



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

N00164.AR.000633
NSWC CRANE
5090.3a

IN REPLY REFER TO:

5090
Ser 095/1125
11 APR 2001

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
Attn: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits two copies of the replacement pages for the Fourth Quarter 2000 Quarterly Interim Progress Report (IPR) as enclosure (1). This report covers the Bioremediation Facility operating period for October 1 through December 31, 2000. Enclosure (2) 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
Director Environmental Protection
Department
By direction
of the Commander

Encls:

- (1) IPR 4TH Quarter 2000 Rev. 1
- (2) Certification Statement

Copy to:

Administrative Record
IDEM (D. Griffin)
SOUTHNAVFACENGCOM (Code 1864)
SOUTHNAVFACENGCOM ROICC (w/o encls)
TOLTEST Crane (w/o encls)

**Naval Facilities Engineering Command
Naval Surface Warfare Center
Crane, Indiana**

**Full-Scale Operations
Soils Bioremediation Facility**

**Quarterly Interim Progress Report
4th Quarter 2000
October 1 –December 31**

Revision 1

TOLTEST, INC.

QUARTERLY INTERIM PROGRESS REPORT

4th Quarter 2000

October 1 – December 31

Revision 1

**FULL-SCALE OPERATIONS
SOILS BIOREMEDIATION FACILITY
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA**

**ENVIRONMENTAL JOB ORDER CONTRACT
CONTRACT NO. N68950-96-D-0052
TOLTEST PROJECT NUMBER 37324.01**

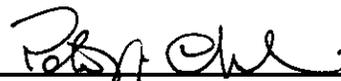
Submitted to:

**OFFICER IN CHARGE OF NAVFAC CONTRACTS
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA**

Submitted by:

**TOLTEST, INC.
1915 NORTH 12TH STREET
P.O. BOX 2186
TOLEDO, OHIO 43603
(419) 241-7175**

Prepared by:
Environmental Specialist

 4/10/01
Peter J. Chevalier Date

Approved by:
Project Manager

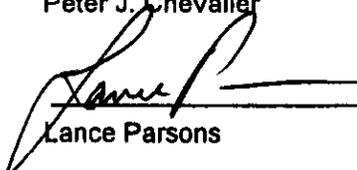
 4/10/01
Lance Parsons Date

TABLE OF CONTENTS

| | <u>Page No.</u> |
|---|-----------------|
| EXECUTIVE SUMMARY | E-1 |
| 1.0 INTRODUCTION | 1 |
| 2.0 EXCAVATION..... | 2 |
| 2.1 <u>Pre-Excavation Soil Sampling</u> | 2 |
| 2.1.1 <u>MFA</u> | 2 |
| 2.1.2 <u>MFB</u> | 3 |
| 2.1.3 <u>RKY</u> | 3 |
| 2.2 <u>In-Process Excavation Soil Sampling</u> | 3 |
| 2.3 <u>Post-Excavation Soil Sampling</u> | 3 |
| 2.4 <u>Soil Excavation and Screening</u> | 4 |
| 2.4.1 <u>MFA</u> | 4 |
| 2.4.2 <u>MFB</u> | 4 |
| 2.4.3 <u>Rockeye</u> | 4 |
| 3.0 COMPOSTING OPERATIONS..... | 5 |
| 3.1 <u>Amendments</u> | 5 |
| 3.2 <u>Windrow Construction and Treatment</u> | 5 |
| 3.3 <u>Analytical Data Interpretation and Validation</u> | 6 |
| 4.0 DISPOSITION OF TREATED SOIL AND SITE RESTORATION | 8 |
| 5.0 STATUS OF VARIOUS REPORTS | 9 |
| 6.0 QUALITY CONTROL | 10 |
| 7.0 SAFETY AND INDUSTRIAL HYGIENE..... | 11 |
| 7.1 <u>General Safety</u> | 11 |
| 7.2 <u>Industrial Hygiene Sampling</u> | 11 |
| 8.0 FACILITY MAINTENANCE AND REPAIRS | 13 |
| 9.0 REFERENCES | 14 |

TABLE OF CONTENTS, con't

TABLES

| | |
|-----------|--|
| Table 1.0 | Full-Scale Operations Soil Excavation Quantities |
| Table 2.0 | Windrows Process Schedule |
| Table 3.0 | Average Explosive Compounds Day Last Analytical Data |
| Table 4.0 | Average Day Last Explosive Compounds Levels |
| Table 5.0 | Average Staged Windrow Re-Sampling Analytical Data |

FIGURES

MFB Pre-excavation Sample Grids (2 pages)

Windrow Location Maps:

MFA;

B-153 (3 pages)

MFB;

B-171 ((3 pages)

B-172 (2 pages)

B-2501 (2 pages)

Permanent Placement Area (1 page)

Attachment A

Field Change Request 029: Disposition of Staged Compost

EXECUTIVE SUMMARY

This interim progress report has been prepared by ToITest, Inc. (ToITest) for Southern Division, Naval Facilities Engineering Command. This report documents the progress at the Bioremediation Facility (Biofacility) for treatment of explosives-contaminated soil at the Naval Surface Warfare Center (NSWC) Crane, Indiana. On March 27, 1999, ToITest assumed responsibility for the excavation and treatment of contaminated soil at the Biofacility. This report summarizes the work actions performed from October 1 through December 31, 2000 pursuant to the requirements of the approved *Full-Scale Operational Plan* and the *Quality Assurance Project Plan*. Full-scale bioremediation operations started in April 1998. All interim measures work actions have been performed in accordance with approved plans.

The scope of work includes initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment to the Biofacility, process monitoring and confirmatory sampling of the compost windrows, and disposal of treated soil.

All initial characterization sampling at Mine Fill A (MFA) is complete. Initial characterization sampling was completed at Mine Fill B (MFB) during this reporting period around buildings 165 and 174. No explosives contamination was detected in these grids above cleanup goals however an odor, possibly of fuel, was detected in one grid. In-process field screening was conducted on grid samples from Rockeye (RKY). No post-excavation grid sampling was conducted during this reporting period.

A total of 58.52 tons of screened soil from MFA were transported to the Biofacility during this reporting period. A total of 694.66 tons of screened soil and 163.47 tons of reject soil and gravel from MFB were transported to the Biofacility during this reporting period. A total of 16.45 tons of screened soil from RKY were transported to the Biofacility during this reporting period.

A total of 10 new windrows were constructed during this reporting period, from windrow 191 to windrow 200. Eleven windrows achieved Day Last status during this period: windrows 188 to 198. Windrows 199 and 200 were sampled for Day Last analysis but results were above industrial cleanup goals: continued treatment is necessary.

A total of 2669.15 tons of contaminated soil was treated during this time period: 2321 tons to residential cleanup levels, and 348.15 tons failed to meet industrial clean up levels (windrows 199 and 200).

1.0 INTRODUCTION

This interim progress report has been prepared by TolTest for the Southern Division, Naval Facilities Engineering Command to document the progress of the full-scale bioremediation operation of explosives-contaminated soil at NSWC Crane, Crane, Indiana. It summarizes the work actions performed by TolTest during the period October 1 through December 31, 2000 pursuant to the requirements of the approved *Full-Scale Operational Plan (OP)* [MK, 1998a] and the *Quality Assurance Project Plan (QAPP)* [MK, 1998b]. Full-scale bioremediation operations started in April 1998. TolTest assumed responsibility on March 27, 1999 from Morrison Knudsen Corp. after the completion of their contract.

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

On-site bioremediation of the high-explosives contaminated soil utilizing a windrow composting process has been selected as the preferred treatment alternative for the Interim Measures at these four SWMUs.

The scope of work includes initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment at the Biofacility, process monitoring, confirmatory sampling, disposal of treated soil, and site restoration.

2.0 EXCAVATION

Field activities (discussed below) were conducted at MFA and MFB during this reporting period. Work activities at the excavation site included: in-process sampling, post-excavation sampling, soil excavation, soil screening, and vegetation establishment. All fieldwork activities were performed in accordance with procedures included in the *Full-Scale OP* [MK, 1998a] and the *QAPP* [MK, 1998b]. Final drawings showing grid locations, post-excavation sample locations, and extent of excavation will be included in the Interim Measures Report for Bioremediation.

2.1 Pre-Excavation Soil Sampling

Pre-excavation sampling is performed to provide initial site characterization and delineate the extent of contamination. Pre-excavation samples are analyzed for SWMU-specific compounds by an off-site analytical laboratory.

A minimum of three soil samples are normally obtained from each grid for characterization of the soil prior to excavation. Explosive compounds and metals analyses were completed on composite samples obtained from zero to 12-inches in depth and 24 to 36-inches in depth. On occasion, the presence of rock or other obstacles prohibited obtaining the deeper composite sample. Volatile organic compounds (VOCs) analysis are completed on grab samples obtained at 12-inches.

The horizontal boundaries of explosive constituents are influenced by the presence of buildings, roads, railroad tracks, and grids with either no detectable levels of the respective constituent or levels that are below the cleanup goals. To date, no metals or VOCs have been detected above clean-up action levels in any sample.

2.1.1 MFA

Pre-excavation soil sampling at MFA is complete.

2.1.2 MFB

Pre-excavation sampling was completed in five grids at MFB during this time period. Two grids were sampled around Building 165 and three grids were sampled around Building 174. These buildings are at opposite ends of the Mine Fill and are not areas of suspected soil contamination. The grids were located in the drainage ditches leading away from the buildings where contamination, if it was present, would most likely be found.

No contamination was detected above cleanup levels in any of the 5 grids. An odor of petroleum (possibly diesel fuel) was detected at approximately 18 inches by TolTest's Environmental Specialist while sampling grid 279. An additional sample was obtained from this location for Volatile Organic Compound (VOC) analysis. No VOCs were detected in this sample.

The location of these grids are shown on the Pre-Excavation Sample Grid maps. The B-165 map includes grids that were sampled by the previous contractor as part of an earlier investigation.

2.1.3 RKY

No pre-excavation sampling was completed at RKY during this time period.

2.2 In-Process Excavation Soil Sampling

Field screening of in-process excavation soil samples occurred during this reporting period on samples obtained at RKY during excavation of contaminated soil. Results indicated that contamination is still present, however weather conditions prevented further excavation from occurring.

2.3 Post-Excavation Soil Sampling

No post-excavation soil samples were obtained during this reporting period.

2.4 Soil Excavation and Screening

2.4.1 MFA

A total of 58.52 tons of MFA soil, previously excavated and brought to the screener site at MFB, were screened and transported to the Biofacility in this reporting period.

2.4.2 MFB

Soil excavation continued at MFB at the back side of Building 173 around the screening equipment. During this reporting period, a total of 694.66 tons of soil were screened and transported to the Biofacility. A total of 163.47 tons of MFB reject soil and gravel were transported to the Biofacility during this reporting period.

2.4.3 Rockeye

Excavation of contaminated soil commenced at RKY in grids 8 through 12 and grids 14, 15, and 16. Contaminated soil was hauled to the screener site at MFB for screening. The soil proved to be too wet for processing and only 16.45 tons of soil were screened and transported to the Biofacility.

3.0 COMPOSTING OPERATIONS

Treatment of high-explosives contaminated soil by composting involves microbial degradation of the explosives by optimizing the availability of organic material, temperature, moisture content, pH, and oxygen. The composting operation process description is provided in Section 5.0 of the approved *Full-Scale OP* [MK, 1998a].

3.1 Amendments

The compost mix used in full-scale operations consists of 25% soil, 15% chicken manure, and 60% straw by volume. A sufficient volume of straw has been delivered to satisfy the straw requirements for processing the remaining soil from MFA, MFB, and RKY. Chicken manure continues to be trucked to the Biofacility on an as-needed basis in quantities sufficient to support operations.

3.2 Windrow Construction and Treatment

Field screening has been performed at least weekly to monitor RDX levels within each windrow. Field screening of treated compost for TNT is not completed since RDX is a better indicator of contaminant degradation than TNT. Final compost samples are collected once the field test kits indicated RDX levels are below industrial clean-up goals. The day that final compost samples are collected for off-site laboratory confirmation analysis is referred to as Day Last.

Thirteen windrows were formed during this reporting period (188 through 200) but only eleven (188 through 198) successfully achieved Day Last status (i.e. results were below cleanup goals). Windrows 188, 189, and 190 were constructed in the previous reporting period and windrows 191 through 200 were constructed in this reporting period.

All windrows reported in this period achieved residential cleanup goals for explosive compounds except windrows 199 and 200 which failed to meet industrial cleanup goals. Analytical data regarding windrows that achieved Day Last status during this period are discussed in Section 3.3. Windrows 188, 190, 191, 193, 196, and 199 were composed with soil from MFB. Windrow 198 consisted of 35 buckets of MFA soil and 5

buckets of MFB soil. Windrow 200 was constructed with MFB rejects. Windrows 192 and 197 were constructed with MFA rejects and windrows 194 and 195 were constructed with MFA soil.

The average number of days between Day Zero and Day Last (for windrows 188 through 198) was 20.3. The details of the progress of windrows are included as Table 2.0.

The total amount of soil processed in this reporting period was 2669.15 tons: 2321 tons to residential cleanup levels, and 348.15 tons failed to meet industrial clean up levels

3.3 Analytical Data Interpretation and Validation

Table 3.0 provides this quarter's average laboratory analytical results for HMX, RDX, and TNT, and the regulatory cleanup goals. All windrow results represent an average of 15 individual data points (five cross sections, three sample locations per cross section). Day Last results are given for each windrow, demonstrating the effectiveness of the bio-degradation process. Day Zero samples are no longer collected on compost with soil from either MFA or MFB.

All data associated with windrow monitoring was verified, and at least 10% of the samples were validated and compared with field and laboratory quality control (QC) sample data to assess the data's usability for supporting full-scale operations. Data was verified by reviewing chain-of-custody forms, sample preservation records, analytical holding times, requested turnaround times, sample data in comparison to QC data, and reporting requirements. In addition, more than 10% of the data was validated using the validation procedures specified in Section 9.2.2 of the QAPP.

Analytical results for the trip blanks, field blanks, equipment rinsates, and field duplicates were evaluated to identify potential sources of error introduced during sampling, transportation and storage. Field QC performed with the monitoring of windrows has been performed according to the requirements defined in the QAPP.

Laboratory QC consists of method blank, sample matrix spike (MS), sample matrix spike duplicate (MSD), surrogate, laboratory control sample (LCS), and laboratory

control sample duplicate (LCSD) analyses to evaluate laboratory accuracy and precision. Laboratory quality control was performed consistent with the requirements of the QAPP. Method blanks, LCS, LCSD, and surrogates were acceptable in every analytical batch. Day Last data did not show interference with spiking solutions because initial concentrations were low in comparison to the concentration of spiking solution added to the sample. Comparing the analytical reporting limits to the industrial and residential clean-up levels, the data is determined to be acceptable to show that clean-up goals have been successfully met.

Based on technical review of the field and laboratory QC data, analyses were performed within acceptable accuracy and precision requirements specified in the QAPP. The confirmation data meets the project's data quality objectives and are therefore considered usable to support full-scale operations. Table 4.0 provides the average Day Last explosive compound levels for the windrows listed in Table 3.0.

4.0 DISPOSITION OF TREATED SOIL AND SITE RESTORATION

Treated soil (compost) has been transported back to the SWMU of origination either to the permanent storage areas or used as backfill in the open excavations. Disposal activity to date is shown in Table 2.0. Field-generated drawings showing backfill placement of treated compost are included as attachments in Figures. Site restoration (seeding, mulching, and watering) has been or will be implemented at all areas where ToITest has backfilled treated soil.

The five windrows staged at MFA (windrows 92, 93, 98, 101, and 102) were sampled in October to determine if degradation had occurred over time such that residential cleanup goals had been achieved (these windrows originally met industrial cleanup goals). Analytical results indicated that all 5 windrows had attained residential status. Average analytical results for these 5 windrows are presented in Table 5.0.

The windrows were not moved from their position at the temporary staging area at MFA during this reporting period. The sampling procedure and approval for sampling the staged windrows were detailed in Field Change Request (FCR) 029 (see Attachment A).

5.0 STATUS OF VARIOUS REPORTS

The Mine Fill A Interim Measures Report has been submitted by Washington Group (WG, formerly Morrison Knudsen) to the Navy and EPA. It is expected that WG will submit an addendum to this report once all remaining MFA work is completed by ToITest. The remaining work, all of it at the old screener site behind building 153, includes completing backfill of treated soil (compost), grading, seeding, and final surveying.

6.0 QUALITY CONTROL

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

During this period, 103 individual items were verified and no deficiencies were identified. Immediate actions were taken to correct any minor findings observed.

7.0 SAFETY AND INDUSTRIAL HYGIENE

7.1 General Safety

During this period 5,627.5 man-hours were expended by ToITest. There were no OSHA recordable injuries. The project has a cumulative total of 53,981.0 man-hours.

Thirteen formal safety inspections were performed during this quarter. 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 workers safety performance.

7.2 Industrial Hygiene Sampling

During this period total dust, airborne explosive compounds, and ammonia monitoring were performed. Ammonia samples were taken at the Biofacility by colorimetric methods. Sampling indicated ammonia levels greater than the occupational exposure limits of 50 ppm permissible exposure limit (PEL) and 25 ppm (TLV). Sampling commenced on Day 0 of the windrow life cycle and continued until the levels were below 25 ppm (TLV). The chicken manure amendment was the primary contributor to ammonia concentrations. Full-face air purifying respirators with ammonia cartridges were worn during windrow formation and during composting activities when ammonia levels were 25 ppm (TLV) or above. Ammonia was localized near each pile and was significantly affected by natural ventilation of the building, moisture in the windrow, and turning of the windrow.

Airborne dust sampling for explosive compounds was performed at the Biofacility. Four area samples and four personnel samples were collected over a period of four hours. All samples were below the 1.5 mg/m³ 8 hour time weighted average exposure limit.

Wipe sampling for explosive residues was performed at the Biofacility. Five area samples were collected from the laboratory trailer, shower trailer, office trailer, and lunchroom. The explosives HMX and RDX were detected in all 5 samples but were below the sample quantitation limit.

No noise monitoring was performed during this quarter. Prior monitoring has concluded that associates are required to wear hearing protection while working around heavy equipment, which is when noise levels are likely to exceed 85 dBa during a weighted network steady state, or 140 dBa impulse, regardless of the duration of exposure.

In summary, ammonia monitoring indicates respiratory protection is warranted during the early stages of the windrow cycle. Monitoring for airborne explosive compounds showed no hazards to be significant enough for concern. Wipe sample analysis indicates that personnel decontamination procedures are adequate when adhered to. Noise monitoring indicates a need for hearing protection while working around heavy equipment at the site.

8.0 FACILITY MAINTENANCE AND REPAIRS

- Removed and repaired tire on the water tank trailer.
- Replaced hydraulic hoses on Scarab.
- Replaced teeth on Scarab.
- The Ford Tractor was taken to Reeds Tractor for repair.
- Changed the bucket on the backhoe.
- Completed maintenance on lights on the trailer.
- Collected, cleaned and checked all fire extinguishers with the NSWV Fire Department. They were returned to the same designated places.
- Winterized the trucks.
- Repaired the hydraulic cylinder on the 966 loader.
- Replaced the broom on the Bobcat.
- Replaced the hydraulic hose on the Bobcat.
- Winterized the facility by: draining and servicing pumps, cleaning the straw and manure storage areas, cleaning the pond weirs and sweeping the compost buildings.

9.0 REFERENCES

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, Environmental Services Group. 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, Environmental Services Group. Revision 2, March 12, 1998.

TABLES

TABLE 1.0
FULL-SCALE OPERATIONS SOIL EXCAVATION QUANTITIES
October through December 2000
Quantity (Tons)

| Period | Mine Fill A | Mine Fill B | Rockeye | Cumulative |
|------------------------|--------------------|--------------------|----------------|-------------------|
| Previously reported | 20,986.87 | 19,459.04 | 0.00 | 40,445.91 |
| October | 58.52 | 588.03 | 0.00 | 41,092.46 |
| November | 0.00 | 270.10 | 16.45 | 41,379.01 |
| December | 0.00 | 0.00 | 0.00 | 41,379.01 |
| Reporting Period Total | 58.52 | 858.13 | 16.45 | 933.10 |
| Site Total | 21,045.39 | 20,317.17 | 16.45 | |

**TABLE 2.0
 WINDROW PROCESS SCHEDULE**

| Windrow # | Start Date | Day Zero | Day Last | Lab Results Received | Complete Unload | Ton Processed | Soil Qty Ton Processed | Processed to Residential or Industrial Levels | Compost Disposal Location | Grid Disposal Locations |
|-----------|------------|----------|----------|----------------------|-----------------|---------------|------------------------|---|---------------------------|-------------------------|
| M-188 | 9/13/00 | 9/14/00 | 10/5/00 | 10/11/00 | 10/11/00 | 232.1 | 30589.48 | Residential | B-2501,B-172,B-168 | 56,57,70,71 |
| M-189 | 9/21/00 | 9/22/00 | 10/10/00 | 10/16/00 | 10/16/00 | 232.1 | 30821.58 | Residential | B-171 | 126,134,136,178,185 |
| S-190 | 9/25/00 | 9/26/00 | 10/12/00 | 10/18/00 | 10/18/00 | 232.1 | 31053.68 | Residential | PPA,B-2501 | 54,55 |
| S-191 | 10/2/00 | 10/3/00 | 10/20/00 | 10/26/00 | 10/26/00 | 232.1 | 31285.78 | Residential | PPA | na |
| N-192 | 10/9/00 | 10/11/00 | 10/25/00 | 10/31/00 | 11/6/00 | 116 | 31402.28 | Residential | B-154 | 31 - 33 |
| M-193 | 10/12/00 | 10/13/00 | 11/13/00 | 11/20/00 | 11/20/00 | 232.1 | 31634.38 | Residential | PPA | Na |
| M-194 | 10/16/00 | 10/18/00 | 11/6/00 | 11/12/00 | 11/14/00 | 232.1 | 31866.48 | Residential | B-154 | 29 - 36 |
| S-195 | 10/18/00 | 10/19/00 | 11/10/00 | 11/16/00 | 11/16/00 | 232.1 | 32098.58 | Residential | B-154 | 29 - 36 |
| S-196 | 10/25/00 | 10/27/00 | 11/20/00 | 11/29/00 | 11/29/00 | 232.1 | 32330.68 | Residential | PPA | Na |
| N-197 | 11/6/00 | 11/7/00 | 11/27/00 | 12/4/00 | 12/4/00 | 232.1 | 32447.18 | Residential | B-154 | 29 - 36 |
| M-198 | 11/13/00 | 11/15/00 | 12/6/00 | 12/6/00 | 2/7/01 | 232.1 | 32679.28 | Residential | Nm | Nm |
| M-199 | 11/27/00 | 11/29/00 | 12/21/00 | 12/27/00 | | | | Failed | Nm | Nm |
| N-200 | 11/30/00 | 12/1/00 | 12/18/00 | 12/24/00 | | | | Failed | Nm | Nm |

PPA = Permanent Placement Area

TSA = Temporary Storage Area

Na = not applicable

Nm = not moved from the Biofacility in this reporting period

| WINDROW # | DAY # | HMX | RDX | TNT |
|--------------------------|--------------|------------|------------|------------|
| M-188 | 21 | 1 | 2.1 | 0.5 |
| M-189 | 18 | 1.4 | 1.5 | 0.5 |
| S-190 | 16 | 0.7 | 1.9 | 1.6 |
| S-191 | 17 | 0.7 | 1.9 | 0.6 |
| N-192 | 14 | 0.3 | 0.7 | 0.5 |
| M-193 | 31 | 0.7 | 1.3 | 0.5 |
| M-194 | 19 | 0.5 | 0.6 | 0.6 |
| S-195 | 22 | 0.5 | 0.4 | 0.5 |
| S-196 | 24 | 1.2 | 3.6 | 0.3 |
| N-197 | 20 | 0.3 | 0.2 | 0.5 |
| M-198 | 21 | 0.5 | 1.1 | 0.4 |
| M-199 | 22 | 4.9 | 18.1 | 0.5 |
| N-200 | 18 | 29 | 133.3 | 1.2 |
| CLEANUP GOALS | Residential | 3,300 | 4 | 15 |
| | Industrial | 34,000 | 17 | 64 |

TABLE 4.0
AVERAGE DAY LAST EXPLOSIVE COMPOUNDS LEVELS

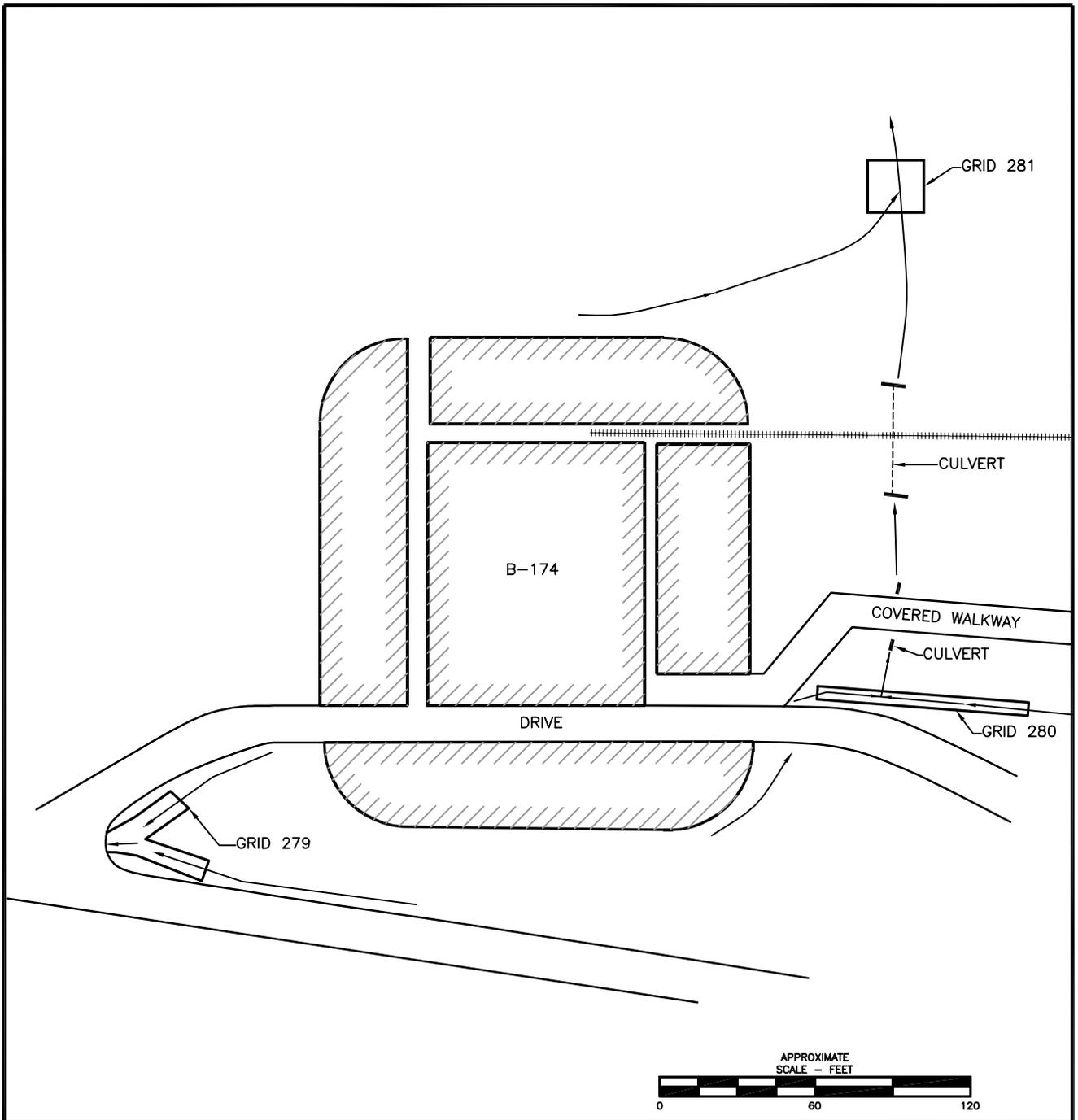
| | ppm |
|------------|-----|
| HMX | 1.7 |
| RDX | 1.4 |
| TNT | 0.6 |

Day 0 samples are no longer collected for compost containing MFA or MFB soil.

| WINDROW # | DAY # | HMX | RDX | TNT |
|------------------|--------------|------------|------------|------------|
| 92 | 453 | 0.6 | 0.6 | 0.5 |
| 93 | 452 | 0.7 | 0.6 | 0.5 |
| 98 | 442 | 0.4 | 0.6 | 0.5 |
| 101 | 433 | 0.6 | 1.1 | 0.5 |
| 102 | 432 | 0.7 | 1.5 | 0.4 |

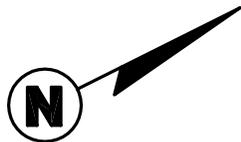
FIGURES:

**PRE-EXCAVATION SAMPLE GRID MAPS, MFB
&
WINDROW PLACEMENT SITE MAPS, MFA and MFB**



LEGEND

- > DRAINAGE PATTERN
- ===== RAILROAD TRACKS



100100-123100 QUARTERLY REPORT

PRE-EXCAVATION SAMPLE GRIDS

NAVAL SURFACE WARFARE CENTER
 BUILDING 174, MINE FILL B
 CRANE, INDIANA

PREPARED FOR

NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN RJO/2-13-01

CHECKED

REVISED WBR/2-15-01

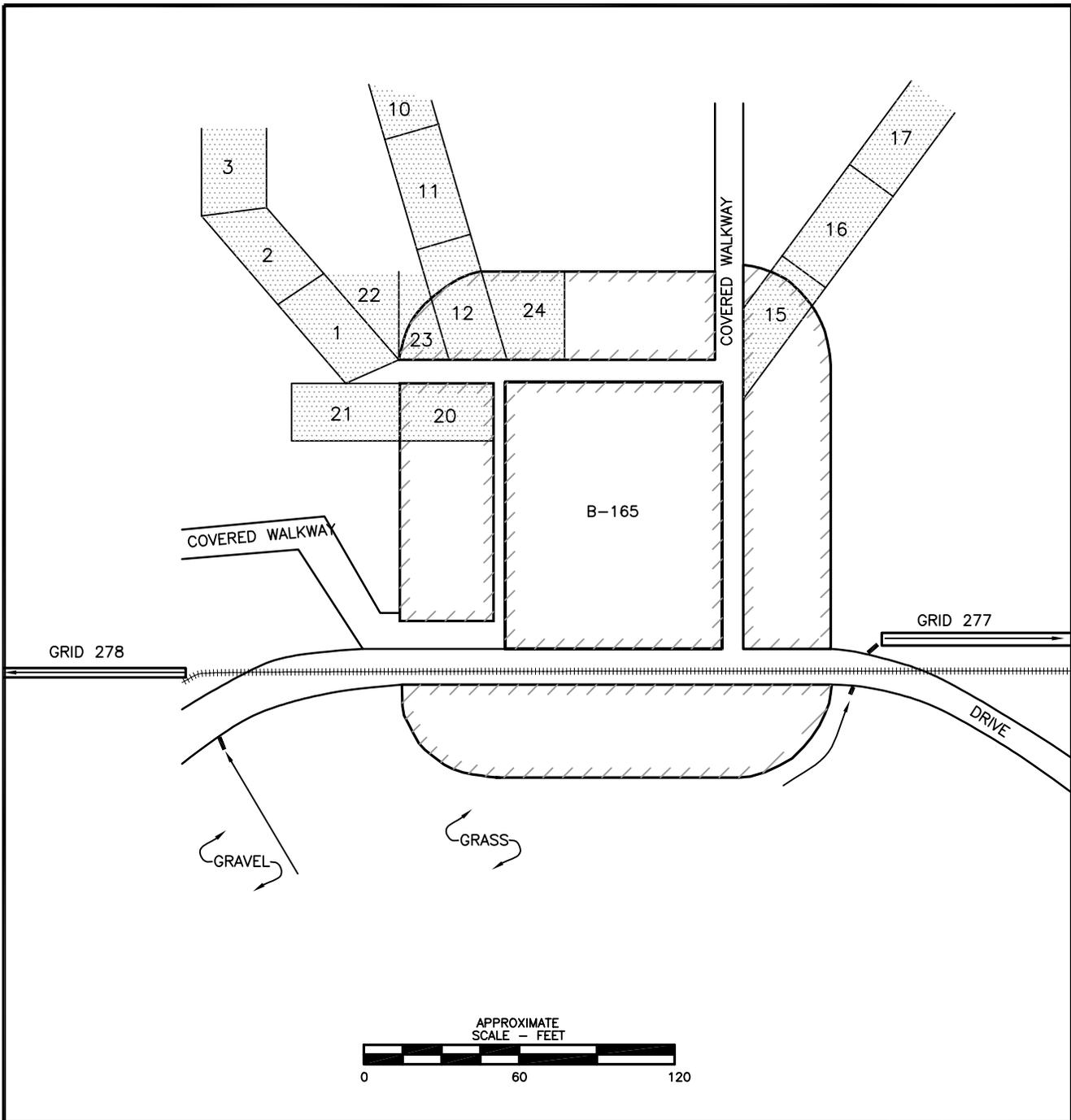
APPROVED

JOB NO.: 37324.01

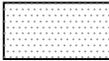
SHEET NUMBER

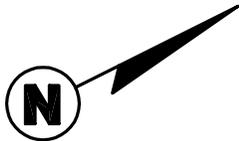
1 of 2





LEGEND

-  DRAINAGE PATTERN
-  RAILROAD TRACKS
-  GRIDS SAMPLED BY PREVIOUS CONTRACTOR



100100-123100 QUARTERLY REPORT

PRE-EXCAVATION SAMPLE GRIDS

NAVAL SURFACE WARFARE CENTER
BUILDING 165, MINE FILL B
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN RJO/2-14-01

CHK

APPR

REVISED MRC/3-21-01

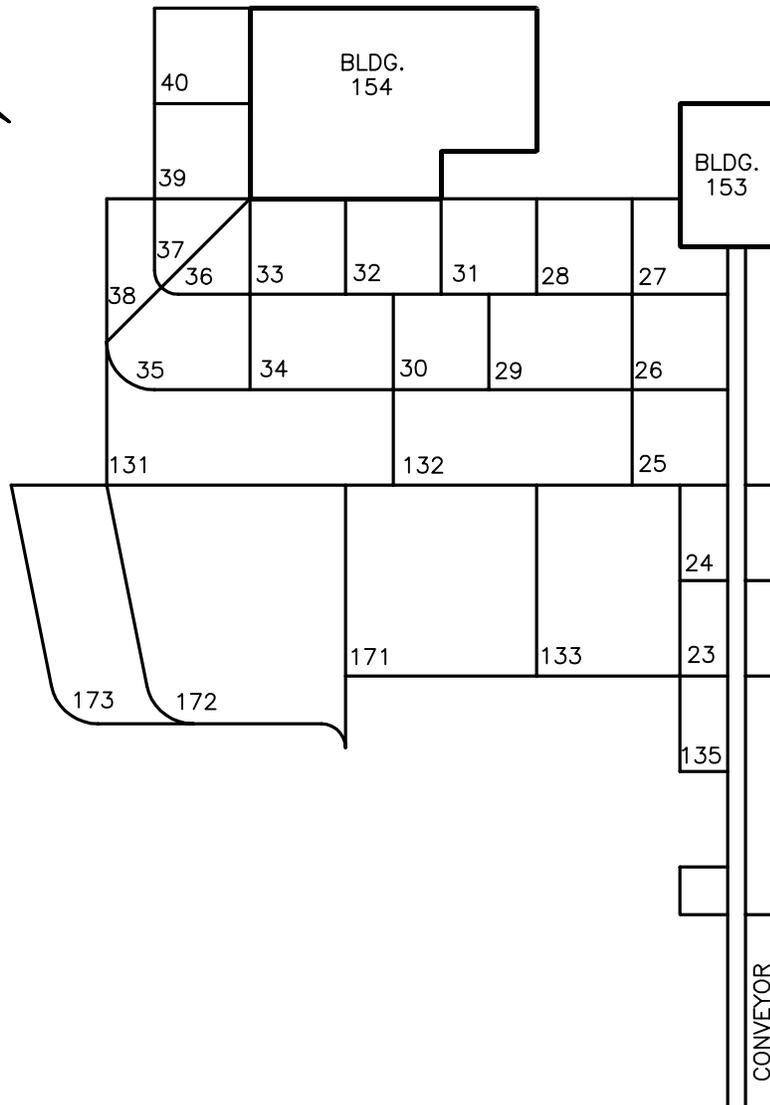
DRAWING NO.: 37324PESG165.dwg

JOB NO.: 37324.01

SHEET NUMBER

2 of 2

TOULIST, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

WINDROW LOCATION MAP

BACKFILL OPERATIONS
GRIDS: #29, 30, 31, 32, 33, 34, 35, 36
WINDROW: #197(R)
BUILDING 154, MINE FILL A
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-05-01

CHECKED

REVISED

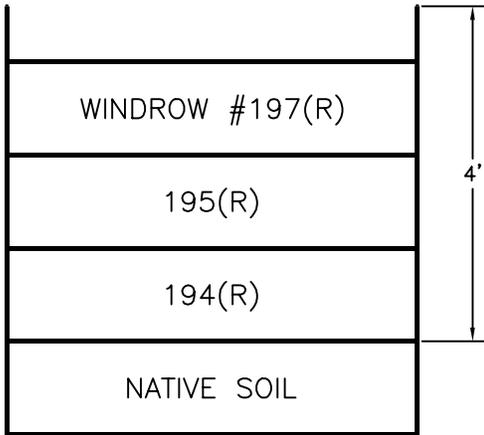
APPROVED

JOB NO.: 37324.01

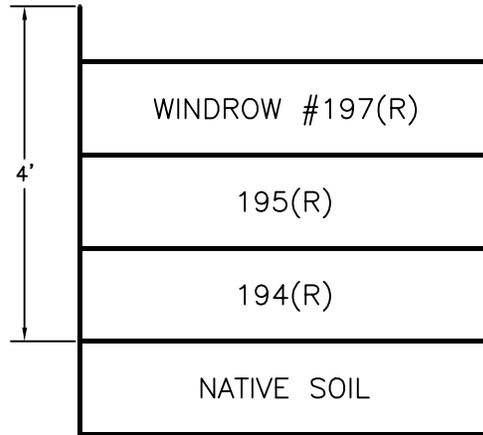
SHEET NUMBER

1 of 3

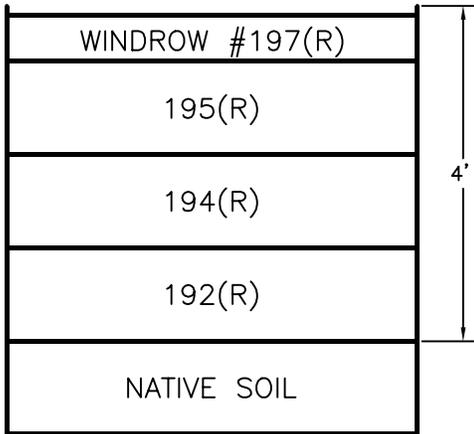




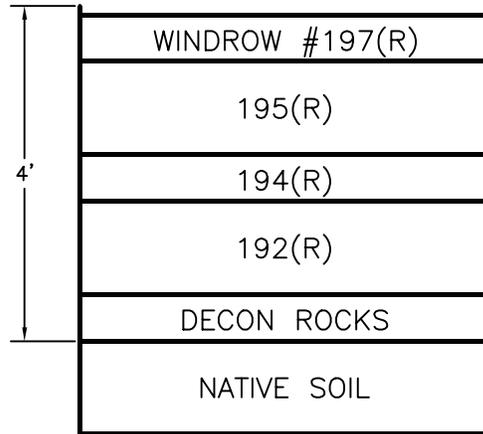
GRID #29



GRID #30



GRID #31



GRID #32

MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

SIDE VIEW

BACKFILL OPERATIONS
GRIDS: #29, 30, 31, 32
WINDROW: #197(R)
BUILDING 154, MINE FILL A
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-05-01

CHECKED

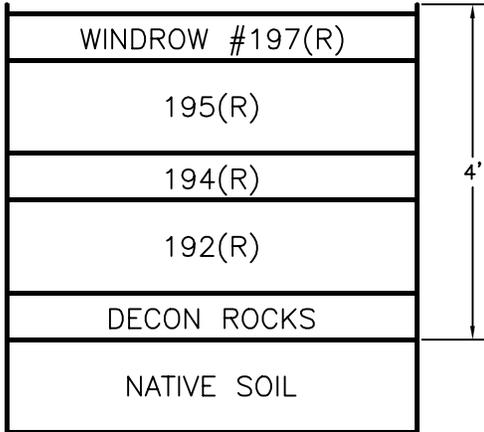
REVISED

APPROVED

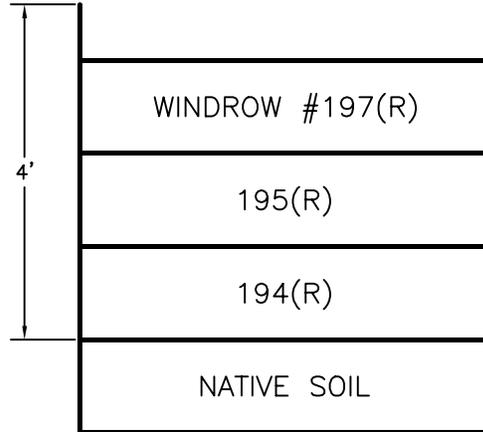
JOB NO.: 37324.01

SHEET NUMBER

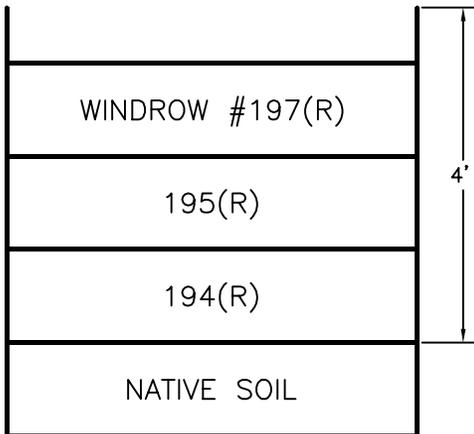




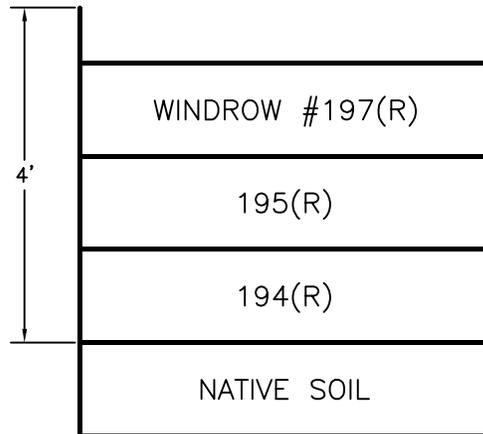
GRID #33



GRID #34



GRID #35



GRID #36

MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

SIDE VIEW
BACKFILL OPERATIONS
GRIDS: #33, 34, 35, 36
WINDROW: #197(R)
BUILDING 154, MINE FILL A
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC\01-05-01

CHECKED

REVISED

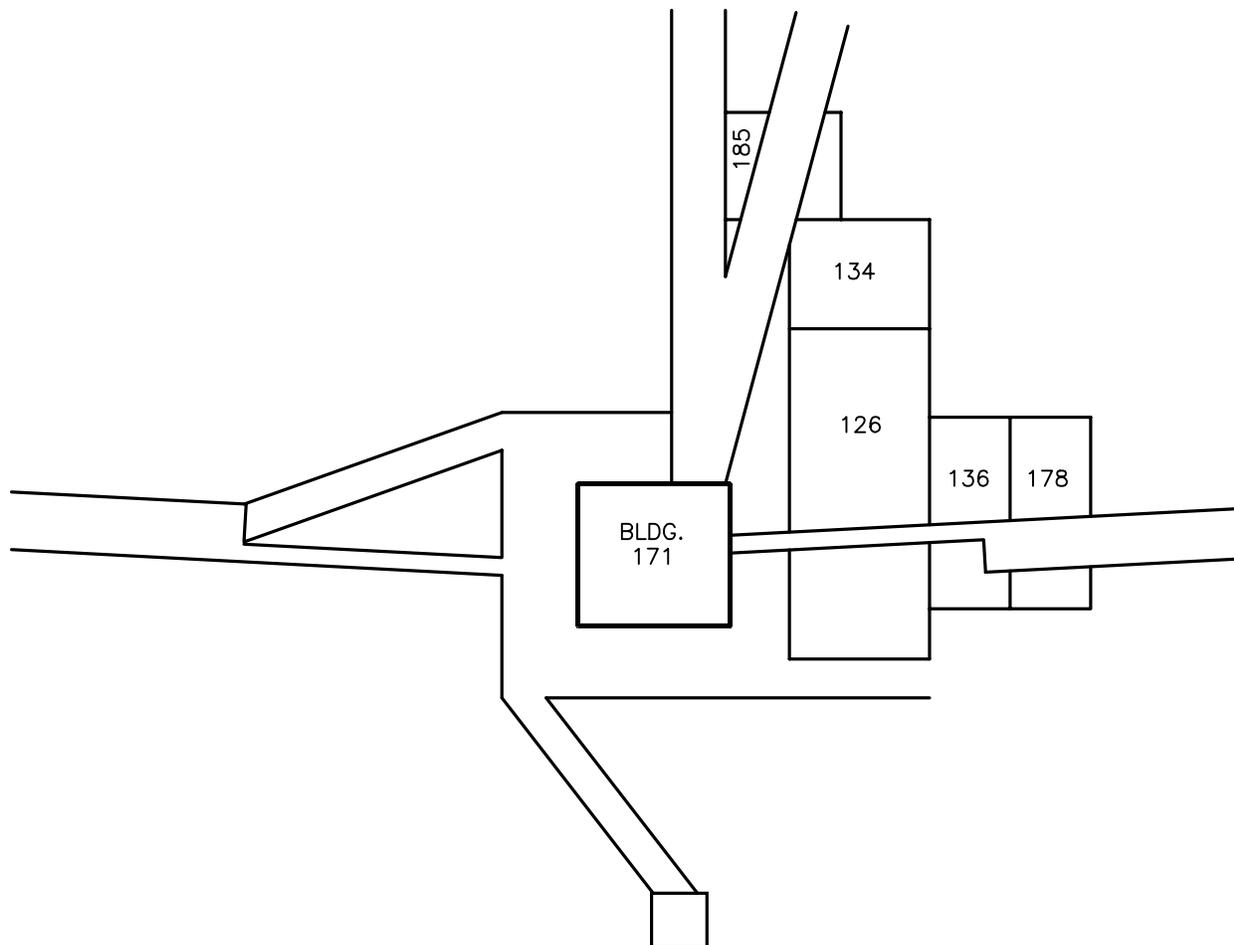
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

3 of 3





MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

WINDROW LOCATION MAP

BACKFILL OPERATIONS
GRIDS: #126, 134, 136, 178, 185
WINDROW: #189(R)
BUILDING 171, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-03-01

CHECKED

REVISED

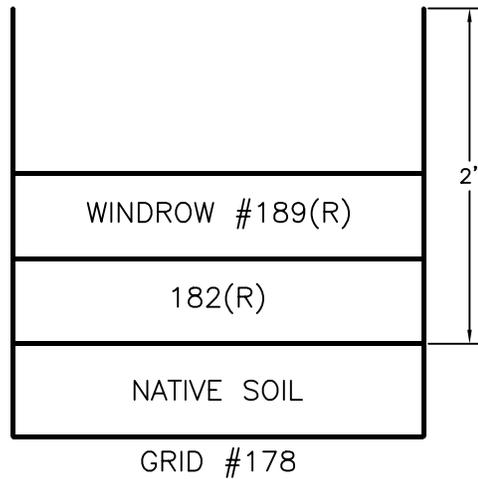
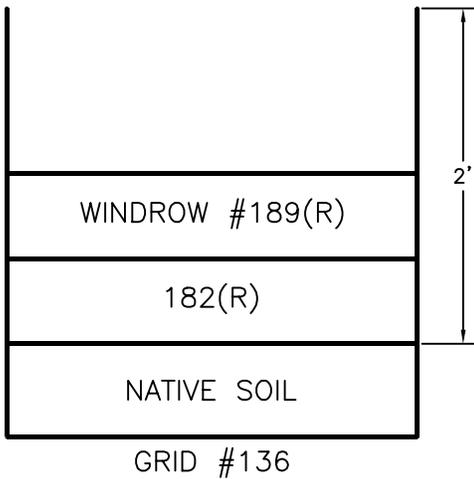
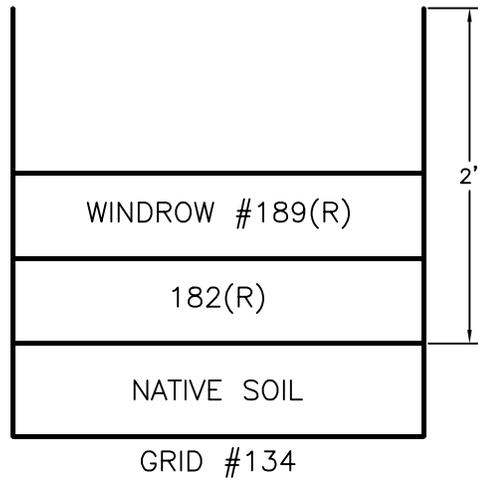
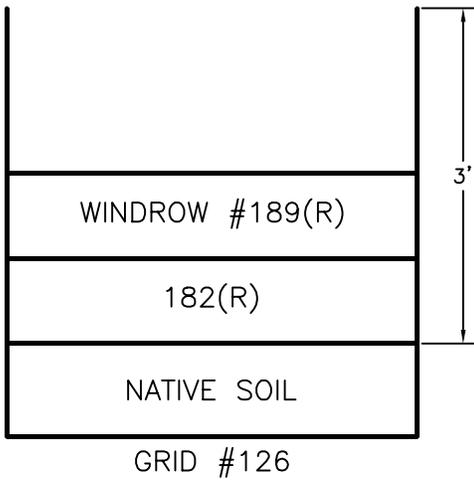
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

1 of 3

TOLLEST, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

SIDE VIEW

BACKFILL OPERATIONS
GRIDS: #126, 134, 136, 178
WINDROW: #189(R)
BUILDING 171, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-03-01

CHECKED

REVISED

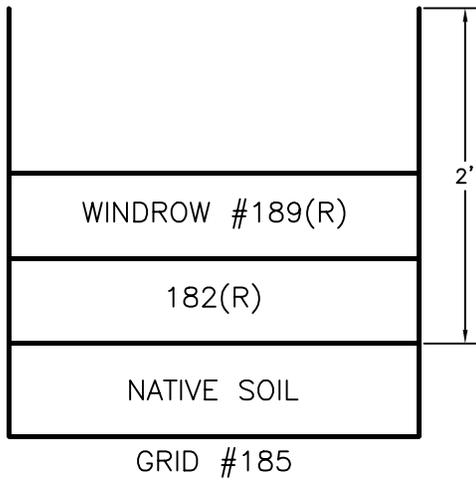
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

2 of 3

TOLLEST, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

SIDE VIEW

BACKFILL OPERATIONS
GRID: #185
WINDROW: #189(R)
BUILDING 171, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-03-01

CHECKED

REVISED

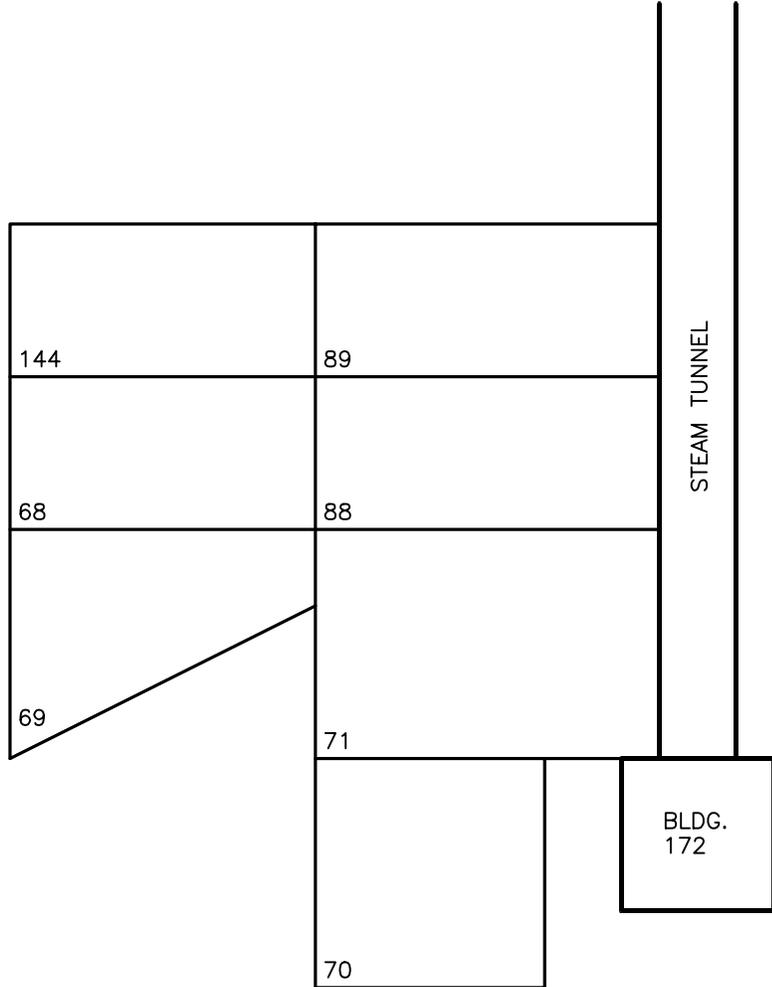
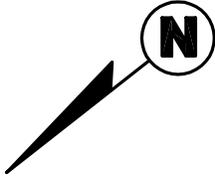
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

3 of 3

TOLTEST, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

WINDROW LOCATION MAP

BACKFILL OPERATIONS
GRIDS: #70, 71
WINDROW: #188(R),
BUILDING 172, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC\01-04-01 CHECKED

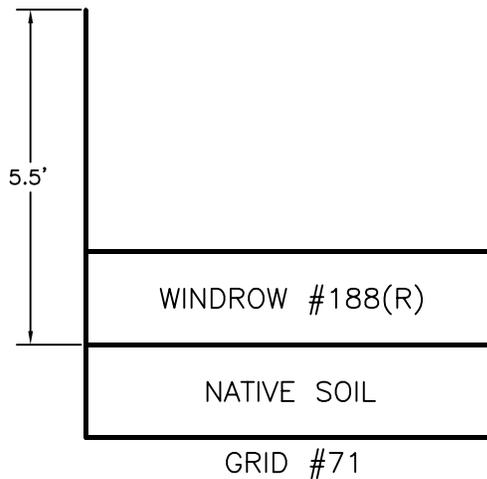
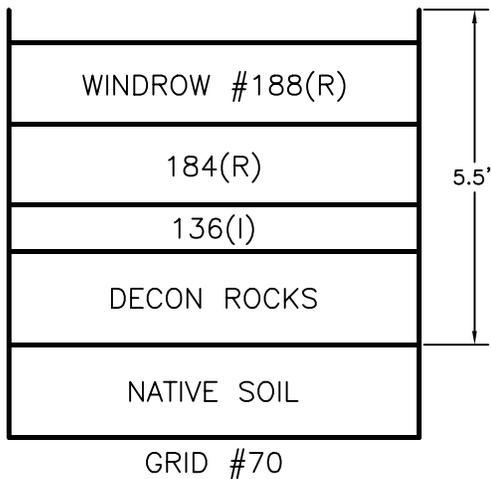
REVISED APPROVED

JOB NO.: 37324.01

SHEET NUMBER

1 of 2





MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

SIDE VIEW

BACKFILL OPERATIONS
GRIDS: #70, 71
WINDROW: #188(R)
BUILDING 172, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC\01-04-01

CHECKED

REVISED

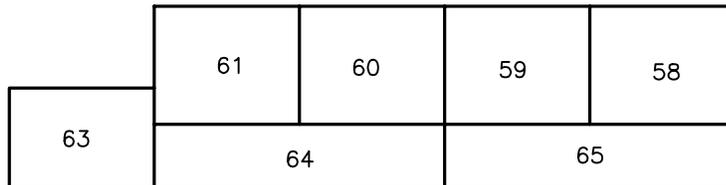
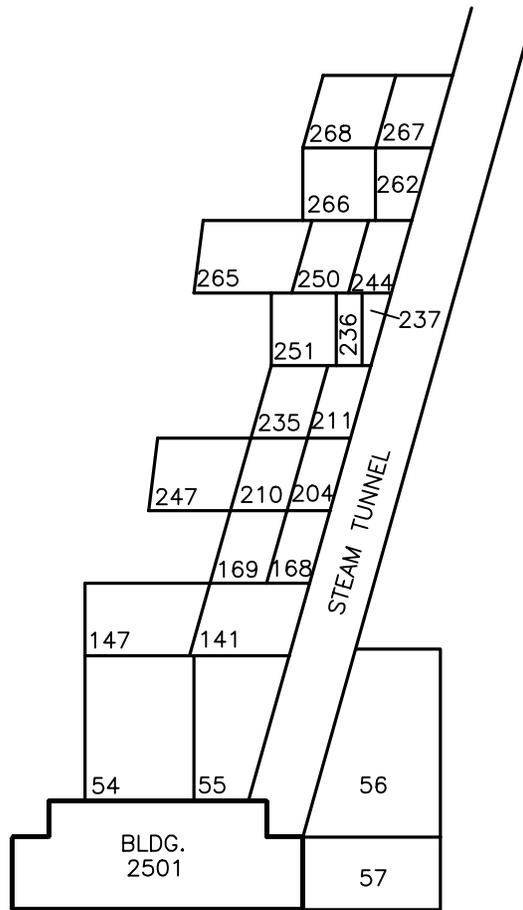
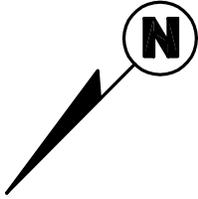
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

2 of 2

TOLTEST, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100100-123100 QUARTERLY REPORT

WINDROW LOCATION MAP

BACKFILL OPERATIONS
GRIDS: #54, 55, 56, 57
WINDROWS: #188(R), 190(R)
BUILDING 2501, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-04-01

CHECKED

REVISED

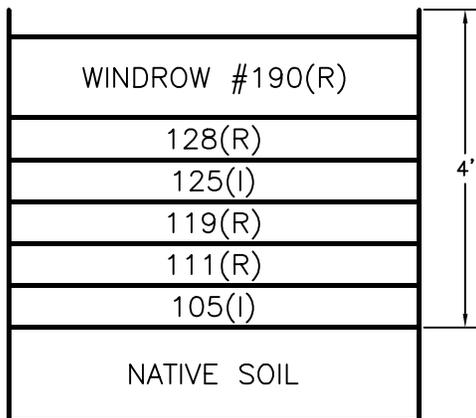
APPROVED

JOB NO.: 37324.01

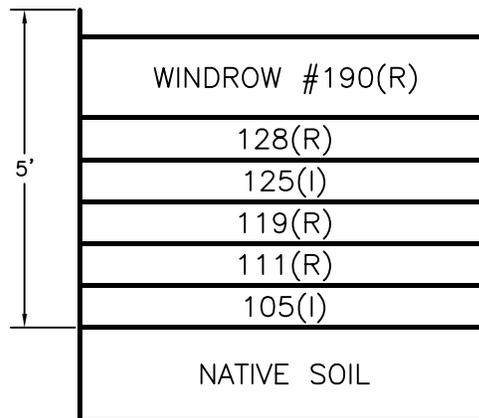
SHEET NUMBER

1 of 2

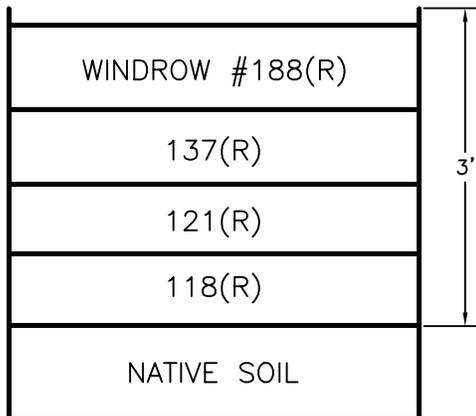




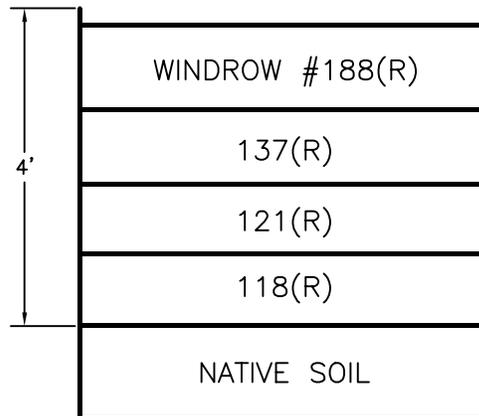
GRID #54



GRID #55



GRID #56



GRID #57

MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

SIDE VIEW

BACKFILL OPERATIONS
GRIDS: #54, 55, 56, 57
WINDROWS: #188(R), 190(R)
BUILDING 2501, MINE FILL B
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR

**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN**

DRAWN MRC\01-04-01

CHECKED

REVISED

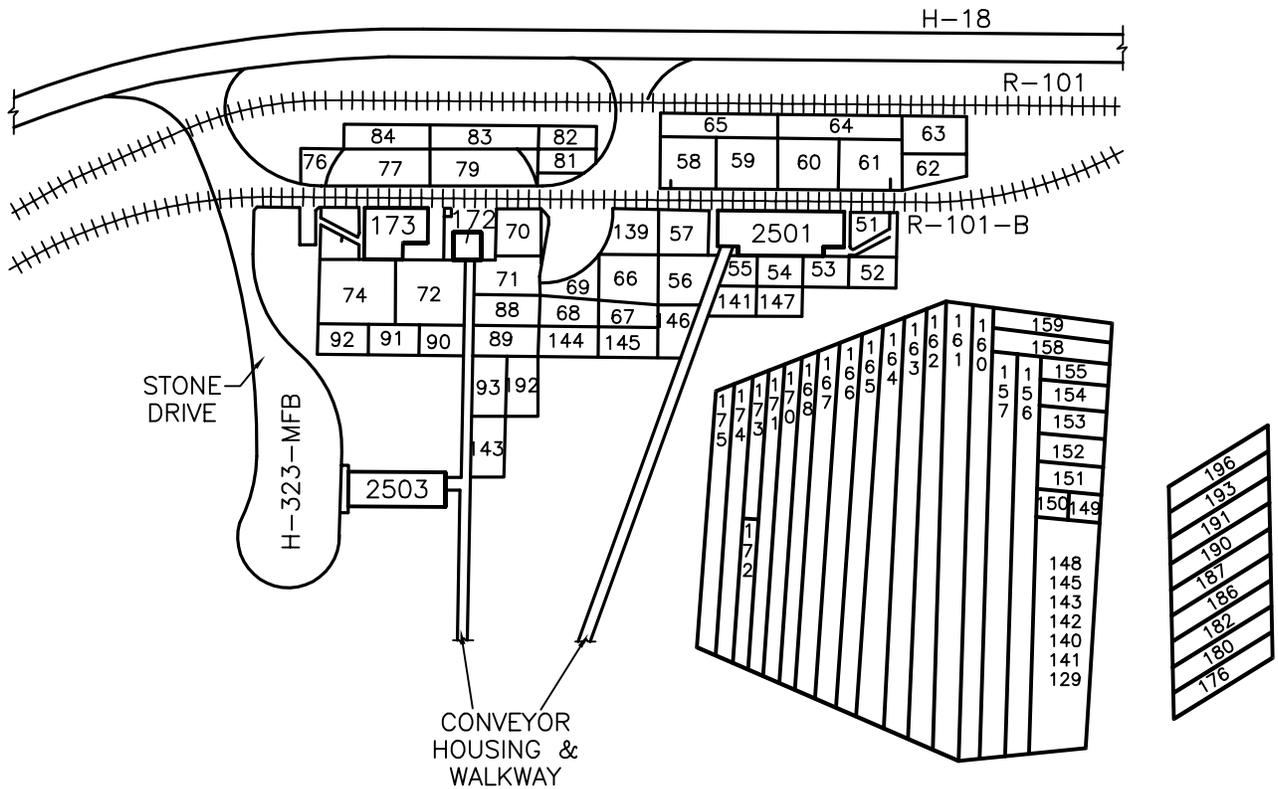
APPROVED

JOB NO.: 37324.01

SHEET NUMBER

2 of 2

TOLUESI, INC.



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

WINDROW LOCATION MAP

BACKFILL OPERATIONS
WINDROWS: #190(R), 191(R), 193(R), 196(R)
MINE FILL B - PERMANENT PLACEMENT AREA
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC\01-04-01

CHECKED

REVISED

APPROVED

JOB NO.: 37324.01

SHEET NUMBER

1 of 1



ATTACHMENT A

Field Change Request 029: Disposition of Staged Compost

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.: FC03-FCR-FS029 Rev. 1 |
|------------------------------------|--------------------------------|--|

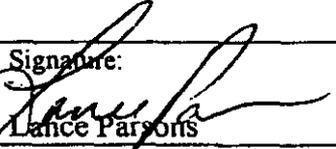
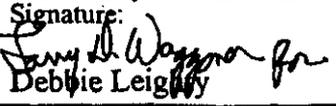
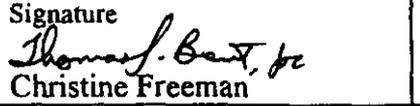
| | |
|--------------------------------------|-------------|
| Disposition of Staged Compost | Page 1 of 1 |
|--------------------------------------|-------------|

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, July 1999 Rev. 3

Problem / Change Description:
There are currently 5 windrows staged at the Mine Fill A temporary staging area and 6 windrows staged at the Mine Fill B temporary staging area. The average Day Final explosives results for these windrows were above residential cleanup goals but below industrial cleanup goals. Handling and disposal requirements for compost meeting industrial cleanup goals are more restrictive than for compost meeting residential cleanup goals: this compost must either be buried and covered with a minimum of two feet of compost meeting residential cleanup goals or be staged on and under plastic until a burial place becomes available. Excavation of contaminated soil is nearly complete at both Mine Fills and there are not enough excavations deep enough to contain all of the staged compost.

| | | | |
|---------------------|--|------------------------------------|------------------------|
| Initiated by | Signature:  | Organization: TolTest, Inc. | Date: 9/29/2000 |
|---------------------|--|------------------------------------|------------------------|

Resolution:
At the discretion of TolTest Inc, each compost windrow at the staging areas may be sampled to determine if explosives degradation has occurred such that residential cleanup goals have now been achieved. To gain access to the interior of the windrow for sampling purposes, a backhoe with a decontaminated bucket will be utilized to dig into the compost at 5 locations to a minimum depth of 5 feet. Three grab samples will be obtained at each of the 5 locations at an approximate depth of 1 foot, 3 feet, and 5 feet. The samples will be obtained from the face of the cut opened by the backhoe. The depths specified are perpendicular to the surface of the pile. Using this procedure, 15 samples will be obtained which is the same number of samples required by the approved Quality Assurance Project Plan for Full-Scale Operations Soils Bioremediation Facility (QAPP) when sampling a windrow at the Biofacility. All analytical requirements, quality control samples (duplicates, MS/MSD), sample handling, and custody procedures will be followed as outlined in the QAPP. Should analytical results show that residential cleanup goals have been achieved and the windrows are moved from the staging areas, the location of their final disposition will be tracked and logged.

| | | | | | |
|------------------------------------|--|--------------------------|-------------------------------------|---|--------------------------|
| Approval by TolTest, PM | Signature:  Lance Parsons | Date: 10/19/00 | Approval by ROICC/NTR or RPM | Signature:  Brent Robertson | Date: 10/27/00 |
| Approval by TolTest QC/SHSO | Signature:  Debbie Leighty | Date: 10/19/00 | Approval by EPD ECOTR: | Signature:  Christine Freeman | Date: 10/19/00 |

Regulator Approval/Notification Recommended:
Yes No

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

FIELD CLARIFICATION REQUEST (FCR)

| | | |
|--------------------------------------|--------------------------------|--|
| Delivery Order No.: FC03 | Subcontract No.: N/A | FCR No.: FC03-FCR-FS029 Rev. 1 |
| Disposition of Staged Compost | | 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, July 1999 Rev. 3

Problem / Change Description:
 There are currently 5 windrows staged at the Mine Fill A temporary staging area and 6 windrows staged at the Mine Fill B temporary staging area. The average Day Final explosives results for these windrows were above residential cleanup goals but below industrial cleanup goals. Handling and disposal requirements for compost meeting industrial cleanup goals are more restrictive than for compost meeting residential cleanup goals: this compost must either be buried and covered with a minimum of two feet of compost meeting residential cleanup goals or be staged on and under plastic until a burial place becomes available. Excavation of contaminated soil is nearly complete at both Mine Fills and there are not enough excavations deep enough to contain all of the staged compost.

| | | | |
|---------------------|-------------------|------------------------------------|------------------------|
| Initiated by | Signature: | Organization: TolTest, Inc. | Date: 9/29/2000 |
|---------------------|-------------------|------------------------------------|------------------------|

Resolution:
 At the discretion of TolTest Inc, each compost windrow at the staging areas may be sampled to determine if explosives degradation has occurred such that residential cleanup goals have now been achieved. To gain access to the interior of the windrow for sampling purposes, a backhoe with a decontaminated bucket will be utilized to dig into the compost at 5 locations to a minimum depth of 5 feet. Three grab samples will be obtained at each of the 5 locations at an approximate depth of 1 foot, 3 feet, and 5 feet. The samples will be obtained from the face of the cut opened by the backhoe. The depths specified are perpendicular to the surface of the pile. Using this procedure, 15 samples will be obtained which is the same number of samples required by the approved Quality Assurance Project Plan for Full-Scale Operations Soils Bioremediation Facility (QAPP) when sampling a windrow at the Biofacility. All analytical requirements, quality control samples (duplicates, MS/MSD), sample handling, and custody procedures will be followed as outlined in the QAPP. Should analytical results show that residential cleanup goals have been achieved and the windrows are moved from the staging areas, the location of their final disposition will be 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 10/4/2000

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James M. Hunsick
SIGNATURE

DIRECTOR, ENVIRONMENTAL PROTECTION DEPARTMENT
BY DIRECTION OF THE COMMANDER
TITLE

4/11/01
DATE