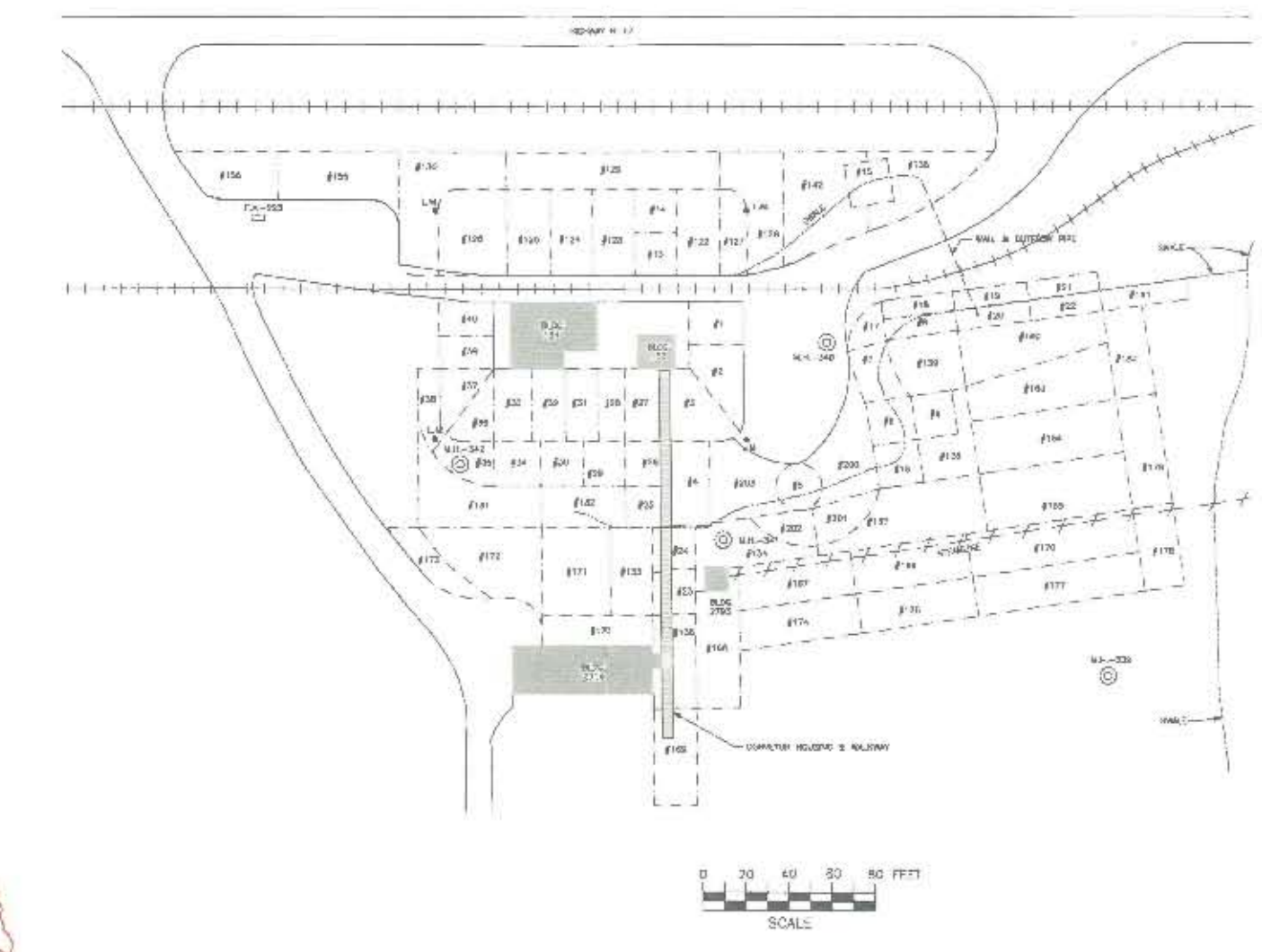
L.M. LIGHTNING MAST

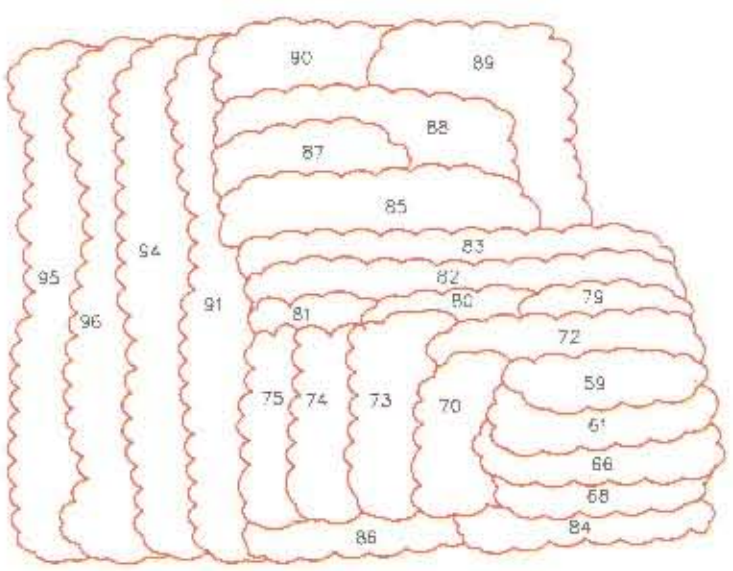
CONVEYOR HOUSING AND WALKWAY

UNIFORM GABION (RIPRAP)

#2 (12") STONE

59 BACKFILL WINDROW NUMBER





GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

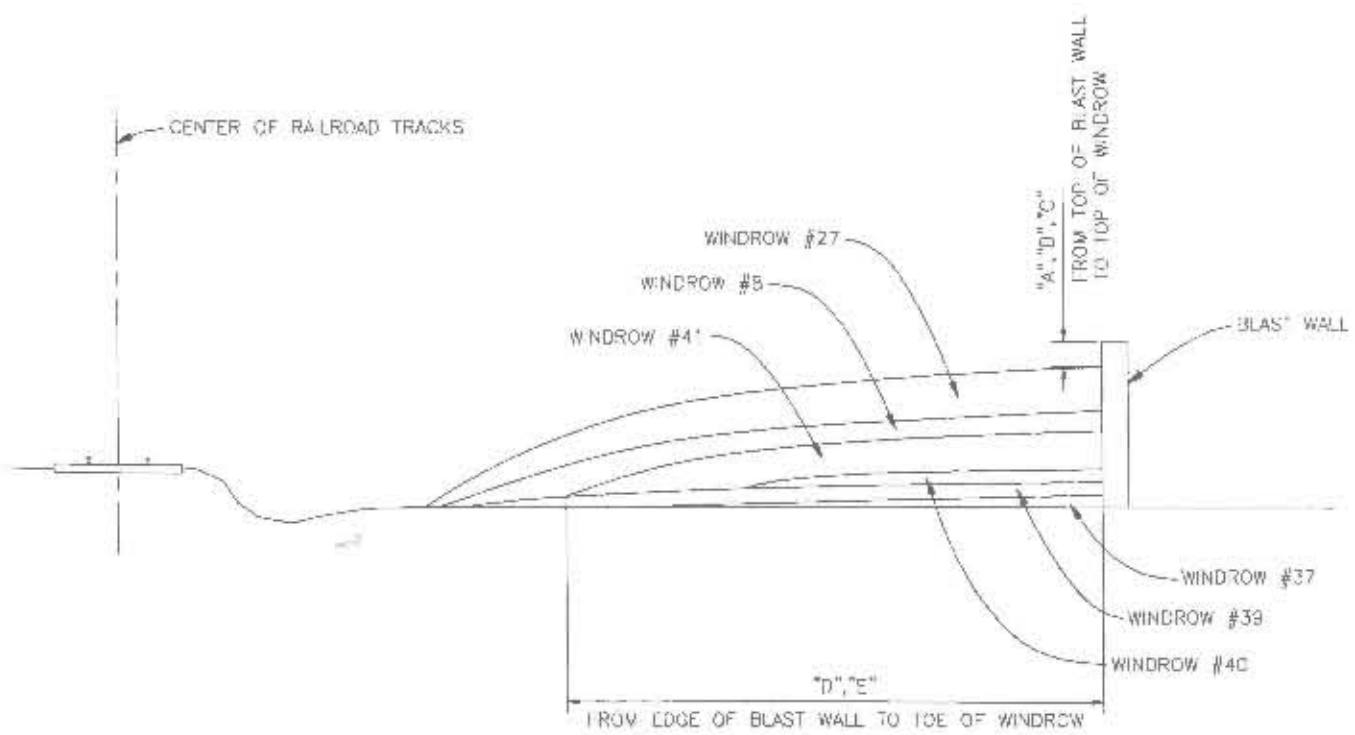
AS OF 3/26/99

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE J1
BACKFILL LOCATIONS
MINE FILL A BUILDING 153/154
PAGE 2 OF 4

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 5/23/00 | FILE NAME: MFACT-4.DWG



SECTION A

MFAC1-1DWG

WINDROW #37 1/21/99
A=12'
B=12'
C=12'
D=37'
E=37'

WINDROW #41 2/12/99
A=7'
B=7'
C=8'
D=42'
E=42'

WINDROW #39 1/31/99
A=11'
B=11'
C=11'
D=50'
E=50'

WINDROW #8 2/16/99
A=5'-5"
B=3'-7"
C=2'-10"
D=51'
E=52'

WINDROW #40
A=10'
B=10'
C=11'
D=29'
E=28'

WINDROW #27 3/17/99
A=2'
B=2'
C=2'
D=52'
E=53'

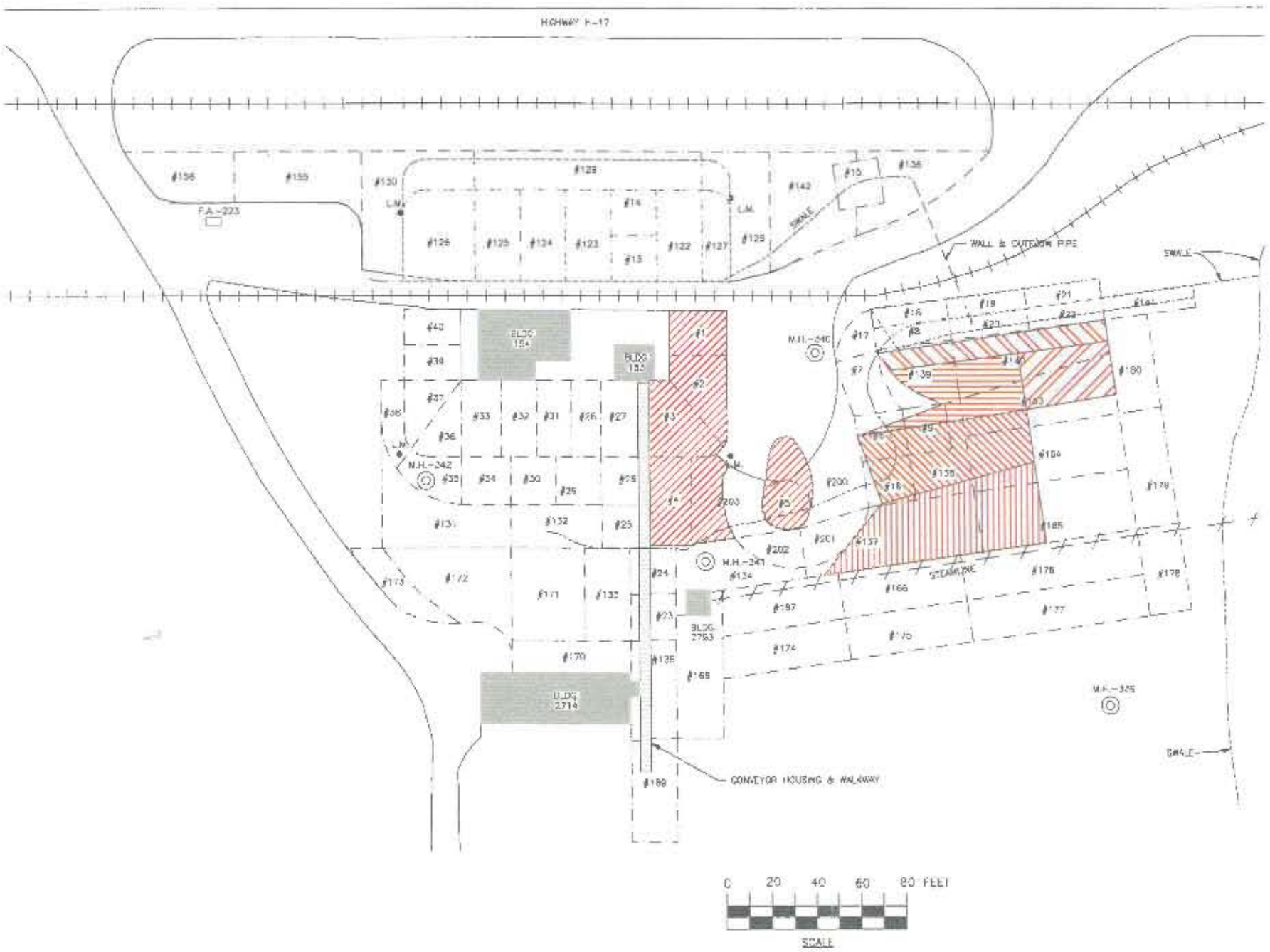
AS OF 3/26/99

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE 31
BACKFILL LOCATIONS
MINEFILL A BUILDING 153/154
PAGE 3 OF 4

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAC1-2.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- UNIFORM GABION (RIPRAP)
- WINDROW #38 1/29/99
- WINDROW #16 1/25/99 (2' DEEP)
- WINDROW #18 1/26/99 (3' DEEP)
- WINDROW #19 1/27/99 (3' DEEP)
- WINDROW #21 1/22/99 (3' DEEP)
- WINDROW #22 1/27/99 (3' DEEP)
- WEST BERM

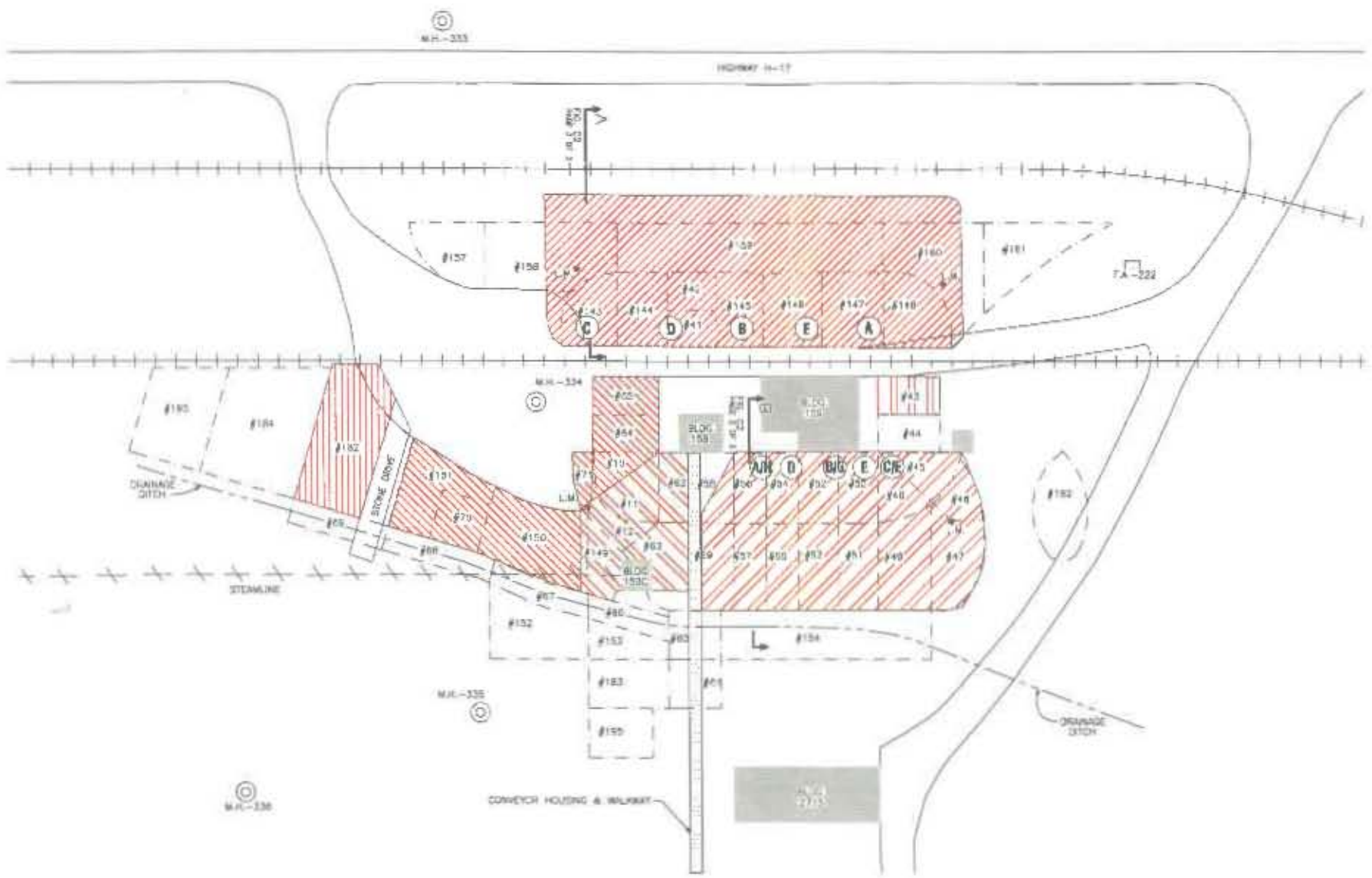
NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE 11
BACKFILL LOCATIONS
MINE FILL A BUILDING 153/154
PAGE 4 OF 4

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: HFAC1-3.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- (D) WINDROW DIMENSION LOCATION
- CONVEYOR HOUSING AND WALKWAY
- WEST BERM WINDROWS #1,2,4, 7,10,30,PILOT SCALE MIXES
- WINDROW #12 GRID #182 12" DEEP
- WINDROW #33 GRID #70,150,151, 3' DEEP GRIDS #71,10 18" DEEP GRIDS #64,65 10" DEEP
- BACK BERM WINDROWS #6, 28,34,35
- WINDROW #6 (1/20/99)
- WINDROW #42 3' DEEP

WINDROWS #99 & 100 SPREAD EVENLY OVER ALL GRIDS (2" ± DEPTH)

NOTES:

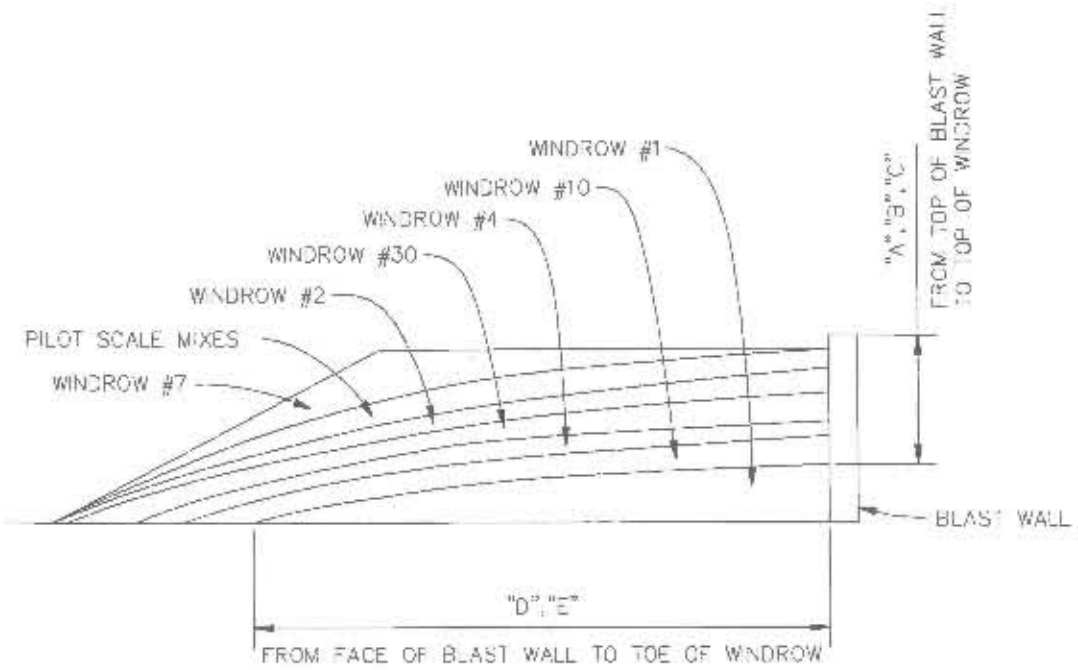
1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE J2
BACKFILL LOCATIONS
MINE FILL A, BUILDING 158/159
PAGE 1 OF 3

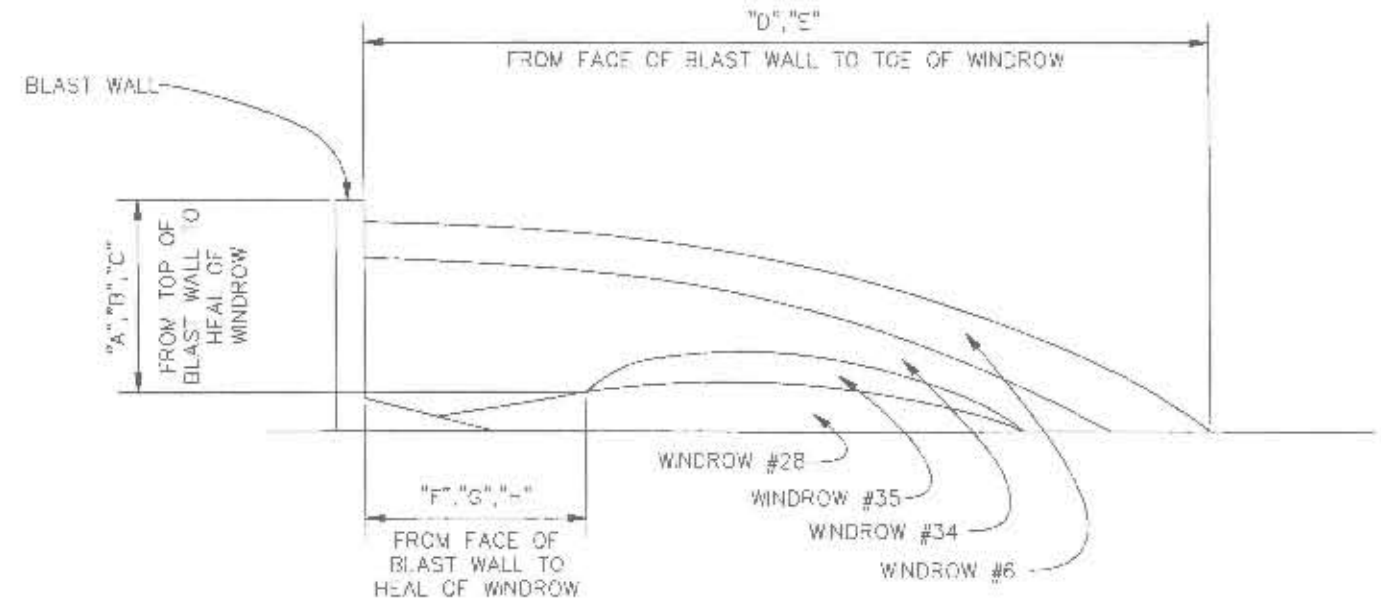
MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/28/00 | FILE NAME: MFAC2-1.DWG



SECTION A

MFAC2-1.DWG



SECTION B

MFAC2-1.DWG

WINDROW #1 12/9/98
A=8'
B=9'
C=10'
D=40'
E=38'

WINDROW #2 12/28/98
A=18"
B=4'
C=7'
D=53'
E=54'

WINDROW #10 12/10/98
A=7'
B=7'
C=10'
D=45'
E=38'

PILOT SCALE MIXES 12/29/98
A=12"
B=12"
C=7'
D=54'
E=48'

WINDROW #4 12/23/98
A=5'-6"
B=6'
C=9'
D=47'
E=44'

WINDROW #7 12/30/98
A=12"
B=12"
C=12"
D=54'
E=54'

WINDROW #30 12/28/98
A=5'-8"
B=6'
C=6'
D=48'
E=49'

WINDROW #28 12/31/98
A=13'
B=13'
C=15'
D=46'
E=46'
F=5'
G=11'
H=16'

WINDROW #35 1/11/99
A=10'
B=11'
C=13'
D=46'
E=46'
F=5'
G=11'
H=16'

WINDROW #34 1/13/99
A=4'
B=4'
C=4'
D=52'
E=52'

WINDROW #6 1/20/99
A=18"
B=18"
C=18"
D=59'
E=59'

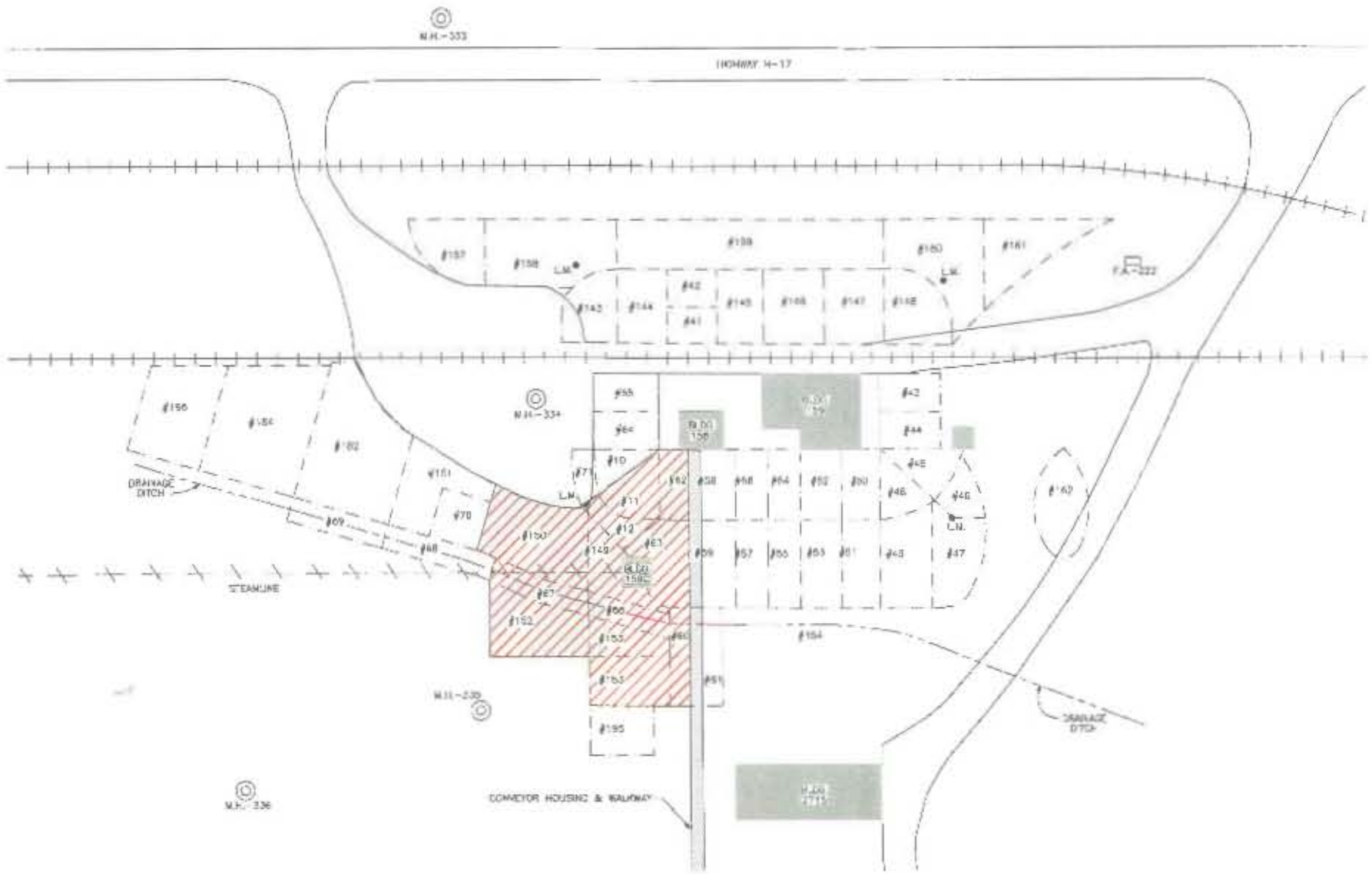
AS OF 3/26/99

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE J2
BACKFILL LOCATIONS
MINE FILL A BUILDING 158/159
PAGE 2 OF 3

DWG DATE: 4/26/00 | FILE NAME: MFAC2-2.DWG



LEGEND

- BUILDING
- STEAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALL/DITCH
- MAN HOLE
- #9 GRID NUMBER
- L.M. LIGHTNING MAST
- CONVEYOR HOUSING AND WALKWAY
- WINDROW #23 TO ORIGINAL GRADE

NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

0 20 40 60 80 FEET

SCALE

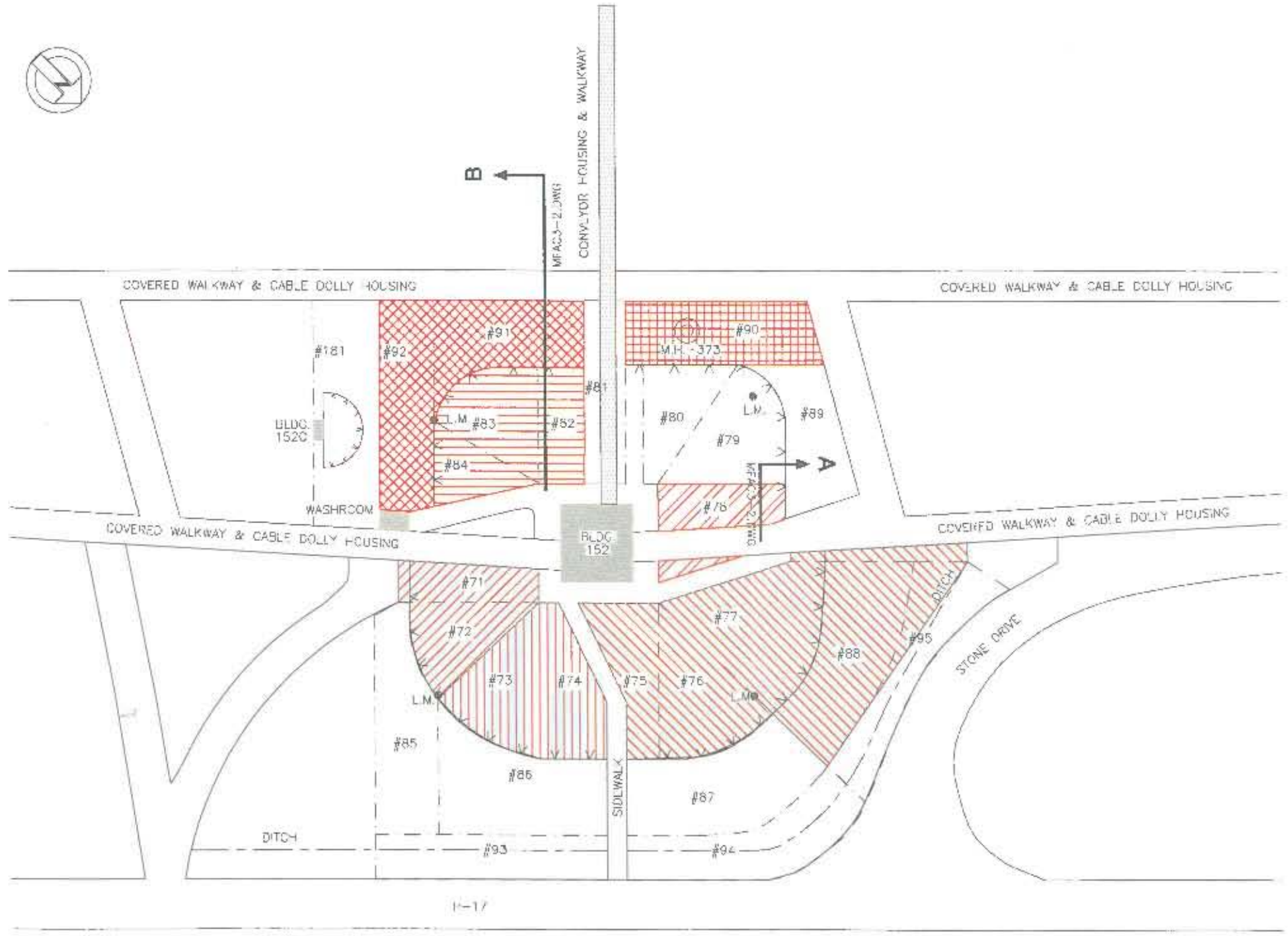
AS OF 3/26/99

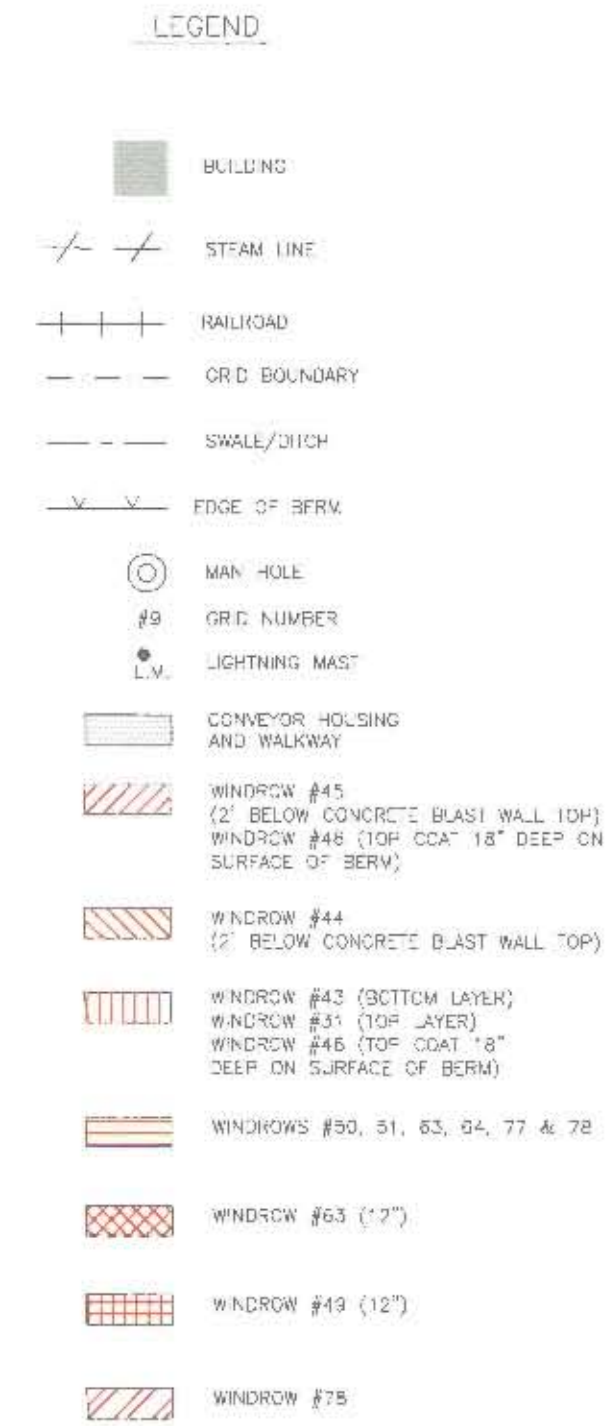
FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE J2
BACKFILL LOCATIONS
MINE FILL A, BUILDING 158/159
PAGE 3 OF 3

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAC2-3.DWG





SCALE

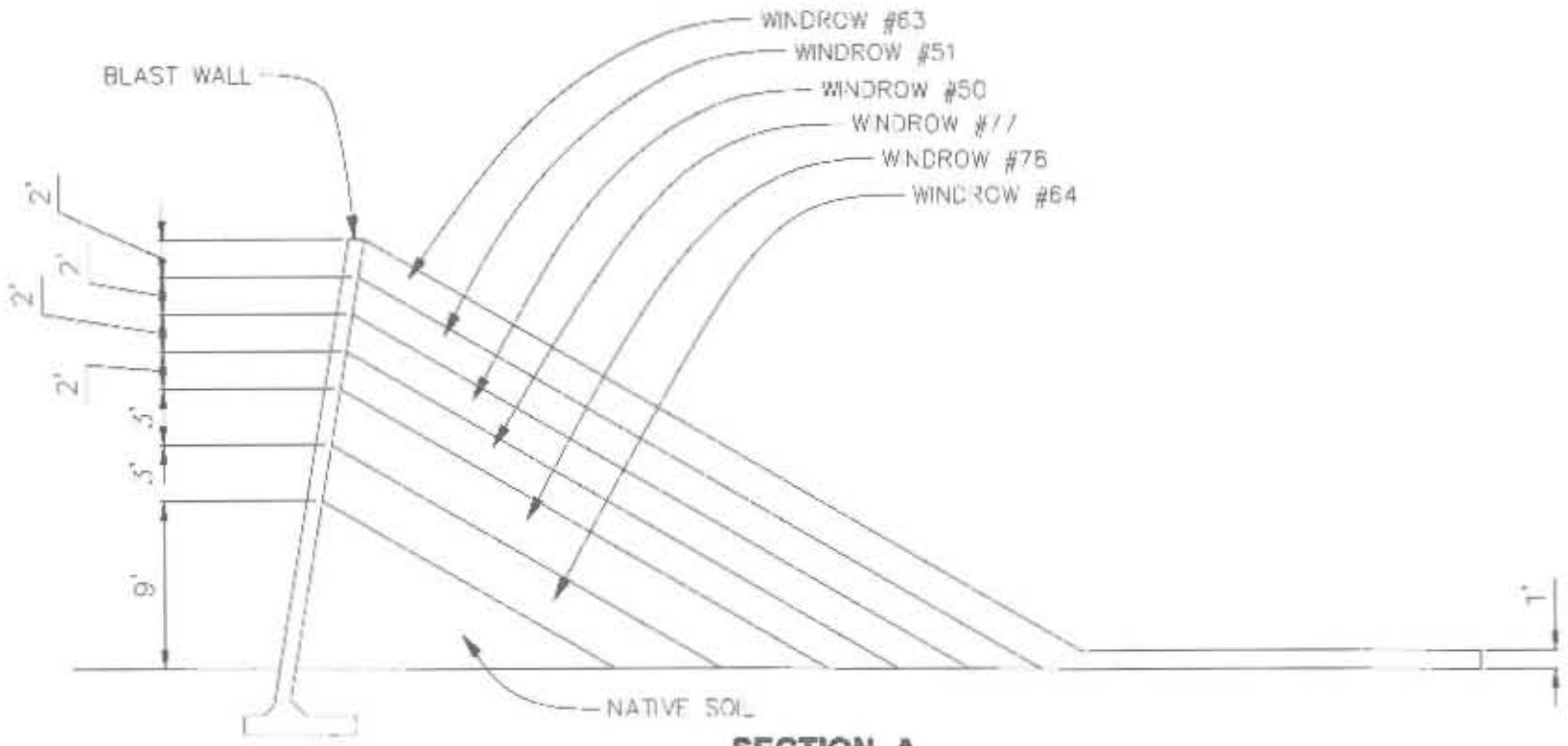
NOTE: GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE 3
BACKFILL LOCATIONS
MINE FILL A BUILDING 152
PAGE 1 OF 2

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

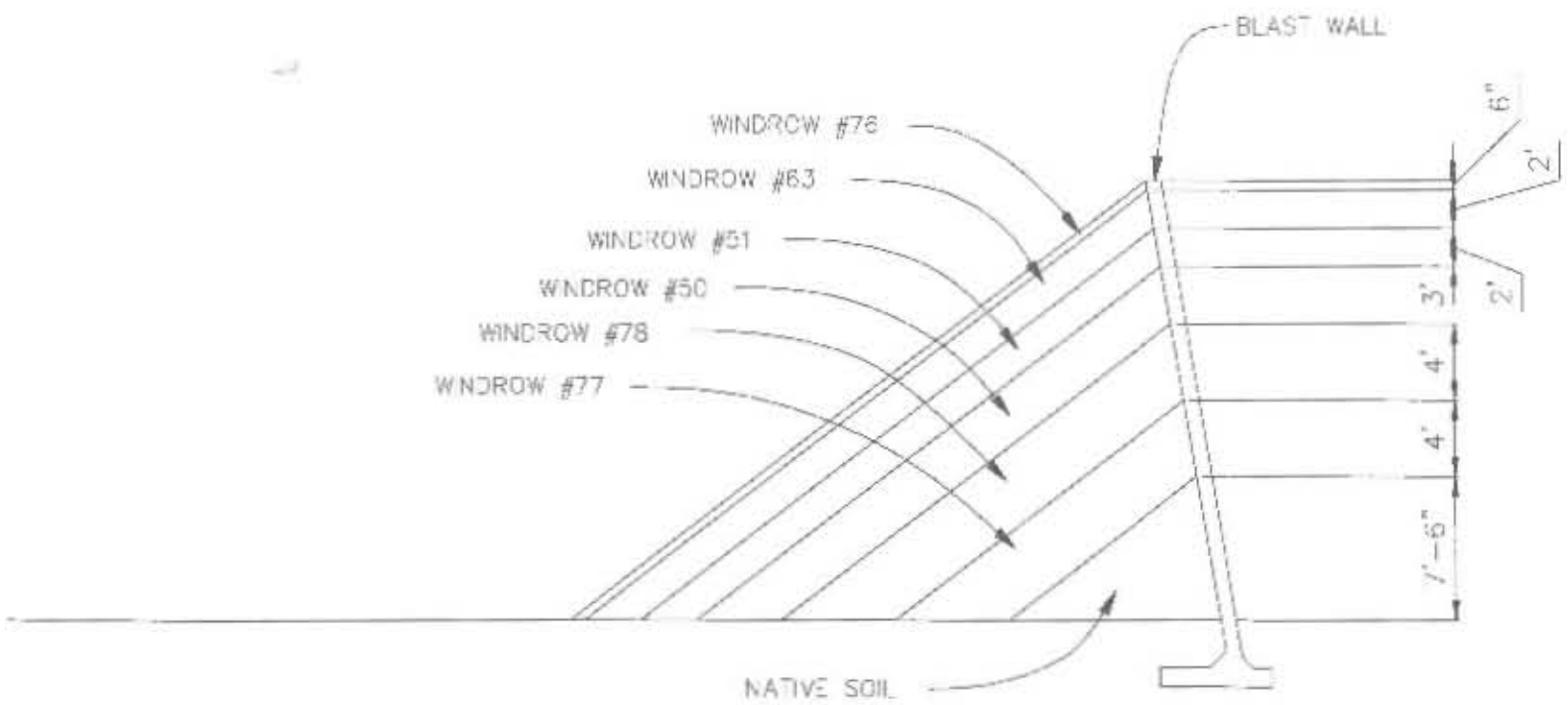
DWG DATE: 4/26/00 | FILE NAME: MFAC3-1.DWG



SECTION A

MFAC3-1.DWG

(NTS)



SECTION B

MFAC3-1.DWG

(NTS)

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE 13
BACKFILL LOCATIONS
MINE FILL A, BUILDING 152
PAGE 2 OF 2

DWG DATE: 4/26/00 | FILE NAME: MFAC3-2.DWG

LEGEND

- BUILDING
- STREAM LINE
- RAILROAD
- GRID BOUNDARY
- SWALE/DITCH
- EDGE OF BERM
- L.V. LIGHTNING MAST
- MAN HOLE
- #9 GRID NUMBER
- CONVEYOR HOUSING AND WALKWAY
- DECONTAMINATED ROCKS
- WINDROWS #5 & 53
- WINDROWS #3, PART OF 48, 49 & 60
- WINDROW #4
- WINDROWS #62, 65, 67 & PART OF 48
- WINDROWS #47, PART OF 48, 49, 50, 69 & 71
- PART OF WINDROW #48

NOTES:

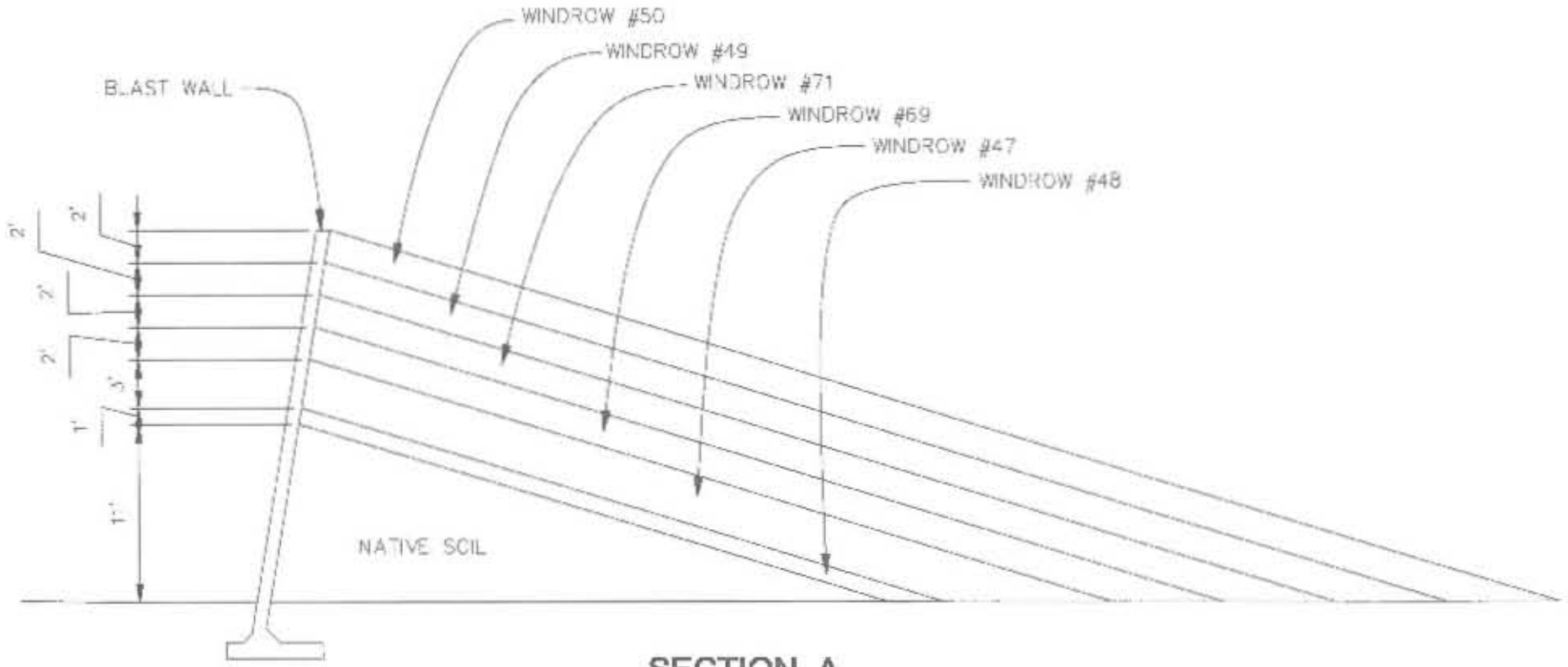
1. GRID LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.

FULL-SCALE BIOREMEDIATION OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE J4
BACKFILL LOCATIONS
MINE FILL A, BUILDING 157
PAGE 1 OF 3

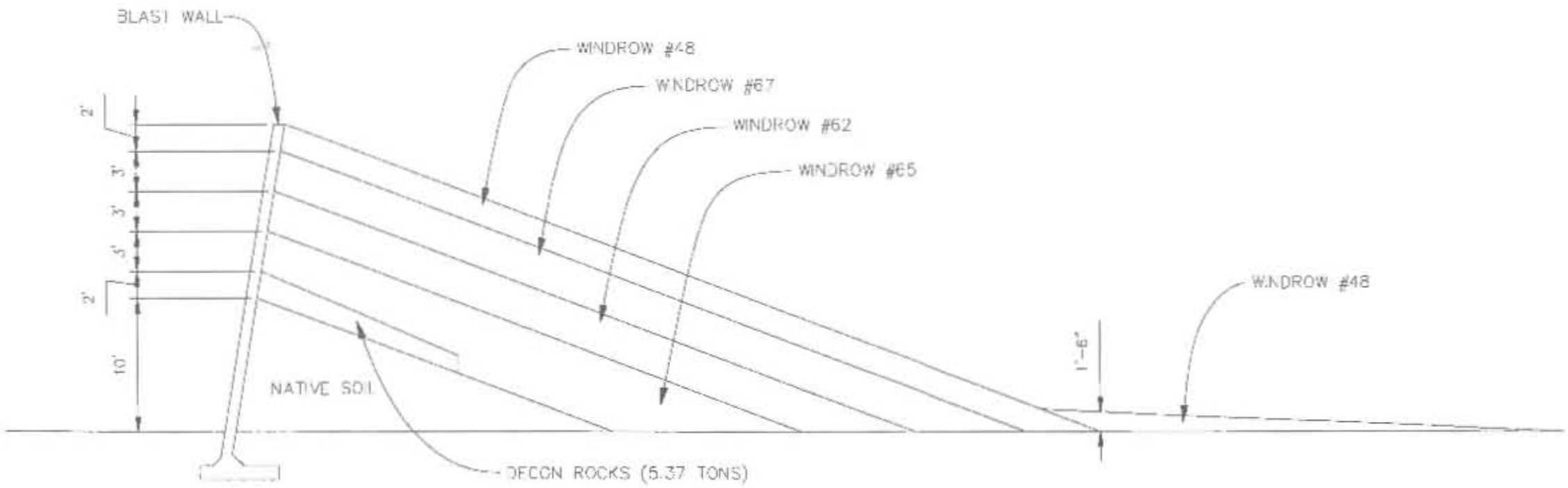
MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAC4-1.DWG



SECTION A

MFAC4-1.DWG
GRIDS #100, 101, 102, 112, 113, & 114
(NTS)



SECTION B

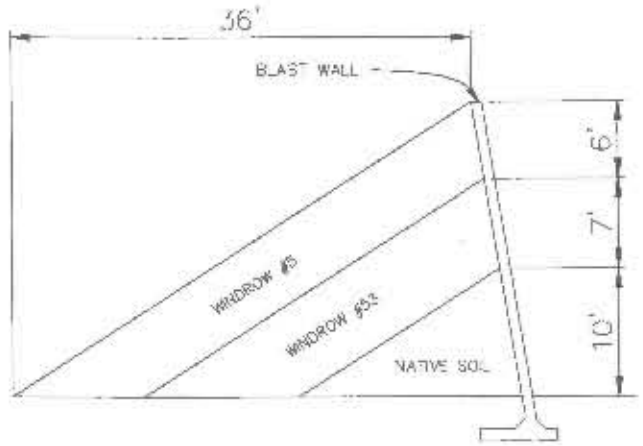
MFAC4-1.DWG
GRIDS #96, 97, 98, 99, & 111
(NTS)

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

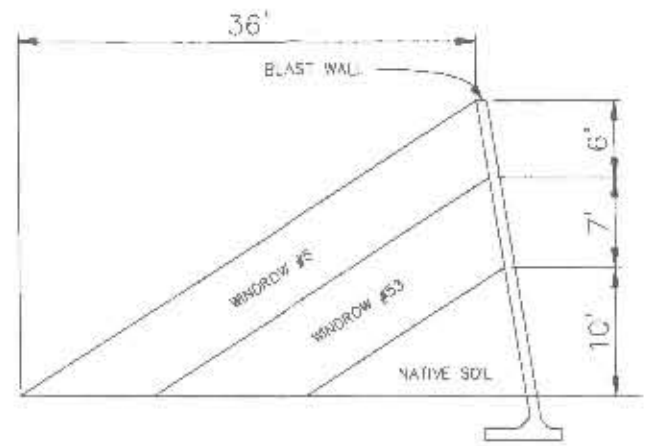
FIGURE J4
BACKFILL LOCATIONS
MINE FILL A, BUILDING 157
PAGE 2 OF 3

DWG DATE: 4/26/00 | FILE NAME: MFAC4-2.DWG



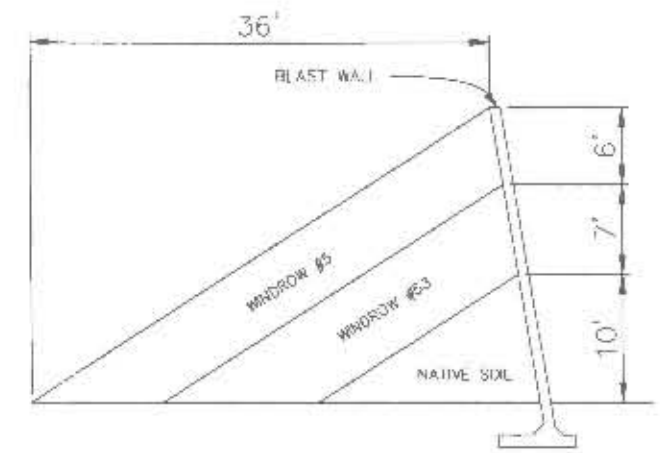
SECTION C

MFAC4-1.DWG
GRID #103
(NTS)



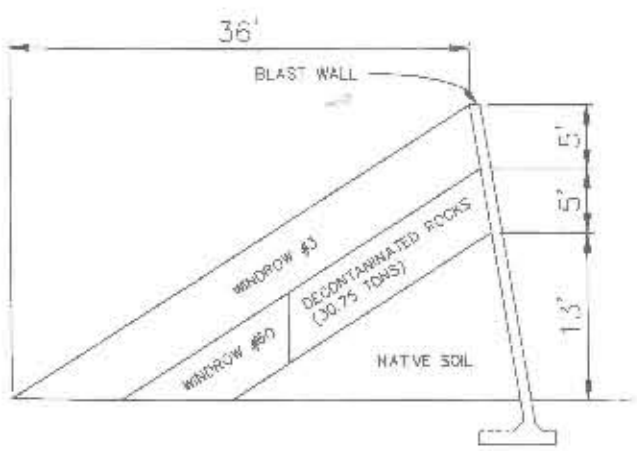
SECTION D

MFAC4-1.DWG
GRID #104
(NTS)



SECTION E

MFAC4-1.DWG
GRID #105
(NTS)



SECTION F

MFAC4-1.DWG
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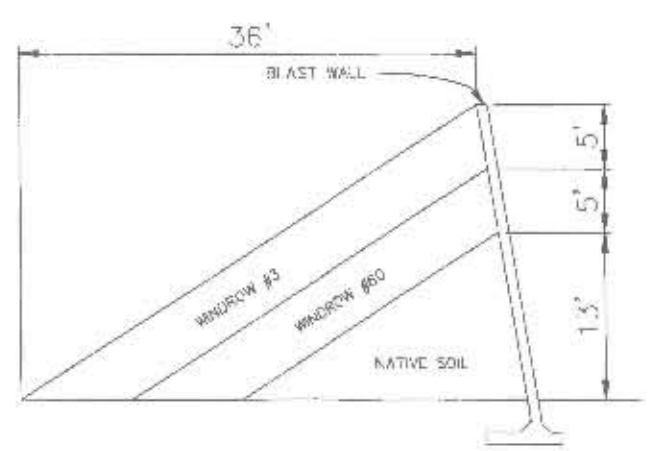
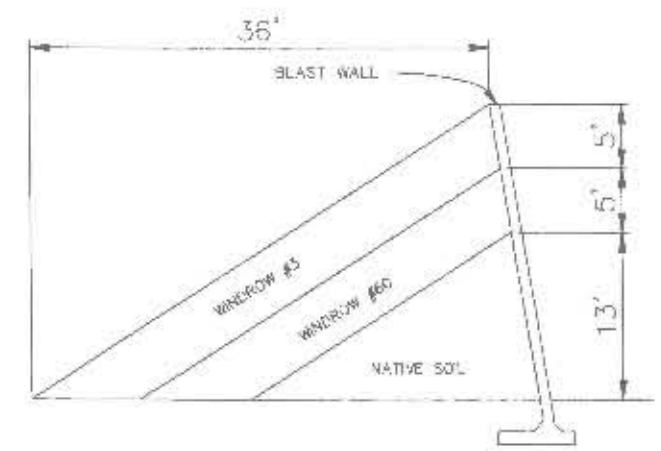
(NTS)



SECTION G

MFAC4-1.DWG
GRID #108
(NTS)



SECTION H

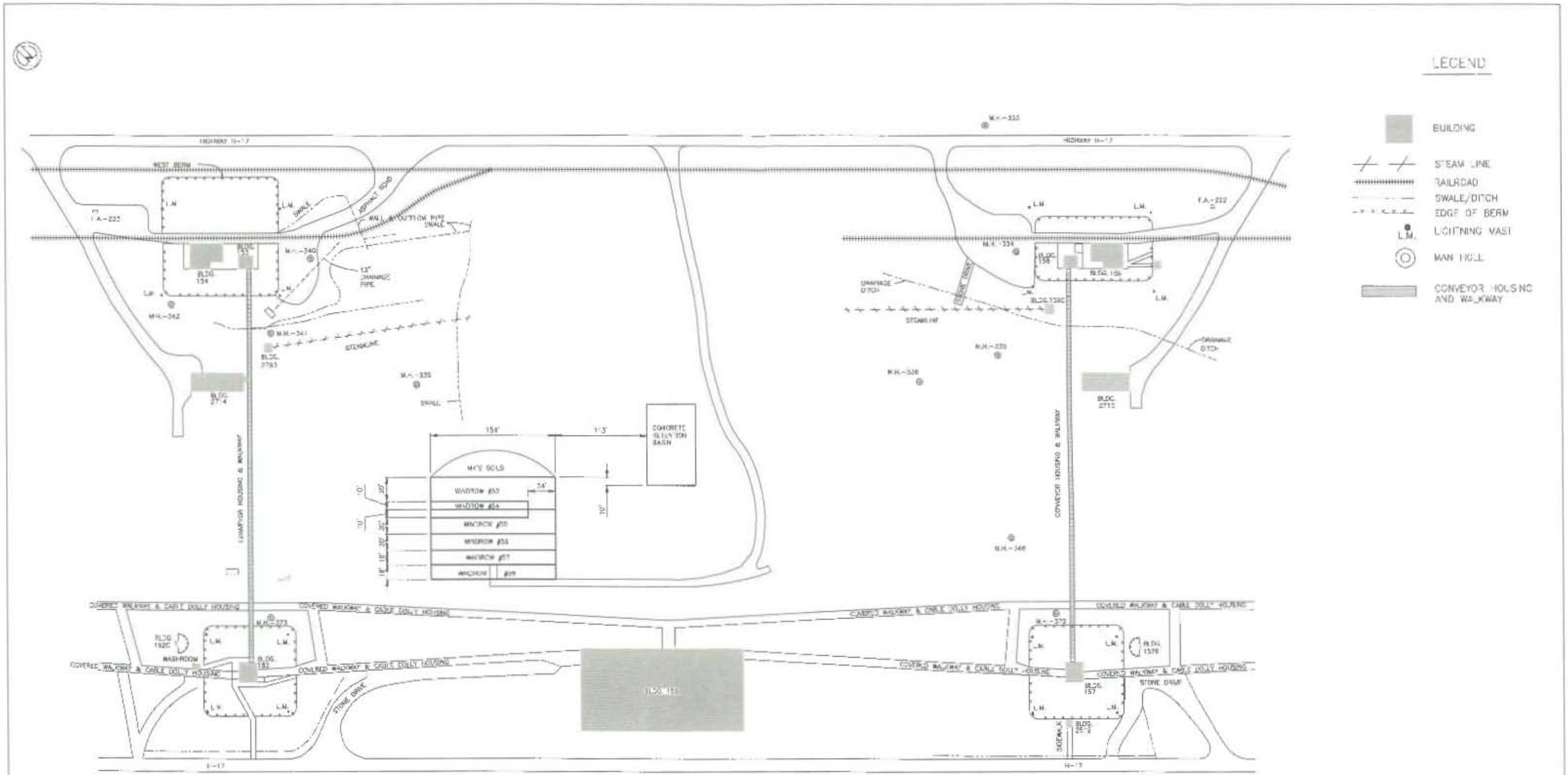
MFAC4-1.DWG
GRID #109
(NTS)

FULL-SCALE
BIOREMEDIATION
OPERATIONS
NSWC CRANE
CRANE, IN

FIGURE J4
BACKFILL LOCATIONS
MINE FILL A, BUILDING 157
PAGE 3 OF 3

MORRISON KNUUSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 4/26/00 | FILE NAME: MFAC4-3.DWG



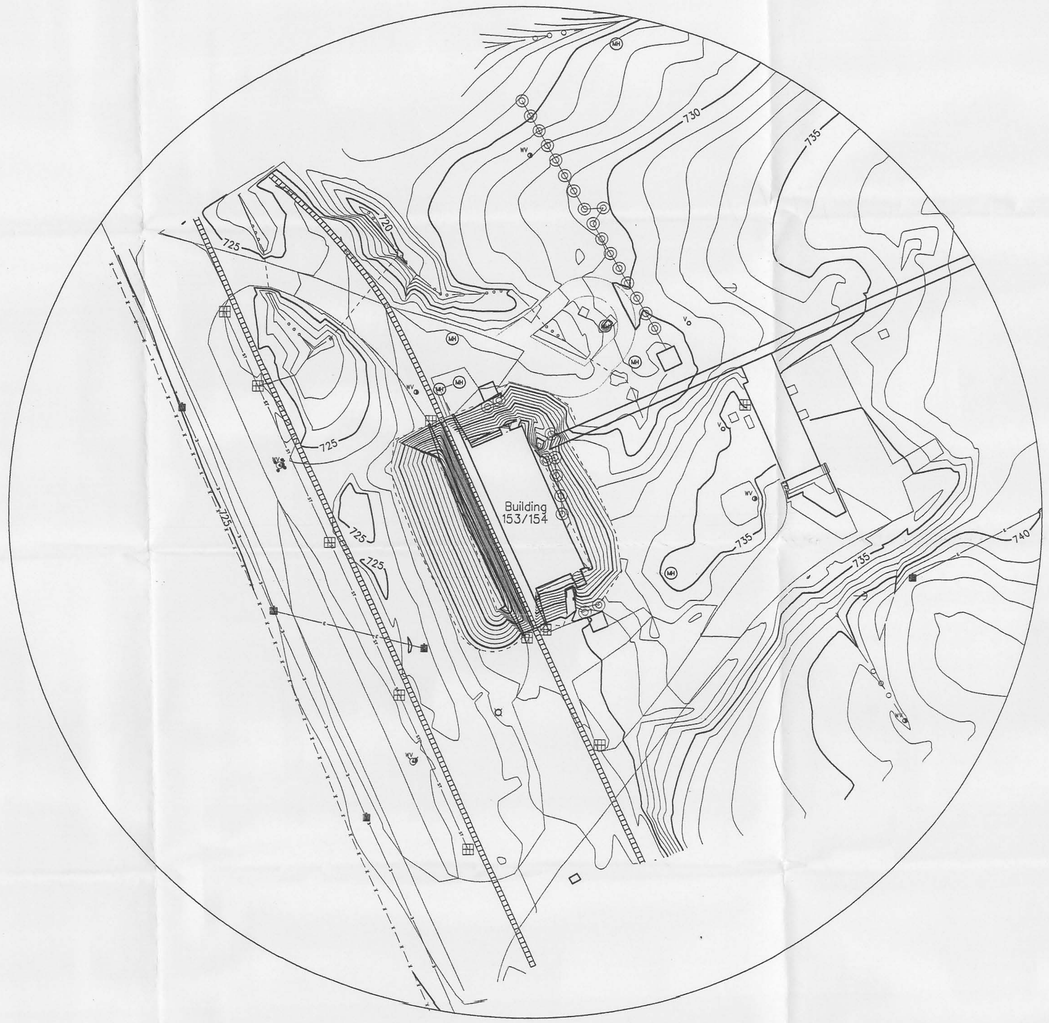
NOT TO SCALE

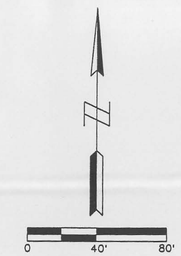
FULL-SCALE BIOREMEDIATION OPERATIONS NSWC CRANE CRANE, IN

FIGURE 15
WINDROWS PERMANENTLY BACKFILLED AT STAGING AREA MINE FILL A

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES

DWG DATE: 7/21/00 | FILE NAME: MFASTG.DWG





MINE FILL A

Building 153/154

REVISIONS AND DATES
Revised 3/1/99 GSB
Revised 4/14/99 GSB

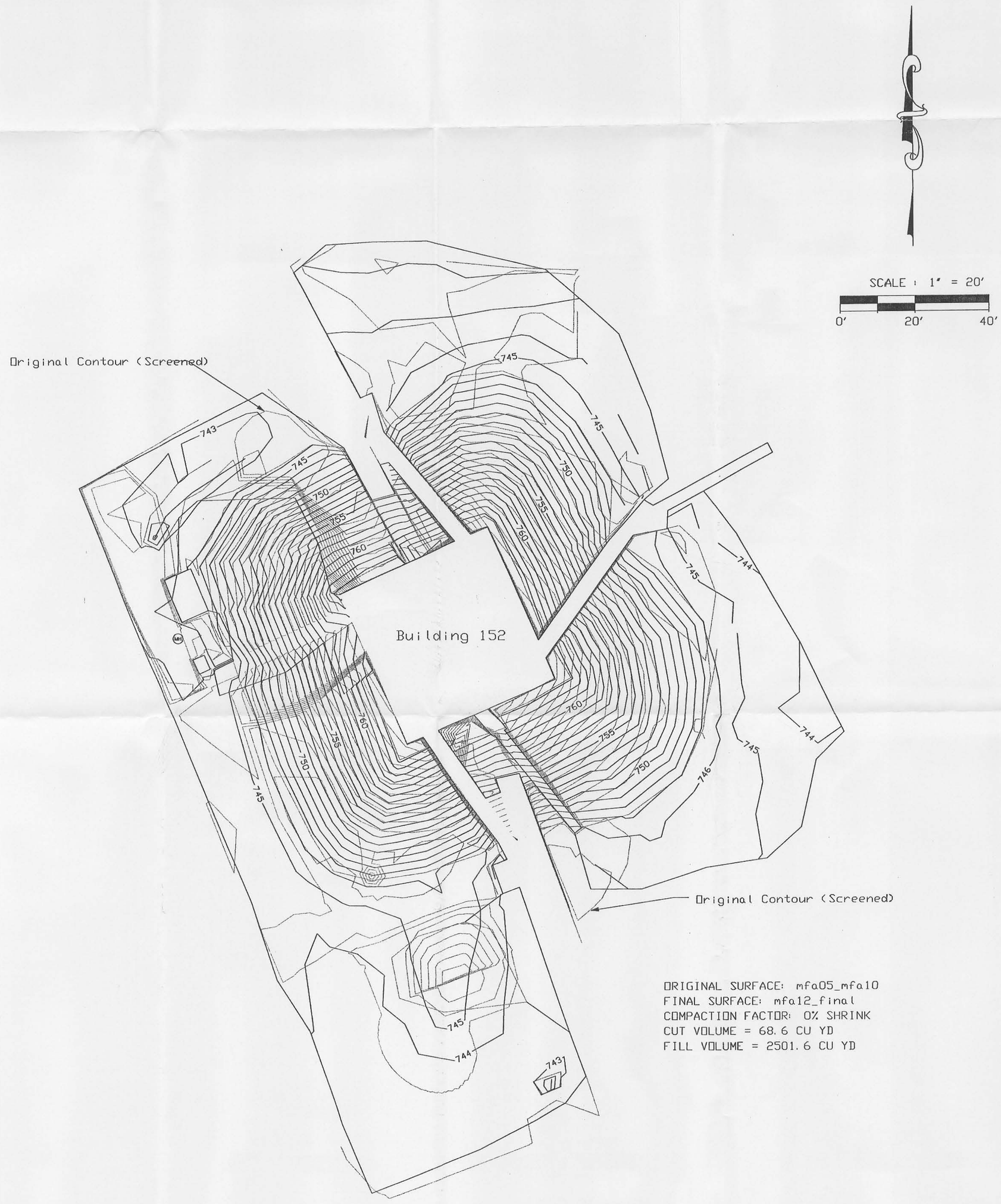
DESIGNED BY:

DRAWN BY: MDK

CHECKED BY: RLB

APPROVED BY:

Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax



ORIGINAL SURFACE: mfa05_mfa10
FINAL SURFACE: mfa12_final
COMPACTION FACTOR: 0% SHRINK
CUT VOLUME = 68.6 CU YD
FILL VOLUME = 2501.6 CU YD

Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax

REVISIONS AND DATES

DESIGNED BY:
DRAWN BY: GSB
CHECKED BY: RLB
APPROVED BY:

DATE: November 7, 2000

Mine Fill A

Building 152

As-Built Locations Done October 18, 1999

SCALE: 1" = 20' JOB No.: 121-4909 SHEET No.: 1 of 1

mfa12.dgn

ORIGINAL SURFACE: mfa_03
FINAL SURFACE: mfa_15
COMPACTION FACTOR: 0% SHRINK
CUT VOLUME = 10.5 CU YD
FILL VOLUME = 5819.3 CU YD

Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax

REVISIONS AND DATES

DESIGNED BY:
DRAWN BY: GSB
CHECKED BY: RLB
APPROVED BY:
DATE: October 30, 2000

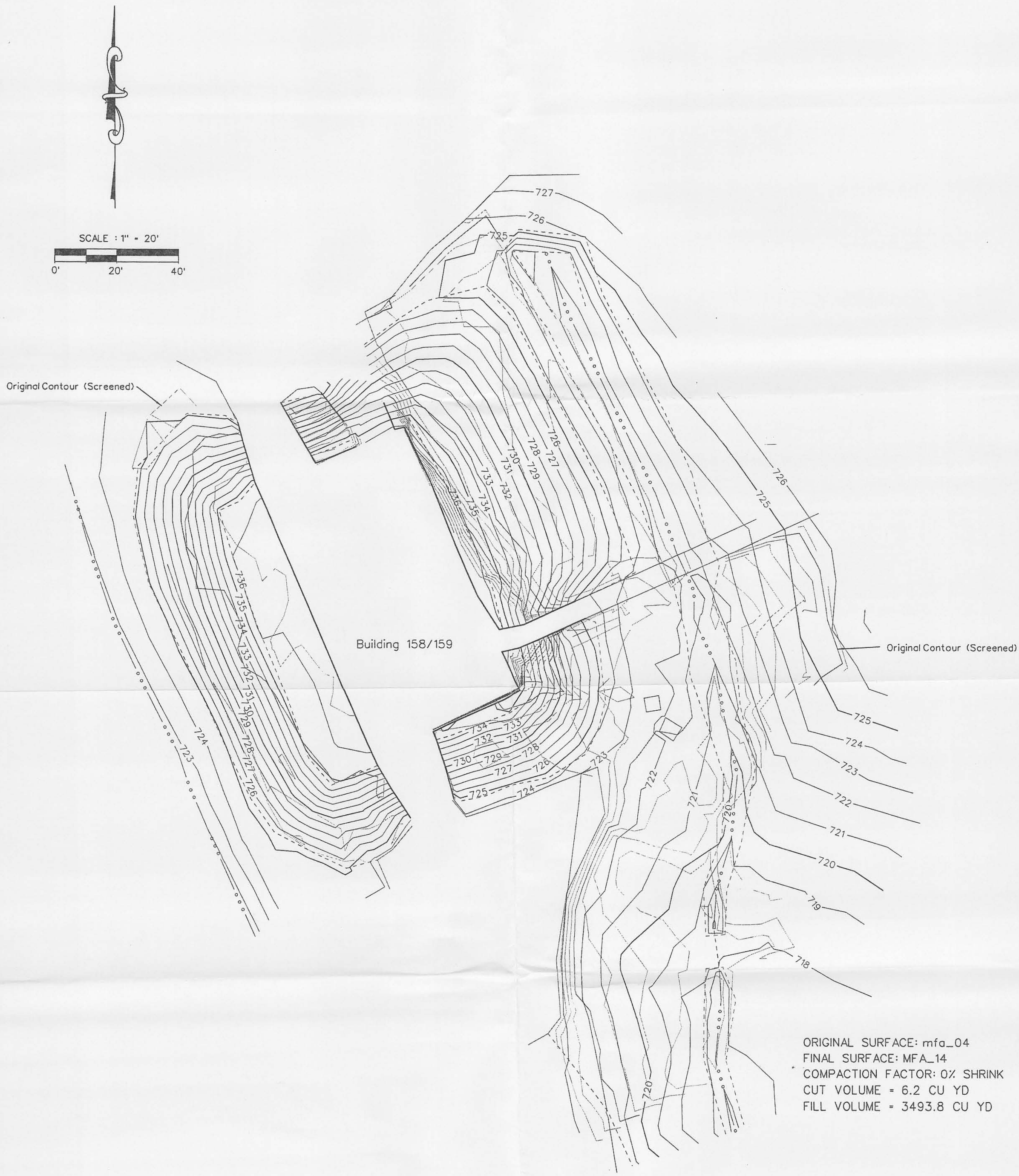
Mine Fill A

Building 153/154

As-Built Locations Done October 21, 2000

SCALE: 1" = 20' JOB No.: 121-4909 SHEET No.: 1 of 1

mfa_15.dgn



Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax

REVISIONS AND DATES

DESIGNED BY:

DRAWN BY: GSB

CHECKED BY: RLB

APPROVED BY:

DATE: October 30, 2000

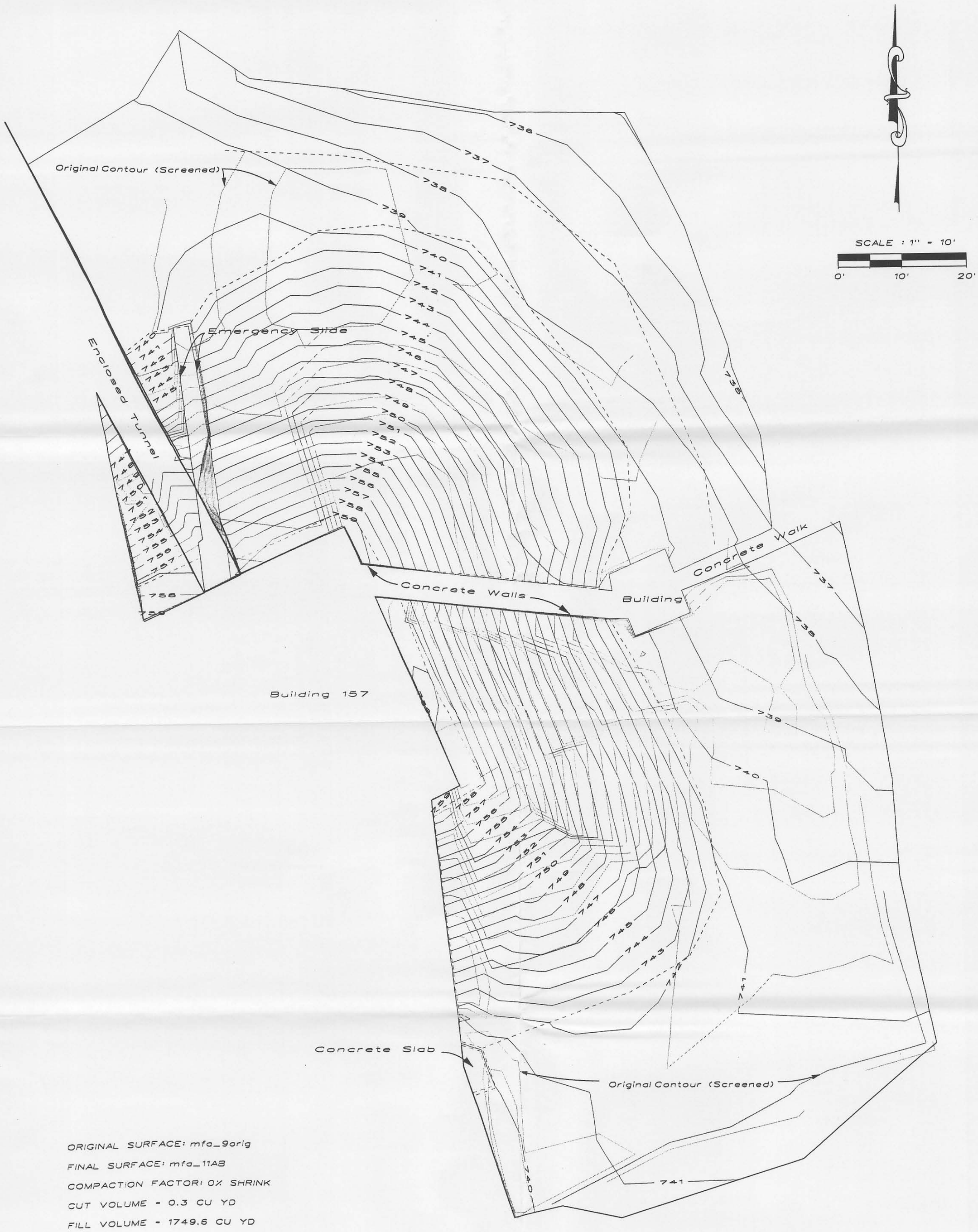
Mine Fill A

Building 158/159

As-Built Locations Done October 21, 2000

SCALE: 1" = 20' JOB No.: 121-4909 SHEET No.: 1 of 1

mfa_14.dgn



ORIGINAL SURFACE: mfa_9orig

FINAL SURFACE: mfa_11AB

COMPACTION FACTOR: 0% SHRINK

CUT VOLUME - 0.3 CU YD

FILL VOLUME - 1749.6 CU YD

Mine Fill A

Building 157

As-Built Locations Done October 20, 1999
Backfill Locations

SCALE: 1" = 10' JOB No.: 121-4359 SHEET No.: 1 of 1

REVISIONS AND DATES

DESIGNED BY:

DRAWN BY: GSB

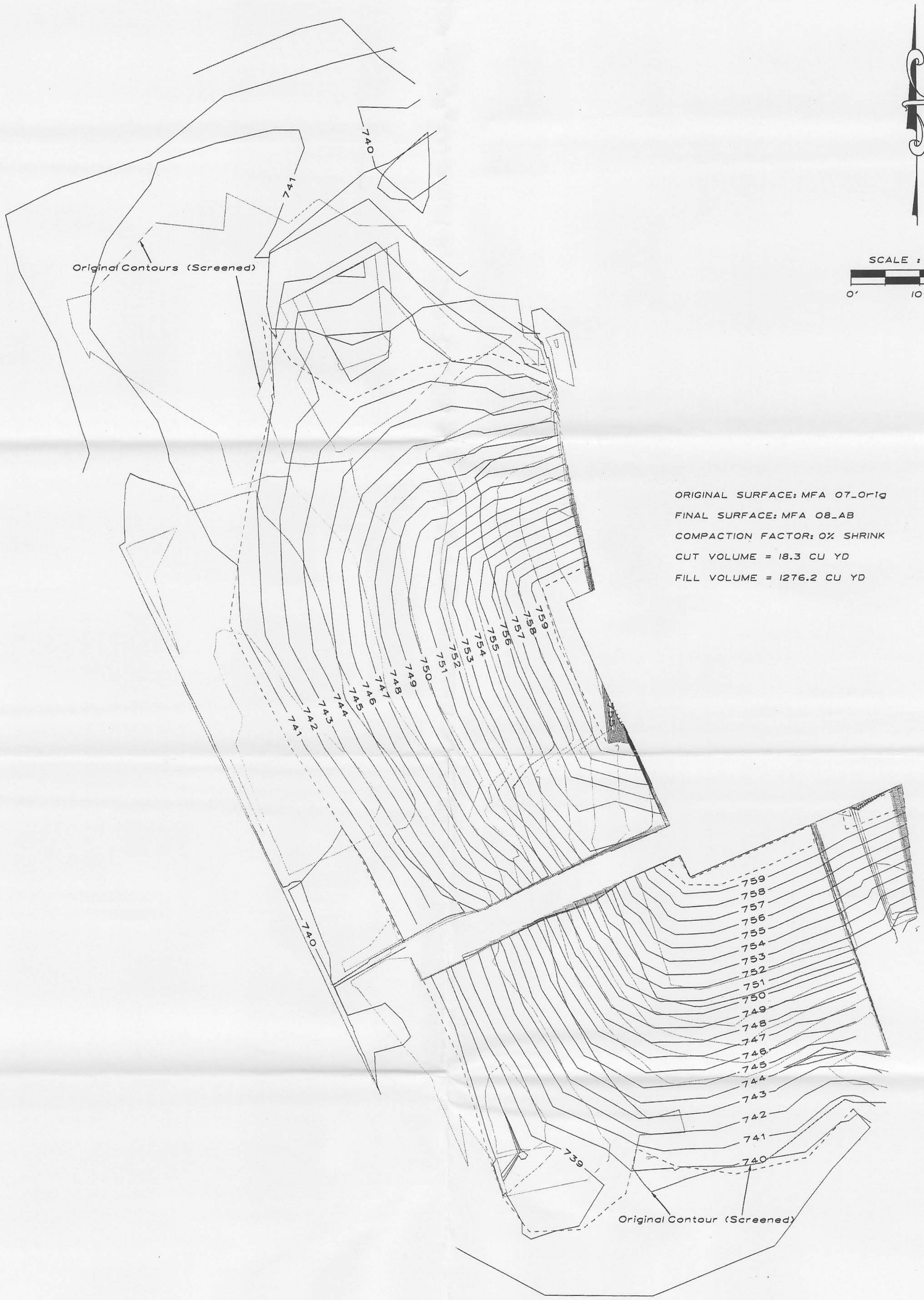
CHECKED BY: RLB

APPROVED BY:

DATE: October 29,1999

Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax

mfa11.dgn



Mine Fill A

Building 157

As-Built Locations Done June 7, 1999
Backfill Locations

SCALE: 1" = 10' JOB No.: 121-4359 SHEET No.: 1 of 1

REVISIONS AND DATES

DESIGNED BY:

DRAWN BY: GSB

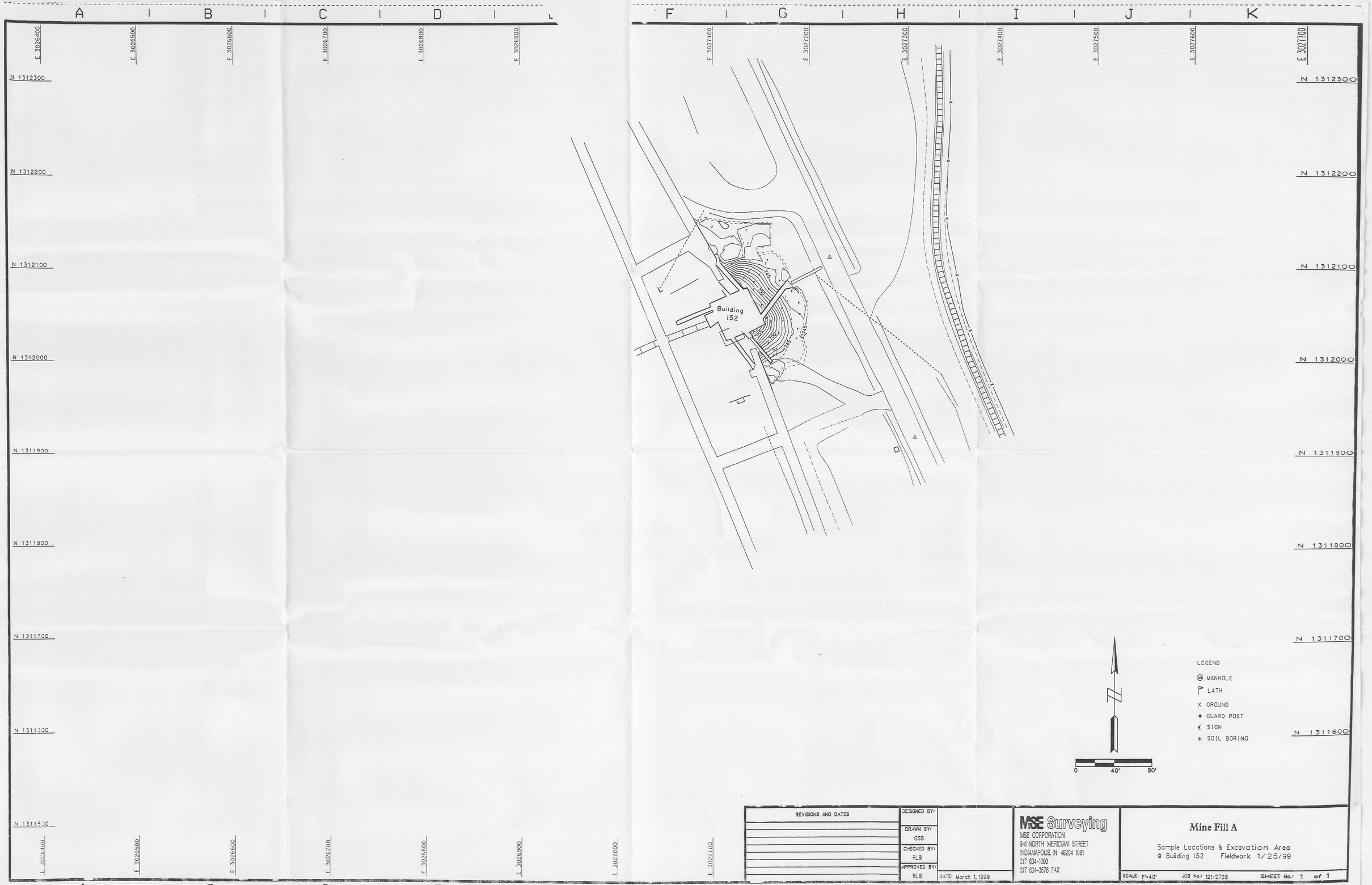
CHECKED BY: RLB

APPROVED BY:

DATE: May 12, 1999

Mid-States ENGINEERING
350 E. New York St., Suite 300
Indianapolis, IN 46204
(317) 634-6434 Phone
(317) 634-3576 Fax

Toltest_Crane\MFA08.dgn



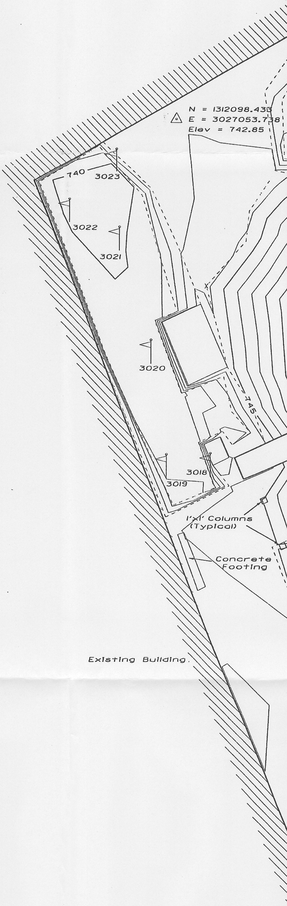
REVISIONS AND DATES	DESIGNED BY:	
	DRAWN BY: GSB	
	CHECKED BY: RLB	
	APPROVED BY: RLB	DATE: March 1, 1999

MSE Surveying
MSE CORPORATION
941 NORTH MERIDIAN STREET
INDIANAPOLIS, IN 46204 1061
317 634-1000
317 634-3576 FAX

Mine Fill A

Sample Locations & Excavation Area
@ Building 152 Fieldwork 1/25/99

SCALE: 1"=40' JOB No.: 121-2728 SHEET No.: 1 of 1



NODE/COORDINATE LIST

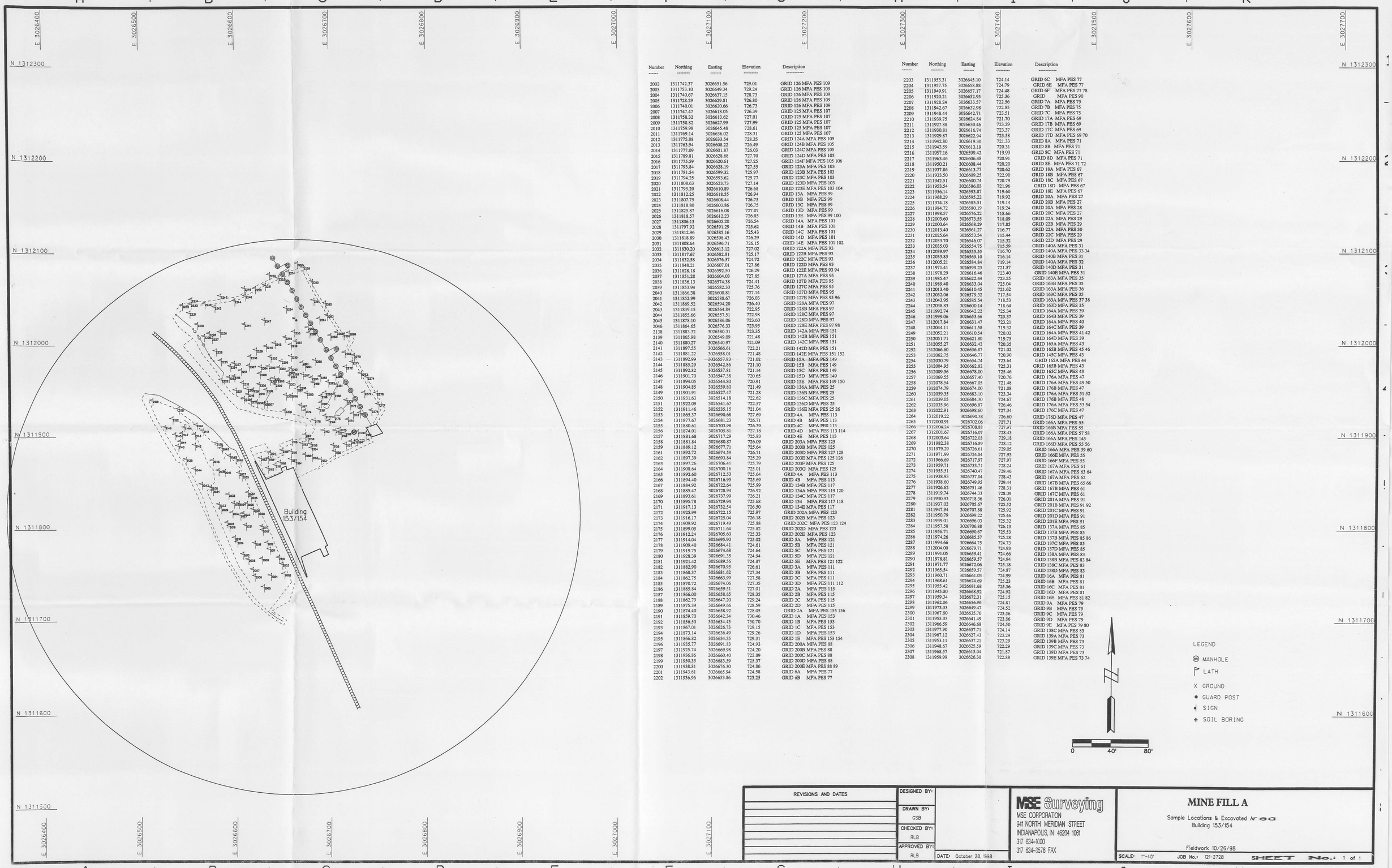
Number	Northing	Easting	Elevation	Description
3000	1311982.82	3027135.77	742.50	Grid 92A MFA PES 280
3001	1311973.43	3027115.97	742.43	Grid 92B MFA PES 280
3002	1311981.31	3027114.40	741.78	Grid 92C MFA PES 280
3003	1311992.82	3027133.08	742.02	Grid 92D MFA PES 280
3004	1311983.68	3027122.99	741.77	Grid 92E MFA PES 280 281
3005	1312001.32	3027130.39	744.40	Grid 84A MFA PES 278
3006	1311998.68	3027120.66	744.01	Grid 84B MFA PES 278
3007	1312005.44	3027122.43	746.84	Grid 84C MFA PES 278 279
3008	1312017.14	3027122.08	752.10	Grid 84D MFA PES 278
3009	1312014.10	3027113.09	750.06	Grid 83A MFA PES 276
3010	1312003.34	3027112.40	746.00	Grid 83B MFA PES 276 277
3011	1311996.37	3027110.67	743.11	Grid 83C MFA PES 276
3012	1312003.95	3027101.99	744.11	Grid 83D MFA PES 276
3013	1312016.03	3027096.49	744.85	Grid 82A MFA PES 274
3014	1312025.88	3027091.23	745.09	Grid 82B MFA PES 274
3015	1312027.47	3027101.25	748.23	Grid 82C MFA PES 274 275
3016	1312032.99	3027100.80	751.94	Grid 82D MFA PES 274
3017	1312033.97	3027111.13	751.70	Grid 82E MFA PES 274
3018	1312036.36	3027060.36	740.83	Grid 96A MFA PES 265
3019	1312036.16	3027052.39	740.96	Grid 96B MFA PES 265
3020	1312055.90	3027049.53	740.85	Grid 96C MFA PES 265 266
3021	1312075.30	3027043.75	739.83	Grid 96D MFA PES 265
3022	1312080.18	3027034.69	739.96	Grid 96E MFA PES 265
3023	1312089.07	3027043.12	739.29	Grid 96F MFA PES 267 268
3024	1312088.44	3027101.19	743.34	Grid 78A MFA PES 270
3025	1312085.98	3027093.98	742.62	Grid 78B MFA PES 270
3026	1312078.68	3027106.93	745.36	Grid 78C MFA PES 270 271
3027	1312072.33	3027098.34	750.33	Grid 78D MFA PES 272 273
3028	1312062.24	3027112.15	749.14	Grid 78E MFA PES 270

Mine Fill

Building 152

Locations Done June

SCALE: 1" = 10' JOB No.: 121-4359



Number	Northing	Easting	Elevation	Description
2002	1311742.37	3026651.56	729.01	GRID 126 MFA PES 109
2003	1311753.10	3026649.34	729.24	GRID 126 MFA PES 109
2004	1311740.67	3026637.15	728.73	GRID 126 MFA PES 109
2005	1311728.29	3026629.81	726.80	GRID 126 MFA PES 109
2006	1311740.01	3026620.66	726.73	GRID 126 MFA PES 109
2007	1311747.47	3026618.05	726.39	GRID 125 MFA PES 107
2008	1311758.32	3026613.62	727.01	GRID 125 MFA PES 107
2009	1311758.82	3026627.99	727.99	GRID 125 MFA PES 107
2010	1311759.98	3026645.48	728.61	GRID 125 MFA PES 107
2011	1311769.14	3026636.02	728.31	GRID 125 MFA PES 107
2012	1311775.88	3026633.54	728.35	GRID 124A MFA PES 105
2013	1311763.94	3026608.22	726.49	GRID 124B MFA PES 105
2014	1311777.09	3026601.87	726.03	GRID 124C MFA PES 105
2015	1311789.81	3026628.68	727.70	GRID 124D MFA PES 105
2016	1311775.59	3026620.61	727.25	GRID 124F MFA PES 105 106
2017	1311793.84	3026628.19	727.55	GRID 123A MFA PES 103
2018	1311781.54	3026599.32	725.97	GRID 123B MFA PES 103
2019	1311794.25	3026593.62	725.77	GRID 123C MFA PES 103
2020	1311808.63	3026623.73	727.14	GRID 123D MFA PES 103
2021	1311795.20	3026610.89	726.68	GRID 123E MFA PES 103 104
2022	1311812.25	3026618.55	726.94	GRID 13A MFA PES 99
2023	1311807.75	3026608.44	726.75	GRID 13B MFA PES 99
2024	1311818.80	3026603.86	726.75	GRID 13C MFA PES 99
2025	1311825.87	3026616.08	727.07	GRID 13D MFA PES 99
2026	1311818.57	3026612.23	726.85	GRID 13E MFA PES 99 100
2027	1311806.13	3026605.20	726.54	GRID 14A MFA PES 101
2028	1311797.92	3026591.29	725.62	GRID 14B MFA PES 101
2029	1311812.96	3026585.16	725.43	GRID 14C MFA PES 101
2030	1311818.89	3026598.43	726.29	GRID 14D MFA PES 101
2031	1311808.64	3026596.71	726.15	GRID 14E MFA PES 101 102
2032	1311830.20	3026613.12	727.02	GRID 122A MFA PES 93
2033	1311817.67	3026582.81	725.17	GRID 122B MFA PES 93
2034	1311832.58	3026576.37	724.72	GRID 122C MFA PES 93
2035	1311848.21	3026607.01	727.86	GRID 122D MFA PES 93
2036	1311828.18	3026592.50	726.29	GRID 122E MFA PES 93 94
2037	1311851.28	3026604.03	727.85	GRID 127A MFA PES 95
2038	1311836.13	3026574.38	724.41	GRID 127B MFA PES 95
2039	1311853.94	3026582.30	725.76	GRID 127C MFA PES 95
2040	1311866.38	3026600.81	727.14	GRID 127D MFA PES 95
2041	1311852.99	3026588.67	726.03	GRID 127E MFA PES 95 96
2042	1311869.52	3026594.20	726.40	GRID 128A MFA PES 97
2043	1311839.15	3026564.84	722.95	GRID 128B MFA PES 97
2044	1311855.66	3026557.51	722.98	GRID 128C MFA PES 97
2045	1311878.10	3026586.06	723.60	GRID 128D MFA PES 97
2046	1311864.65	3026576.33	723.95	GRID 128E MFA PES 97 98
2128	1311883.32	3026580.31	723.35	GRID 142A MFA PES 151
2139	1311865.98	3026549.09	721.48	GRID 142B MFA PES 151
2140	1311880.27	3026540.97	721.09	GRID 142C MFA PES 151
2141	1311897.55	3026566.61	722.21	GRID 142D MFA PES 151
2142	1311881.22	3026558.01	721.48	GRID 142E MFA PES 151 152
2143	1311892.99	3026557.83	721.02	GRID 15A MFA PES 149
2144	1311885.29	3026542.86	721.10	GRID 15B MFA PES 149
2145	1311892.82	3026537.81	721.14	GRID 15C MFA PES 149
2146	1311901.70	3026547.38	720.65	GRID 15D MFA PES 149
2147	1311894.05	3026544.80	720.91	GRID 15E MFA PES 149 150
2148	1311904.85	3026559.80	721.49	GRID 136A MFA PES 25
2149	1311901.91	3026527.47	721.28	GRID 136B MFA PES 25
2150	1311931.63	3026514.18	722.62	GRID 136C MFA PES 25
2151	1311922.09	3026541.67	722.57	GRID 136D MFA PES 25
2152	1311911.46	3026535.15	721.04	GRID 136E MFA PES 25 26
2153	1311865.37	3026690.68	727.69	GRID 4A MFA PES 113
2154	1311877.67	3026681.23	726.71	GRID 4B MFA PES 113
2155	1311880.61	3026703.98	726.39	GRID 4C MFA PES 113
2156	1311874.01	3026705.81	727.18	GRID 4D MFA PES 113 114
2157	1311881.68	3026717.29	725.83	GRID 4E MFA PES 113
2158	1311881.84	3026680.87	726.09	GRID 203A MFA PES 125
2159	1311889.12	3026677.71	725.64	GRID 203B MFA PES 125
2161	1311892.72	3026674.59	726.71	GRID 203D MFA PES 127 128
2162	1311897.39	3026693.84	725.29	GRID 203E MFA PES 125 126
2163	1311897.26	3026706.41	725.79	GRID 203F MFA PES 125
2164	1311908.64	3026700.16	725.01	GRID 203G MFA PES 125
2165	1311892.60	3026712.53	725.64	GRID 4A MFA PES 113
2166	1311894.40	3026716.95	725.69	GRID 4B MFA PES 113
2167	1311884.92	3026722.64	725.99	GRID 134B MFA PES 117
2168	1311885.47	3026728.94	726.92	GRID 134A MFA PES 119 120
2169	1311893.61	3026737.99	726.21	GRID 134C MFA PES 117
2170	1311895.78	3026729.94	725.68	GRID 134 MFA PES 117 118
2171	1311917.13	3026732.54	726.50	GRID 134E MFA PES 117
2172	1311925.99	3026722.15	725.97	GRID 202A MFA PES 123
2173	1311916.17	3026725.04	726.18	GRID 202B MFA PES 123
2174	1311909.92	3026719.49	725.88	GRID 202C MFA PES 123 124
2175	1311899.05	3026711.64	725.82	GRID 202D MFA PES 123
2176	1311912.24	3026705.60	725.33	GRID 202E MFA PES 123
2177	1311914.04	3026695.90	725.02	GRID 5A MFA PES 121
2178	1311909.40	3026684.41	724.61	GRID 5B MFA PES 121
2179	1311919.75	3026674.68	724.64	GRID 5C MFA PES 121
2180	1311928.39	3026691.35	724.94	GRID 5D MFA PES 121
2181	1311921.42	3026689.56	724.87	GRID 5E MFA PES 121 122
2182	1311882.90	3026670.95	726.61	GRID 3A MFA PES 111
2183	1311868.37	3026681.62	727.34	GRID 3B MFA PES 111
2184	1311862.75	3026663.99	727.58	GRID 3C MFA PES 111
2185	1311870.72	3026674.06	727.35	GRID 3D MFA PES 111 112
2186	1311885.84	3026659.51	727.01	GRID 2A MFA PES 115
2187	1311866.00	3026658.65	728.35	GRID 2B MFA PES 115
2188	1311862.79	3026647.20	729.24	GRID 2C MFA PES 115
2189	1311875.39	3026649.66	728.59	GRID 2D MFA PES 115
2190	1311874.40	3026658.92	728.05	GRID 2A MFA PES 155 156
2191	1311859.70	3026642.34	730.46	GRID 1A MFA PES 153
2192	1311856.50	3026634.43	730.70	GRID 1B MFA PES 153
2193	1311867.01	3026626.73	729.15	GRID 1C MFA PES 153
2194	1311873.14	3026636.49	729.26	GRID 1D MFA PES 153
2195	1311866.32	3026634.55	729.31	GRID 1E MFA PES 153 154
2196	1311935.77	3026691.33	724.93	GRID 200A MFA PES 88
2197	1311925.74	3026669.98	724.20	GRID 200B MFA PES 88
2198	1311936.86	3026660.40	723.89	GRID 200C MFA PES 88
2199	1311950.35	3026683.59	725.37	GRID 200D MFA PES 88
2200	1311938.81	3026676.30	724.86	GRID 200E MFA PES 88 89
2201	1311943.61	3026665.94	724.58	GRID 6A MFA PES 77
2202	1311936.96	3026653.86	723.25	GRID 6B MFA PES 77

Number	Northing	Easting	Elevation	Description
2203	1311953.31	3026645.10	724.14	GRID 6C MFA PES 77
2204	1311957.75	3026658.88	724.79	GRID 6E MFA PES 77
2205	1311949.91	3026657.17	724.48	GRID 6F MFA PES 77 78
2206	1311920.21	3026652.95	725.36	GRID MFA PES 90
2207	1311928.24	3026633.57	722.56	GRID 7A MFA PES 75
2208	1311942.67	3026632.98	722.85	GRID 7B MFA PES 75
2209	1311948.44	3026642.71	723.51	GRID 7C MFA PES 75
2210	1311939.75	3026624.84	721.70	GRID 17A MFA PES 69
2211	1311927.88	3026630.46	723.29	GRID 17B MFA PES 69
2212	1311930.81	3026616.74	723.37	GRID 17C MFA PES 69
2213	1311929.87	3026622.94	723.58	GRID 17D MFA PES 69 70
2214	1311942.80	3026619.30	721.33	GRID 8A MFA PES 71
2215	1311943.59	3026613.19	720.31	GRID 8B MFA PES 71
2216	1311957.16	3026599.42	719.99	GRID 8C MFA PES 71
2217	1311963.46	3026606.48	720.91	GRID 8D MFA PES 71
2218	1311950.21	3026608.44	720.20	GRID 8E MFA PES 71 72
2219	1311937.86	3026613.77	720.62	GRID 18A MFA PES 67
2220	1311933.50	3026609.25	722.90	GRID 18B MFA PES 67
2221	1311942.51	3026600.74	720.79	GRID 18C MFA PES 67
2222	1311953.54	3026586.03	721.96	GRID 18D MFA PES 67
2223	1311956.14	3026593.87	719.60	GRID 18E MFA PES 67
2224	1311968.29	3026595.22	719.92	GRID 20A MFA PES 27
2225	1311974.18	3026585.51	719.14	GRID 20B MFA PES 27
2226	1311984.72	3026580.19	719.24	GRID 20A MFA PES 28
2227	1311998.57	3026576.22	718.66	GRID 20C MFA PES 27
2228	1312003.60	3026573.55	718.09	GRID 22A MFA PES 29
2229	1312000.64	3026568.29	717.85	GRID 22B MFA PES 29
2230	1312013.40	3026561.27	716.77	GRID 22A MFA PES 30
2231	1312025.64	3026553.54	715.44	GRID 22C MFA PES 29
2232	1312033.70	3026546.07	715.32	GRID 22D MFA PES 29
2233	1312035.03	3026554.75	715.59	GRID 140A MFA PES 31
2234	1312039.97	3026555.55	716.70	GRID 140A MFA PES 33 34
2235	1312035.85	3026569.10	716.14	GRID 140B MFA PES 31
2236	1312005.21	3026584.84	719.14	GRID 140A MFA PES 32
2237	1311971.41	3026599.23	721.57	GRID 140D MFA PES 31
2238	1311978.29	3026616.46	723.40	GRID 140E MFA PES 31
2239	1311985.47	3026622.44	723.55	GRID 163A MFA PES 35
2240	1311989.40	3026633.04	725.04	GRID 163B MFA PES 35
2241	1312013.40	3026610.45	721.62	GRID 163A MFA PES 36
2242	1312032.06	3026579.32	717.54	GRID 163C MFA PES 35
2243	1312043.95	3026585.54	718.53	GRID 163A MFA PES 37 38
2244	1312038.83	3026600.14	718.64	GRID 163D MFA PES 35
2245	1311992.74	3026642.22	725.34	GRID 164A MFA PES 39
2246	1311990.06	3026653.66	725.37	GRID 164B MFA PES 39
2247	1312017.84	3026631.47	723.21	GRID 164A MFA PES 40
2248	1312044.11	3026611.58	719.32	GRID 164C MFA PES 39
2249	1312052.21	3026610.54	720.02	GRID 164A MFA PES 41 42
2250	1312051.71	3026621.80	719.75	GRID 164D MFA PES 39
2251	1312055.27	3026632.42	720.35	GRID 165A MFA PES 43
2252	1312066.60	3026636.87	721.02	GRID 165B MFA PES 45 46
2253	1312062.75	3026646.77	720.90	GRID 145C MFA PES 43
2254	1312030.79	3026654.74	723.64	GRID 165A MFA PES 44
2255	1312004.95	3026662.82	725.31	GRID 165B MFA PES 43
2256	1312009.56	3026678.00	725.46	GRID 165C MFA PES 43
2257	1312069.55	3026657.40	720.76	GRID 176A MFA PES 47
2258	1312078.54	3026667.05	721.48	GRID 176A MFA PES 49 50
2259	1312074.79	3026674.00	721.08	GRID 176B MFA PES 47
2260	1312059.35	3026683.10	723.34	GRID 176A MFA PES 51 52
2261	1312039.05	3026684.30	724.67	GRID 176B MFA PES 48
2262	1312035.96	3026696.87	726.46	GRID 176A MFA PES 53 54
2263	1312022.91	3026698.60	727.34	GRID 176C MFA PES 47
2264	1312019.22	3026690.38	726.60	GRID 176D MFA PES 47
2265	1312000.91	3026702.06	727.71	GRID 166A MFA PES 55
2266	1312004.24	3026708.88	727.97	GRID 166B MFA PES 55
2267	1312001.67	3026716.07	728.43	GRID 166A MFA PES 57 58
2268	1312003.64	3026722.03	729.18	GRID 166A MFA PES 145
2269	1311982.38	3026716.89	728.12	GRID 166D MFA PES 55 56
2270	1311979.29	3026726.61	729.05	GRID 166A MFA PES 59 60
2271	1311971.99	3026724.84	727.93	GRID 166E MFA PES 55
2272	1311966.69	3026717.97	727.97	GRID 166F MFA PES 55
2273	1311959.71	3026733.71	728.24	GRID 167A MFA PES 61
2274	1311955.51	3026740.47	729.46	GRID 167A MFA PES 63 64
2275	1311938.93	3026737.04	728.43	GRID 167A MFA PES 62
2276	1311938.60	3026749.95	729.44	GRID 167B MFA PES 65 66
2277	1311926.62	3026751.46	728.31	GRID 167B MFA PES 61
2278	1311919.74	3026744.33	728.09	GRID 167C MFA PES 61
2279	1311930.93	3026718.36	726.01	GRID 201A MFA PES 91
2280	1311937.02	3026705.67	725.52	GRID 201B MFA PES 91 92
2281	1311947.94	3026707.88	725.92	GRID 201C MFA PES 91
2282	1311950.79	3026699.22	725.46	GRID 201D MFA PES 91
2283	1311939.01	3026696.03	725.32	GRID 201E MFA PES 91
2284	1311957.58	3026706.88	726.13	GRID 137A MFA PES 85
2285	1311956.71	3026690.67	725.53	GRID 137B MFA PES 85
2286	1311974.26	3026685.57	725.28	GRID 137B MFA PES 85 86
2287	1311994.66	3026664.75	724.73	GRID 137C MFA PES 85
2288	1312004.00	3026679.71	724.93	GRID 137D MFA PES 85
2289	1311991.05	3026659.41	724.66	GRID 138A MFA PES 83
2290	1311978.81	3026659.57	724.94	GRID 138B MFA PES 83 84
2291	1311971.77	3026672.06	725.18	GRID 138C MFA PES 83
2292	1311965.54	3026659.57	724.87	GRID 138D MFA PES 83
2293	1311960.71	3026661.03	724.99	GRID 16A MFA PES 81
2294	1311968.61	3026674.69	725.23	GRID 16B MFA PES 81
2295	1311955.42	3026681.68	725.36	GRID 16C MFA PES 81
2296	1311945.80	3026668.92	724.92	GRID 16D MFA PES 81
2297	1311959.34	3026672.31	725.15	GRID 16E MFA PES 81 82
2298	1311962.06	3026656.96	724.81	GRID 9A MFA PES 79
2299	1311973.33	3026649.47	724.52	GRID 9B MFA PES 79
2300	1311967.80	3026635.76	723.56	GRID 9C MFA PES 79
2301	1311955.03	3026641.49	723.86	GRID 9D MFA PES 79
2302	1311966.59	3026646.68	724.50	GRID 9E MFA PES 79 80
2303	1311977.90	3026637.71	724.14	GRID 138C MFA PES 83
2304	1311967.12	3026627.43	723.29	GRID 139A MFA PES 73
2305	1311953.11	3026637.21	723.29	GRID 139B MFA PES 73
2306	1311948.67	3026625.59	722.29	GRID 139C MFA PES 73
2307	1311968.57	3026615.04	721.87	GRID 139D MFA PES 73
2308	1311959.99	3026626.30	722.88	GRID 139E MFA PES 73 74

REVISIONS AND DATES

DESIGNED BY:
DRAWN BY: GSB
CHECKED BY: RLB
APPROVED BY: RLB
DATE: October 28, 1998

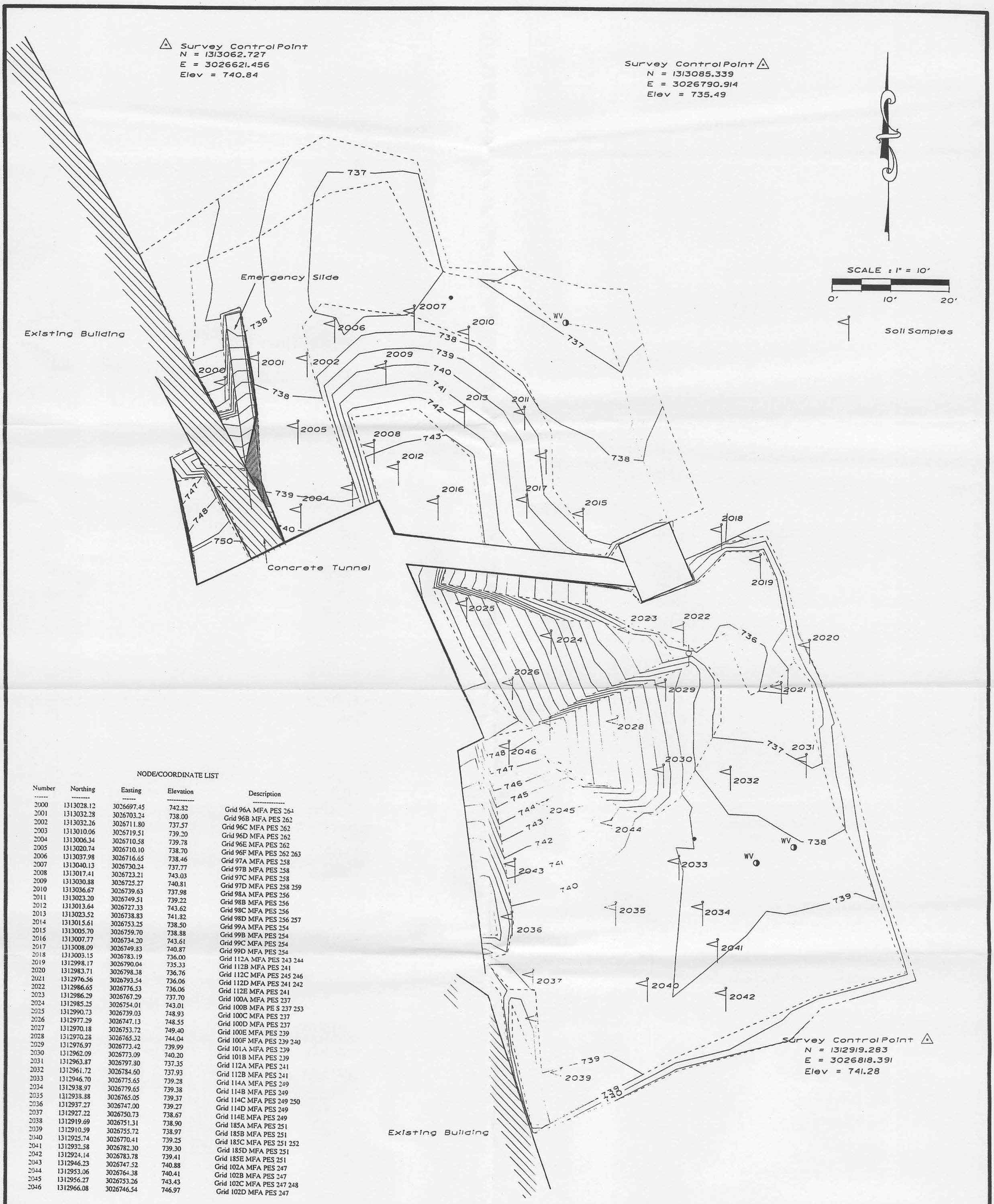
MSE Surveying
MSE CORPORATION
941 NORTH MERIDIAN STREET
INDIANAPOLIS, IN 46204 1061
317 634-1000
317 634-3576 FAX

MINE FILL A

Sample Locations & Excavated Area
Building 153/154

Fieldwork 10/26/98

SCALE: 1"=40' JOB No.: 121-2728 SHEET No.: 1 of 1



NODE/COORDINATE LIST

Number	Northing	Easting	Elevation	Description
2000	1313028.12	3026697.45	742.82	Grid 96A MFA PES 264
2001	1313032.28	3026703.24	738.00	Grid 96B MFA PES 262
2002	1313032.26	3026711.80	737.57	Grid 96C MFA PES 262
2003	1313010.06	3026719.51	739.20	Grid 96D MFA PES 262
2004	1313006.34	3026710.58	739.78	Grid 96E MFA PES 262
2005	1313020.74	3026710.10	738.70	Grid 96F MFA PES 262 263
2006	1313037.98	3026716.65	738.46	Grid 97A MFA PES 258
2007	1313040.13	3026730.24	737.77	Grid 97B MFA PES 258
2008	1313017.41	3026723.21	743.03	Grid 97C MFA PES 258
2009	1313030.88	3026725.27	740.81	Grid 97D MFA PES 258 259
2010	1313036.67	3026739.63	737.98	Grid 98A MFA PES 256
2011	1313023.20	3026749.51	739.22	Grid 98B MFA PES 256
2012	1313013.64	3026727.33	743.62	Grid 98C MFA PES 256
2013	1313023.52	3026738.83	741.82	Grid 98D MFA PES 256 257
2014	1313015.61	3026753.25	738.50	Grid 99A MFA PES 254
2015	1313005.70	3026759.70	738.88	Grid 99B MFA PES 254
2016	1313007.77	3026734.20	743.61	Grid 99C MFA PES 254
2017	1313008.09	3026749.83	740.87	Grid 99D MFA PES 254
2018	1313003.15	3026783.19	736.00	Grid 112A MFA PES 243 244
2019	1312998.17	3026790.04	735.33	Grid 112B MFA PES 241
2020	1312983.71	3026798.38	736.76	Grid 112C MFA PES 245 246
2021	1312976.56	3026793.54	736.06	Grid 112D MFA PES 241 242
2022	1312986.65	3026776.53	736.06	Grid 112E MFA PES 241
2023	1312986.29	3026767.29	737.70	Grid 100A MFA PES 237
2024	1312985.25	3026754.01	743.01	Grid 100B MFA PE S 237 253
2025	1312990.73	3026739.03	748.93	Grid 100C MFA PES 237
2026	1312977.29	3026747.13	748.55	Grid 100D MFA PES 237
2027	1312970.18	3026753.72	749.40	Grid 100E MFA PES 239
2028	1312970.28	3026765.32	744.04	Grid 100F MFA PES 239 240
2029	1312976.97	3026773.42	739.99	Grid 101A MFA PES 239
2030	1312962.09	3026773.09	740.20	Grid 101B MFA PES 239
2031	1312963.87	3026797.30	737.35	Grid 112A MFA PES 241
2032	1312961.72	3026784.60	737.93	Grid 112B MFA PES 241
2033	1312946.70	3026775.65	739.28	Grid 114A MFA PES 249
2034	1312938.97	3026779.65	739.38	Grid 114B MFA PES 249
2035	1312938.88	3026765.05	739.37	Grid 114C MFA PES 249 250
2036	1312937.27	3026747.00	739.27	Grid 114D MFA PES 249
2037	1312927.22	3026750.73	738.67	Grid 114E MFA PES 249
2038	1312919.69	3026751.31	738.90	Grid 185A MFA PES 251
2039	1312910.59	3026755.72	738.97	Grid 185B MFA PES 251
2040	1312925.74	3026770.41	739.25	Grid 185C MFA PES 251 252
2041	1312932.58	3026782.30	739.30	Grid 185D MFA PES 251
2042	1312924.14	3026783.78	739.41	Grid 185E MFA PES 251
2043	1312946.23	3026747.52	740.88	Grid 102A MFA PES 247
2044	1312953.06	3026764.38	740.41	Grid 102B MFA PES 247
2045	1312956.27	3026753.26	743.43	Grid 102C MFA PES 247 248
2046	1312966.08	3026746.54	746.97	Grid 102D MFA PES 247

Mine Fill A

Building 157
Sample Locations & Excavated Area

Locations Done June 7, 1999

SCALE: 1" = 10' JOB No.: 121-4359 SHEET No.: 1 of 1

REVISIONS AND DATES

DESIGNED BY:

DRAWN BY: GSB

CHECKED BY: RLB

APPROVED BY:

DATE: June 24, 1999

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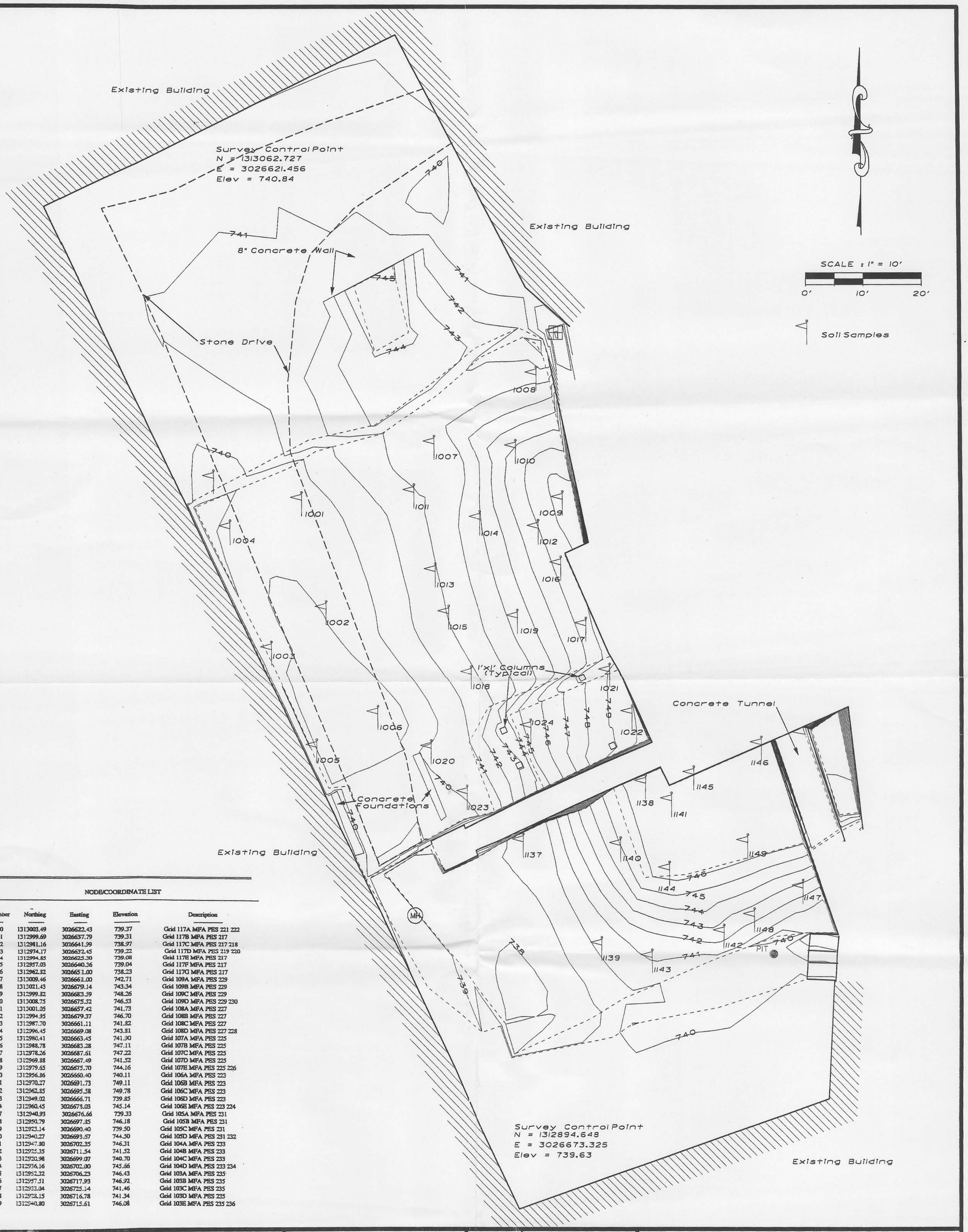
Toltest_Crane\MFA09.dgn



NODE/COORDINATE LIST

Number	Northing	Easting	Elevation	Description
1000	1313003.49	3026622.43	739.37	Grid 117A MFA PES 221 222
1001	1312999.69	3026637.79	739.31	Grid 117B MFA PES 217
1002	1312981.16	3026641.99	738.97	Grid 117C MFA PES 217 218
1003	1312974.17	3026632.45	739.22	Grid 117D MFA PES 219 220
1004	1312994.85	3026625.30	739.08	Grid 117E MFA PES 217
1005	1312957.03	3026640.36	739.04	Grid 117F MFA PES 217
1006	1312962.32	3026651.00	738.23	Grid 117G MFA PES 217
1007	1313009.46	3026661.00	742.71	Grid 109A MFA PES 229
1008	1313021.43	3026679.14	743.34	Grid 109B MFA PES 229
1009	1312999.82	3026683.59	748.26	Grid 109C MFA PES 229
1010	1313008.75	3026675.52	746.53	Grid 109D MFA PES 229 230
1011	1313001.05	3026657.42	741.73	Grid 108A MFA PES 227
1012	1312994.95	3026679.37	746.70	Grid 108B MFA PES 227
1013	1312987.70	3026661.11	741.82	Grid 108C MFA PES 227
1014	1312996.45	3026669.08	743.81	Grid 108D MFA PES 227 228
1015	1312980.41	3026663.45	741.90	Grid 107A MFA PES 225
1016	1312988.78	3026683.28	747.11	Grid 107B MFA PES 225
1017	1312978.26	3026687.61	747.22	Grid 107C MFA PES 225
1018	1312969.88	3026667.49	741.52	Grid 107D MFA PES 225
1019	1312979.65	3026675.70	744.16	Grid 107E MFA PES 225 226
1020	1312956.36	3026660.40	740.11	Grid 106A MFA PES 223
1021	1312970.27	3026691.73	749.11	Grid 106B MFA PES 223
1022	1312962.35	3026695.58	749.78	Grid 106C MFA PES 223
1023	1312949.02	3026666.71	739.85	Grid 106D MFA PES 223
1024	1312960.45	3026678.03	745.14	Grid 106E MFA PES 223 224
1137	1312940.93	3026676.66	739.33	Grid 105A MFA PES 231
1138	1312950.79	3026697.85	746.18	Grid 105B MFA PES 231
1139	1312923.14	3026690.40	739.50	Grid 105C MFA PES 231
1140	1312940.27	3026693.57	744.50	Grid 105D MFA PES 231 232
1141	1312947.80	3026702.35	746.31	Grid 104A MFA PES 233
1142	1312925.35	3026711.54	741.52	Grid 104B MFA PES 233
1143	1312920.98	3026699.07	740.70	Grid 104C MFA PES 233
1144	1312936.16	3026702.00	745.66	Grid 104D MFA PES 233 234
1145	1312952.32	3026706.23	746.43	Grid 103A MFA PES 235
1146	1312957.51	3026717.93	746.92	Grid 103B MFA PES 235
1147	1312933.04	3026725.14	741.46	Grid 103C MFA PES 235
1148	1312928.15	3026716.78	741.34	Grid 103D MFA PES 235
1149	1312940.80	3026715.61	746.08	Grid 103E MFA PES 235 236

Mine Fill A

Building 157

Sample Locations & Excavated Area

Original Locations Done May 6, 1999

SCALE: 1" = 10' JOB No.: 121-4359 SHEET No.: 1 of 1

REVISIONS AND DATES

DESIGNED BY:

DRAWN BY: GSB

CHECKED BY: RLB

APPROVED BY:

DATE: May 12, 1999

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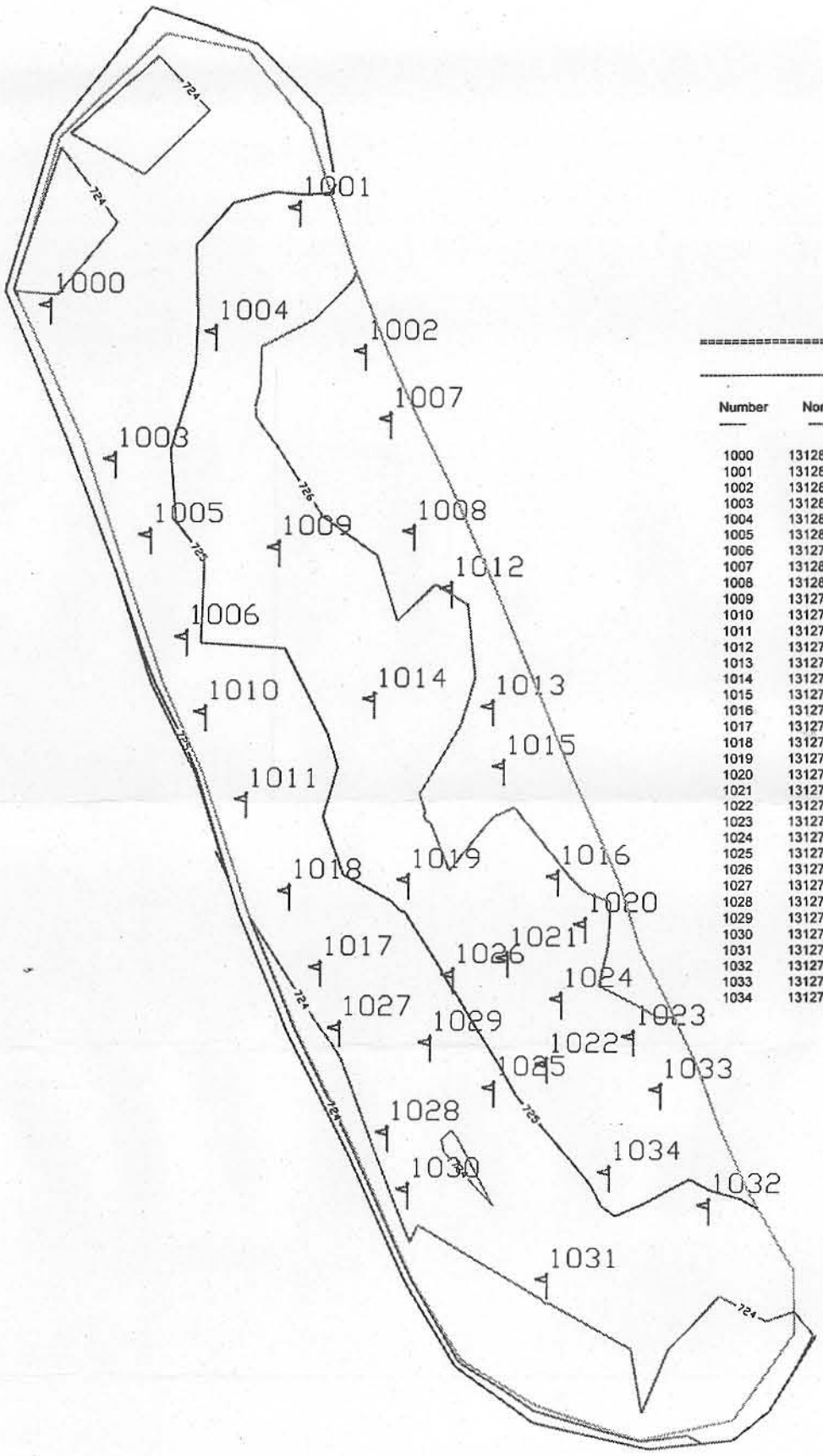

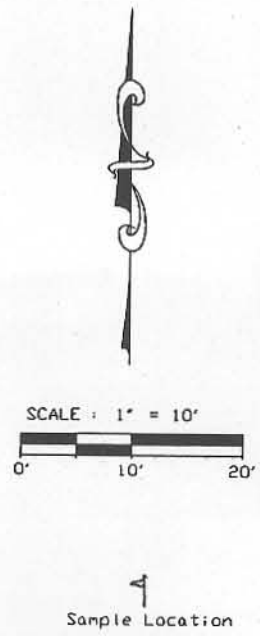

NODE/COORDINATE LIST

Number	Northing	Easting	Elevation	Description
1000	1312825.41	3026140.45	724.19	Grid 148A MFA PES 009
1001	1312836.07	3026167.23	725.41	Grid 148B MFA PES 009
1002	1312820.62	3026174.55	726.66	Grid 148C MFA PES 009
1003	1312808.91	3026147.54	724.34	Grid 148D MFA PES 009
1004	1312822.61	3026158.29	725.24	Grid 148E MFA PES 010
1005	1312800.76	3026151.41	724.68	Grid 147A MFA PES 011
1006	1312789.87	3026155.41	724.92	Grid 147B MFA PES 011
1007	1312813.40	3026177.39	726.87	Grid 147C MFA PES 011
1008	1312801.26	3026180.03	726.21	Grid 147D MFA PES 011
1009	1312799.47	3026165.31	725.44	Grid 147E MFA PES 012
1010	1312781.71	3026157.49	724.56	Grid 146A MFA PES 013
1011	1312772.19	3026161.98	724.24	Grid 146B MFA PES 013
1012	1312795.16	3026184.14	725.85	Grid 146C MFA PES 013
1013	1312782.43	3026188.73	726.11	Grid 146D MFA PES 013
1014	1312783.16	3026175.84	725.70	Grid 146E MFA PES 014
1015	1312775.93	3026189.98	726.02	Grid 145A MFA PES 015
1016	1312763.83	3026196.03	725.92	Grid 145B MFA PES 015
1017	1312753.90	3026170.15	724.14	Grid 145C MFA PES 015
1018	1312762.17	3026166.72	724.35	Grid 145D MFA PES 015
1019	1312763.39	3026179.69	725.11	Grid 145E MFA PES 016
1020	1312758.73	3026199.04	725.71	Grid 41A MFA PES 017
1021	1312755.00	3026190.55	725.72	Grid 41B MFA PES 017
1022	1312743.56	3026194.89	725.47	Grid 41C MFA PES 017
1023	1312746.57	3026204.33	725.66	Grid 41D MFA PES 017
1024	1312750.59	3026196.45	725.63	Grid 41E MFA PES 018
1025	1312741.01	3026189.10	724.62	Grid 42A MFA PES 019
1026	1312753.16	3026184.58	724.96	Grid 42B MFA PES 019
1027	1312747.45	3026172.26	724.03	Grid 42C MFA PES 019
1028	1312736.18	3026177.51	724.13	Grid 43D MFA PES 019
1029	1312745.90	3026182.13	724.30	Grid 44E MFA PES 020
1030	1312730.05	3026179.77	724.11	Grid 144A MFA PES 021
1031	1312720.42	3026194.98	724.04	Grid 144B MFA PES 021
1032	1312728.42	3026212.61	724.75	Grid 144C MFA PES 021
1033	1312740.79	3026207.30	725.39	Grid 144D MFA PES 021
1034	1312731.94	3026201.76	725.14	Grid 144E MFA PES 022

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DESIGNED BY:
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CHECKED BY: RLB
APPROVED BY:

DATE: April 13, 1999

Mine Fill A

Building 158/159
Sample Location & Excavated Area

Locations done August 18, 1998
Locations done December 12, 1998

SCALE: 1" = 10' JOB No.: 121-2728 SHEET No. 1 of 1

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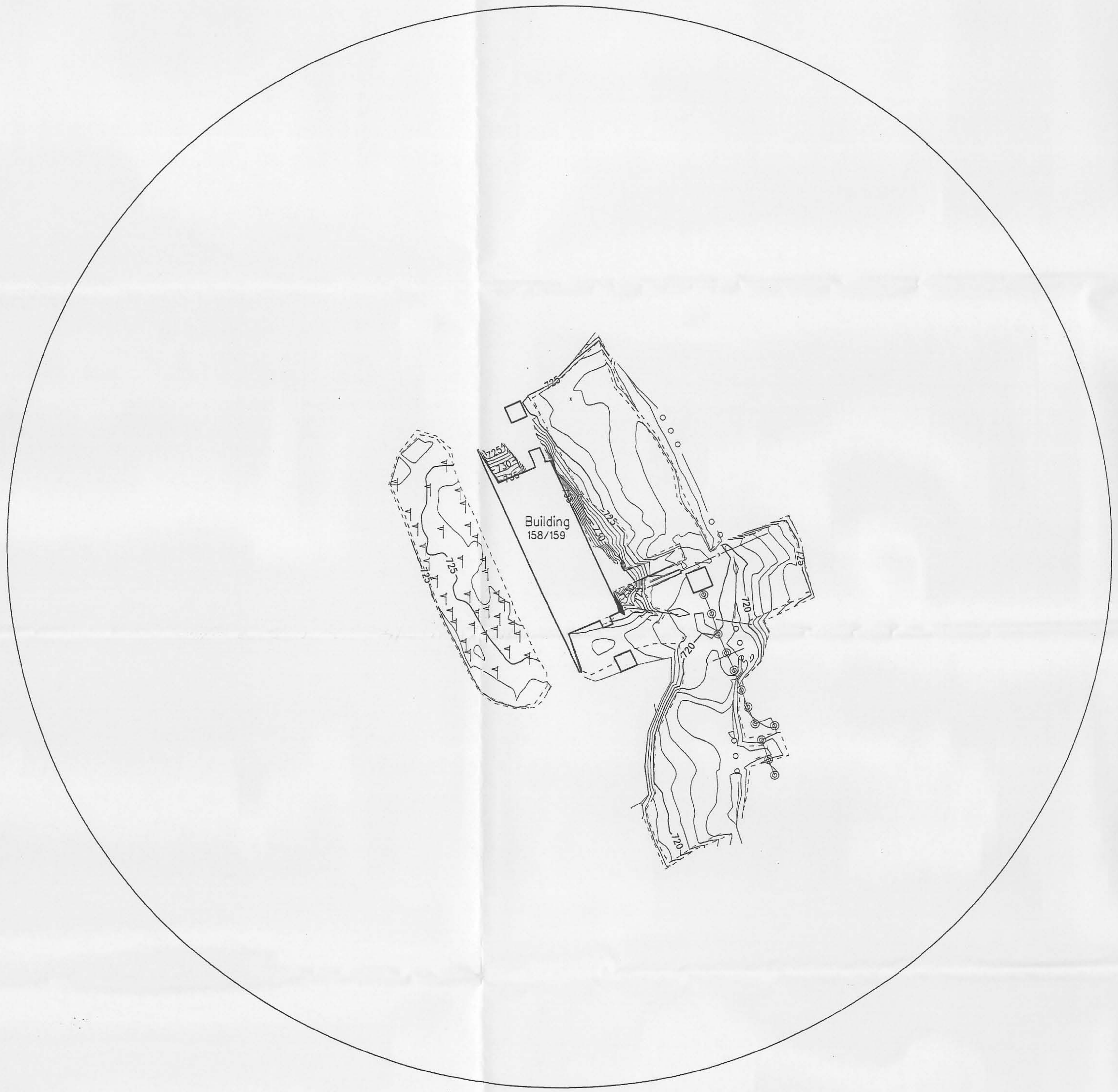

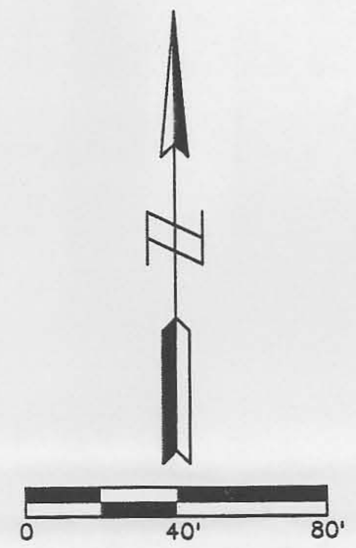

LEGEND

- MANHOLE
- LATH
- X GROUND
- GUARD POST
- SIGN
- SOIL BORING

MINE FILL A

Sample Locations & Excavated Area
Building 158/159

Fieldwork 8/18/98
Fieldwork 12/12/98

SCALE: 1" = 40'   JOB No.: 121-2728   SHEET No.: 6 of 7

REVISIONS AND DATES

DESIGNED BY:	
DRAWN BY:	GSB
CHECKED BY:	RLB
APPROVED BY:	RLB
DATE:	April 13, 1999

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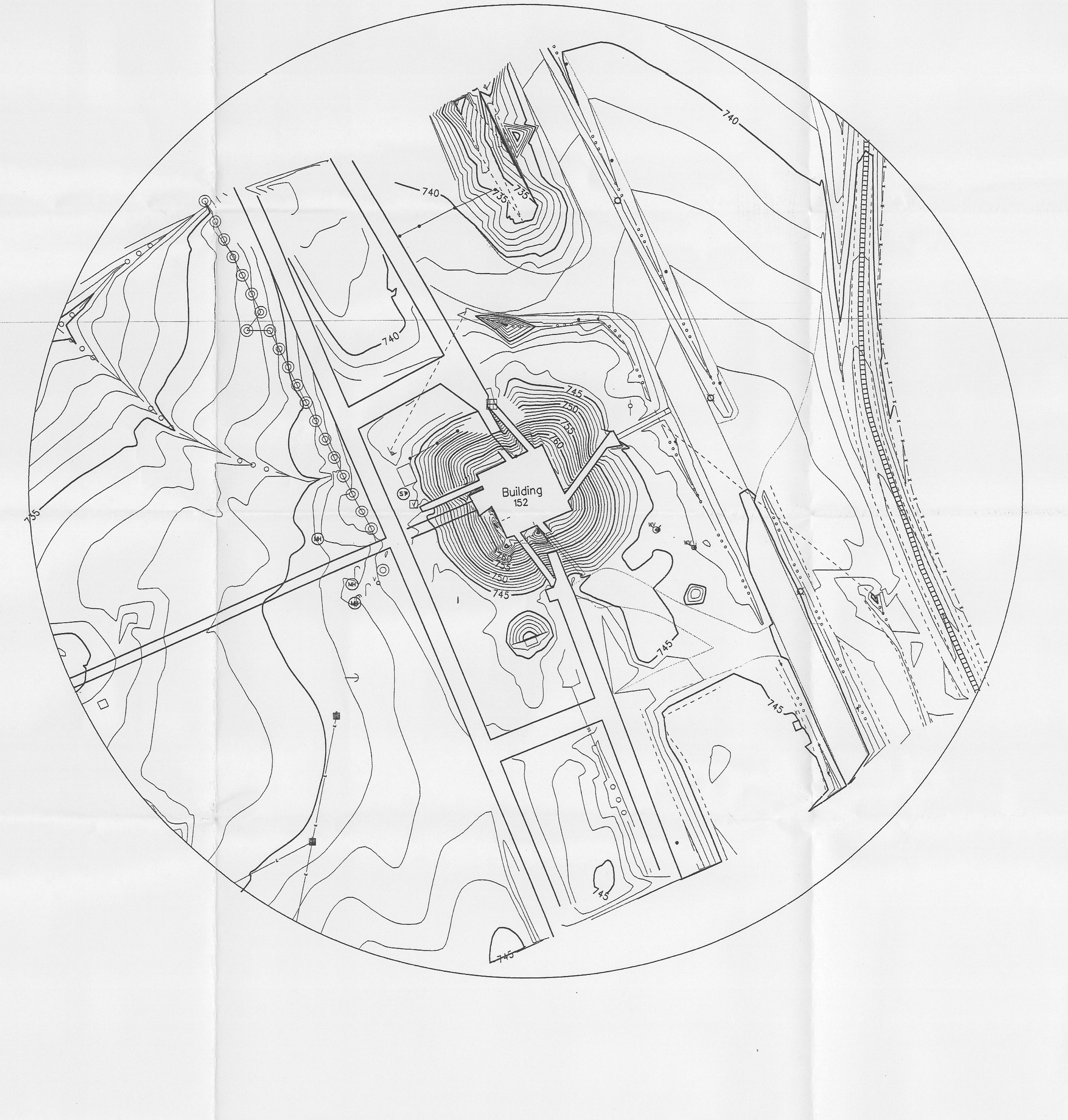
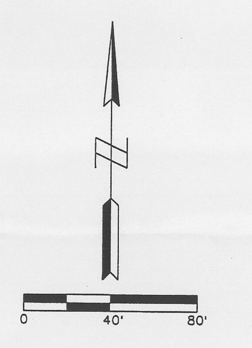
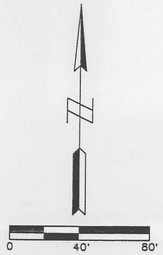




MINE FILL A Building 152	REVISIONS AND DATES Revised 3/1/99 GSB Revised 4/14/99 GSB	DESIGNED BY: DRAWN BY: MDK CHECKED BY: RLB APPROVED BY: RLB	Mid-States ENGINEERING 350 E. New York St., Suite 300 Indianapolis, IN 46204 (317) 634-6434 Phone (317) 634-3576 Fax
SCALE: 1"=40' JOB No.: 121-2729 SHEET No.: 4 of 7		DATE: JUNE 12, 1995	



MINE FILL A
Building 157

REVISIONS AND DATES
Revised 3/1/99 GSB
Revised 4/14/99 GSB

DESIGNED BY:
DRAWN BY: MDK
CHECKED BY: RLB
APPROVED BY: RLB
DATE: JUNE 12, 1995

SCALE: 1"=40' JOB No.: 121-2728 SHEET No.: 2 of 7

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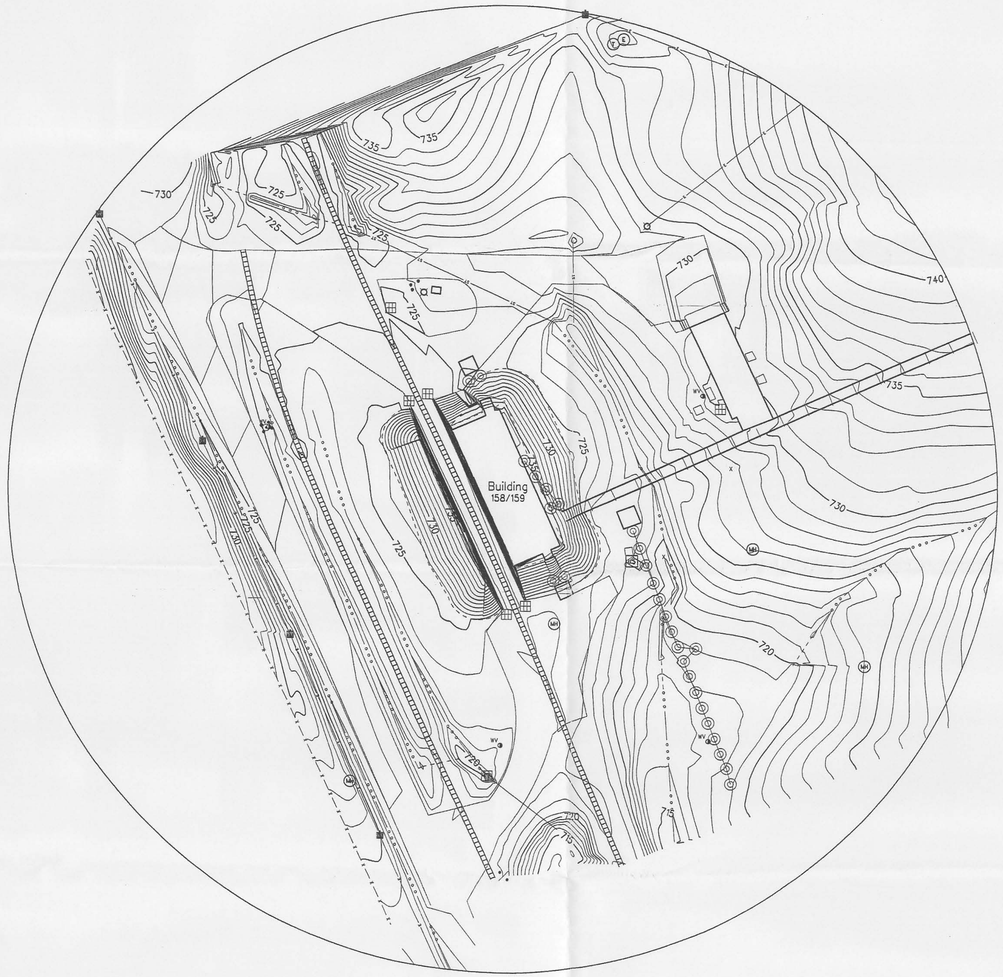

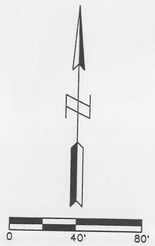

MINE FILL A

Building 158/159

REVISIONS AND DATES
Revised 3/1/99 GSB
Revised 4/14/99 GSB

DESIGNED BY:

DRAWN BY: MDK

CHECKED BY:

APPROVED BY: RLB

DATE: JUNE 12, 1995

SCALE: 1"=40' JOB No.: 121-2728 SHEET No.: 1 of 7

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