

**BUILDING N-121 SOIL REMOVAL AND SPILL
CLEANUP ACTIVITY REPORT
NAVAL SUPPORT ACTIVITY MEMPHIS
MILLINGTON, TENNESSEE**

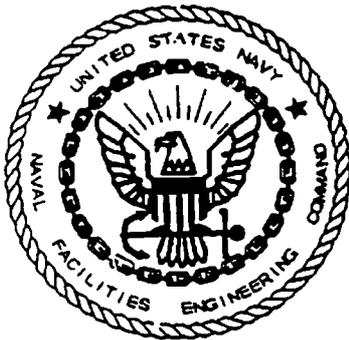
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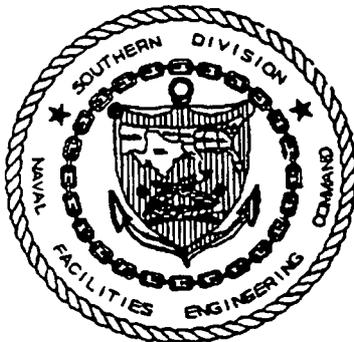


Prepared for:

**Department of the Navy
Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina**

Prepared by:

**EnSafe/Allen & Hoshall
5720 Summer Trees Drive, Suite 8
Memphis, Tennessee 38134
(901) 383-9115**



The Contractor, EnSafe/Allen & Hoshall, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0318 are complete, accurate, and comply with all requirements of the contract.

Date: August 29, 1997
Signature: [Signature]
Name: Lawson Anderson
Title: Task Order Manager

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1.0 INTRODUCTION

This Activity Report documents the cleanup of material suspected to be chromic acid plating solution spilled outside of Building N-121 (a former plating shop) at Naval Support Activity (NSA) Memphis, Millington, Tennessee (Figure 1). EnSafe/Allen & Hoshall (E/A&H) provided oversight for all portions of cleanup activities.

Building N-121 is on the NSA Memphis Northside, approximately 100 feet west of Eighth Street on the north side of Casablanca Street, and is a 4,343-square-foot structure formerly used for training military personnel in plating processes. According to the spill report (Appendix A) on file at the NSA Memphis Public Works Office, Environmental Division, the material spilled from a previously empty vat labeled "Chromic Acid" that had filled with rainwater while being stored outside Building N-121 for up to a month and a half prior to the release. A vat labeled "Danger Hydrochloric Acid" was also outside with the "Chromic Acid" vat; however, the hydrochloric acid vat was punctured, which prevented rainwater accumulation.

On February 4, 1997, the spilled liquid ran over a sidewalk, across a grassy area, then flowed across the adjacent parking lot, and entered a storm sewer catch basin approximately 85 feet west of Building N-121 (Figure 2). The spill was reported to the Public Works Department on February 5, when the material released appeared to be hazardous due to its visible environmental effects (stained pavement and severely stressed vegetation). The following offices/personnel were informed of the material release on February 5:

- Tennessee Department of Environment and Conservation, Memphis Field Office
Jim Morrison — Division of Superfund
Mark Thomas — RCRA
John Leonard — NPDES

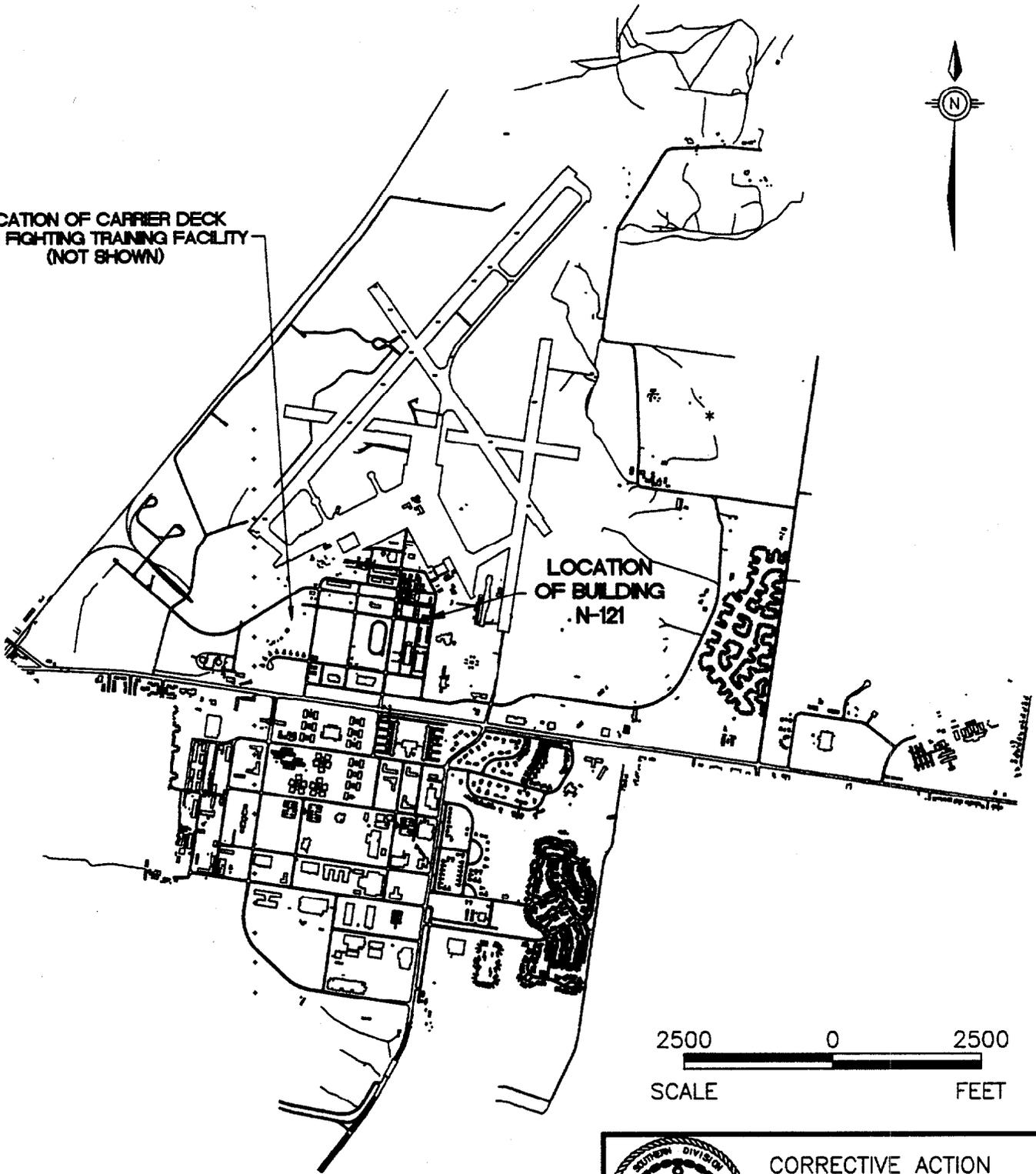
- U. S. Navy, Jacksonville, Florida
Jerry Wallmeyer — Navy On-Scene Coordinator/Regional Environmental Coordinator
- U.S. Navy Facilities Engineering Command, Southern Division
David Porter — BRAC Environmental Coordinator
- U.S. Environmental Protection Agency, Region IV, Atlanta, Georgia
Brian Donaldson — Regional Project Manager

On February 5, 1997, NSA Memphis Environmental Division personnel covered the grassy areas with plastic to prevent precipitation and storm water runoff from spreading contamination. Per a Tennessee Department of Environment and Conservation (TDEC) request, the affected pavement also was covered with plastic and protected with hay bales and sand bags on February 6. The storm sewer catch basin was surrounded with corrosive spill pillows and hay bales. The vats were cleaned and decontaminated by NSA Memphis personnel and then moved to Building 1694, a Part B Permitted Hazardous Waste Storage Facility. The cleanup activities were completed in three phases. Phase I cleanup activities, initiated on April 8, 1997, included pressure washing all paved surfaces, excavating the top 1 foot of visibly stained soil, and collecting confirmation soil samples. Phase II consisted of additional excavation and confirmation sampling. Phase III consisted of backfilling and seeding the site. These activities are described in Section 4 of this report.

The primary references for this activity report are the *Comprehensive RCRA Facility Investigation Work Plan, NAS Memphis, Millington, Tennessee* (E/A&H, 1994), the *RCRA Facility Investigation Report, Building N-121 Plating Shop Dry Well, NAS Memphis, Millington, Tennessee* (E/A&H, 1996), and the spill report (Appendix A) on file with NSA Memphis Public Works Office, Environmental Division.



LOCATION OF CARRIER DECK
FIRE FIGHTING TRAINING FACILITY
(NOT SHOWN)



LOCATION OF BUILDING
N-121

2500 0 2500
SCALE FEET



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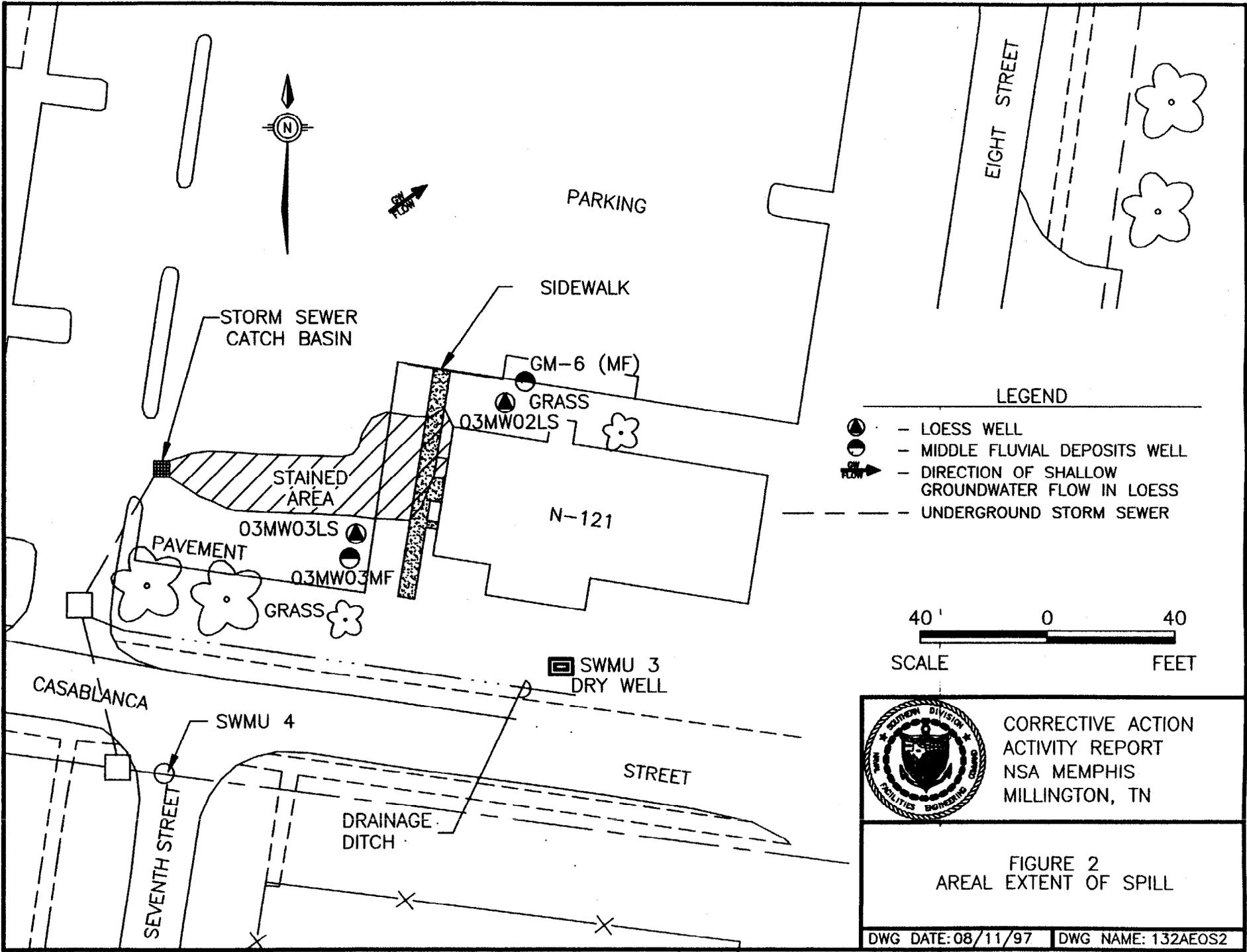
FIGURE 1
SITE LOCATION MAP

DWG DATE: 07/07/97 | DWG NAME: 132SLMW2

000006

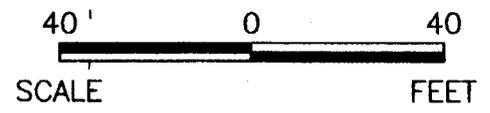
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LEGEND

- LOESS WELL
- MIDDLE FLUVIAL DEPOSITS WELL
- DIRECTION OF SHALLOW GROUNDWATER FLOW IN LOESS
- UNDERGROUND STORM SEWER



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FIGURE 2
AREAL EXTENT OF SPILL

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2.0 SITE LAYOUT

2.1 Topography and Drainage

Building N-121 and its surrounding area are characterized by relatively level, low-relief topography. The immediate area is covered by grass and descends slightly to the south and west toward an east-west oriented drainage ditch which flows westward into the underground storm sewer (Solid Waste Management Unit [SWMU] 4). The underground storm sewer follows Casablanca Street westward until it surfaces and becomes an open drainage ditch on the north side of the Carrier Deck Fire Fighting Training Facility and ultimately empties to North Fork Creek, approximately 4,000 feet west of the site. A storm sewer catch basin in the parking lot (Figure 2) west of Building N-121 leads to the underground storm sewer (SWMU 4) described above. Storm sewer maps provided by NSA Memphis are included in Appendix B.

2.2 Hydrogeologic Information

The regional and site-specific hydrogeology are described in Sections 5.1 and 5.3 of the SWMU 3 RFI report. SWMU 3, a former dry well used by Building N-121, was recently removed during a voluntary corrective action and is within 100 feet of the spill area (Figure 2).

Stratigraphy

Site-specific stratigraphic data from the SWMU 3 RFI indicate low to very low-permeability silty clays and clays (loess) overlying a sand and gravel horizon (fluvial deposits). The loess extends from land surface to a depth of 36 feet. The fluvial deposits extend from 36 feet below ground surface (bgs) to 85 feet bgs.

Shallow Groundwater

During the SWMU 3 RFI, a moist zone in the loess was encountered between 12 and 22 feet bgs, which is the uppermost zone of saturation onsite. The fluvial deposits are saturated throughout their entire thickness. Groundwater elevations were measured on September 9 and 19, 1995, to

determine flow directions and gradients in the loess and fluvial deposits. The potentiometric maps that were generated are included in the SWMU 3 Resource Conservation and Recovery Act Facility Investigation report. Water-level measurements indicated a northeast flow for groundwater in the loess, with a slight north-northeast orientation identified two weeks later. Groundwater in the fluvial deposits exhibited semiradial flow to the northeast, east, and east-southeast.

2.3 Climatological Data

Regional climatological data are provided in Section 2.8 of the Comprehensive RFI Work Plan.

3.0 SOURCE CHARACTERIZATION

According to the *RCRA Facility Assessment* (ERC, 1990), the exact dates of operation for Building N-121 are unclear. One data source states operation from 1953 to 1965, while a second source states operation from 1951 to 1976. Building N-121 was used to train personnel in plating operations. Aircraft corrosion-control plating processes taught there employed cyanide-based solutions using cadmium, chromium, copper, and nickel. The Building N-121 survey form (Appendix C) completed following a walk-through of the building during the 1993-94 Base Realignment and Closure (BRAC) Environmental Baseline Survey indicated that electroplating process equipment and tanks had been removed from the building. When the two vats were moved into Building N-121 or where they came from is not known.

According to the spill report on file with the NSA Memphis Public Works Office, Environmental Division, on February 4, 1997, NSA Memphis personnel were to move the vats back inside the building, but the one labeled "Chromic Acid" was too heavy to lift after filling with rainwater. While trying to move this vat, the drain plug was broken. Attempts to plug the broken drain were unsuccessful. The personnel, assuming the liquid inside the vat was rainwater, then overturned the vat to facilitate lifting. The resulting spill of liquid stained the pavement and concrete, and

stressed the vegetation (grass) adjacent to the west side of the building. The vat capacity is approximately 135 gallons. A release of approximately 100 gallons was reported. The approximate extent of the stained area is shown in Figure 2.

On February 5, 1997, a sample of the liquid remaining in the "Chromic Acid" vat was collected to characterize the material spilled. The results of the sample analyses (reactivity, ignitability, corrosivity, metals, and volatile organic compounds) are summarized in Table 1 and included in Appendix A. Based on the analytical results (pH = 2.2 standard units; chromium = 35,560 milligrams per liter), the material is presumed to have been chromic acid plating solution sludge reconstituted by rainwater.

Table 1
Analytical Results of
Material in Chromic Acid Vat
Sample ID: 121Z020597

Test	Result	Method
Reactive Cyanide	<0.125	9010
Cyanide	<0.125	335.2
Ignitability Flashpoint	>96°C	1010
pH - Corrosivity	2.2 Std. Units	9040
Reactive Sulfide	<0.125	9030
Silver	<0.2	6010/7000 series
Arsenic	<5.0	6010/7000 series
Barium	0.9	6010/7000 series
Cadmium	32.2	6010/7000 series
Chromium	35,560	6010/7000 series
Lead	<4.5	6010/7000 series

Table 1
Analytical Results of
Material in Chromic Acid Vat
Sample ID: 121Z020597

Test	Result	Method
Selenium	< 37	6010/7000 series
Volatile Organic Compounds	Nondetect for all compounds	8240

Notes:

This was a liquid sample collected from the material remaining in the "Chromic Acid" vat. Results in milligrams per liter unless stated otherwise.

4.0 SOIL REMOVAL AND SPILL CLEANUP ACTIVITIES

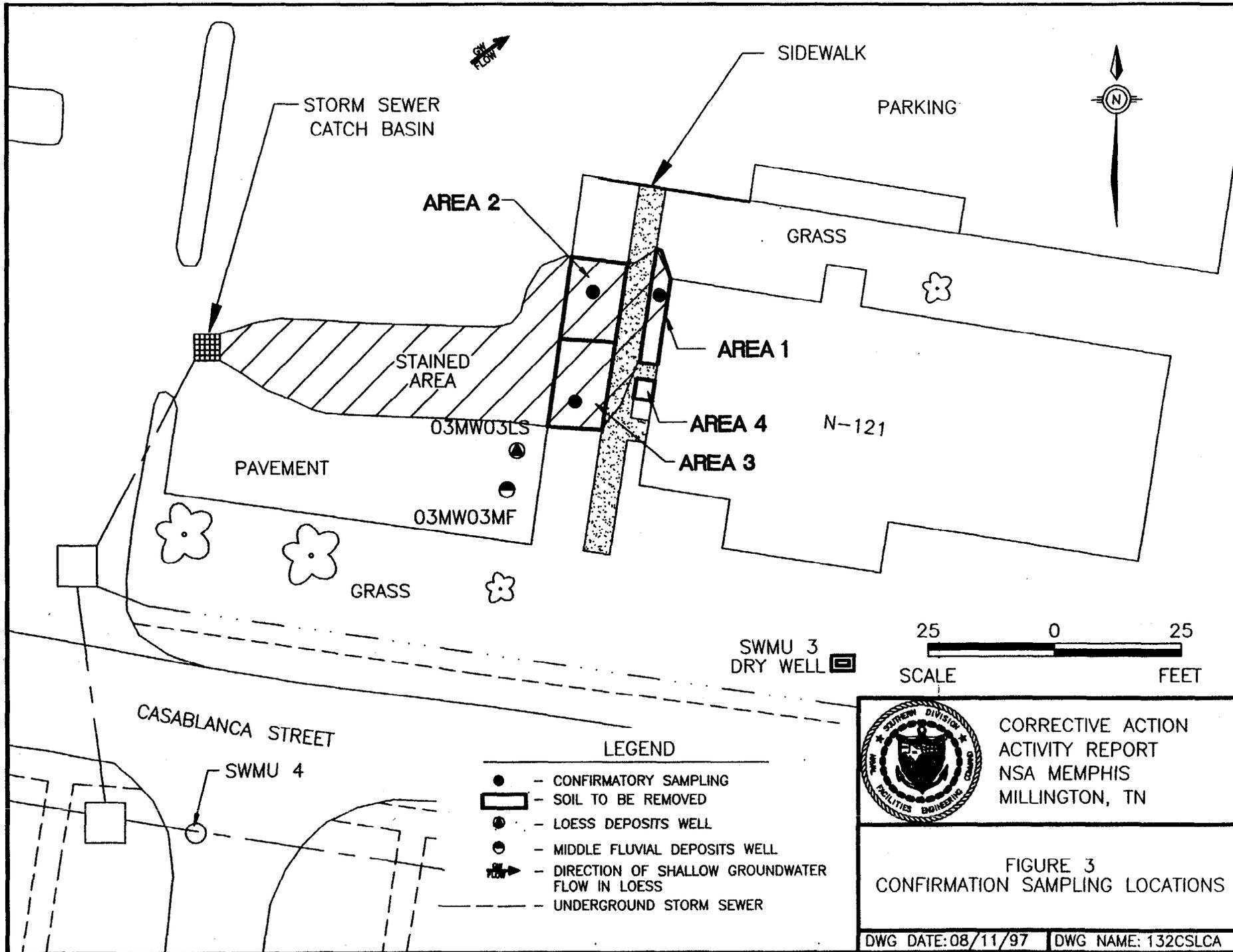
4.1 Phase I Activities

Initial Sampling with TDEC

On April 8, 1997, before any remedial activities were performed at the site, TDEC collected samples from the stained soil. Per a request by NSA Memphis, E/A&H split the samples with TDEC. The samples were analyzed for toxicity characteristic leaching procedure (TCLP) chromium by U.S. Environmental Protection Agency (USEPA) Method 1311. The two samples collected were a six-part composite sample and a grab sample. The six-part composite sample had two aliquots from Area 1 (Figure 3) and the remaining aliquots were collected from Area 2. E/A&H and TDEC split sample results are listed in Table 2.

Table 2
Results of Split Samples
(in micrograms per liter)

Sampler	Analyte	Six-part composite (132S000201)	Grab (132S000101)
E/A&H	TCLP Chromium	27,400	24,000
TDEC	TCLP Chromium	42,000	56,500



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Cleaning of the Storm Sewer Catch Basin

Residual contaminants from paved and concrete surfaces of the spill area were removed by pressure-washing and scrubbing. The storm sewer catch basin was lined with plastic before pressure-washing activities began (see Appendix B for storm sewer schematic). Water generated from pressure-washing and scrubbing paved surfaces was pumped from the lined catch basin into a portable tank provided by the removal contractor to minimize disposal sampling and container handling. No sediments were encountered in the bottom of the storm sewer catch basin (Figure 2) prior to pressure-washing of paved surfaces. Site conditions did not allow adequate sealing of the storm sewer catch basin outlet, therefore pressure-washing was not performed there because a release of the generated water could not be prevented.

Pressure-Washing of the Paved and Concrete Surfaces

All paved and concrete surfaces in the spill area (denoted in Figure 2) were pressure-washed with hot water and scrubbed to remove residual contaminants. Approximately 2,000 square feet of parking lot and sidewalk surfaces were cleaned. Two flush-mount monitoring wells in the parking lot, 03MW03LS and 03MW03MF, did not require remedial activity since they were outside the limit of the spill. All fluids generated by the pressure-washing activities were pumped from the plugged catch basin and containerized in the portable tank.

Contaminated Soil Removal

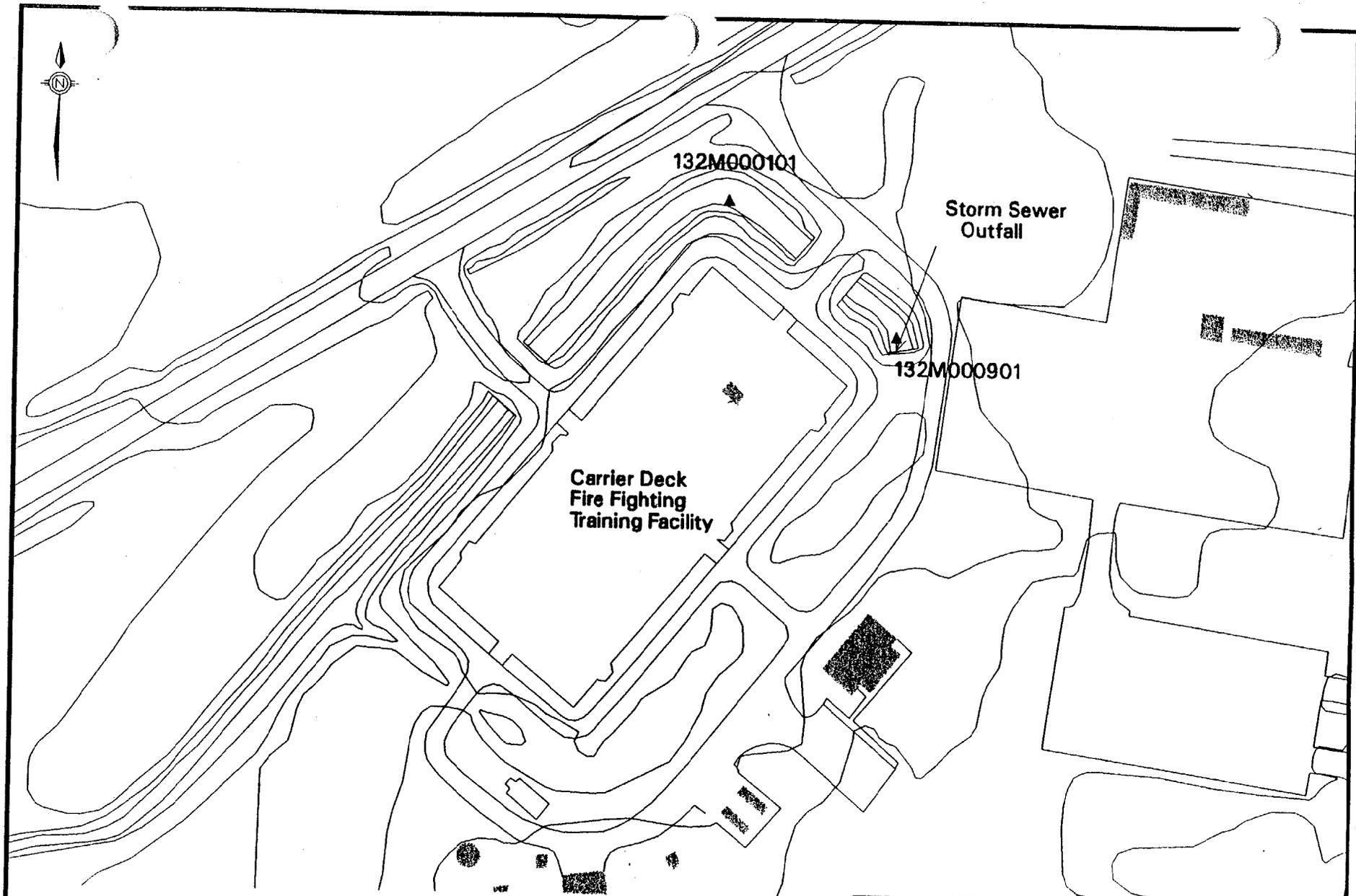
The contaminated soil excavated by the removal contractor was placed directly into two lined, covered, lockable, roll-off boxes provided by NSA Memphis. The areas of soil removed, shown in Figure 3, are approximately 5 feet wide by 25 feet long (Area 1) and 12 feet wide by 45 feet long (Areas 2 and 3 combined). One foot of soil was excavated in Phase I, generating approximately 15 to 20 cubic yards of material. Photographs of site activities are presented in Appendix D.

Confirmation samples collected on April 8, 1997, from the bottom of the excavation were analyzed for the following metals associated with electroplating processes — cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), silver (Ag), and zinc (Zn) — by USEPA Method 6010/7000 series and for pH by USEPA Method 9040. Confirmation sampling locations are shown in Figure 3. Results of the confirmation samples are tabulated in Table 3.

Although the analytical results were below SSLs for Chromium, the Navy decided to remove additional soil from Areas 1 and 2.

In addition to the confirmation samples collected at N-121, sediment samples were collected on April 9, 1997, at the outfall of the storm sewer catch basin. These samples were collected to determine if the spill had impacted any areas downstream of the outfall. This outfall is just north of the Carrier Deck Fire Fighting Training Facility. Two samples were collected — one at the outfall (132M000901) and one downstream at the edge of the concrete ditch (132M001001) (Figure 4). The sample collected at the edge of the concrete ditch was chosen because the ditch was deeper at this point, indicating slower water velocities and the potential for heavier materials settling in this area. At the time of sampling, water in the ditch was stagnant. Results from these samples are listed in Table 4.

Based on these sediment sampling results, the BCT determined no further action related to sediments would be required.



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**FIGURE 4
SEDIMENT SAMPLING LOCATIONS**

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Table 3
Phase I Confirmation Sampling Results

Analyte	Area 1 (132S000301)	Area 2 (132S000401)	Area 3 (132S000501)	Background Reference Concentration
Cadmium	3.8	0.88	0.21	3.24
Chromium	124	80.1	20.9	28.28
Copper	57.7	33.5	22.2	32.52
Lead	69.7	43.5	28.1	19.8
Nickel	19.1	17.1	17.6	ND
Silver	1.1	0.98	0.97	ND
Zinc	85.8	71.5	65.6	109
pH (std. units)	6.1	6.2	6.3	NA

Notes:

All units in milligrams per kilogram, unless otherwise stated.

ND = Nondetect

NA = Not applicable

Table 4
Sediment Sample Results

Analyte	132S000901	132S001001	Region IV Sediment Screening Values
Cadmium	0.6	1.0	1.0
Chromium	9.4	11.4	52.3
Copper	11.1	17.0	18.7
Lead	13.3	14.4	30.2
Nickel	9.6	21.0	15.9
Silver	0.8	1.3	2.0
Zinc	73.0	133.0	124.0
pH (std. units)	7.2	7.2	NA

Note:

All units in milligrams per kilogram, unless otherwise stated.

4.2 Phase II

To determine whether removing another foot of soil from Areas 1 and 2 would result in chromium concentrations less than the reference concentration, a screening sample was collected on April 23, 1997. This sample was a three-part composite collected with a hand auger within Area 1, from 12 to 18 inches below the bottom of excavation.

During Phase I sampling with TDEC, a purplish stained soil was encountered in the upper 3 inches in Area 1. A similar purplish soil was uncovered by the backhoe outriggers in an area south of Area 1 between the sidewalk and the building (Area 4). Because of earlier concerns about this material, the surface soil in Area 4 was removed from 0 to 6 inches as delineated by the purplish staining. The approximate extent of Area 4 is shown on Figure 3. To determine whether spill-related contamination was removed, a second screening sample was collected from Area 4. This was a three-part composite of surficial soil from the bottom of the excavation in Area 4. The screening samples from Areas 1 and 4 were analyzed for total chromium. Results from these samples are listed in Table 5.

Based on the screening sample results, another 1 foot of soil required excavation in Areas 1 and 2 to adequately remove contamination. Area 4 did not appear to be impacted by the spill, so no further excavation was required.

Table 5
Results from Initial Screening

Analyte	Area 1 (132S012001)	Area 4 (132S013001)	Reference Concentration
Chromium	9.26	20.0	28.28

Note:

All units in milligrams per kilogram.

On May 8, 1997, Areas 1 and 2 were excavated again. This soil was put into a third roll-off box provided by NSA Memphis. When excavation was complete, confirmation samples collected from Areas 1 and 2 were analyzed for the same analytes as in Phase I. Results of the confirmation sampling are summarized in Table 6.

While these results indicated the chromium concentration in Area 2 still exceeded the reference concentration, they were below residential respective RBCs/SSLs. The BCT determined that since this area is intended for non-residential use, the reported concentration is protective of human health and the environment and authorized backfilling the site.

Table 6
Phase II Confirmation Sample Results

Analyte	Area 1 (132S014001)	Area 2 (132S015001)	Background Reference Concentration
Cadmium	0.28	0.22	3.24
Chromium	17.5	37.4	28.28
Copper	18.4	20.3	32.52
Lead	16.0	15.9	19.8
Nickel	17.6	20.4	ND
Silver	0.68	0.65	ND
Zinc	65.9	69.0	109

Note:
 All units in milligrams per kilogram.

4.3 Phase III

Backfilling of Excavation

On June 16, 1997, the site was backfilled with approximately 30 cubic yards of clean soil. The soil was lightly compacted with the backhoe bucket and graded to match the existing soil profiles. After the site was graded, all disturbed portions were seeded with bermuda grass and fertilized with a commercial lawn fertilizer. The seeded area was then covered with approximately 6 inches of straw mulch to prevent excessive erosion and retain moisture while the seed germinated.

4.4 Disposal of Contaminated Soil and Water

All investigation-derived waste was handled in accordance with the IDW management plan for NSA Memphis (E/A&H, 1996).

Soil

E/A&H collected a composite sample of excavated soil from each of the three roll-off boxes for disposal characterization. Samples (132S000601 and 132S000701) from two of the roll-off boxes used during Phase I activities were collected on April 8, 1997. The remaining sample (132S016001) was collected from the third roll-off box on May 8, 1997, during Phase II activities. The composite samples consisted of a homogenization of three equal volumes of soil collected from 2 feet deep into the soil mass within the roll-off. One sample volume was collected from each end, and one was collected from the center of the roll-off box, for a total of three equal soil volumes. The samples were analyzed for TCLP metals (USEPA Method 6010/7000 series) with copper, nickel, and zinc added. Disposal sample results are listed in Table 7.

NSA Memphis decided to profile the excavated soil as a hazardous waste mixture following a telephone conversation with TDEC. NSA Memphis then labeled the roll-off boxes in accordance with applicable regulations and disposed of the material through the Defense Reutilization and Marketing Office. The spill was considered a less-than-90-day storage area for staging the soil

excavated from the site, until analytical results were received and the waste was disposed. The final disposal of the soil was to the LWD Landfill in Calvert City, Kentucky to undergo stabilization/chemical fixation using cement or pozzalonic materials. The liquids and solid material in two of the three roll-off boxes were also to undergo incineration. Copies of the manifests provided to E/A&H by NSA Memphis are included in Appendix E.

Table 7
Soil Disposal Sample Results

Analyte	Sample ID			TCLP Limits
	132S000601	132S000701	132S016001	
TCLP Arsenic	<0.027	<0.027	<0.027	5.0
TCLP Barium	1.350	1.380	0.849	100.0
TCLP Cadmium	0.0739	0.120	0.004	1.0
TCLP Chromium	0.700	0.968	0.291	5.0
TCLP Copper	0.152	0.245	<0.010	NA
TCLP Lead	0.0647	0.104	0.0124	5.0
TCLP Mercury	<0.00008	<0.00008	<0.00080	0.2
TCLP Nickel	0.0215	0.0257	0.0351	NA
TCLP Selenium	<0.027	<0.027	<0.027	1.0
TCLP Silver	<0.029	<0.029	<0.029	5.0
TCLP Zinc	0.963	1.180	0.629	NA
pH (std. units)	6.5	6.3	5.6	NA

Note:
 All units in milligrams per liter, unless otherwise stated.

Water

Water generated during pressure-washing and equipment decontamination activities was containerized in a single portable storage tank by the removal contractor. The water in the storage

tank was sampled by E/A&H personnel on April 8, 1997, to determine whether it could be discharged to the sanitary sewer system connected to the City of Millington publicly owned treatment works. The sample was analyzed for pH, and total metals associated with electroplating processes (Cd, Cr, Cu, Pb, Ni, Ag, and Zn). The results of these analyses were submitted by E/A&H to the NSA Memphis Public Works Office and the City of Millington contracted engineers and are summarized in Table 8.

Approval to discharge the water generated at Building N-121 was granted by the City of Millington's engineers, Fisher & Arnold Inc., on April 28, 1997. A copy of the letter granting discharge of the generated water is provided in Appendix F. On May 8, 1997, the water was discharged to the sanitary sewer at the decontamination pad at Building S-775. The water was flushed down the sanitary sewer with deionized water from the system within Building S-775. This sanitary sewer drain is connected to an onsite oil/water separator.

Table 8
Water Disposal Sample Results
Sample ID: 132W000801

Analyte	Concentration (milligrams/liter)
Cadmium	0.0338
Chromium	7.160
Copper	1.090
Lead	1.230
Nickel	0.0779
Silver	0.0088
Zinc	30.500
pH (std. units)	6.95

Note:
All units in milligrams per liter, unless otherwise stated.

4.5 Quality Assurance/Quality Control

The analytical data collected at N-121 were validated at data quality objective level III equivalent. The data validation report and copies of all laboratory reports are provided in Appendix G.

4.6 Decontamination Procedures

Decontamination adhered to Section 4.11 of the *Comprehensive RCRA Facility Investigation (RFI) Work Plan*.

5.0 REFERENCES

EnSafe/Allen & Hoshall. (September 1995). *Investigation-Derived Waste Management Plan (NSA Memphis RFI)*. E/A&H: Memphis, Tennessee.

EnSafe/Allen & Hoshall. (October 1994). *Comprehensive RCRA Facility Investigation Work Plan*, Naval Air Station Memphis. E/A&H: Memphis, Tennessee.

EnSafe/Allen & Hoshall. (July 1996). *RCRA Facility Investigation Report, Building N-121 Plating Shop Dry Well, NAS Memphis, Millington, Tennessee*. E/A&H: Memphis, Tennessee.

ERC. (August 1990). *RCRA Facility Assessment (RFA), NAS Memphis, Millington, Tennessee*.
ERC: Knoxville, Tennessee.

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APPENDIX A
SPILL REPORT

**Spill Response Notification Form
National Response Center 1-800-424-8802**

Note: It is not necessary to wait for all information before calling the NRC

TABLE ERAP C.1: SPILL RESPONSE NOTIFICATION FORM	
REPORTER INFORMATION	
Reporter's name	
Last	Chief Dooley
First	
Reporter's phone number	
Company	Navy
Organization type	Military
Position	
Address	Street: Bldg. 930
	City: Millington
	State: Tn
	Zip Code: 38054
Materials released	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Confidential	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Time call received	11:15 2-5-97 (use 24 hour time)

JB
2-12-97

TABLE ERAP C.1: SPILL RESPONSE NOTIFICATION FORM

INCIDENT DESCRIPTION	
Source and/or cause of incident	Two vats one labeled chromic acid and the other labeled danger hydrochloric acid were removed from building N-121 and set outside, at least a month to a month and a half ago for removal. The vats were presumed to be empty before they were moved outside per Master Chief French of the 1 st LT office. The vats filled up with rain water and were emptied onto the ground. PO Pernerman and Styles assumed they were dumping rusty rain water.
Date	2-4-97 Called in 2-5-97
Time of incident	0800 2-4-97 (use 24 hour time)
Incident address/location	N-121
Nearest city	Millington Tn.
County	Shelby
State	Tn.
Zip code	38054-5045
Distance from city (miles)	approx. 1
Section	
Township	
Range	
Container type	Vat
Tank capacity (include units)	approx 135 gallons each container
Facility capacity (include units)	N/A
Facility latitude	35 degrees 20 minutes 30 seconds
Facility longitude	89 degrees 52 minutes 00 seconds
Weather conditions	Cold Partly Cloudy Temp Low 40's
Materials released	CHRIS code N/A
<input checked="" type="checkbox"/> Yes	Quantity released approx. 100 gallons (include units)
<input type="checkbox"/> No	Material released into water <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Quantity released into water Approx. 0 gals (include units)



TABLE ERAP C.1: SPILL RESPONSE NOTIFICATION FORM

RESPONSE ACTIONS

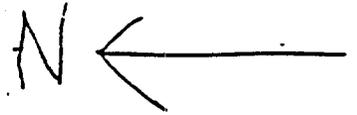
<p>Actions taken to correct incident</p>	<p>The area was barricaded off. The exposed soil and pavement was covered with plastic and protected with straw bales and sand bags. The storm drain was protected with corrosive spill pillows and straw bales. A sample of the material was taken and sent to a lab. The results of the sample showed the material to be a corrosive liquid with a ph of 2.2 and chromium of 31,560 ppm (totals).</p>
<p>Actions taken to control incident</p>	<p>Additional sampling will be conducted on the affected soil, pavement and drainage ditches. All clean up operations will be conducted by contract at a later date. Approximately 22 feet by 50 feet by 1 foot deep of soil will be removed and the pavement will be pressure washed.</p>
<p>Actions taken to mitigate incident</p>	<p></p>

TABLE ERAP C.1: SPILL RESPONSE NOTIFICATION FORM

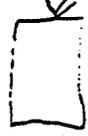
Impact	
Number of injuries	0
Number of deaths	0
Evacuation(s) required	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Was there any damage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Damage in dollars (estimated)	Clean up cost \$40,000
Medium affected	Soil and pavement
Description of affect	Soil next to the building on the west side and the parking lot on west
	side of the building. See video tape or pictures for additional
	information.
Additional information about medium	None
Additional information Any information about the incident not recorded elsewhere in the report	The State of Tennessee RCRA and Stormwater Departments were
	also notified in addition to the agencies already listed.
	Additional information is attached to this report.
Caller Notifications	
EPA	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
USCG	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
SERC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
LEPC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
NOSC Jerry Wallmeyer 1405	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other (list) PWE	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other (list) PWO 1140	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other State Jim Morrison 1500	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other (list) BEC David Porter 1500	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

N-121

40'-0"



2x3'x3'
METAL
BOX



CONCRETE
SIDEWALK

5'-0" GRASS

5'-0"

50'-0"

22'-0"

GRASS

GRASS

URB

HEAVY
STAINING

MONITORING
WELL

15'-0"

90'-0"

ASPHALT
PARKING
LOT

GRASS



STORM
WATER
INLET

ENVIRONMENTAL TESTING & CONSULTING, INC.
 2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750
INORGANIC ANALYSIS DATA SHEET

Handwritten notes:
 5/2/97
 1/1/97
 1/1/97

Client Name **Ensafe/Allen & Heshall**
Navy Clean Joint Venture
5909 Shelby Oaks Dr.
Suite 201
Memphis, TN 38134

Project #

Site ID **Special**

Date Arrived **02/05/97**
 ETC Order Number **9702125**

ETC Lab ID **9702125-01**
 Sample ID: **121Z020597**

Matrix : **LIQUID**
 Sample Date : **02/05/97**

TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED BY	METHO
Reactive Cyanide	<0.125	mg/L	0.125	0850	02/06/97 GD	9010
Cyanide	<0.125	mg/L	0.125	0850	02/06/97 GD	335.2
Ignitability/Flashpoint	>96	°C		0900	02/06/97 GD	1010
pH - Corrosivity	2.2	SU		1525	02/06/97 RE	9040
Reactive Sulfide	<0.125	mg/L	0.125	0850	02/06/97 GD	9030
Silver	<0.200	mg/Kg	0.200	1300	02/06/97 TD	6010A
Arsenic	<5.00	mg/Kg	5.00	1300	02/06/97 TD	6010A
Barium	0.909	mg/Kg	0.050	1300	02/06/97 TD	6010A
Cadmium	32.2	mg/Kg	0.100	1300	02/06/97 TD	6010A
Chromium	31,560	mg/Kg	0.200	1300	02/06/97 TD	6010A
Mercury		mg/Kg	0.020			7471
Lead	<4.50	mg/Kg	4.50	1300	02/06/97 TD	6010A
Selenium	<37.1	mg/Kg	37.1	1300	02/06/97 TD	6010A

Handwritten signature
LABORATORY MANAGER
 000034

ENVIRONMENTAL TESTING & CONSULTING, INC.
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ORGANIC ANALYSIS DATA SHEET

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Navy Clean Joint Venture
5909 Shelby Oaks Dr.
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Memphis, TN 38134
 Site ID **Special**

Project #
 FID #

Date Arrived **02/05/97**
 ETC Order Number **9702125**

ETC Lab ID **9702125-01**
 Sample ID: **121Z020597**

Matrix : **LIQUID**
 Sample Date : **02/05/97**

TEST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYSED	BY	METHOD
Volatile Organics							8240
				02/06/97	LS		
Acetone	ND	ug/L	2000				
Acrolein	ND	ug/L	1000				
Acrylonitrile	ND	ug/L	1000				
Benzene	ND	ug/L	100				
Bromodichloromethane	ND	ug/L	100				
Bromoform	ND	ug/L	100				
Bromomethane	ND	ug/L	100				
Carbon Disulfide	ND	ug/L	1000				
Carbon Tetrachloride	ND	ug/L	100				
Chlorobenzene	ND	ug/L	100				
Chlorodibromomethane	ND	ug/L	100				
Chloroethane	ND	ug/L	100				
2-Chloroethyl vinyl ether	ND	ug/L	1000				
Chloroform	ND	ug/L	100				
Chloromethane	ND	ug/L	100				
Dibromomethane	ND	ug/L	100				
1,4-Dichloro-2-butene	ND	ug/L	200				
Dichlorodifluoromethane	ND	ug/L	100				
1,2-Dichlorobenzene	ND	ug/L	100				
1,3-Dichlorobenzene	ND	ug/L	100				
1,4-Dichlorobenzene	ND	ug/L	100				
1,1-Dichloroethane	ND	ug/L	100				
1,2-Dichloroethane	ND	ug/L	100				
1,1-Dichloroethene	ND	ug/L	100				
trans-1,2-Dichloroethene	ND	ug/L	100				
1,2-Dichloropropane	ND	ug/L	100				
cis-1,3-Dichloropropene	ND	ug/L	100				
trans-1,3-Dichloropropene	ND	ug/L	100				
Ethylbenzene	ND	ug/L	100				
Ethyl Methacrylate	ND	ug/L	1000				
2-Hexanone (MBK)	ND	ug/L	1000				
Iodomethane	ND	ug/L	400				
4-Methyl-2-pentanone (MIBK)	ND	ug/L	1000				
Methyl Ethyl Ketone (MEK)	ND	ug/L	1000				
Methylene Chloride	ND	ug/L	500				
Styrene	ND	ug/L	100				
1,1,2,2-Tetrachloroethane	ND	ug/L	100				
Tetrachloroethane	ND	ug/L	100				
Toluene	ND	ug/L	100				
1,1,1-Trichloroethane	ND	ug/L	100				
1,1,2-Trichloroethane	ND	ug/L	100				
Trichloroethene	ND	ug/L	100				

D - Not Detected

[Signature]
 LABORATORY MANAGER

000035

ENVIRONMENTAL TESTING & CONSULTING, INC.
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ORGANIC ANALYSIS DATA SHEET

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Navy Clean Joint Venture
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 Site ID **Special**

Project # _____
 FID # _____

Date Arrived **02/05/97**
 CTC Order Number **9702125**

CTC Lab ID **9702125-01**
 Sample ID: **121Z020597**

Matrix : **LIQUID**
 Sample Date : **02/05/97**

EST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
Volatile Organics							
					02/06/97	LS	8240
	Trichlorofluoromethane	ND	ug/L	100			
	1,2,3-Trichloropropane	ND	ug/L	100			
	Vinyl Acetate	ND	ug/L	1000			
	Vinyl Chloride	ND	ug/L	200			
	Xylenes	ND	ug/L	100			
	cis-1,2-Dichloroethene	ND	ug/L	100			
Surrogate Standard							
		% Recovery		OC Limits			
S	Dibromofluoromethane	108		86	118		
	Toluene-d8	108		88	110		
	4-Bromofluorobenzene	99		86	115		

000036

D - Not Detected

Handwritten Signature
 LABORATORY MANAGER

I TODD STYLES WAS SENT OVER NORTHSIDE BLDG. N121
TO MOVE EQUIPEMENT INTO THE BUILDING WHILE MOVING
A CLEANING TANK A DRAIN FITTING WAS BROKEN OFF, WE
WERE UNSUCCESSFUL IN STOPPING THE LEAK. WE THEN TURNED
THE TANK OVER SO WE COULD MOVE THE TANK EASIER, THE CON-
-ENTS OF THE TANK APPEARED TO BE HALF WATER OR MORE MIXED
WITH WHAT APPEARED TO BE ALODINE. IN COLOR.

AMS² T. STYLES

NOTE: NO ONE GOT ANY THING
ON THEM OR THEIR CLOTHES

LCDR:

SIR, THE VATS IN QUESTION HAVE BEEN OUTSIDE IN THE RAIN FOR AT LEAST A MONTH, MONTH AND A HALF. WHEN WE MOVED THEM FROM INSIDE, NOTHING WAS IN THEM THAT I COULD SEE BUT DUST.


J. E. [unclear] 1ST LT.

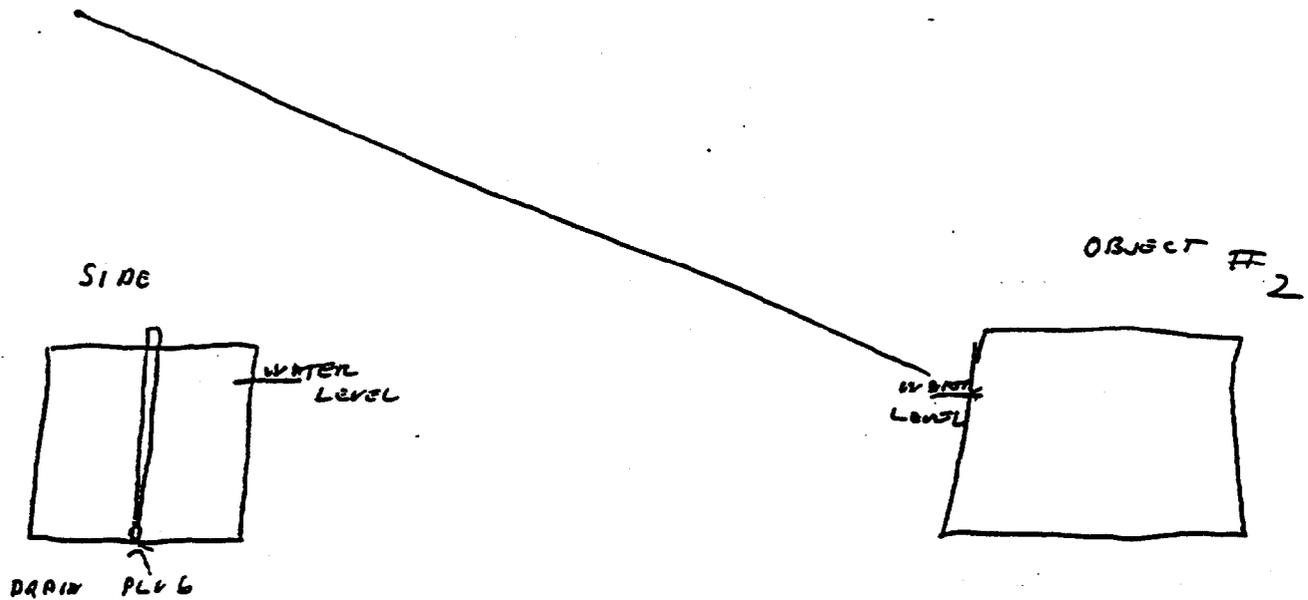
John Leonard - 2/11/77
0033

1 out from payroll line

Barth Thomas 2/12/77

0947

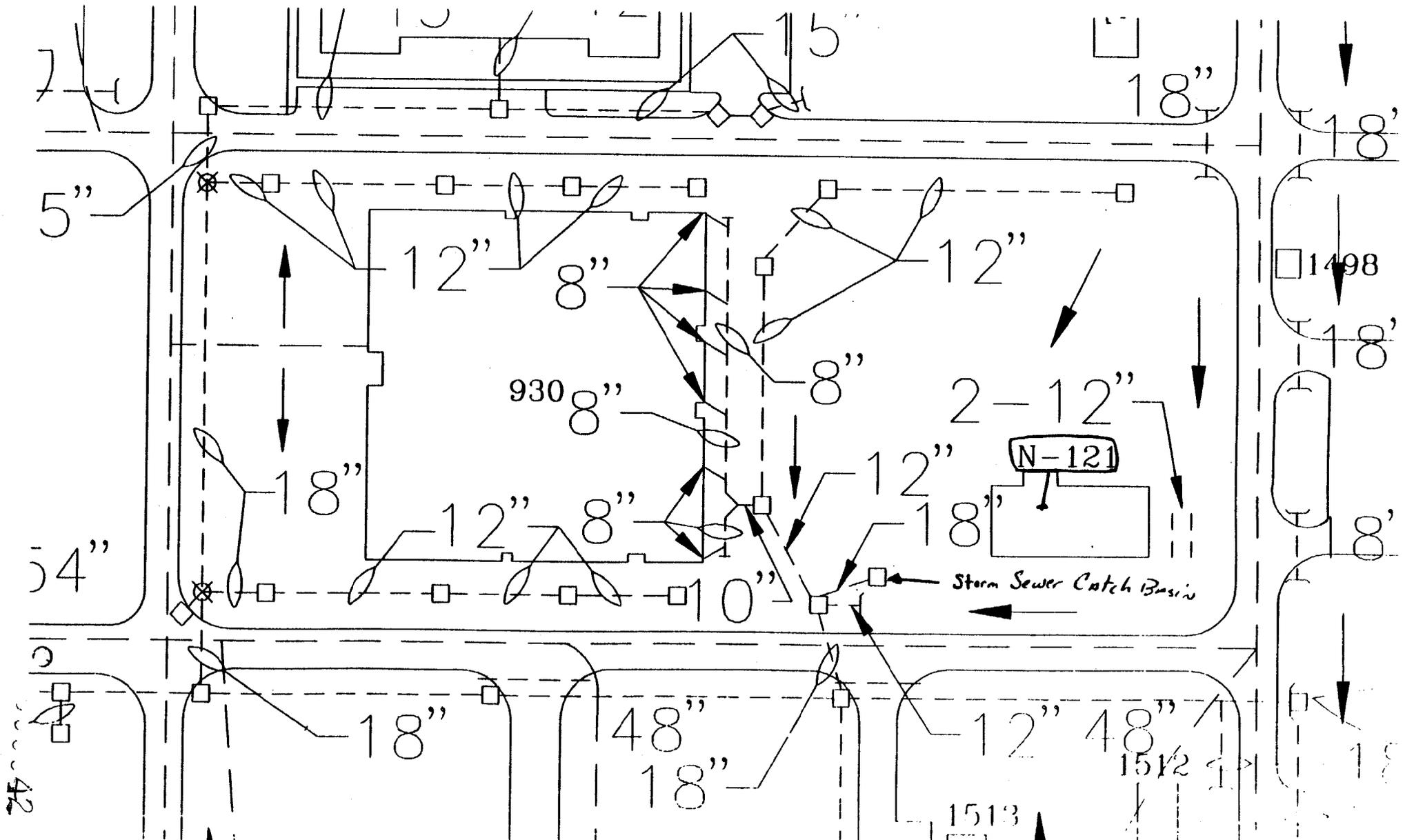
I ABE-2 PENERMAN WAS TOLD TO REPORT TO BLDG 121 TO MOVE EVERYTHING THAT WAS OUTSIDE BACK IN THE INSIDE, I INFORMED MY SUPERVISOR THAT THE THREE OBJECTS WAS TOO HEAVY FOR ME TO MOVE BY MYSELF, HE SENT A COUPLE OF INMATES TO HELP ME WITH NETTY OFFICER STYLES, SO WE STARTED TO MOVE IT WHEN THE DRAIN PLUG BROKE OFF, (IT WAS 3/4 FULL) SO WE LET IT DRAIN, WE WAS PRESSED FOR TIME, THINKING IT WAS RAIN WATER WE PUSHED IT OVER TOWARDS THE BUILDING PICKED IT UP AND MOVED IT INSIDE, NOBODY I KNOW GOT ANYTHING ON THEM.

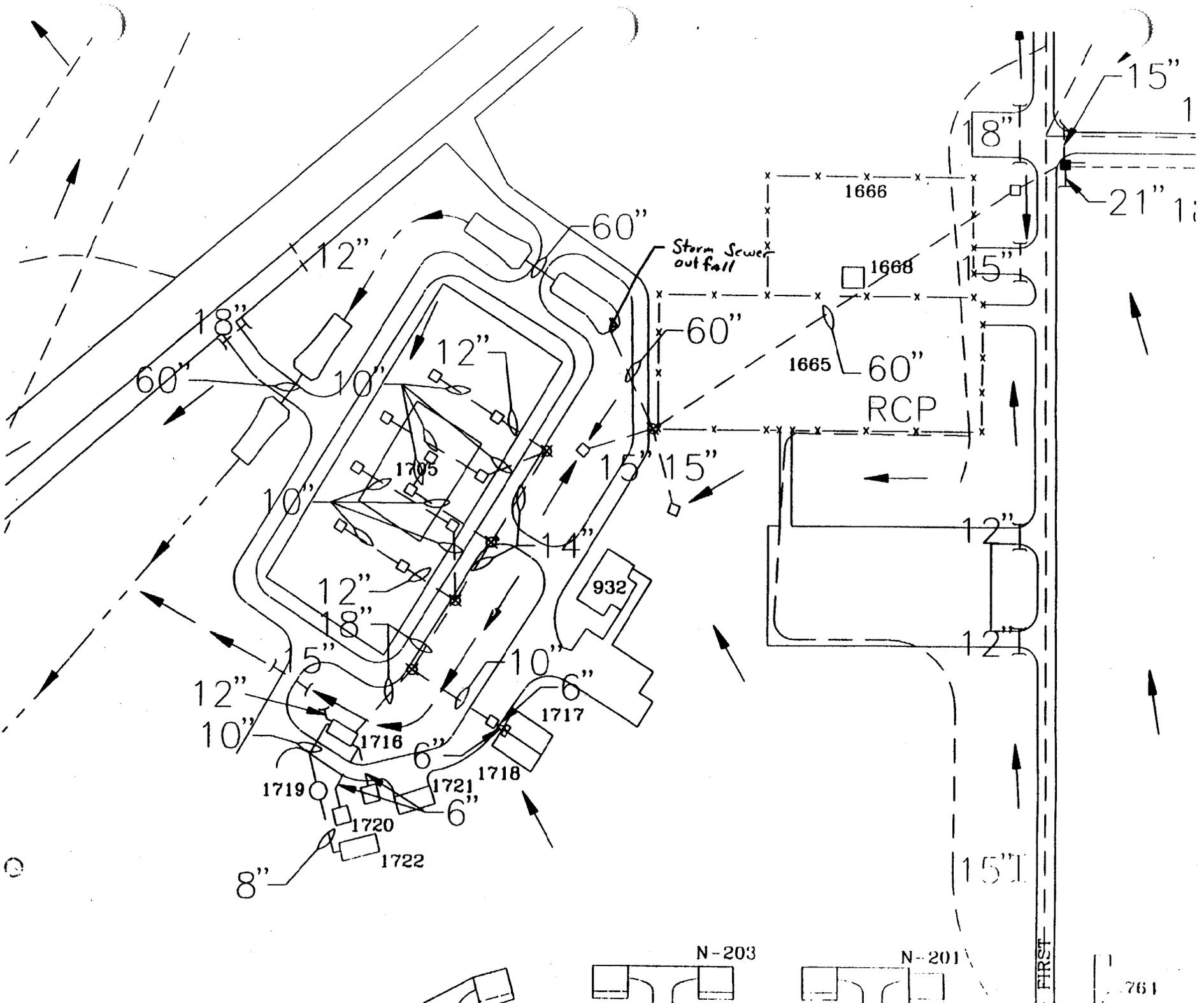


Robert J. [Signature]
[Signature]

APPENDIX B
STORM SEWER MAPS

000041





000044

N-203

N-201

FIRST

761

APPENDIX C
ENVIRONMENTAL BASELINE SURVEY FORM

000045

Note which documents you review in all sections of this form

Base NAS Memphis
 Building Number N-121.SWMU 3
 Site Location 50-2X

FACILITY INFORMATION		Site Classification Number/Color	6/Red
Surveyor's Name(s)	Paul E. Ortstadt		
Date	January 10, 1994		
Building Contacts: <i>Contact personnel should be persons knowledgeable of the uses and physical characteristics of the property and facility.</i>	Name	Title	Telephone Number
	Jim Forbess	MWR Equipment Division Head	901/873-5163
	Gerald Stiles	MWR Maintenance Mechanic	901/873-5163
Years Associated with Building	36 years		
	20 years		
Name of Command	NAS Memphis		
Name of Operating Command	Public Works Department		
Building Name	Plating Shop		
Building Number	N-121 and SWMU 3		
Other Building Identification	Property record number 200666		
Street Name	Casablanca Street		
Facility Type	<input type="checkbox"/> Utilities <input type="checkbox"/> Light Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Undeveloped <input type="checkbox"/> Recreation <input type="checkbox"/> Heavy Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Housing <input checked="" type="checkbox"/> Miscellaneous		
Telephone	None	Number of Employees	0
Fax Numbers	None	Length of time of current operations	2 years
Ownership details (Lease ?)	Owned by NAS Memphis since April 17, 1942. Part of Tract I, Parcel 10, Northside, the original 113.13 acres were acquired by Civil Action 420 from John R. Aycock and Ruth A. Aycock.		
Description of Facility (Construction and use)			
<p>Building N-121 was constructed in 1951. It is a pre-engineered metal structure of 4343 square feet (see photographs N-121-1, -2, and -4). It is currently used as a storage building and contains boxes of records, lockers, MWR electronic scoreboards, tables, etc. The plating room is full of construction and general debris (see photographs N-121-6, -7, -8, and -9). SWMU 3, a 6' x 6' x 10' dry well, is located immediately south of N-121 (see photographs N-121-3)</p>			

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

General Comments (Permitted Operations if applicable)

No permitted operations occur in this facility based on document reviews and interviews.

List all previous operators of the facility

Previous Facility Operators	Date
Naval Reserve Air Base Training Command/NAS NATTC	1941-1976
NAS MWR	1976-1991

Describe all current and previous uses of the property by the current and former land owners and operators.

N-121 is currently a secured storage facility under the cognizance of NAS Public Works. Its contents include MWR equipment and records, construction debris, tables, lockers, and three upright freezer units (locked) which according to interview, belonged to the NAS Commissary (see page 16).

From Navy acquisition in 1941 until the construction of N-121 in 1951, the property was the southeast corner of the "Airman School." After N-121 construction until 1976, N-121 was used as a Plating Shop for the instruction of aircraft corrosion control conducting cadmium, chromium, copper, and nickel plating processes employing cyanide-based solutions. During this time a reported 9,000 gallons of neutralized plating process wastes were discharged through floor drains into a 10' x 10' x 6' deep dry well (SWMU 3) on the south side of the property (photographs N-121-3 and references N-121-1, -2, -3, and EA-26). Soil samples collected from the dry well in early 1980 indicated the presence of nickel, cadmium, and chromium (Ref. EA-15). The dry well requires full RFI characterization (Ref. EA-11).

Sometime after the termination of plating operations in 1976 and until 1991 the NAS MWR employed N-121 for a storage and recycling facility. In 1991 the MWR moved its recycling operations to S-233 and released the building to NAS Public Works. For further details on N-121 and associated SWMU 3 (Ref. EA-04, 06, 11, 15, 26, and N-121-1 through -6).

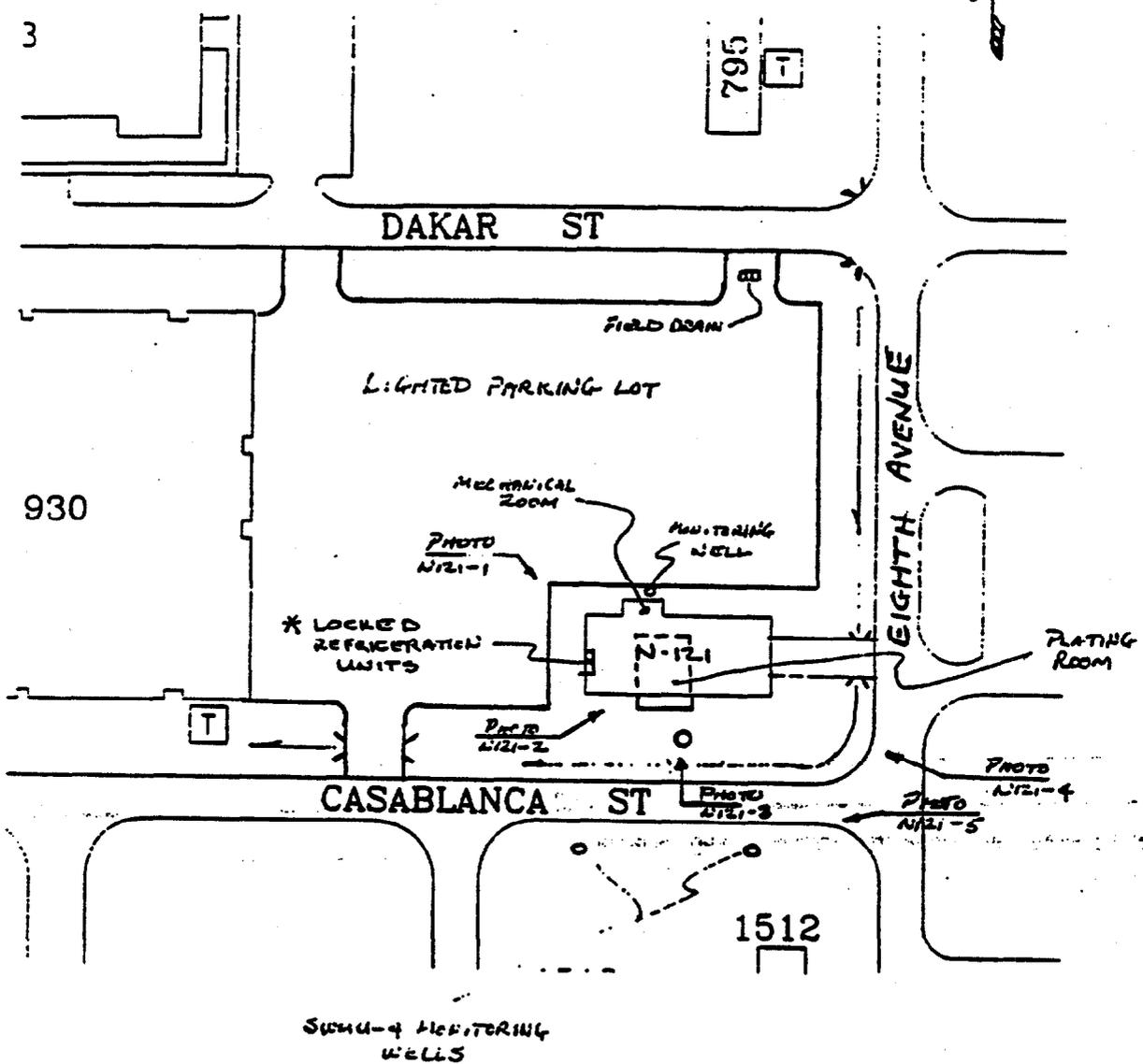
Historically, NAS Memphis and associated properties received various pesticide and/or herbicide applications. It is assumed that residual amounts of these materials are present in soils and bodies of water throughout the Base (Ref. EA-48).

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121, SWMU
Site Location 50-3

Sketch a plot plan of the property and a location plan showing surrounding buildings or attach copy of map/blue-line drawing. Provide reference numbers and titles of pertinent building drawings.

904
02:20:41pm



* SEE PAGE 10 OF THIS IBS REPORT

n_.tif

000048

Note which documents you review in all sections of this form

Base NAS Memphis
 Building Number N-121.SWMU 3
 Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
SITE RECONNAISSANCE		
<p>The environmental professional conducting the site reconnaissance should visually and physically observe the property and any structures located upon it. The following items should be described based upon the site inspection and interviews with the owner/occupant of the property.</p>		
<p>Take photos of facility from all angles outside and of key areas inside.</p>		
General Site Setting		
Current Uses of the Property		
<p>Are any current uses likely to involve the use, treatment, storage, disposal, or generation of hazardous substances or petroleum products? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>		
Past Uses of the Property		
<p>Were any past uses likely to involve the use, treatment, storage, disposal, or generation of hazardous substances or petroleum products? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>		
<p>Report all past uses which can be determined based upon observations and interview/record review below.</p>		
<p>N-121 and associated property has been used as Navy Reserve Air Base Administrative Complex, a training facility for aircraft corrosion control plating operations training, and an MWR storage and recycling facility. During plating operations hazardous waste substances were discharged into a dry well on the property and into storm drains south of the facility.</p>		
Current and Past Uses of Adjoining Properties		
<p>Report all past and present uses of adjoining properties which can be determined based upon observations and interview/record review below. Only information concerning activities likely to cause a recognized environmental impact on the subject need be reported.</p>		
<p>Adjoining properties contain no activities likely to cause any recognizable environmental impact.</p>		
General Description of Structure		
<p>Describe all structures or other improvements on the property.</p>		
<p>N-121 has a metal roofed, concrete block extension on the south side which, according to interviews, housed plating process equipment, possibly vats (see photographs N-121-2, -3, and -4) and on the north side an attached mechanical room for handling NAS steam for heating (see photograph N-121-1). Both building extensions were locked and therefore were not inspected. Building N-121 is adjoined on the west and north by a lighted parking lot.</p>		

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
Roads		
Describe all public thoroughfares adjoining the property and any roads, streets, and parking lots on the property.		
North - parking lot and Dakar Street; South - Casablanca Street; East - Eighth Avenue; West - Parking lot to building 930		
Air Pollution Sources		
Describe all sources, emission allowances etc.		
No permitted or non-permitted air pollution sources were discovered during visual site inspection, interviews or document search.		
Potable Water Supply		
Describe the source of potable water for the facility. (Lead content tested?)		
The source of potable water is the NAS Memphis water treatment system. Lead and copper testing are routinely accomplished (Ref EA30).		
Sewage Disposal System		
Describe the sewage disposal system for the facility.		
The July 16, 1968 NAS Sanitary Sewerage Drawing does not show service to N-121, however, after 1980, the building may have been connected to the present sewage system. Prior to 1980 it is apparent that N-121 drains were connected to the Northside Storm/Sewer drain.		
Storm Water		
Describe the storm water characteristics of site.		
Storm water drainage is handled by parking lot field drain to the north and yard drainage to the east and south to street side drainage ditches.		
Storage Tanks		
Identify all underground storage tanks, vent pipes, fill pipes, material stored, capacity, containment etc. indicating underground storage tanks based on physical observations, interviews, or records review.		
No evidence of underground storage tanks was determined by physical observations, interviews, or document searches. (Reference EA08)		

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
Odors		
Report any strong, pungent, or noxious odors. If possible, indicate the source of such odors.		
No strong, pungent or noxious odors were discovered during physical observations or interviews.		
Pools of Liquid		
Report all standing surface waters. Describe all pools or low areas containing liquids likely to be hazardous substances or petroleum products.		
No standing surface waters, pools, or low areas containing liquids likely to be hazardous substances or petroleum products were discovered during physical observations or interviews.		
Unidentified Substance Containers		
Describe all open or damaged containers containing unidentified substances suspected of being hazardous substances or petroleum products. Include the approximate quantities, types of containers, and storage conditions.		
No open or damaged containers containing unidentified substances or petroleum products were discovered during physical observations.		
PCBs		
Describe all electrical or hydraulic equipment known or suspected to contain PCBs. (Survey conducted, When, Results??)		
There are no transformers located at N-121. A PCB audit and survey was conducted, report dated December 1982 (Ref. EA-36). this survey report shows three transformers associated with N-121, however, they have been removed from the site. The date of removal was not determined, however, it appears to have been after the 1992 PCB survey.		
Heating/Cooling		
Describe the means of heating and cooling all buildings on the property (Fuel source, boiler size)		
The building is heated by the base steam heating system dispersed by ceiling fans. The building has a roof-mounted exhaust fan for circulation.		

000051

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
Stains		
Describe all significant stains on floors, walls, and ceilings.		
No significant stains were discovered during physical observations or identified during interviews on any floors, walls or ceilings. The plating room floor could not be readily examined due to the amount of stored equipment and construction debris present.		
Drains and Sumps		
Describe all floor drains and sumps.		
A floor drain was noted in the eastern-most room, however, the floor of the plating room could not be examined for drains or sumps due to stored equipment and debris.		
Pits, Ponds, and Lagoons		
Describe all pits, ponds, and lagoons on the property, especially if they are or were used in conjunction with waste disposal or waste treatment. Also describe pits, ponds, or lagoons on adjoining properties.		
No pits, ponds, or lagoons were discovered on or adjoining the property during physical observations or identified during interviews.		
Stained Soil		
Describe any significant areas of stained soil found on the property. Note on plot plan.		
No significant areas of stained soil were found on the property during physical observations or identified during interviews.		

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121, SWMU 3
Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
Stressed Vegetation		
Describe any areas of stressed vegetation (from a cause other than insufficient water) found on the property.		
No areas of stressed vegetation were noted on the property during physical observations or identified during interviews.		
Solid Waste		
Describe any areas that are apparently filled or graded by non-natural causes, areas filled by fill of unknown origin, or mounds or depressions which suggest that trash or other solid waste disposal may have occurred.		
Solid waste dumpsters at NAS Memphis are designed by Base personnel for disposal of non-hazardous materials only. The dumpsters are marked "No wood or metal", and are transported to the BFI Millington Landfill located at 7111 Old Millington Road for disposal. The current waste contractors are Maclin Sanitation for family housing and wet garbage wastes, and Military Waste Management, Inc., for the mixed refuse collected from on-base dumpsters. No areas that had been apparently filled or graded by non-natural causes, or filled by fill of unknown origin or mounds or depressions were noted on the property during physical observations or identified during interviews.		
Wastewater		
Describe any wastewater or other liquids other than storm water which discharge into a ditch or stream on or adjacent to the property.		
No evidence was discovered during physical observations or interviews of any wastewater or liquids other than storm water discharging into ditches or streams.		
Dry Wells		
Describe all wells that are not sources of water or of known mineral extraction and are used or suspected to be used for disposal of liquid wastes.		
N-121 has an inactive 10' x 10' x 6' deep dry well filled with gravel (SWMU 3) located on the south side of the building. During plating operations it was the receptor of concentrated plating solutions and plating tank overflows. SWMU 3 requires full RFI characterization (Ref. EA-11).		
Wetlands		
Describe location and approximate area.		
No wetlands exist on or adjacent to the property based on document searches, interviews, or physical observations.		

000053

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121, SWMU 3
Site Location 50-2X

PHASE I ENVIRONMENTAL SITE ASSESSMENT		✓
Septic Tanks		
Describe all onsite septic systems or cesspools which exist on the property. If none are known to exist, describe any indications that such devices may be on the property.		
No onsite septic systems or cesspools or indications of the existence of previous systems were discovered on the property during document searches, interviews, or physical observations.		
Asbestos-Containing Materials		
Note any suspect asbestos containing materials. (Survey conducted, When, Results??)		
A report of a base-wide asbestos assessment/inventory of NAS Memphis was published in 1992. This report revealed no ACM detected, assumed, or suspected for N-121 (Ref. EA-27).		
Lead-Based Paint		
Note any suspect lead-based paint. (Survey conducted, When, Results??)		
As of November 1993, there has not been a comprehensive lead-based paint study conducted at the NAS Memphis complex. However, pre-1978 buildings and structures are likely to have been painted with paints containing lead (Ref EA-31). Since N-121 was constructed in 1951, it is possible that its interior could contain lead-based paint.		
Radon		
Note any affected areas. (Survey conducted, When, Results??)		
No evidence of a radon survey was found during interviews or document searches.		
Radioactive Materials		
Note locations, quantities, types, uses.		
No known radioactive materials were discovered during physical observations, document searches, or interviews.		

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

PROCESS FLOW DIAGRAM

(Describe any processes or pollution control that is conducted/fitted within the building and indicate any possible process closure/decontamination requirements or waste disposal problems)

The following items on this site require proper closure:

The west room of N-121 contains three large locked refrigeration units. Interviews with MWR personnel indicate that at one time, these units belonged to the NAS commissary. The keys to these units were not located during the survey of N-121, therefore their contents were not identified. It is therefore recommended that N-121 closure activities include identification of the units' contents (if any) and their proper disposition.

*Note which documents you review
in all sections of this form*

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

PROCESS FLOW DIAGRAM (As appropriate)

See previous page.

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121, SWMU 3
Site Location 50-2X

CONCLUSION/EXECUTIVE SUMMARY
(Attach plans and photographs)

Classification (Based on the information/data/documentation available at the time of the survey)	Classification Number	Map Color
Areas where no storage, release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).	1	White
Areas where only storage of hazardous substances or petroleum products has occurred (but no release, disposal, or migration from adjacent areas has occurred).	2	Blue
Areas where storage, release, disposal and/or migration of hazardous substances or petroleum products has occurred, but at concentrations that do not require a removal or a remedial action.	3	Light Green
Areas where storage, release, disposal and/or migration of hazardous substances or petroleum products has occurred, and all remedial actions necessary to protect human health and the environment have been taken.	4	Dark Green
Areas where storage, release, disposal and/or migration of hazardous substances or petroleum products has occurred, removal and/or remedial actions are under way, but all required remedial actions have not yet been taken.	5	Yellow
Areas where storage, release, disposal and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been implemented.	6	Red
Areas that have not been evaluated or require additional evaluation.	7	Grey

EXECUTIVE SUMMARY:

Building N-121's use as a plating shop during the period from 1951 to 1976 and the use, storage, and release of hazardous substances to its associated dry well (SWMU 3), and its required RFI characterization, which has not yet been implemented, causes N-121 and SWMU 3 to be classified 6/Red.

Note which documents you review
in all sections of this form

Base NAS Memphis
Building Number N-121.SWMU 3
Site Location 50-2X

List a description of documents reviewed.

EA 01. Master Plan, Naval Complex, Memphis, Tennessee April 1965
EA 02. History of NAS Memphis Environmental Program
EA 03. RCRA Facility Assessment NAS Memphis April 1990
EA 04. RFS Work Plan NAS Memphis 16 November 1989
EA 05. Final Remedial Action Plan NAS Memphis August 11, 1988
EA 06. Visual Site Inspection Report NAS Memphis April 1990
EA 07. Inventory of Used or Stored Hazardous Waste Material by Activity 03 June 1992
EA 08. Tank Management Plan NAS Memphis 27 September 1993
EA 09. Hazardous Waste Storage Permit NAS Memphis from Tennessee Department of Health and Environment 15 September 1986
EA 10. Air Pollution Control Operating Permits Listing NAS Memphis 14 July 1982
EA 11. RCRA Facility Workplan NAS Memphis 16 September 1993
EA 12. Hazardous Waste Management Plan NAS Memphis 17 June 1993
EA 13. Oil and Hazardous Substances Pollution Contingency Plan, CNTECHTRA NAS Memphis 13 May 1991
EA 14. Oil Spill Prevention Control and Countermeasures Plan NAS Memphis January 1990
EA 15. Initial Assessment Study of NAS Memphis November 1983
EA 16. Environmental Engineering Survey NAS Memphis December 1977
EA 17. NAS Memphis Instruction 890.1A (Hazardous Waste Management Plan) 2 October 1989
EA 18. 1992 Haz. Waste Stream Report NAS Memphis 25 February 1993
EA 19. Phase II Final Report UST Evaluation NAS Memphis 20 March 1987
EA 20. Letter from CO, NAS Memphis, Survey of Shore Facilities Refueling facilities/equipment 14 July 1989
EA 21. Letter from FWO, NAS Memphis, Lists of regulated and unregulated facilities 6 October 1982
EA 22. Tennessee Tank Survey NAS Memphis 1 March 1989
EA 23. Basewide MSDS Survey NAS Memphis 6 May 1989
EA 24. CY 1990 Hazardous Waste Annual Report NAS Memphis
EA 25. Solid Waste Annual Report FY92 NAS Memphis 26 January 1993
EA 26. Navy Assessment and Control of Installation Pollutants Program Confirmation Study, Verification Phase NAS Memphis 1985
EA 27. Basewide Asbestos Assessment/Inventory NAS Memphis June 1982
EA 28. Engineering Service Request 2084-082 NAS Memphis "Study of Sewage Treatment Plant and Oil/Water Separators" 17 Nov 1982
EA 29. Air Emissions Compliance Audit Report, NAS Memphis, May 1983
EA 30. NAS Memphis Public Water System Lead and Copper Testing Letter to State of Tennessee, 29 April 1983
EA 31. Notification of lead-based paint in government housing
EA 32. NAS Memphis 1993 Preliminary Draft - NAS Memphis Master Plan, March 15, 1993
EA 33. Master Plan Memphis Complex 1978
EA 34. Master Plan Naval Complex, Memphis, Tennessee, 1971
EA 35. Detailed Inventory of Naval Shore Facilities, Air Station, Millington, Tennessee, September 30, 1982
EA 36. PCB Audit and Survey, 1982 NAS Memphis, Millington TN. Prepared for SOUTHDIRNAVFACENCOM, Charleston, SC. December. Contract # N62467-82-C-0013
EA 37. NAS Memphis Hazardous Material Inventory, October 1983.
EA 38. December 2, 1993. Interview with Phil Coop - NAS Memphis.
EA 39. Aerial photographs of NAS Memphis.
EA 40. NAS Memphis - Photography Summary Report, December 13, 1983, by Atlantic Aerial Surveys.
EA 41. Property line map - Prior owners - January 31, 1994.
EA 42. Real Estate Summary Map - NAS Memphis (DWG 1079657).
EA 43. Real Estate Ownership Records - NAS Memphis.
EA 44. EDI Survey - December 23, 1983 (outside fence).
EA 45. EDI Survey - December 28, 1983 (inside fence).
EA 46. Map of Navy Memphis Complex, updated December 2, 1983.
EA 47. Hazard Ranking System (FWO DWG 10648) updated April 8, 1983 (SWMU map)
EA 48. 1984. Memo from Bill Bennett regarding historic pesticide/herbicide applications at NAS Memphis.
N-121-1 Notification of hazardous waste site
N-121-2 Potential Hazardous Waste Site Inspection Report
N-121-3 Report on Potential Hazardous Waste Disposal Facility
N-121-4 Potential Hazardous Waste Site Preliminary Assessment
N-121-5 EPA to NAS CO, Dated February 22, 1990
N-121-6 NAS Memphis Hazard Ranking System - Final Scoring Book I

SUPPLEMENTAL INFORMATION

000061

APPENDIX D
PHOTOGRAPHS OF SITE ACTIVITIES

Phase I Activities

000063



Site prior to any activities being performed.



Collection of samples taken from surface soil in spill area.

00645 FBIY

000064



Pressure washing of paved sidewalk adjacent to N-121.



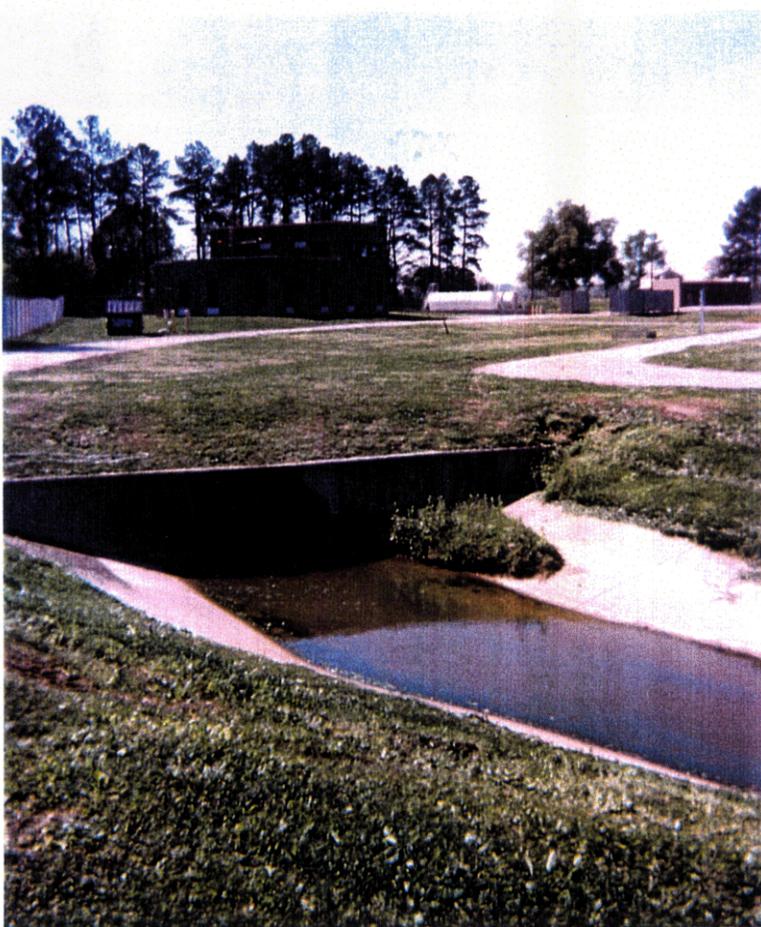
Pressure washing of pavement.



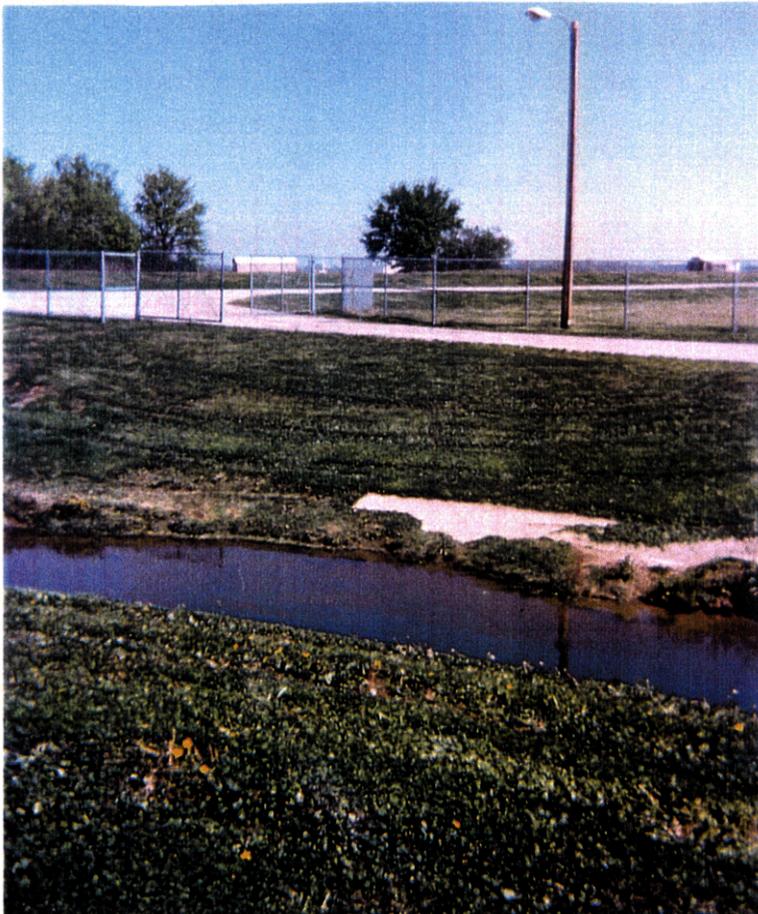
Excavation in Area 3 during Phase I.



Area 1 after excavation during Phase I.



Location of sediment sample location 132M000901.



Location of sediment sample location 132M001001.

Phase II Activities

000068



Beginning excavation of Area 2 during Phase II activities.



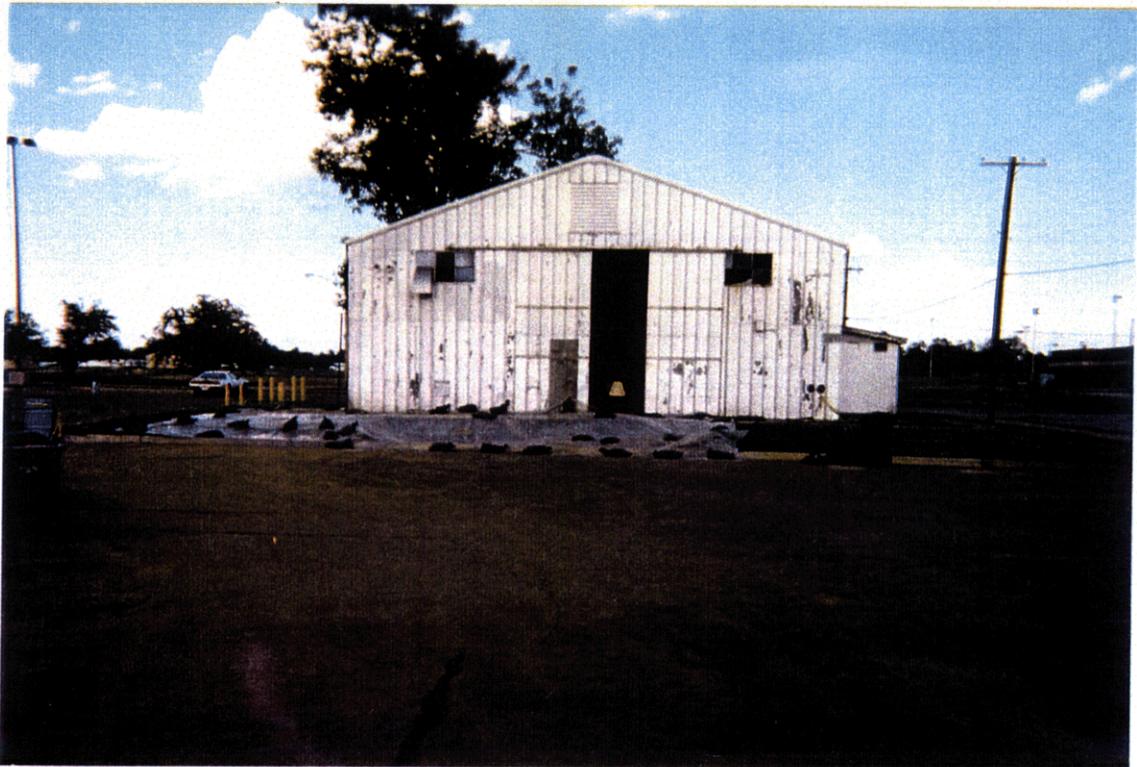
Excavation of Area 2 completed.

00645FB2Y

000069



Area 1 excavation complete after Phase II operations.



Site covered and secured after Phase II operation.

Phase III Activities



Backfill delivered to site for Phase III operations.



Spreading backfill material.

00645FB3Y

000072



Final touch up of grading activities.



Seeding and fertilizing of the site.



Site with completed straw mulch cover.



View from Casablanca Street of straw mulch cover.

APPENDIX E
DISPOSAL MANIFESTS FOR ROLL-OFF BOXES

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. TN 2170022600	Manifest Document No. 71827	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
3. Generator's Name and Mailing Address YSA HELLINGTON PUBLIC WORKS 5236 HELLINGTON, TN 38854				A. State Manifest Document Number TN000552	
4. Generator's Phone (901) 874-5509				B. State Generator's ID	
5. Transporter 1 Company Name ENVIRONMENTAL TRANSPORTATION SERVICES		6. US EPA ID Number OKD981605363		C. State Transporter's ID	
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone (800) 677-1772	
9. Designated Facility Name and Site Address LWD SOUTHERN LANDFILL, INC. SNOOPE-CALVERT CITY RD. CALVERT CITY, KY 42029		10. US EPA ID Number KY0790001500		E. State Transporter's ID	
				F. Transporter's Phone	
				G. State Facility's ID	
				H. Facility's Phone (502) 395-8313	
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)		12. Containers	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. <input checked="" type="checkbox"/> NO HAZARDOUS WASTE, SOLID, M.O.S., 9, WA3077, PG III (0007) (pf:), (), (org: 171)		No. Type 001 CH	33880	P	0007
b.					
c.					
d.					
J. Additional Descriptions for Materials Listed Above Ref 11A: Inhoff box PC# RL60-26			K. Handling Codes for Wastes Listed Above MS41 MS43 MS44		
15. Special Handling Instructions and Additional Information SP4400-97-00006; D.O.S 18; A/2; EMERGENCY CONTACT: (317) 691-5746 Tony Outess					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name LARRY JONES			Signature <i>Larry Jones</i>		Month Day Year 6/7/01/1997
17. Transporter 1 Acknowledgement of Receipt of Materials			Signature <i>Sally L. Madison</i>		Month Day Year 10/7/01/1997
Printed/Typed Name SALLY L. MADISON			Signature		Month Day Year
18. Transporter 2 Acknowledgement of Receipt of Materials			Signature		Month Day Year
Printed/Typed Name			Signature		Month Day Year
19. Discrepancy Indication Space * see LWD McELVEEN, DP for LWD					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.					
Printed/Typed Name Shawn Howard			Signature <i>Shawn Howard</i>		Month Day Year 10/21/01/1997

LDR NOTIFICATION

(EPA Hazardous Wastes Only)

Generator Name Millington N.A.S. Manifest No. IN000552 Page 1 of 4

Pursuant to 40 CFR §268.7, this shipment contains waste restricted under PART 268 of RCRA Section 3004(d):

A. Manifest Line Item No. 11A & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): D007

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

B. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

C. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

D. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

NOTE: Hazardous wastes subject to Waste Constituent Notification, e.g., Underlying Hazardous Constituents, are as follows: D001LQ (liquid) if not combusted, D002, D003WR (water reactive) & D003OR (other reactives), D012-D043, F701-F705, F039 & wastes subject to California List (§268.32) or RCRA section 3004(d).

Lab Pack (§268.42(c)) Certification: I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack does not contain any wastes identified at Appendix IV to Part 268. I am aware that there are significant penalties for submitting a false certification including possibility of fine or imprisonment.

Generator Signature [Signature] Date 07/01/97
(Required for §268.42(c) Certification)

WASTE CODE SUBCATEGORY LEGEND

AN	Anhydrous	LM	Low Mercury (< 260 mg/kg)	RS	Reactive Sulfide
	Calcium Binary	LQ	Liquid	TOC	Total Organic Carbon
	Calcium Sulfate	NCS	Non Calcium Sulfate	WR	Water Reactive
	High Mercury (≥ 250 mg/kg)	NIRR	Not Incineration or RMERC Residues	W/W	Wastewater (≤ 1% TOC and ≤ 1% Total Suspended Solids)
HY	Hydrated	NWW	Non-Wastewater		
I2R	Incineration or RMERC Residues	OR	Other Reactives		
L3	Lead Acid Battery	RC	Reactive Cyanide		

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. T N 2 1 7 0 0 2 2 6 0 0	Manifest Document No. 71821	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.		
3. Generator's Name and Mailing Address SA HILLINGTON PUBLIC WORKS S236 HILLINGTON, TN 38054			A. State Manifest Document Number T N 000 553				
4. Generator's Phone (901)874-5509			B. State Generator's ID				
5. Transporter 1 Company Name ENVIRONMENTAL TRANSPORTION SERVICES		6. US EPA ID Number 0 K D 9 8 1 6 0 5 3 6 3		C. State Transporter's ID			
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone (800)677-1772			
9. Designated Facility Name and Site Address LMD SANITARY LANDFILL, INC. SHAWPE-CALVERT CITY RD. CALVERT CITY, KY 42029		10. US EPA ID Number 4 0 9 8 5 0 7 3 1 9 6 K Y 0 7 9 0 0 0 1 5 0 0		E. State Transporter's ID			
				F. Transporter's Phone			
				G. State Facility's ID			
				H. Facility's Phone (502)395-8313			
GENERATOR	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)		12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.	
	a. RM HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PG III (0007) (pf:),(),(org: 171)		0 0 1	C H	30.720	P	0007
	b.						
	c.						
	d.						
Additional Descriptions for Materials Listed Above Ref 11A: Introlff box PG# 2160-261			K. Handling Codes for Wastes Listed Above M 11 (SE)				
15. Special Handling Instructions and Additional Information SP4400-97-00006; D.O.# 18; A/1; EMERGENCY CONTACT: (317) 691-5746 Tony Outless							
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.							
Printed/Typed Name LARRY JONES			Signature <i>Larry Jones</i>		Month Day Year 10/19/97		
TRANSPORTER	17. Transporter 1 Acknowledgement of Receipt of Materials						
	Printed/Typed Name GARY L. MADISON			Signature <i>Gary L. Madison</i>		Month Day Year 10/19/97	
	18. Transporter 2 Acknowledgement of Receipt of Materials			Signature		Month Day Year	
FACILITY	19. Discrepancy Indication Space # per LLOYD McELVEEN, DP BR LWD						
	20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						
Printed/Typed Name Shawn Howard			Signature <i>Shawn Howard</i>		Month Day Year 10/19/97		

LDR NOTIFICATION

(EPA Hazardous Wastes Only)

1. Generator Name Millington NAS 2. Manifest No. T X000553 Page 1 of 1

3. Pursuant to 40 CFR §268.7, this shipment contains waste restricted under PART 268 or RCRA Section 3004(d):

A. Manifest Line Item No. 11A & RES/Apous Waste Stream No. _____
 i. EPA Waste Code(s) & Subcategories (if any): D007

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

B. Manifest Line Item No. _____ & RES/Apous Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

C. Manifest Line Item No. _____ & RES/Apous Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

D. Manifest Line Item No. _____ & RES/Apous Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

NOTE: Hazardous wastes subject to Waste Constituent Notification, e.g., Underlying Hazardous Constituents, are as follows: D001LQ (liquid) if not combusted, D002, D003WR (water reactive) & D003OR (other reactives), D012-D043, F901-F005, F039 & wastes subject to California List (§268.32) or RCRA section 3004(d).

Lab Pack (§268.42(c)) Certification: I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack does not contain any wastes identified at Appendix IV to Part 268. I am aware that there are significant penalties for submitting a false certification including possibility of fine or imprisonment.

Generator Signature [Signature] Date 07/01/92
 (Required for §268.42(c) Certification)

WASTE CODE SUBCATEGORY LEGEND

- Anhydrous	LM - Low Mercury (< 260 mg/kg)	RS - Reactive Sulfide
- Cadmium Battery	LO - Liquid	TOC - Total Organic Carbon
- Calcium Sulfate	NCS - Non Calcium Sulfate	WR - Water Reactive
HM - High Mercury (> 260 mg/kg)	NIR - Not Incineration or RMERC Residue	WW - Wastewater (< 1% TOC and < 1% Total Suspended Solids)
HY - Hydrated	NWW - Non-Wastewater	
IR - Incineration or RMERC Residue	OR - Other Reactives	
LB - Lead Acid Battery	RC - Reactive Granule	

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. T N 2 1 7 0 0 2 2 6 0 0		Manifest Document No. 7.18.23		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.		
Generator's Name and Mailing Address ATC INDUS S236 MELLENBORN, IN 30054						A. State Manifest Document Number IN 000554				
4. Generator's Phone (901) 874-5509 ATTN: LARRY JONES						B. State Generator's ID				
5. Transporter 1 Company Name ENVIRONMENTAL TRANSPORTATION SERVICES				6. US EPA ID Number OKD981605363		C. State Transporter's ID		D. Transporter's Phone (800) 677-1772		
7. Transporter 2 Company Name				8. US EPA ID Number		E. State Transporter's ID		F. Transporter's Phone		
9. Designated Facility Name and Site Address LWD SANITARY-LANDFILL, INC. SHOPE-CALVERT CITY RD. CALVERT CITY, KY 42029						10. US EPA ID Number *D985073196 KY 0790001500		G. State Facility's ID		
						H. Facility's Phone (502) 395-8313				
GENERATOR	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)					12. Containers		13. Total Quantity	14. Unit Wt/Vol	15. Waste No.
	a. NO HAZARDOUS WASTE, SOLID, N.O.S., 9, INK3077, PG III (6007) (pf:),(),(org: 171)					No. Type				
						0 0 1 C H		34110	P	0007
	b.									
	c.									
d.										
Additional Descriptions for Materials Listed Above Ref 11A: Inseff box: PG 4 RL60-261						K. Handling Codes for Wastes Listed Above MSH1 MS03 M11 DP				
15. Special Handling Instructions and Additional Information SP4400-97-00006; 0.0.5 18; A/3; EMERGENCY CONTACT: (317) 691-5746 Tony Gates										
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.										
Printed/Typed Name LARRY JONES					Signature <i>Larry Jones</i>			Month Day Year 10/7/97		
TRANSPORTER	17. Transporter 1 Acknowledgement of Receipt of Materials					Signature <i>Gary L. Madison</i>			Month Day Year 10/7/10/1997	
	Printed/Typed Name GARY L. MADISON					Signature			Month Day Year	
	18. Transporter 2 Acknowledgement of Receipt of Materials					Signature			Month Day Year	
Printed/Typed Name					Signature			Month Day Year		
FACILITY OWNER	19. Discrepancy Indication Space * PER LOYD McELVEEN, DP or LWD									
	J. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.									
Printed/Typed Name Shawn Howard					Signature <i>Shawn Howard</i>			Month Day Year 10/7/08/97		

000080

LDR NOTIFICATION

(EPA Hazardous Wastes Only)

Generator Name Millington N.A.S 2. Manifest No. TN00052 Page 1 of 1

3. Pursuant to 40 CFR §268.7, this shipment contains waste restricted under PART 268 or RCRA Section 3004(d):

A. Manifest Line Item No. 11A & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): D007

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

B. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

C. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

D. Manifest Line Item No. _____ & RES/Aptus Waste Stream No. _____

i. EPA Waste Code(s) & Subcategories (if any): _____

Check if ATTACHMENT I: EPA Waste Code Listing is being submitted with this notification instead of listed above.

ii. Treatability Group: NWW (including debris) WW Lab Pack (Appendix IV) Lab Pack (§268.42(c))^a

iii. Waste Constituent Notification(s) (if any): _____

Check if ATTACHMENT II: Waste Constituent Notification is being submitted with this notification instead of listed above.

NOTE: Hazardous wastes subject to Waste Constituent Notification, e.g., Underlying Hazardous Constituents, are as follows: D001LO (liquid) if not combusted, D002, D003WR (water reactive) & D003OR (other reactives), D013-D043, F001-F005, F039 & wastes subject to California List (§268.32) or RCRA section 3004(d).

Lab Pack (§268.42(c)) Certification: I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack does not contain any wastes identified at Appendix IV to Part 268. I am aware that there are significant penalties for submitting a false certification including possibility of fine or imprisonment.

Generator Signature [Signature]
(Required for §268.42(c) Certification)

Date 07/21/97

WASTE CODE SUBCATEGORY LEGEND

AN	- Anhydrous	LM	- Low Mercury (< 260 mg/kg)	RS	- Reactive Sulfide
CB	- Cadmium Battery	LO	- Liquid	TOC	- Total Organic Carbon
C	- Calcium Sulfate	NCS	- Non Calcium Sulfate	WR	- Water Reactive
Hm	- High Mercury (> 260 mg/kg)	NIR	- Not Incineration or RMERC Residues	WW	- Wastewater (< 1% TOC and < 1% Total Suspended Solids)
HY	- Hydrated	NWW	- Non-Wastewater		
IR	- Incineration or RMERC Residues	OR	- Other Residues		
LB	- Lead Acid Battery	RC	- Reactive Cyanide		

000081

HANDLING CODES VS. SYSTEM CODES

T06/T07 -- LIQUID INJECTION INCINERATION
ROTARY KILN INCINERATION

→ M041 -- INCINERATION OF LIQUIDS
M042 -- INCINERATION OF SLUDGES
→ M043 -- INCINERATION OF SOLIDS

S01 -- STORAGE IN CONTAINERS
S02 -- STORAGE IN TANKS

M141 -- STORAGE ONLY -- SHIPPED OFF-SITE WITHOUT TREATMENT ON-
SITE

M061 -- FUEL BLENDING

ENERGY RECOVERY -- REUSE AS FUEL, EX. USED OIL
M051 -- LIQUID
M052 -- SLUDGE
M053 -- SOLID

T21 -- CHEMICAL FIXATION/STABILIZATION

→ M111 -- STABILIZATION/CHEMICAL FIXATION USING CEMENT &/OR
POZZALONIC MATERIALS

T31 -- NEUTRALIZATION

M121 -- NEUTRALIZATION ONLY

M032 -- OTHER RECOVERY, WASTE OIL RECOVERY
M124 -- PHASE SEPARATION (E.G. EMULSION BREAKING, FILTRATION
ONLY)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE OF PAGES

AMENDMENT/MODIFICATION NO.

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.

5. PROJECT NO. (If applicable)

PO0014

SEE BLOCK 16C

JHC-96-12

6. ISSUED BY

CODE

S1403A

7. ADMINISTERED BY (If other than Item 6)

CODE

DEFENSE REUTILIZATION & MARKETING SERVICE
OPERATIONS WEST
500 WEST 12TH STREET, BLDG. 2A1
OGDEN, UTAH 84407-5000

BM 801-399-7570

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

APPLIED TECHNOLOGY, INC.
10078 LANTERN ROAD
FISHERS, IN 46038

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

SP4400-97-D-0006

10B. DATED (SEE ITEM 13)

21 JAN. 97

CODE OUTS3

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

- (a) By completing Items 6 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

Accounting and Appropriation Data (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

- A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in payee office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 42.104(b).
- C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF _____
- D. OTHER (Specify type of modification and authority) H.22, H.5

E. IMPORTANT:

Contractor is not is required to sign (this document and return _____ copies to the issuing office).

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF session headings, including solicitation/contract subject matter where feasible.)

1. THE FOLLOWING FIRM IS LICENSED/PERMITTED TSDF AND AUTHORIZED FOR USE ON THE ABOVE NOTED CONTRACT FOR THE CLINS APPLICABLE. FIRMS TO BE UTILIZED IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL LAWS, REGULATIONS AND THE FACILITIES TSDF PERMIT.

LWD
1741 SHAR-CAL RD
CALVERT CITY, KY 42029
EPA# KY0 790001500

LWD
HWY 1523
CALVERT CITY, KY 42029
EPA# KYD088435517

LWD
OLD COKE PLANT RD
CALVERT CITY, KY 42029
EPA# KYD 985073196

HOLNAM INC.
ARTESIA PLANT
EPA# MSD 077655876

2. NO OTHER CHANGES.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.

NAME AND TITLE OF SIGNER (Type or print)

15A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

CATHY KEITH, CONTRACTING OFFICER

000083

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16A. UNITED STATES OF AMERICA

16C. DATE SIGNED

BY

Cathy Keith
(Signature of Contracting Officer)

7 Jul 97

(Signature of person authorized to sign)

AUG. -26' 97 (TUE) 08:05 DRMS
08:15 JUN 25, 1997 ID: 317-841-2644

TEL: 801 599 7827

P. 003

TEL NO: 317-841-2644

#4926 PAGE: 1/1



June 25, 1997

Braden Mann
DRMS-Operations West
500 West 12th Street
Ogden, UT 84407

RE: SP4400-97-D006

Dear Mr. Mann,

Please add the following three TSDFs and one Transporter to H.22/HL23 of subject contract. They are all on the Internet Approved List.

Transporter

LWD Trucking
P.O. Box 327
Calvert City, KY 42029
KYD981477821

on Contract already!

TSDFs

LWD
1741 Shar-cal Rd
Calvert City, KY 42029
KY0790001500

LWD
Hwy 1523
Calvert City, KY 42029
KYD088438817

LWD
Old Coke Plant Rd
Calvert City, KY 42029
KYD985073196

If you have any questions or concerns about this matter please call me at (317) 842-0722.

Sincerely,
Applied Technology, Inc.

Jon Pelis
Marketing Specialist

Applied Technology Inc.
ENVIRONMENTAL SERVICES
e-mail: contact@atinc.com

000084

AUG. -26 97 (TUE) 08:06 DRMS
14:44 JUL 22, 1997 ID: 317-841-8644

TEL: 801 599 7827

P. 004

TEL NO: 317-841-8644

#5251 PAGE: 1/1



July 2, 1997

Braden Mann
DRMS-Operations West
500 West 12th Street
Ogden, UT 84407

RE: SP4400-97-D006

Dear Mr. Mann,

Please add the following TSDs to H.22/H.23 of subject contract. They are on the Internet Approved List.

Holnam Inc. Artesia Plant
MSD077655876

If you have any questions or concerns please call me at (317) 842-0722.

Sincerely,
Applied Technology, Inc.

Jon Pelis
Marketing Specialist

APPENDIX F
LETTER FROM CITY OF MILLINGTON'S ENGINEER



Fisher & Arnold, Inc.

Engineers
Planners
Landscape Architects
Environmental Consultants

April 28, 1997

Mr. Robert Smith
Ensafe/Allen & Hoshall
5909 Shelby Oaks
Memphis, TN 38134

**RE: INVESTIGATION DERIVED WASTE
BUILDING N-121, NSA MEMPHIS**

Dear Mr. Smith:

Your request of April 25, 1997, to discharge 200 gallons of water to the Millington Sewer System is approved. Please call me if I can be of further assistance.

Sincerely,

FISHER & ARNOLD, INC.

James L. Cox, P. E.
Principal

JLC/cu

cc: Mayor George Harvell

APPENDIX G
DATA VALIDATION REPORT

Table of Contents

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Attachment A Data Summary Tables

1.0 INTRODUCTION

This report presents the analytical data collected during Building N-121 soil removal and spill cleanup activities at Naval Support Activity (NSA) Memphis and the quality assurance/quality control (QA/QC) evaluation of those data. Data are evaluated to verify that the QC requirements of the data set have been met and to characterize the weakness of any questionable data.

The Building N-121 soil and water samples were collected at NSA Memphis during April and May 1997. The samples were analyzed by Ceimic laboratory in San Diego, California, were reported using U.S. Environmental Protection Agency (USEPA) data deliverables level III and IV. The analytical methods and laboratory data deliverables are summarized in Table 1-1.

Table 1
NSA Memphis Analytical Program

Analytical Method	Data Deliverable Level Equivalents	Method Reference
TCLP Metals	III & IV	SW846 Method 1311/1610/7470
Total Metals	III & IV	SW-846 Method 6010/7471

Notes:

Toxicity Characteristic Leaching Procedure (TCLP) Metals = Arsenic (As), barium (Ba), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), silver (Ag), selenium (Se), copper (Cu), nickel (Ni), and zinc (Zn)

Total Metals = Cadmium (Cd), chromium (Cr), lead (Pb), silver (Ag), copper (Cu), nickel (Ni), and zinc (Zn)

The references for the methods listed in Table 1 were obtained from the following sources:

- USEPA Office of Solid Waste and Emergency Response (OSWER), *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)*, Third Edition, revised July 1992.
- Data quality objectives (DQOs) for data deliverables as cited in: *USEPA Data Quality Objectives for Remedial Response Activities*, EPA-540/G-87/003, March 1987.

Data were validated using the following documents (as appropriate):

- USEPA OSWER, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (Inorganic Functional Guidelines), (EPA-540/R-94/013) February 1994.

The NSA Memphis data were validated by EnSafe/Allen and Hoshall (E/A&H). One hundred percent of the data were validated at DQO Level III equivalent. The data validation findings were summarized separately for each sample delivery group (SDG). Each SDG usually contained 20 investigative samples of one matrix type, i.e., either a solid (soil and/or sediment) or water (groundwater and/or surface water) samples, except for QC samples, which are not counted as investigative samples. The data summary tables are included in Attachment A to this document.

2.0 INORGANIC EVALUATION CRITERIA

The SW-846 methods define QC criteria that the laboratory must meet; however, the methods do not address data evaluation from a user's perspective. Evaluation criteria are available in the Inorganic Functional Guidelines (February 1994), which was used throughout the data evaluation process when the analytical methods did not address data usability.

Data evaluation for samples collected at NSA Memphis included the following parameters:

- Holding times
- Instrument calibration
- Matrix spike results
- Laboratory duplicates
- Blank analysis
- Inductively Coupled Plasma (ICP) interference check samples (ICS)

- ICP serial dilutions 1
- LCS results 2

According to Inorganic Functional Guidelines, when the QC parameters do not fall within the specific method guidelines, the data evaluator annotates or "flags" the corresponding analytes where deficiencies were found. The data from NSA Memphis were evaluated using this approach. The following flags were used to annotate laboratory and/or field deficiencies or problems during data evaluation.

Evaluation Qualifiers

- U** **Undetected** — The analyte was found in an associated blank, but at a concentration less than five times the blank concentration; the associated value shown is the detection limit after evaluation blank correction.
- J** **Estimated Value** — At least one QC parameter was outside control limits or the analyte's concentration was less than the practical quantitation limit.
- UJ** **Undetected and Estimated** — The analyte was analyzed for but not detected above the listed estimated instrument detection limit (IDL); the IDL is estimated because one or more QC parameters were outside control limits.
- R/UR** **Unusable Data** — One or more QC parameter grossly exceeded control limits.

These evaluation flags were applied to values where data deficiencies were noted during data examination. Because the laboratory used some of the same qualifiers during analyses, laboratory qualifier "U" remained on the data unless superseded by an evaluation qualifier e.g., ("UJ," "UR").

The laboratory qualifier that remained on the data after examination is described below: 1

Laboratory Qualifiers 2

U Undetected — The analyte was analyzed for but not detected above the IDL. 3

2.1 Holding Times 4

Acceptable technical holding times are specified in the analytical methods. For aqueous samples, 5
the holding time for metals analysis is six months, except for mercury, which is 28 days from the 6
date of collection. The methods do not specify holding times for soil matrices. Therefore, data 7
reviewers can apply the water sample holding time criteria to soil at their discretion. 8

2.2 Instrument Calibration 9

Initial and continuing calibrations with standard solutions are used to check that the instrument is 10
capable of producing acceptable qualitative and quantitative data for the analytes on the project 11
target analyte list. 12

An initial calibration is performed to check the performance of the instrument at the beginning of 13
the analytical run and to establish a linear calibration curve. Calibration standard solutions are 14
analyzed periodically to check the instrument's performance and confirm that the initial calibration 15
curve is still valid. Calibrations are verified by calculating the percent recovery (%R) and 16
comparing the amount of the analyte recovered by analysis to the known amount of standard. The 17
%R for metals, except for mercury and cyanide, should fall between 90% and 110%. The %R 18
for mercury should fall between 80% and 120%. 19

2.3 Blank Analysis

Laboratory method blanks are used to assess the existence and magnitude of potential contamination introduced during analysis. Additionally, *field* and *rinsate blanks* may be collected to assess the potential contamination introduced during sample collection as well as ambient field conditions. When chemicals are detected in samples and laboratory blanks, the usability of the data depends on the reviewer's judgment and the blank's origin. According to Inorganic Functional Guidelines, a sample result should not be considered positive unless the concentration of the compound in the sample exceeds five times the amount in any blank, referred to as *action levels (ALs)*. Because blank samples may not be prepared using the same weight, dilution, or volume of sample, these variables also should be considered when using these blank criteria. The specific actions to be taken are as follows:

- If a chemical is found in the blank but not the sample, no action is taken.
- If the sample concentration is between the IDL, and less than the AL, the concentration is reported as "U."
- If the sample concentration is greater than the AL, the concentration may be used unqualified.

When the blank concentration was less than the IDL (negative value), but had an absolute value greater than the IDL, the AL was 10 times the absolute value of the blank concentration. The specific actions are as follows:

- If the sample concentration is greater than the AL, the concentration may be used unqualified.

- If the concentration of any detected analyte was less than the AL, it was qualified as estimated "J" for positive results. 1 2
- If the result was nondetect then it was qualified as estimated "UJ" for nondetect results. 3

2.4 ICP Interference Check Samples 4

The ICP ICS is used to confirm the laboratory instrument's interelement and background correction factors. Interference samples should be run at the beginning and end of each sample analysis run or at least twice per eight-hour working shift, whichever is more frequent. The ICS consists of two solutions: Solution A and Solution AB. Solution A contains the interferents (aluminum, calcium, iron, and magnesium), and solution AB contains the target analytes mixed with the interferents. An ICS analysis consists of analyzing both solutions consecutively, starting with Solution A, for all wavelengths used for each analyte reported by ICP. 5 6 7 8 9 10 11

No analytes should be detected in ICS Solution A other than aluminum, calcium, iron, and magnesium. The presence of other analytes could lead to the possibility of false positives or false negatives of that analyte in the investigative samples. The %Rs for the ICS Solution AB should fall between 80% and 120%. 12 13 14 15

2.5 Laboratory Control Samples 16

LCSs are used to monitor the overall performance of steps in the analysis, including the sample preparation. All aqueous LCS %R results must fall within the control limits of 80% to 120%, except for antimony and silver, which have no control limits. Soil LCS standards are generally provided by the USEPA (or state agency or private laboratory). Control limits are established for each soil LCS standard prepared. 17 18 19 20 21

2.6 Matrix Spike Analysis

Samples are spiked with known quantities of analytes to evaluate the effect of the sample matrix on digestion and measurement procedures. The %R should be within 75% to 125%. However, when the sample concentration exceeds the spike concentration by a factor of four or more, spike recovery criteria are not applicable.

2.7 Laboratory Duplicates

Laboratory duplicate samples are analyzed to evaluate data precision, a measure of the reproducibility of the analysis. The relative percent difference (RPD) between the sample and the duplicate sample is calculated. A control limit of 20 RPD for aqueous samples and 35 RPD for soil or sediment samples should not be exceeded for analyte values greater than the quantitation limit or two times the quantitation limit, respectively.

2.8 ICP Serial Dilutions

ICP serial dilutions assess matrix interference. One sample from each set of similar matrix type is chosen for the serial dilution (a fivefold dilution). For an analyte concentration that is at least a factor of 10 times above the IDL, the measured concentrations of the undiluted sample and of the diluted sample should agree within 10%.

3.0 DATA EVALUATION

All samples were received by the laboratory intact and with the proper documentation. Table 2 summarizes the samples in SDGs 7528 and 7650.

Naval Support Activity Memphis
 N-121 Data Validation Report
 Revision: 0
 July 14, 1997

Table 2
 SDG 7528 Sample IDs

Sample ID	SDG	TCLP Cr	TCLP As, Ba, Cd, Cr, Pb, Hg, Se, Ag, Cu, Ni, Zn	Total Cd, Cr, Ni, Cu, Pb, Ag, Zn
132S000101	7528	X		
132S000201	7528	X		
132S000301	7528			X
132S000401	7528			X
132S000501	7528			X
132S000601	7528		X	
132S000701	7528		X	
132W000801	7528			X
132M000901	7528			X
132M001001	7528			X
132M001101	7528			X
132S014001	7650			X
132S015001	7650			X
132S016001	7650		X	

3.1 Blanks

Table 3 summarizes the analytes that were detected in the various blanks.

Table 3
 Blank Detections

Blank ID	Analyte	Concentration	Action Level	Associated Samples
CCB	Nickel	-1.3 µg/L	13.0 µg/L	132W000801
	Zinc	-3.5 µg/L	35.0 µg/L	
CCB	Chromium	1.0 µg/L	5.0 µg/L	132W000801
	Zinc	-2.4 µg/L	24.0 µg/L	
CCB	Barium	0.1 µg/L	0.5 µg/L	132S000101, 132S000201, 132S000601
	Chromium	1.8 µg/L	9.0 µg/L	
	Selenium	-2.7 µg/L	27.0 µg/L	
	Silver	3.0 µg/L	15.0 µg/L	
	Zinc	-2.3 µg/L	23.0 µg/L	
CCB	Chromium	1.4 µg/L	7.0 µg/L	132S000101, 132S000201, 132S000601, 132S000701
	Lead	1.5 µg/L	7.5 µg/L	
	Zinc	-3.0 µg/L	30.0 µg/L	
CCB	Barium	0.1 µg/L	0.5 µg/L	132S000701, 132S000301, 132S000401, 132S000501
	Chromium	2.3 µg/L	11.5 µg/L/2.3 mg/kg	
	Silver	3.3 µg/L	16.5 µg/L/3.3 mg/kg	
	Zinc	-3.2 µg/L	32.0 µg/L/6.4 mg/kg	
CCB	Copper	-1.2 µg/L	2.4 mg/kg	132S000301, 132S000401, 132S000501, 132M000901, 132M001001, 132M001101
	Nickel	-1.0 µg/L	2.0 mg/kg	
	Zinc	-2.5 µg/L	5.0 mg/kg	
Preparation Blank	Chromium	0.55 mg/kg	2.75 mg/kg	132S000301, 132S000401, 132S000501, 132M000901, 132M001001, 132M001101
	Lead	0.25 mg/kg	1.25 mg/kg	
	Silver	0.60 mg/kg	3.0 mg/kg	
	Zinc	-0.20 mg/kg	2.0 mg/kg	
CCB	Chromium	1.0 µg/L	1.0 mg/kg	132S014001, 132S015001
Preparation Blank	Cadmium	0.06 mg/kg	0.30 mg/kg	132S014001, 132S015001
	Chromium	0.36 mg/kg	1.8 mg/kg	
	Copper	0.31 mg/kg	1.55 mg/kg	
	Lead	0.35 mg/kg	1.75 mg/kg	
	Zinc	0.27 mg/kg	1.35 mg/kg	
CCB	Copper	-1.3 µg/L	13.0 µg/L	132S016001
	Nickel	-0.8 µg/L	8.0 µg/L	
	Zinc	1.8 µg/L	9.0 µg/L	
CCB	Chromium	-1.0 µg/L	10.0 µg/L	132S016001
	Copper	-1.1 µg/L	11.0 µg/L	
	Nickel	-1.0 µg/L	10.0 µg/L	
	Zinc	-0.7 µg/L	7.0 µg/L	
Preparation Blank	Zinc	9.90 µg/L	49.5 µg/L	132S016001

Notes:
 µg/L = micrograms per liter
 mg/kg = milligrams per kilogram
 CCB = Continuing Calibration Blank

The associated samples were qualified as described in Section 2.3. 1

3.2 Laboratory Duplicates 2

Sample 132S000301, in SDG 7528, was used for the laboratory duplicate for total metals analysis. 3
The RPD of nickel (65.5%) exceeded the control limits of 35%. The positive results for nickel 4
in samples 132S000301, 132S000401, 132S000501, 132M000901, 132M001001, and 5
132M001101 were qualified as estimated "J." 6

3.3 Serial Dilution 7

Sample 132S000101, in SDG 7528, was used for the serial dilution for TCLP metals analysis. 8
The percent difference of zinc (10.7%) exceeded the control limits of 10%. The positive results 9
for zinc in samples 132S000101, 132S000601, and 132S000701 were qualified as estimated "J." 10

3.4 Data Quality 11

The overall data quality of the analytical work performed for NSA Memphis at Building N-121 12
was satisfactory and usable for site remediation and risk assessment. Results that were outside 13
QA/QC requirements were flagged as estimated "J," alerting the data user to the possibility the 14
data could be biased high or low. Although the data are qualified as estimated, they remain 15
dependable for use in risk assessment and site remediation. 16

Attachment A
Data Summary Tables

NSA MEMPHIS
NSA MEMPHIS, BUILDING N-121 CLEANUP

7528 METALS		SAMPLE ID -----> 132-S-0003-01	132-S-0004-01	132-S-0005-01	132-W-0008-01	132-M-0009-01	132-M-0010-01
		ORIGINAL ID -----> 132S000301	132S000401	132S000501	132S000801	132M000901	132M001001
		LAB SAMPLE ID ----> 7528-03	7528-04	7528-05	7528-08	7534-01	7534-02
		SAMPLE DATE -----> 04/08/97	04/08/97	04/08/97	04/08/97	04/09/97	04/09/97
		DATE EXTRACTED --> 04/10/97	04/10/97	04/10/97	04/10/97	04/10/97	04/10/97
		DATE ANALYZED ----> 04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
		MATRIX -----> Soil	Soil	Soil	Water	Sedmt	Sedmt
		UNITS -----> NG/KG	NG/KG	NG/KG	UG/L	NG/KG	NG/KG
CAS #	Parameter	A	A	A	A	A	A
7440-43-9	Cadmium (Cd)	3.8	0.88 J	0.21 J	33.8	0.56 J	0.95 J
7440-47-3	Chromium (Cr)	124.	80.1	20.9	7160.	9.4	11.4
7440-50-8	Copper (Cu)	57.7	33.5	22.2	1090.	11.1	17.
7439-92-1	Lead (Pb)	69.7	43.5	28.1	1230.	13.3	14.4
7440-02-0	Nickel (Ni)	19.1 J	17.1 J	17.6 J	77.9	9.6 J	21. J
7440-22-4	Silver (Ag)	1.1 U	0.98 U	0.97 U	8.8 J	0.81 U	1.3 U
7440-66-6	Zinc (Zn)	85.8	71.5	65.6	30500.	73.	133.

000101

NSA MEMPHIS
NSA MEMPHIS, BUILDING N-121 CLEANUP

00102

7528 METALS		SAMPLE ID -----> 132-N-0011-01 ORIGINAL ID -----> 132N001101 LAB SAMPLE ID ----> 7534-03 SAMPLE DATE -----> 04/09/97 DATE EXTRACTED --> 04/10/97 DATE ANALYZED ----> 04/11/97 MATRIX -----> Sediment UNITS -----> MG/KG	A				
CAS #	Parameter						
7440-43-9	Cadmium (Cd)	0.4	J				
7440-47-3	Chromium (Cr)	14.3					
7440-50-8	Copper (Cu)	18.6					
7439-92-1	Lead (Pb)	12.4					
7440-02-0	Nickel (Ni)	17.6	J				
7440-22-4	Silver (Ag)	0.77	U				
7440-66-6	Zinc (Zn)	56.8					

NSA MEMPHIS
NSA MEMPHIS, BUILDING N-121 CLEANUP

7528 TCLP-METAL		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> SAMPLE DATE -----> DATE EXTRACTED --> DATE ANALYZED ----> MATRIX -----> UNITS ----->	132-S-0001-01 132S000101 7528-01 04/08/97 04/10/97 04/11/97 Soil UG/L	132-S-0002-01 132S000201 7528-02 04/08/97 04/10/97 04/11/97 Soil UG/L	132-S-0006-01 132S000601 7528-06 04/08/97 04/10/97 04/11/97 Soil UG/L	132-S-0007-01 132S000701 7528-07 04/08/97 04/10/97 04/11/97 Soil UG/L		
CAS #	Parameter							
7440-38-2	Arsenic (As)	27. U	NR	27. U	27. U			
7440-39-3	Barium (Ba)	1430. J	NR	1350. J	1380. J			
7440-43-9	Cadmium (Cd)	160.	NR	73.9	120.			
7440-47-3	Chromium (Cr)	24000.	27400.	700.	968.			
7440-50-8	Copper (Cu)	187. J	NR	152. J	245. J			
7439-92-1	Lead (Pb)	49.4	NR	64.7	104.			
7439-97-6	Mercury (Hg)	0.08 U	NR	0.08 U	0.08 U			
7440-02-0	Nickel (Ni)	23.9 J	NR	21.5 J	25.7 J			
7782-49-2	Selenium (Se)	27. UJ	NR	27. UJ	27. U			
7440-22-4	Silver (Ag)	29. U	NR	29. U	29. U			
7440-66-6	Zinc (Zn)	1470. J	NR	963. J	1180. J			

000003

NSA MEMPHIS
NSA MEMPHIS, BUILDING N-121 CLEANUP

70100

7650 METALS		SAMPLE ID ----->	132-S-0140-01	132-S-0150-01			
		ORIGINAL ID ----->	132S014001	132S015001			
		LAB SAMPLE ID ---->	7650-01	7650-02			
		SAMPLE DATE ----->	05/08/97	05/08/97			
		DATE EXTRACTED -->	05/09/97	05/09/97			
		DATE ANALYZED ---->	05/13/97	05/12/97			
		MATRIX ----->	Soil	Soil			
		UNITS ----->	MG/KG	MG/KG			
CAS #	Parameter						
7440-43-9	Cadmium (Cd)	0.28	U	0.22	U		
7440-47-3	Chromium (Cr)	17.5		37.4			
7440-50-8	Copper (Cu)	18.4		20.3			
7439-92-1	Lead (Pb)	16.		15.9			
7440-02-0	Nickel (Ni)	17.6		20.4			
7440-22-4	Silver (Ag)	0.68	U	0.65	U		
7440-66-6	Zinc (Zn)	65.9		69.			

NSA MEMPHIS
NSA MEMPHIS, BUILDING N-121 CLEANUP

7650 TCPL-METAL		SAMPLE ID -----> 132-S-0160-01 ORIGINAL ID -----> 132S016001 LAB SAMPLE ID -----> 7650-03 SAMPLE DATE -----> 05/08/97 DATE EXTRACTED ---> 05/12/97 DATE ANALYZED ----> 05/13/97 MATRIX -----> Soil UNITS -----> UG/L	A				
CAS #	Parameter						
7440-38-2	Arsenic (As)	27.	U				
7440-39-3	Barium (Ba)	849.	J				
7440-43-9	Cadmium (Cd)	4.1	J				
7440-47-3	Chromium (Cr)	291.					
7440-50-8	Copper (Cu)	10.	UJ				
7439-92-1	Lead (Pb)	12.4	J				
7439-97-6	Mercury (Hg)	0.8	U				
7440-02-0	Nickel (Ni)	35.1	J				
7782-49-2	Selenium (Se)	27.	U				
7440-22-4	Silver (Ag)	29.	U				
7440-66-6	Zinc (Zn)	629.					

000105

ENVIRONMENTAL TESTING & CONSULTING, INC.
 2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750
INORGANIC ANALYSIS DATA SHEET

Client Name **Ensafe/Allen & Hoshall**
Navy Clean Joint Venture
5909 Shelby Oaks Dr.
Suite 201
Memphis, TN 38134

Site ID **Navy**

Project # **0132-09000**

Date Arrived **04/23/97**
 ETC Order Number **9704682**

ETC Lab ID **9704682-01**
Sample ID: 1325012001

Matrix : **SOIL**
 Sample Date : **04/23/97**

TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED BY	METHOD
Chromium	9.26	mg/Kg	2.00	1450	04/24/97 JF	7190

ETC Lab ID **9704682-02**
Sample ID: 1325013001

Matrix : **SOIL**
 Sample Date : **04/23/97**

TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED BY	METHOD
Chromium	20.0	mg/Kg	2.00	1450	04/24/97 JF	7190

Allen

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D. 132S000301			
MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	752803		
LEVEL (LOW/MED):		DATE RECEIVED	4-9-97		
% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	09:01 AM	
CONCENTRATION UNIT		mg/kg			
pH	6.1	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
		BEFORE:		BEFORE:	
		AFTER:		AFTER:	

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D. 132S000401	
MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	752804
LEVEL (LOW/MED):		DATE RECEIVED	4-9-97
% SOLIDS :		PACKAGE PREP. DATE :	5-8-97 08:17 AM
CONCENTRATION UNIT	mg/kg		

pH	6.2	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				

COLOR:	CLARITY:
BEFORE:	BEFORE:
AFTER:	AFTER:

000122

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D 132S000501			
	MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	752805	
	LEVEL (LOW/MED):		DATE RECEIVED	4-9-97	
	% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	08:18 AM
	CONCENTRATION UNIT	mg/kg			
pH	6.3	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
		BEFORE:			BEFORE:
		AFTER:			AFTER:

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.		CLIENT SAMPLE I.D. 132S000601		
MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	752806		
LEVEL (LOW/MED):		DATE RECEIVED	4-9-97		
% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	08:33 AM	
CONCENTRATION UNIT	mg/kg				
pH	6.5	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
		BEFORE:		BEFORE:	
		AFTER:		AFTER:	

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D. 132S000701			
	MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	752807	
	LEVEL (LOW/MED):		DATE RECEIVED	4-9-97	
	% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	09:03 AM
	CONCENTRATION UNIT	mg/kg			
pH	6.3	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
	BEFORE:		BEFORE:		
	AFTER:		AFTER:		

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D. 132S000801			
	MATRIX(SOIL/WATER):	WATER	LAB SAMPLE ID: 752808		
	LEVEL (LOW/MED):		DATE RECEIVED 4-9-97		
	% SOLIDS :		PACKAGE PREP. DATE : 5-8-97		08:05 AM
	CONCENTRATION UNIT	mg/l			
pH	6.95	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
	BEFORE:		BEFORE:		
	AFTER:		AFTER:		

000126

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D. 132M000901			
	MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID: 753401		
	LEVEL (LOW/MED):		DATE RECEIVED 4-10-97		
	% SOLIDS :		PACKAGE PREP. DATE : 5-8-97		09:05 AM
	CONCENTRATION UNIT	mg/kg			
pH	7.2	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
	BEFORE:		BEFORE:		
	AFTER:		AFTER:		

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.	CLIENT SAMPLE I.D			
		132M001001			
	MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	753402	
	LEVEL (LOW/MED):		DATE RECEIVED	4-10-97	
	% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	09:06 AM
	CONCENTRATION UNIT	mg/kg			
pH	7.2	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
	BEFORE:		BEFORE:		
	AFTER:		AFTER:		

000128

INORGANIC ANALYSIS DATA SHEET

NAME	CEIMIC, CORP.		<u>CLIENT SAMPLE I.D</u> 132N001101		
	MATRIX(SOIL/WATER):	SOIL	LAB SAMPLE ID:	753403	
	LEVEL (LOW/MED):		DATE RECEIVED	4-10-97	
	% SOLIDS :		PACKAGE PREP. DATE :	5-8-97	09:07 AM
	CONCENTRATION UNIT	mg/kg			
pH	7.5	** %	EC	umho/cm	
CAS NO.	ANALYTE	CONC.	C	Q	M
	Alkalinity				
	Bicarbonate				
	Carbonate				
	Hydroxide				
	Chloride				
	Fluoride				
	Formaldehyde				
	Hexavalent Chromium				
	Surfactants (M.B.A.S)				
	Nitrate (NO3 AS N)				
	Nitrate/Nitrite as N				
	Oil Grease (FTIR)				
	Oil Grease (Grav.)				
	Petroleum Hydrocarbons				
	Phosphate				
	Silica				
	Sulfate (-SO4)				
	Sulfide (-S)				
	Sulfite (-SO3)				
	Total Cyanide				
	Total Dissolved Solid				
	Total Kjeldahl Nitrogen				
	Total Organic Carbon				
	Total Organic Halides				
	Total Phenols				
	Total Suspended Solid				
	Total Volatile Solid	**			
	Cation Exchange Capacity *				
	Total Organic Carbon (WB) #				
COLOR:			CLARITY:		
	BEFORE:		BEFORE:		
	AFTER:		AFTER:		