Contractor's Closeout Report
Time Critical Removal Action Plan
Soil Remediation
Operable Unit 11, Site 80
MCB Camp Lejeune
Jacksonville, North Carolina

Contract No. N62470-93-D-3032
Delivery Order 0100

Volume I of III

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
Norfolk, VA

Prepared by

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October 1996

OHM Project No. 18319

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EXECUTIVE SUMMARY

From March 1996 to August 1996, OHM Remediation Services Corp. (OHM) performed removal and disposal of approximately 988 tons pesticide contaminated soils at Operational Unit 11, Site 80, Marine Corps Base Camp Lejeune, North Carolina. OHM's project activities involved excavation, clearing and grubbing, sampling, backfill, and transportation and disposal of the contaminated soil.

A field gas chromatogram (GC) was utilized to screen potential "hot spots" in the areas of concern (AOC). A 10 ft by 10 ft grid was established at each of the eight AOCs and samples collected from in each grid. Samples were analyzed for the contaminants of concern and limits of excavation determined by levels of contamination present versus the remedial goal established by Baker. Areas identified at contaminated were excavated to a depth of approximately one-foot load directing into trucks for transport to an off-site disposal site.

Confirmation sampling performed upon completion of excavation activities revealed that soils remaining on-site exhibited concentrations of constituents of concern below the action levels for soil remediation goal identified in Bakers letter to LANTDIV dated May 14, 1996. Site restoration included placement of clean backfill from the Base borrow area and re-vegetation.

1.0 INTRODUCTION

This Contractor's Closeout Report summarizes action taken during the removal and disposal of contaminated soil at Operational Unit 11, Site 80, at Marine Corps Base (MCB) Camp Lejeune, North Carolina. This closeout report has been prepared for the Department of the Navy, Naval Facilities Engineering Command (NAVFAC), Atlantic Division (LANTDIV) under Multi-Contaminant Remedial Action Contract (RAC), Contract Number N62470-93-D-3032 by OHM Remediation Services Corp. (OHM). This closeout report was developed in accordance with the 100% Technical Specifications prepared by Baker dated December 15, 1995 , Section 01010, Paragraph 1.3.1.10 and Section 7.0 of OHM's Work Plan dated April 1996. OHM has completed all activities as required by Delivery Order No. 0100: Soil Remediation Operable Unit 11 at Site 80 Marine Camp Lejeune, North Carolina, in accordance with the 100% Statement of Work and Technical Specifications prepared by Baker dated December 15, 1996 and OHM's Work Plan dated April 1996.

The contaminated soil generated during the excavation was transported off-site to an EPA approved disposal facility. Further groundwater assessment and/or remediation is presently being addressed by the Department of the Navy and is not included in this Contractor's Closeout Report.

1.1 SITE BACKGROUND

MCB Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), National Priorities List (NPL) effective October 4, 1989 (54 Federal Register 41015, October 4, 1989). Subsequent to this listing, the United States Environmental Protection Agency (USEPA) Region IV, the North Carolina Department of Environment, Health and Natural Resources (NCDEHNR) and the United States Department of the Navy (DoN) entered into a Federal Facilities Agreement (FFA) for MCB Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at MCB Camp Lejeune were thoroughly investigated and appropriate CERCLA response/Resources Conservation and Recovery Act (RCRA) corrective action alternatives were developed and implemented as necessary to protect the public health and the environment.

Based on the results of the Remedial Investigation (RI) conducted at Site 80 (Baker Environmental, Inc., (1995), contaminated surface soil may present an imminent threat to human health and the environment. As a result, the remediation of this surface soil is being conducted as a Time Critical Remedial Action (TCRA). The TCRA includes excavation of the pesticide-contaminated surface soil and disposal of the soil in an appropriate treatment/disposal facility.

1.2 SITE DESCRIPTION

MCB Camp Lejeune is a training base for the U.S. Marine Corps, located in Onslow County, North Carolina. The Base covers approximately 170 square miles and includes 14 miles of coast line. MCB Camp Lejeune is bounded to the southeast by the Atlantic Ocean, to the northeast by State Route 24, and to the west by U.S. Route 17. The town of Jacksonville, North Carolina is located north of the Base. The remedial action area, OU 11, is one of 17 operable units within Camp Lejeune. OU No. 11, as shown in Figure 1.1, is located on the southern bank of Northeast Creek at MCB Camp Lejeune.

Site 80, located northwest of Brewster Boulevard within the Paradise Point Golf Course, is referred to as the Paradise Point Golf Course Maintenance Area. The site consists of a 1-acre area which is relatively flat, with a slight slope to the northeast. Site elevations vary from 3 to 26 feet above mean sea level (MSL).

Figure 1.2 presents a site map of the specific area of interest as developed by Baker during the Remedial Investigation. The eight areas of concern (AOC) shown on this figure are those that contain pesticide compounds in concentrations exceeding the Remedial Action Objectives for surface soil discussed in Section 2.0. Site 80 features include a machine shop (Building 1916), a maintenance building (Building 600), and a maintenance wash-down area consisting of a concrete wash pad and sump. The wash pad is used to clean golf course maintenance equipment and the sump is used to collect water and oil run-off generated from the equipment cleaning. Water and oil collected by the sump travels into an oil/water separation pit located southeast of the wash pad (Baker, 1994).

A drainage ditch is located east of the wash-down area. During a March 1994 site reconnaissance, surface water run-off was observed flowing southeast across the site toward the drainage ditch. Groundwater flow direction in the shallow aquifer is generally toward the northeast with a mounding effect near the wash-down area.

The northeast portion of the site contains several large soil mounds that are overgrown with small pines. There is an open area located south of the mounds where golf course maintenance debris (i.e., tree limbs, lawn clippings, wooden timbers, and brush piles) is deposited. Evidence of burning operations conducted within this open area was documented during the March 1994 site reconnaissance. These soil mounds were generated from the installation of golf course ponds along the fairways in the late 1980s. It has been reported that wastes were disposed of on or around the mounds. However, the types of waste that were disposed and the exact disposal locations are unknown. Employees of the maintenance garage were instructed not to use the soil from this area for fill material (Baker, 1994).

In addition, old maintenance equipment has been deposited in the open and wooded areas surrounding Building 600. Two drums identified during the March 1994 site reconnaissance were removed from the site by activity personnel. These drums were located northeast of Building 600 just across the machine shop road (Baker, 1994). However, the contents of the drums are unknown.

Currently, a mobile trailer is stationed within the west/northwest portion of the site (i.e., the area located north of the machine shop road and east of the golf course road). Base personnel reported that a leach field associated with the golf course's sanitary sewer system is also located within this area. However, the exact location of the leach field is not known. Based on an average depth to groundwater of 13 feet below land surface (bls) in this area, the leach field is most likely located at a shallow depth.

The Paradise Point Golf Course was constructed in the 1940s and Building 1916 was constructed in 1946. Reportedly, Site 80 has been used as a maintenance area since the initial construction of the golf course. Today, the maintenance area is still in operation. Current golf course maintenance operations include the machine shop (a potential source of waste oils), the equipment wash-down area (a potential source of contaminated wash water), and the routine preparation of pesticides and herbicides for spraying.

1.3 SUMMARY OF REMEDIAL INVESTIGATION

In June 1991, Halliburton, NUS conducted surface soil, subsurface soil, groundwater, surface water and sediment investigations at Site 80. Results of their investigation indicated that some of the surface soil and subsurface soils contained pesticides.

In October 1994, Baker initiated an RI consisting of surface soil, subsurface soil, and groundwater investigations. From June through July 1995, an additional round of soil and groundwater samples were collected to further characterize the west/northwest portion of the site. Subsurface soil samples were not collected from the center of the west/northwest area to avoid contact with the underground leach field. Analytical results for pesticides during the RI indicated the presence of pesticides in the northwest and lawn area of the site.

1.4 SITE SOIL REMEDIATION GOALS

The objective of the remedial action at OU No. 11 was to remove and dispose of contaminated soils which have contaminants of concern exceeding the established remediation goals. Under this approach, potential risks due to contaminated soil exposure would be reduced.

The risk-based remediation goals for surface soils from OU No. 11 were revised from those presented in the Baker 100% Basis of Design document dated December 15, 1995 to match the industrial worker Risk-based Criteria (RBCs). The revised remediation goals were obtained from Attachment A of Baker's letter to LANTDIV dated May 14, 1996 (Refer to Appendix E). Table 1.1 presents the applicable remediation goals for contaminated surface soils.

Table 1.1
Remediation Goals for OU No. 11 - Surface Soils

Contaminant of Concern	*Remediation Goal for Surface Soil ($\mu g/kg$)*
Aldrin	340
Dieldrin	360
4,4'-DDD	2,400
4,4'-DDT	1,700
alpha-Chlordane	4,400
gamma-Chlordane	4,400

2.0 *SUMMARY OF ACTION*

Upon receipt of the Notice-to-Proceed from LANTDIV, OHM commenced preparatory activities for the project such as plan preparation and review for all site activities. The work was categorized into definable phases for economical and efficient execution of the work. Listed below are the major phases of the site work that were performed from March 1996 to August 1996 to fulfill the project specifications:

- Phase 1 – Submit work plans, and sample and analyze soil at AOCs to characterize the soil for disposal.
- Phase 2 – mobilization of all equipment and personnel to the site. This also included survey and staking a 10-feet grid at each AOC.
- Phase 3 – Pre-excavation field screening sampling and analysis to determine the limits of excavation.
- Phase 4 – excavation and disposal of contaminated soils and disposal of liquids generated during decontamination.
- Phase 5 – confirmation sampling and analyses of the excavated areas.
- Phase 6 – backfilling the excavation and seeding with grass.
- Phase 7 – demobilization of all equipment and personnel from the site.

The following sections provide more detail on specific events that were performed to support the major site work efforts.

2.1 SUBMITTALS

On April 1, 1996, OHM submitted plans for Delivery Order No. 100. The plans consisted of a Work Plan, Materials Transportation and Disposal Plan, Environmental Protection Plan, Sampling and Analysis Plan, Construction Quality Control Plan, and Site-Specific Health and Safety Plan. The plans provided a description of the project objectives, schedule, sampling, analysis, decontamination, site work, excavation, construction, storage, transportation, quality control, and disposal requirements that would be implemented to fulfill the requirements of the project specifications. The plans were reviewed and approved by LANTDIV. On May 15, 1996 OHM issued revisions to these plans reflecting

changes in the remediation action levels as proposed by Baker Environmental and agreed to by LANTDIV and the Regulators.

2.2 WASTE CHARACTERIZATION

On March 11, 1996, OHM collected a composite sample of contaminated soil for waste characterization analysis to obtain disposal approval at the disposal site. Results of the soil analyses were submitted to various disposal facilities to develop waste profiles and to obtain disposal pre-approval and pricing. The completed waste profiles for the selected facility was submitted to the Base for final approval.

2.3 SOIL FIELD PRE-EXCAVATION SCREENING

A pre-construction meeting was held on April 18, 1996, at MCB Camp Lejeune. Activities included the delivery of equipment and personnel to the project site. The eight AOCs, AOC 1-12, AOC 13-16, AOC 17-20, AOC 21-24, AOC 25-28, AOC 29-32, AOC 33-38, and AOC 39-42 were survey and a 10-foot grid laid out as shown in Figure 6.1.

Portions of the site were cleared and grubbed to allow access for sampling and excavation of contaminated soil. The debris generated during this phase was left piled on-site as directed by the Navy Technical representative (NTR).

2.4 EXCAVATION OF CONTAMINATED SOIL

All necessary measures for site drainage, siltation, and erosion control were implemented. All excavations were diked and diversion ditches constructed to minimize contaminant migration from the site. Soil in areas identified during pre-excavation field screening as contaminated was excavated to a depth of approximately 1 foot. The horizontal extent of excavation is shown in Figure 2.1.

The contaminated soils were removed using an excavator, loaded directly into transport vehicles, and routed to the off-site permitted disposal facility operated by Michigan Disposal, Inc. in Belleville, Michigan. The excavation activities removed approximately 988 tons of contaminated soils. To mitigate the spread of contaminants off-site, the trucks were decontaminated by brushing the tires and sides of the truck bed to remove soil and/or debris prior to leaving the site. No water was used during decontamination activities.

Photographic documentation of the performance of the project activities is provided in Appendix B.

2.5 CONFIRMATION SAMPLING

Following the initial excavation, screening confirmation samples were collected and analyzed on-site by the OHM chemist to confirm that the contaminant level in the adjacent soil were below the remedial goal. Additional excavation was performed adjacent on an as need basis until on-site analyses indicated the soil contaminant levels were below the remedial goals. Confirmatory samples were collected and sent to an off-site Laboratory to verify that the contaminant levels in the soil samples from the soil adjacent to the excavation were below the remedial goals. Off-site confirmation laboratory results did not detect the presence of contaminants above the remedial goals. Refer to Section 6 for a discussion of the test results of confirmation samples.

2.6 WELL ABANDONMENT

Existing monitoring well number MW-3 located in the northeast quadrant of AOC 33-38 was abandoned during the remediation of this AOC in accordance with all North Carolina regulations. The location of this well is shown on Figure 1.2. In May 1996, Groundwater Protection, Inc. under OHM's supervision filled the 35 feet deep, 2-inch diameter well depth with grout (Portland cement and bentonite) which was tremied into the borehole. Once the grout hardened, the surface area was smoothed and any remaining appurtenances or debris were removed from the area. The well abandonment record is included in Appendix I.

2.7 RELOCATION OF THE TRAILER

The existing trailer located in AOC 1-12 was relocated to a temporary location in April 1996 to allow removal of the contaminated soil under it. The trailer was not moved back to its original location as directed by the Base.

2.8 BACKFILLING AND REVEGETATION

Upon completion of field construction activities, excavated areas were backfilled with soils from the Base borrow area. The backfill was compacted utilizing the heavy equipment on-site. Once the areas were brought to the approximate original grade, the area was prepared for planting grass. The disturbed areas were fertilized and seeded. An as-built drawing of the site which depicts the excavation area is presented in Figure 2.1.

3.0 *FINAL HEALTH AND SAFETY REPORT*

3.1 MOBILIZATION AND SITE PREPARATION

The site set-up for MCB Camp Lejeune, North Carolina, included the following:

- The OHM Field Office at Lot 203 was used for this project.

- Prior to the start of on-site operations, all on-site OHM personnel read, understood and signed the OHM Site-Specific Health and Safety Plan (HASP). In accordance with OSHA requirements, the following items were set-up on-site:
  - Employee Right-To-Know poster and station
  - Material Safety Data Sheets (MSDSs) for all on-site chemicals
  - Hospital route and map posted in the command center and a copy placed in the glove compartments of all site vehicles
  - Site-specific evacuation plan posted in the command center
  - Exit signs posted in the command center

3.2 ON-SITE OPERATIONS

The excavation and disposal of pesticide contaminated soil at Operational Unit (OU) 11, Site 80 MCB Camp Lejeune, North Carolina, included these tasks:

- Relocation of a trailer
- Abandonment of a monitoring well
- Soil excavation and off-site disposal of contaminated soils
- Site sampling
- Backfill and site restoration

Prior to excavation of the soil, all utility companies were notified to locate their lines in the area. Daily Safety Meeting Logs are included in Appendix J.

All sampling of soil was performed in Level C Personal Protective Equipment (PPE) which included MSA air purifying respirator with attached MSA GMC-H type cartridges, tyvek and hood, sample gloves, hard hat, steel toe shoes, and vinyl booties. Safety issues stressed during work activities included good housekeeping and heat stress.

Relocation of the trailer, surveying, excavation, backfill operations, and hydro-seeding were performed in Level D PPE. These tasks required protective clothing including hard hat, safety glasses, steel toe boots and cotton gloves. Safety issues stressed during work

activities included good housekeeping, heat stress, shoring and trenching requirements, and communication system for site personnel.

3.3 TRAINING REQUIREMENTS

OHM employees, subcontractors and site visitors allowed access to work areas were required to have completed the 40-hour health and safety training course for Hazardous Waste Site Operations in accordance with 29 CFR 1910.120 and had to read, understand and sign the HASP.

3.4 ACCIDENTS AND/OR INJURIES

The project was completed without an OSHA Reportable Accident or Lost Time Injury.

4.0 SUMMARY OF RECORD DOCUMENTS

A tabular summary of the record documents submitted to the Navy Technical Representative for Delivery Order 100 is presented in Table 4.1.

Spec. No.	SD No. and Type of Submittal Material or Product	Spec. Para. No.	Approval by CO	Gov. or A/E Reviewer	Trans. Control No.	Planned Sub. Date	Action Code	Date of Action	Date Forwarded to Appro. Auth./Date Received from Contr.	Date Forwarded to Other Reviewer	Date Received from Other Reviewer	Action Code	Date of Action	Mailed to Contr./Recd. from Appro. Auth.	Remarks
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
01010	SD-09, Reports	1.2.1													
	Work Plan	1.2.1.1				4/1/96						A/N	5/15		
01010	SD-18, Records	1.3.1													
	As-built Records	1.3.1.1				Closeout Rpt									
	Environmental Conditions Rpt	1.3.1.2				4/1/96						A/N	5/15		
	Network Analysis Diagram	1.3.1.3				4/1/96						A/N	5/15		
	Status Reports	1.3.1.3				Monthly									
	QC Meeting Minutes	1.3.1.4				Weekly									
	Test Results Summary Report	1.3.1.5				As rec. from lab									
	Contractor Production Report	1.3.1.6				Daily									
	QC Report	1.3.1.7				Closeout Rpt									
	Rework Items List	1.3.1.8				NA									
	Permits	1.3.1.9				As received									
	Contractors Closeout Report	1.3.1.10				Closeout Rpt									
01430	SD-08, Statements	1.2.1				NA									
	Sample Log	1.3.1				Closeout Rpt									
01430	SD-12, Field Test Reports	1.2.2				NA									
	Confirmation Sampling	1.3.3				Closeout Rpt									
01561	SD-02, Manufacturer's Catalog Data	1.3.1				NA									
	Silt Fence	2.1				NA									
	Dust Suppressors	2.2.3				NA									
01561	SD-04, Drawings	1.3.2				NA									
	Erosion Control Plan	1.3.2.1				Work Plan						A/N	5/15		
02102	SD-14, Samples	1.1.1				NA									
	Tree Wound Paint	2.1				NA									
02220	SD-04, Drawings	1.3.1				NA									
	Required Data	1.3.1.1				NA									
02220	SD-09, Reports	1.3.2				Closeout Rpt									
	Remediation Closeout Report	1.3.2.1				Closeout Rpt									
02220	SD-12, Field Test Reports	1.3.3				NA									
	Fill and Backfill	2.1.2				NA									

N/A = Not Applicable

Spec. No.	SD No. and Type of Submittal Material or Product	Spec. Para. No.	Approval by CO	Gov. or A/E Reviewer	Trans. Control No.	Planned Sub. Date	Action Code	Date of Action	Date Forwarded to Appro. Auth./Date Received from Contr.	Date Forwarded to Other Reviewer	Date Received from Other Reviewer	Action Code	Date of Action	Mailed to Contr./Recd. from Appro. Auth.	Remarks
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
02223	SD-08, Statements	1.1.1				NA									
	Treatability Facility Permit	1.1.1.1				Closeout Rpt									
02223	SD-18, Records	1.1.2													
	Shipment manifests	1.1.2.1				Closeout Rpt									
	Delivery Certificates	1.1.2.1				Closeout Rpt									
	Disposal Site Decon Certificate	1.1.2.3				Closeout Rpt									
	Work Site Decon Certificate	1.1.2.4				Closeout Rpt									
	Treatment and Disposal Cert	1.1.2.5				Closeout Rpt									

N/A = Not Applicable

5.0 *FIELD CHANGES AND CONTRACT MODIFICATIONS*

5.1 FIELD CHANGES

During field operations, weekly progress meetings were held with the Navy Technical Representative (NTR). During these meetings, items of concern and project status were discussed. Field changes were discussed and implemented when conditions dictated. The following is a summary of changes agreed to by OHM and the Navy with a brief explanation:

- Transport vehicles were routed through clean zones only. Decontamination of transport vehicles was performed by brushing loose soil from the tires.

- Directed to leave office trailer in new location

5.2 CONTRACT MODIFICATIONS

During the course of the project, one contract modification was made. Modification No. 01 was issued by LANTDIV on March 11, 1996, to remove the pesticide contaminated soils from eight AOCs. This resulted in an increase of delivery order amount by $592,953.00.

6.0 SUMMARY OF CHEMICAL AND GEOTECHNICAL TESTING

During the course of the project, chemical analyses of the site soils was used to direct the excavation and disposal activities to ensure that the project requirements were fulfilled. Various sampling and analytical events were conducted to achieve the project goals. Listed below are the chemical analytical events that were conducted for this project.

- Waste characterization by an off-site laboratory of a soil sample collected from the AOCs.

- Field screening by an on-site laboratory equipped with a gas chromatograph of discrete soil samples from each AOC to assist in determining the area to be excavated.

- Confirmation by an on-site chemist with a gas chromatograph of discrete soil samples from the bottom and sides of the excavation pits for the contaminants of concern of each individual location

- Confirmation analyses by an off-site laboratory of discrete soil samples from the bottom and sides of the excavation pits for the contaminants of concern of each individual location

The following paragraphs discuss the general results of the sampling events and actions taken based on those results.

6.1 WASTE CHARACTERIZATION

Prior to the excavation of soils, an OHM technician collected a composite samples from the AOCs. On March 11, 1996 collected waste characterization sample number CLJ-WC-001 from two soil points six inches below lands surface. The soil waste characterization sample was documented, preserved and shipped overnight to OHM Analytical Division. The soil samples were analyzed for the parameters listed in Table 6.1.

Table 6.1 Summary of Soil Waste Characterization Parameters	
Parameter	*Reference/Analytical Method*
Conventional	
Paint Filter Test (Free Liquid)	SW-846/9095
RCRA Characteristics	
Reactive Sulfide	SW-846/7.3.4.2
Flash Point, Seta Flash	SW-846/1020
Reactive Cyanide	SW-846/7.3.3.2
pH, Electrode (Soil)	CLP/1.7.1.1
Metals	
Total Metals	SW-846/6010
Mercury by Cold Vapor	SW-846/7471
Selenium by GFAA	SW-846/7740
Thallium by GFAA	SW-846/7841
Organics	
Pesticides/PCBs by GC	SW-846/8080
Semi-volatile Compounds by GC/MS	CLP SOW/OLMO3.1
Volatile Compounds by GC/MS	CLP SOW/OLMO3.1
RCRA TCLP	
Leachate Preparation	SW-846/1311
Herbicides by GC	SW-846/8150 (1)
Pesticides by GC	SW-846/8080
Metals	SW-846/6010
Mercury by Cold Vapor	SW-846/7470
Semi-volatile Compounds by GC/MS	CLP SOW/OLMO3.1
Volatile Compounds by GC/MS	CLP SOW/OLMO3.1

The complete results and data sheets for these analyses are included in this report in Appendix H and summarized in Table 6.2. This information was forwarded to the identified disposal facilities for disposal approval. Based on these results, the disposal facilities approved the disposal of the materials. Pesticide-contaminated soil was disposed of at the permitted Michigan Disposal, Inc. facility in Belleville, Michigan.

Table 6.2 Summary of Soil Waste Characterization Analytical (Sample CLJ100-WC1, collected 3/11/96)		
Parameter	*Units*	*Level*
Pesticides		
4,4' DDD	mg/kg	3,610
4,4' DDE	mg/kg	BDL
4,4' DDT	mg/kg	827
Total Metals Total		
Aluminum	mg/kg	2,420
Arsenic	mg/kg	20.4
Barium	mg/kg	30.6
Cadmium	mg/kg	1.84
Calcium	mg/kg	7,610
Chromium	mg/kg	59.4
Copper	mg/kg	10.6
Iron	mg/kg	3,800
Lead	mg/kg	70.3
Manganese	mg/kg	41.3
Mercury	mg/kg	3.61
Vanadium	mg/kg	6.78
Zinc		83.2
TLCP Leachate Metals		
Arsenic	mg/L	.068
Cadmium	mg/L	.012

Note: Analytes not listed in this table were below laboratory detection limits.

6.2 PRE-EXCAVATION FIELD SCREENING ANALYSIS

OHM laid out a 10-feet by 10-feet grid in each of the eight AOC identified by Baker. A discrete grid sample was collected at a depth of six-inches at each grid point. Figure 6.1 shows the location of the screening samples. Samples were analyzed for pesticide contamination using an on-site laboratory. Results were compared with the remedial goals to determine the initial excavation limits. Off-site pre-excavation off-site analysis was also performed. Table 6.3 summarizes the results of the off-site pre-excavation sample analyses and the analytical report is included as Appendix H. The on-site analytical results are also included as Appendix H.

Table 6.3 Summary of Off-Site Laboratory Soil Field Screening Samples							
Sample Name	*Aldrin*	*g-Chlordane*	*a-Chlordane*	*Dieldrin*	*4,4' DDD*	*4,4' DDT*	*4,4' DDE*
CLJ100-FS-022				13	19	18	38
CLJ100-FS-23		25	25	200	58	120	
CLJ100-FS-033		54	66	65	93	83	65

Notes:
1. Samples collected on 4/18/96 and recorded on chain-of-custody No. 166541.
2. Analyses performed off-site by CKY Inc., EPA Analytical Method 8080.

6.3 PRE-CONFIRMATION FIELD SCREENING ANALYSES

Confirmation samples were collected discrete soil samples from the bottom and sides of the excavation pits for the contaminants of concern of each individual location. The sample locations are shown in Figure 6.2. The samples were analyzed by an on-site chemist with a gas chromatogram. The results of the on-site analyses is presented in Appendix H.4.

6.4 CONFIRMATION ANALYSES

After excavation of the contaminated soils, dual grab confirmation samples and grab confirmation samples were collected to verify that all soil with contaminant levels above the remedial goals had been removed. One sample was analyzed on-site and the other routed to the off-site laboratory. Samples found contaminated by the field GC were not analyzed by the off-site laboratory. Confirmation samples collected are listed in Table 6.4. One samples was taken from the each 500 square feet of pit excavation area and one sample per each 50 linear feet along each side wall of the excavation. The sample locations are shown in Figure 6.2. The soil samples collected from the excavations following removal of the soils with contaminant levels above the remedial goal were analyzed by CKY Inc. for the pesticides by analytical method 8080. These sample locations are shown in Figure 6.2.

Confirmation laboratory results from samples collected from the bottom and walls of the excavation detected the presence of the contaminants of concern below the remedial goal.

Confirmation result detected dieldrin at a maximum of 260 ug/kg which is below the remediation goal of 360 ug/kg; 4,4'-DDD at a maximum of 1,300 ug/kg which is below the remediation goal of 2,400 ug/kg, and 4,4'-DDT at a maximum of 610 ug/kg which is below the remediation goal of 1,700 ug/kg. The confirmation samples indicated that only sample number CLJ100-CS-66 had alpha-chlordane and gamma-chlordane present above detection limits. Alpha-chlordane was detected at 220 ug/kg and gamma-chlordane was detected at

which is below their remediation goal of 4,400 ug/kg. Aldrin was not detected above detection limit in the confirmation samples.

Table 6.4
Off-Site Soil Confirmation Analytical Summary
(ug/kg)

Date	Chain-of-Custody No.	Sample No.	Sample Location	Date Sampled	Aldrin	alpha-Chlordane	gamma-Chlordane	4,4' DDD	4,4' DDE	4,4' DDT	Dieldrin
5/29/96	166571	CLJ100-CS-001	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	BDL	280	50
5/29/96	166571	CLJ100-CS-002	AOC1-12	5/29/96	NA	NA	NA	NA	NA	NA	NA
5/29/96	166571	CLJ100-CS-003	AOC1-12	5/29/96	NA	NA	NA	NA	NA	NA	NA
5/29/96	166571	CLJ100-CS-004	AOC1-12	5/29/96	NA	NA	NA	NA	NA	NA	NA
5/29/96	166571	CLJ100-CS-005	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/29/96	166571	CLJ100-CS-006	AOC1-12	5/29/96	NA	NA	NA	NA	NA	NA	NA
5/29/96	166571	CLJ100-CS-007	AOC1-12	5/29/96	NA	NA	NA	NA	NA	NA	NA
5/29/96	166571	CLJ100-CS-008	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/29/96	166571	CLJ100-CS-009	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	300	150	56
5/29/96	166571	CLJ100-CS-010	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	390	440	40
5/29/96	166572	CLJ100-CS-011	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/29/96	166572	CLJ100-CS-012	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	110	BDL	35
5/29/96	166572	CLJ100-CS-013	AOC1-12	5/29/96	BDL	BDL	BDL	BDL	220	100	BDL
5/29/96	166572	CLJ100-CS-014	AOC1-12	5/29/96	BDL	BDL	BDL	150	BDL	BDL	67
5/30/96	166573	CLJ100-CS-015	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-016	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-017	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-018	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-019	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-020	AOC33-38	5/30/96	BDL	BDL	BDL	BDL	BDL	BDL	30
5/30/96	166573	CLJ100-CS-021	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166573	CLJ100-CS-022	AOC33-38	5/30/96	BDL	BDL	BDL	BDL	BDL	BDL	110
5/30/96	166573	CLJ100-CS-023	AOC33-38	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166574	CLJ100-CS-024	AOC39-42	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166574	CLJ100-CS-025	AOC39-42	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166574	CLJ100-CS-026	AOC25-28	5/30/96	BDL	BDL	BDL	330	350	610	120
5/30/96	166574	CLJ100-CS-027	AOC39-42	5/30/96	NA	NA	NA	NA	NA	NA	NA
5/30/96	166574	CLJ100-CS-028	AOC29-32	5/30/96	BDL	BDL	BDL	BDL	230	300	250
5/30/96	166574	CLJ100-CS-029	AOC29-32	5/30/96	BDL	BDL	BDL	1,300	1,600	BDL	260
5/30/96	166574	CLJ100-CS-030	AOC29-32	5/30/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-031	AOC25-28	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-032	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-033	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-034	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-035	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166577	CLJ100-CS-036	AOC29-32	5/31/96	BDL	BDL	BDL	120	950	BDL	110

Table 6.4
Off-Site Soil Confirmation Analytical Summary
(ug/kg)

Date	Chain-of-Custody No.	Sample No.	Sample Location	Date Sampled	Aldrin	alpha-Chlordane	gamma-Chlordane	4,4' DDD	4,4' DDE	4,4' DDT	Dieldrin
5/31/96	166577	CLJ100-CS-037	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	180	BDL	30
5/31/96	166577	CLJ100-CS-038	AOC29-32	5/31/96	BDL	BDL	BDL	BDL	180	BDL	60
5/31/96	166577	CLJ100-CS-039	AOC29-32	5/31/96	NA	NA	NA	NA	NA	NA	NA
5/31/96	166577	CLJ100-CS-040	AOC29-32	5/31/96	BDL	BDL	BDL	170	120	BDL	43
5/31/96	166578	CLJ100-CS-041	AOC13-16	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166578	CLJ100-CS-042	AOC13-16	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166578	CLJ100-CS-043	AOC13-16	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166578	CLJ100-CS-044	AOC13-16	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	38
5/31/96	166578	CLJ100-CS-045	AOC13-16	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166578	CLJ100-CS-046	AOC17-20	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5/31/96	166578	CLJ100-CS-047	AOC17-20	5/31/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-048	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-049	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-050	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	62
6/1/96	166583	CLJ100-CS-051	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-052	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-053	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-054	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-055	AOC17-20	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166583	CLJ100-CS-056	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-057	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-058	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-059	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-060	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-061	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/1/96	166584	CLJ100-CS-062	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	39
6/1/96	166584	CLJ100-CS-063	AOC1-12	6/1/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-064	AOC1-12	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-065	AOC39-42	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-066	AOC39-42	6/4/96	BDL	220	230	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-067	AOC33-38	6/4/96	NA	NA	NA	NA	NA	NA	NA
6/4/96	166587	CLJ100-CS-068	AOC33-38	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-069	AOC33-38	6/4/96	BDL	BDL	BDL	180	210	BDL	58
6/4/96	166587	CLJ100-CS-070	AOC33-38	6/4/96	NA	NA	NA	NA	NA	NA	NA
6/4/96	166587	CLJ100-CS-071	AOC33-38	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166587	CLJ100-CS-072	AOC33-38	6/4/96	NA	NA	NA	NA	NA	NA	NA
6/4/96	166588	CLJ100-CS-073	AOC33-38	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166588	CLJ100-CS-074	AOC29-32	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166588	CLJ100-CS-075	AOC1-12	6/4/96	BDL	BDL	BDL	590	BDL	160	BDL

Table 6.4
Off-Site Soil Confirmation Analytical Summary
(ug/kg)

Date	Chain-of-Custody No.	Sample No.	Sample Location	Date Sampled	Aldrin	alpha-Chlordane	gamma-Chlordane	4,4' DDD	4,4' DDE	4,4' DDT	Dieldrin
6/4/96	166588	CLJ100-CS-076	AOC1-12	6/4/96	NA	NA	NA	NA	NA	NA	NA
6/4/96	166588	CLJ100-CS-077	AOC1-12	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166588	CLJ100-CS-078	AOC1-12	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/4/96	166588	CLJ100-CS-079	AOC1-12	6/4/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-080	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-081	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-082	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-083	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-084	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-085	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	180
6/5/96	166591	CLJ100-CS-086	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-087	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166591	CLJ100-CS-088	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166592	CLJ100-CS-089	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166592	CLJ100-CS-090	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166592	CLJ100-CS-091	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	260	160	180
6/5/96	166592	CLJ100-CS-092	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	140	BDL	BDL
6/5/96	166592	CLJ100-CS-093	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166592	CLJ100-CS-094	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/5/96	166592	CLJ100-CS-095	AOC1-12	6/5/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/6/96	166598	CLJ100-CS-096	AOC1-12	6/6/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/6/96	166598	CLJ100-CS-097	AOC33-38	6/6/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/6/96	166598	CLJ100-CS-098	AOC33-38	6/6/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/6/96	166598	CLJ100-CS-099	AOC33-38	6/6/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
6/6/96	166598	CLJ100-CS-100	AOC33-38	6/6/96	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Notes:
1. NA - Not analyzed
2. BDL - Below detection limit
3. Sample locations are shown on Figure 6.2 in this report.
4. Analyses performed by off-site laboratory, CKY Inc.

7.0 OFF-SITE DISPOSAL OF MATERIAL

All contaminated soils destined for off-site disposal facilities were transported by Robbie D. Wood, a licensed waste hauler. Forty-three truck loads containing approximately 988 tons of pesticide-contaminated soil were transported to Envotech Management Services Inc. in Belleville, Michigan. Chemical oxidation followed by stabilization was chosen as the disposal method A summary of off-site hazardous waste disposal is presented in Table 7.1. All transportation and disposal was performed in accordance with state and federal regulations.

All trucks were weighed by the Base scales to establish their weight prior to being loaded. After loading, the trucks were re-weighed to calculate the weight of material hauled and ensure maximum load capacities were within their legal haul limits. The trucks were brushed to remove soil and debris from the vehicles tires and bed, the manifests were signed by Base personnel, and the trucks released for travel to the disposal facility. Copies of the waste manifests are included in this report as Appendix C, and disposal certification for the hazardous waste is located in Appendix D.

Table 7.1
Summary Of Disposal Of Pesticide Contaminated Soils, Hazardous Waste, At Michigan Disposal Inc., Belleville, Michigan

Date	*Quantity (Pounds)*	*State Manifest No.*	*Manifest No.*
5/29/96	44,820	MI 3905294	01375
5/28/96	45,240	MI 4046901	01376
5/28/96	46,120	MI 4046905	01377
5/28/96	44,420	MI 4046906	01378
5/28/96	43,900	MI 4046907	01379
5/28/96	47,540	MI 4046908	01380
5/28/96	49,640	MI 4046910	01381
5/28/96	47,640	MI 4046911	01382
5/28/96	45,260	MI 4046912	01383
5/29/96	47,500	MI 3905295	01384
5/29/96	44,980	MI 3905296	01386
5/29/96	48,000	MI 3905297	01385
5/29/96	50,100	MI 3905299	01387
5/30/96	40,880	MI 3905306	01388
5/30/96	40,040	MI 3905305	01389
5/30/96	45,140	MI 3905304	01390
5/30/96	42,000	MI 3905303	01391
5/30/96	48,060	MI 3905302	01392
5/30/96	48,720	MI 3905301	01393
5/31/96	45,600	MI 4219800	01394
5/31/96	48,500	MI 4219799	01395
5/31/96	48,820	MI 4219787	01396
5/31/96	46,740	MI 4219798	01397
5/31/96	47,800	MI 4219797	01398
6/3/96	44,600	MI 4219788	01402
6/4/96	49,300	MI 4219790	01403
6/6/96	47,760	MI 4219791	01404
6/6/96	42,400	MI 4046946	01405
6/4/96	46,280	MI 4046947	01406

Table 7.1
Summary Of Disposal Of Pesticide Contaminated Soils, Hazardous Waste, At Michigan Disposal Inc., Belleville, Michigan

Date	*Quantity (Pounds)*	*State Manifest No.*	*Manifest No.*
6/4/96	46,300	MI 3941573	01407
6/4/96	46,400	MI 3941574	01408
6/5/96	44,040	MI 3941575	01409
6/5/96	44,700	MI 3941576	01410
6/5/96	48,920	MI 3905292	01412
6/5/96	46,700	MI 3905293	01415
6/6/96	43,380	MI 4046932	01416
6/6/96	44,080	MI 4046933	01417
6/6/96	48,740	MI 4046934	01418
6/6/96	48,720	MI 4046935	01419
6/6/96	39,800	MI 4046936	01420
6/7/96	44,720	MI 4046938	01423
6/7/96	49,300	MI 4046941	01425
6/10/96	42,940	MI 4046939	01424
TOTAL	1,976,580	43 loads	

8.0 QUALITY CONTROL SUMMARY

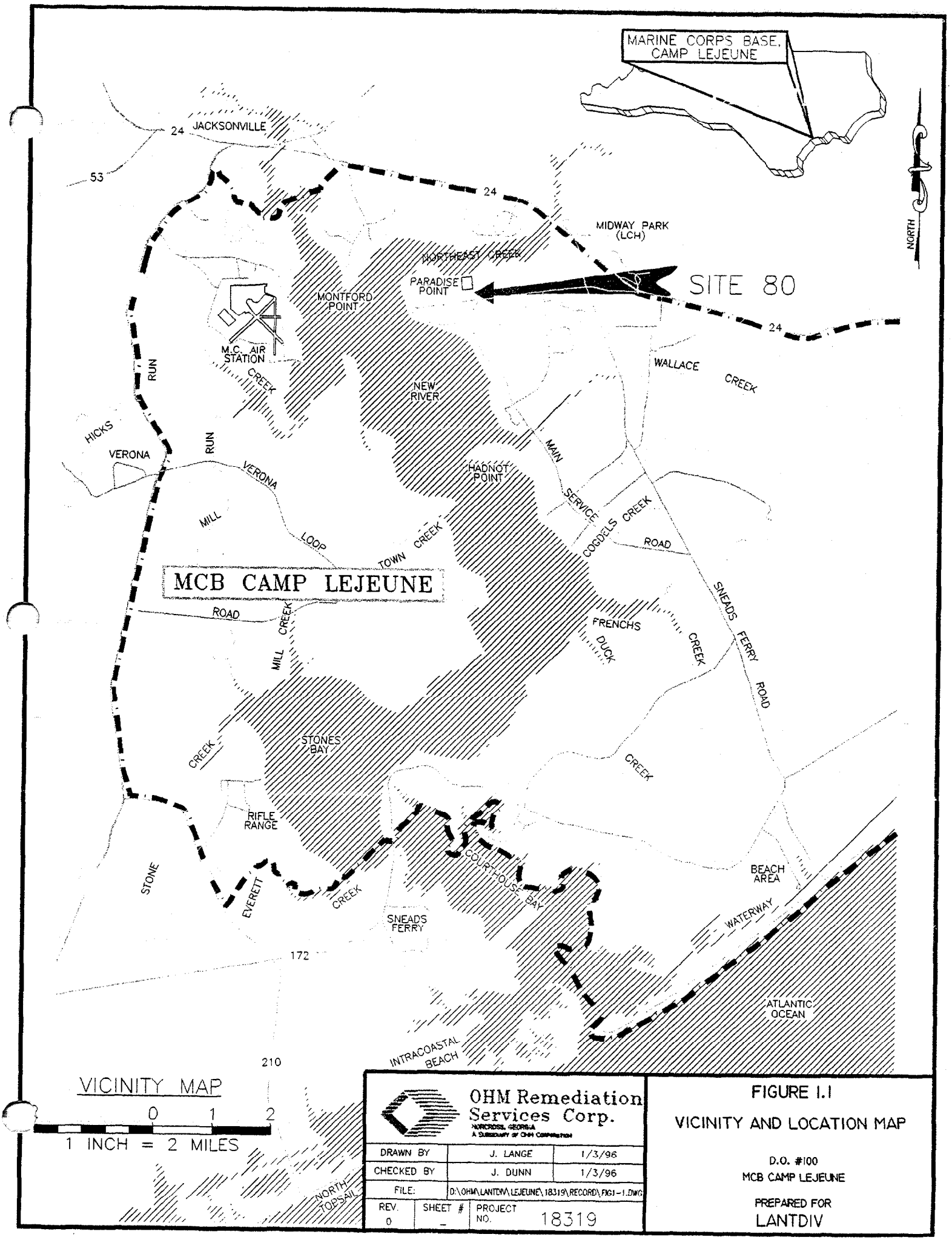
Quality Control (QC) Engineer conducted preparatory and initial site inspections during a site visit. This offered the QC Engineer an opportunity to review the completeness and adequacy of mobilization activities, to observe health and safety practices, to evaluate excavation operations, and to check sampling and analysis documentation. No QC problems were noted during the performance of this project. QC meetings were conducted and the minutes recorded and submitted with the inspection report to the NTR by the Site Supervisor. The minutes of the QC meetings are included in Appendix E.

Additional submittals forwarded to the NTR and their frequency of submission were as follows:

- Daily Sign-in Log
- Daily Health and Safety Report
- Daily Cost Report
- Monthly Progress Report
- Field Sampling Test Results – as received
- Confirmation Sample Test Results – as received

Appendix A

As-Built Drawings



VICINITY MAP

0 1 2

1 INCH = 2 MILES

OHM Remediation Services Corp.
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

DRAWN BY	J. LANGE	1/3/96
CHECKED BY	J. DUNN	1/3/96
FILE:	D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\FIG1-1.DWG	
REV. 0	SHEET # -	PROJECT NO. 18319

FIGURE 1.1

VICINITY AND LOCATION MAP

D.O. #100
MCB CAMP LEJEUNE

PREPARED FOR
LANTDIV

COORDINATES FOR EXCAVATION LIMITS		
PT #	NORTHING	EASTING
1	356,261 3521	2,485,040.5262
2	356,178.6847	2,485,082.7485
3	356,167 2843	2,485,063.8163
4	356,166.2941	2,485,054.9013
5	356,170 5517	2,485,010.2057
6	356,198 1292	2,484,989 4819
7	356,212.9135	2,485,004.2174
8	356,217.7839	2,484,998.1040
9	356,208.6672	2,484,976.3117
10	356,224.0151	2,484,963 9298
11	356,233.9169	2,484,960.4629
12	356,261.3521	2,484,973.2226
13	356,314 4832	2,485,290.1415
14	356,283.1908	2,485,328 7236
15	356,259 8910	2,485,309.8260
16	356,291.3869	2,485,270.9929
17	356,287.1958	2,485,272.9067
18	356,259.0884	2,485,262.4198
19	356,266.5125	2,485,242.5216
20	356,294.6199	2,485,253.0086
21	356,193.9025	2,485,164.5324
22	356,166.5826	2,485,176.9261
23	356,155.1958	2,485,151.8281
24	356,182.5158	2,485,139.4336
25	356,147.7552	2,485,184.2024
26	356,120.4353	2,485,196.5969
27	356,109.5248	2,485,172.5480
28	356,136.8448	2,485,160.1535
29	356,102.9983	2,485,204.7055
30	356,075.6784	2,485,217.0999
31	356,064.6935	2,485,192 8869
32	356,092.0134	2,485,180.4925
33	356,025.0633	2,485,212.9148
34	356,995.0633	2,485,212.9341
35	355,976.1479	2,485,203.6001
36	355,976.1284	2,485,192.2682
37	355,995.0438	2,485,182.9341
38	356,025.0438	2,485,182 9147
39	355,998.8183	2,485,171.9745
40	355,971.4984	2,485,184 3689
41	355,962.7380	2,485,165.0591
42	355,990.0579	2,485,152.6647

LEGEND

- ORIGINAL AOC BOUNDARY POINT
- AREAS OF CONCERN (AOC)
- 16 — TOPOGRAPHIC CONTOIR
- —SF— SILT FENCE
- ---X--- CONSTRUCTION FENCE
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- ABANDONDED MONITORING WELL

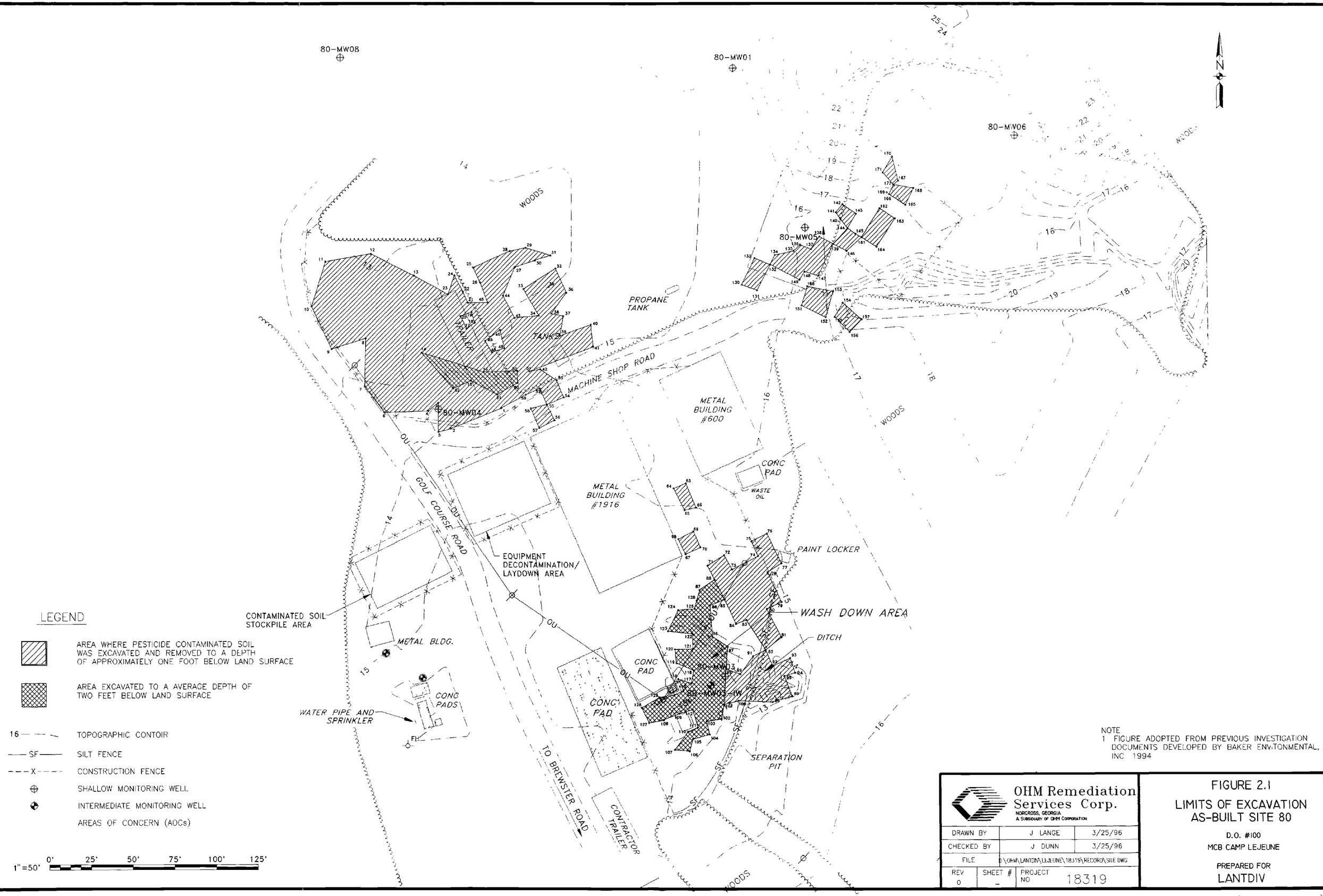
1"=50' 0' 25' 50' 75' 100' 125'

80-MW08
80-MW01
80-MW06
80-MW05
80-MW04
80-MW03
80-MW03-IW
AOC 1-12
AOC 13-16
AOC 17-20
AOC 21-24
AOC 25-28
AOC 29-32
AOC 33-38
AOC 39-42
WOODS
TRAILER
PROPANE TANK
TANKS
MACHINE SHOP ROAD
METAL BUILDING #600
METAL BUILDING #1916
CONC PAD
WASTE OIL
PAINT LOCKER
GOLF COURSE ROAD
EQUIPMENT DECONTAMINATION/ LAYDOWN AREA
CONTAMINATED SOIL STOCKPILE AREA
METAL BLDG.
CONC PADS
WATER PIPE AND SPRINKLER
WASH DOWN AREA
DITCH
SEPARATION PIT
TO BREWSTER ROAD
CONTRACTOR TRAILER
OU
SF

OHM Remediation Services Corp. NORCROSS, GEORGIA A SUBSIDIARY OF OHM CORPORATION		
DRAWN BY	J LANGE	3/25/96
CHECKED BY	B MATTHEWS	3/25/96
FILE	D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\FIG1-2.DWG	
REV 0	SHEET # -	PROJECT NO 18319

FIGURE 1.2
SITE PLAN
SITE 80 CLOSEOUT REPORT
D.O. #100
MCB CAMP LEJEUNE
PREPARED FOR
LANTDIV

OC912.L01X



NOTE
1 FIGURE ADOPTED FROM PREVIOUS INVESTIGATION DOCUMENTS DEVELOPED BY BAKER ENVIRONMENTAL, INC 1994

OHM Remediation Services Corp.
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

DRAWN BY	J LANGE	3/25/96
CHECKED BY	J DUNN	3/25/96
FILE	D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\SITE.DWG	
REV 0	SHEET # -	PROJECT NO 18319

FIGURE 2.1
LIMITS OF EXCAVATION AS-BUILT SITE 80

D.O. #100
MCB CAMP LEJEUNE

PREPARED FOR
LANTDIV

COORDINATES FOR EXCAVATION LIMITS				
PT #	NORTHING	EASTING	TOP EL	CUT EL
1	356,173 56	2,485,072 91	18 20	17 30
2	356,161 34	2,485,042 61	17.80	16 60
3	356,176.36	2,485,034.86	17.50	15 60
4	356,171 81	2,485,029.02	17 40	15 80
5	356,159 44	2,485,034 98	17 60	16 20
6	356,170 88	2,485,002 86	17 10	15 90
7	356.186 27	2,484,991.02	16 90	15 40
8	356,214 64	2,484,991 76	16 70	14 90
9	356,208 25	2,484,971.47	16 50	14 40
10	356,233 43	2,484,959 58	16 30	13 60
11	356,259 70	2,484,967 95	15 60	14 90
12	356,264 35	2,484,994 95	16 70	15 30
13	356,251 50	2,485,020 62	16 70	14 40
14	356,206 13	2,485,025 16	19.00	15 60
15	356,189 67	2,485,054 64	18.00	16.80
16	356,194 93	2,485,062 31	17 10	–
17	356,220 32	2,485,052.17	17 20	16 50
18	356,223 82	2,485,056 93	17.00	16.20
19	356,230 10	2,485,055.12	16 90	16 40
20	356,227 77	2,485,048 55	17 10	16 30
21	356,235 62	2,485,052.95	16.60	15.60
22	356,242 13	2,485,049.93	17.00	15.80
23	356,240.55	2,485,041.15	16.90	15.90
24	356,251.69	2,485,044.91	16.40	15.60
25	356,256.39	2,485,056.08	16.90	15.50
26	356,247 58	2,485,060.32	16.90	15.80
27	356,256 61	2,485,081.12	17.80	16.20
28	356,265.96	2,485,078.17	17.10	16.50
29	356,267 95	2,485,087 69	17.70	16 30
30	356,260 63	2,485,093.34	17.70	16.50
31	356,263 45	2,485,102 54	18.10	16.40
32	356,255.80	2,485,105 47	18 80	16.70
33	356,243 67	2,485,086.25	18.30	16.90
34	356,228 07	2,485,095 44	19.50	17.50
35	355,245 04	2,485,101 45	18.40	17 10
36	355,241 58	2,485,111 94	18.20	16 80
37	355,227 71	2,485,110 13	18.50	16.90
38	356,229 35	2,485,102.94	18.40	17 10
39	355,216 12	2,485,108.03	18 70	17 60
40	355,222.69	2,485,126 48	19 10	18.10
41	355,209 67	2,485,127.93	19 30	17 90
42	355,196 38	2,485,096.22	18.60	17 50
43	356,226 71	2,485,080.85	18 60	17 00
44	356,239 80	2,485,074 04	17.00	15 80
45	356,235 75	2,485,064 82	16.30	15.40
46	356,219 60	2,485,072 15	17.90	16 70
47	356,213 07	2,485,063.17	17.50	16 40
48	356,206 46	2,485,067 20	18 60	17 30
49	356,208 79	2,485,074.70	18.10	17 00
50	356,195 57	2,485,082.45	18.80	17.60

COORDINATES FOR EXCAVATION LIMITS				
PT #	NORTHING	EASTING	TOP EL	CUT EL
51	356,195 27	2,485,089 68	18 80	17 60
52	356,185 10	2,485,095 75	18 50	17 60
53	356,189 83	2,485,106 06	18 50	17 90
54	356,179 71	2,485,110 12	18 60	17 70
55	356,175 57	2,485,100 10	18 50	17 70
56	356,166 45	2,485,104 67	18 40	17 60
57	356,155 59	2,485,097 54	18 40	17 60
58	356,173 32	2,485,090 54	18 30	17 70
59	356,181 35	2,485,087 39	18 40	17 40
60	356,188 39	2,485,082 57	18 50	17 60
61	356,181 47	2,485,070 34	18 60	17 10
62	356,185 05	2,485,044 01	17 15	15 70
63	356,129 03	2,485,183.18	18.99	–
64	356,126 06	2,485,175 84	18 89	–
65	356,113.24	2,485,182 46	18 79	–
66	356,114 83	2,485,189 30	18 79	–
67	356,087 22	2,485,182.94	18 39	–
68	356,096.08	2,485,178 60	18.29	–
69	356,100 70	2,485,187 69	18 79	–
70	356,091 30	2,485,191.84	18.79	–
71	356,080.47	2,485,196 08	18.69	17 59
72	356,086.64	2,485,206 02	18.59	17.59
73	356,078.27	2,485,210.84	18.39	17 69
74	356,086 14	2,485,226.44	18.89	17 59
75	356,094.91	2,485,222.54	19.29	17 89
76	356,099 40	2,485,231 90	18.89	17 99
77	356,081 92	2,485,240 49	18.89	17.79
78	356,076 68	2,485,232.20	18 69	17 69
79	356,059 10	2,485,240 46	18.59	17 79
80	356,054 98	2,485,231.58	18.69	17 69
81	356,038 36	2,485,240 36	18.59	17 79
82	356,031 10	2,485,230 85	18.69	17 49
83	356,048 66	2,485,219 33	18.39	17.39
84	356,046 25	2,485,213.14	18.29	17 59
85	356,060 50	2,485,206 28	18 09	17 29
86	356,057.15	2,485,197 45	18 59	16 39
87	356,066 19	2,485,191.24	18.29	–
88	356,072 30	2,485,200.23	18.29	17 79
89	356,003 84	2,485,246 58	16.59	–
90	356,000 30	2,485,234 88	16 59	–
91	356,027 28	2,485,223 27	18.19	–
92	356,021 49	2,485,235.08	19.59	–
93	356,026 25	2,485,245 50	20 39	–
94	356,017 45	2,485,248.38	19.09	–
95	356,015 59	2,485,241 96	19.79	–
96	356,038 70	2,485,198 88	17 29	15 89
97	356,032 85	2,485,207 96	16.39	15.69
98	356,019 69	2,485,206 93	18.79	16.34
99	356,016.66	2,485,215.57	17.89	16 39
100	356,000.99	2,485,214 39	16.49	15 99

COORDINATES FOR EXCAVATION LIMITS				
PT #	NORTHING	EASTING	TOP EL	CUT EL
101	355,998 85	2,485,205.72	16.79	15 49
102	355,990 24	2,485,204.17	18 09	16 19
103	355,989 02	2,485,195 24	17.99	15 89
104	355,981 27	2,485,197 01	18.09	16 29
105	355,978 43	2,485,186.90	18 19	15 99
106	355,971 32	2,485,185 11	18.39	16 09
107	355,972 11	2,485,176 19	18.19	15 99
108	355,989 70	2,485,169.54	18 10	16 20
109	355,993 43	2,485,179.06	18.99	16 29
110	355,982 74	2,485,184.11	18 99	16 19
111	355,985 46	2,485,190.02	18 99	16 09
112	355,995 76	2,485,186 86	18 99	15 89
113	356,000 31	2,485,185 39	17 99	15 99
114	356,004 39	2,485,175.92	18.29	16 59
115	356,007 08	2,485,181 37	18 39	15 89
116	356,013 71	2,485,178.27	18 39	16 69
117	356,011 20	2,485,186.06	18.89	16 09
118	356,018.84	2,485,187.66	18.39	15 99
119	356,023 20	2,485,177.21	18.59	16 39
120	356,031.33	2,485,176.33	18 76	16 69
121	356,031.54	2,485,187.05	18.79	16.19
122	356,040 30	2,485,187.06	18.39	15.79
123	356,041 95	2,485,172.20	18.29	15 99
124	356,054.19	2,485,178.27	18.09	15.89
125	356,055.08	2,485,188 20	18 19	15.89
126	356,059.94	2,485,189.54	18.39	16.39
127	355,987 92	2,485,160.59	18.30	16.10
128	355,996 85.	2,485,156.30	18.80	16.20
129	356,003 04	2,485,167.16	18 50	16 10
130	356,246 12	2,485,217.10	19.63	18.43
131	356,242 82	2,485,226.34	19.73	18.93
132	356,258.18	2,485,234 29	20 63	19 03
133	356,261 74	2,485,224.90	19 63	18.93
134	356,263.60	2,485,237.07	20.33	19.33
135	356,265.99	2,485,248.27	20 23	19 13
136	356,269.76	2,485,252.21	20 33	19 63
137	356,267.08	2,485,258.76	20.73	19 43
138	356,274 54	2,485,263.82	20 43	19 63
139	356,270 24	2,485,1272 21	20 63	19.63
140	356,248 83	2,485,276.58	21.03	19 93
141	356,288.79	2,485,273.82	20 73	20 13
142	356,293 43	2,485,277.92	20 83	20 13
143	356,287.96	2,485,285.85	20.93	20 03
144	356,279.29	2,485,280.86	21 03	19.83
145	356,276 24	2,485,285 57	20.53	19 93
146	356,265.99	2,485,280.22	20 73	20 03
147	356,251 36	2,485,263.07	20.33	19 53
148	356,253.98	2,485,254.84	20.43	19 43
149	356,249 09	2,485,251 89	20 33	19 23
150	356,245 06	2,485,256.52	20.13	18.63

COORDINATES FOR EXCAVATION LIMITS				
PT #	NORTHING	EASTING	TOP EL	CUT EL
151	356,234 03	2,485,253 05	21 63	18 43
152	356,226 97	2,485,267 67	20 43	18 93
153	356,242.25	2,485,272 05	19 93	19 23
154	356,235 53	2,485,277 84	20 23	19 53
155	356,227 29	2,485,273 10	20 43	19 63
156	356 218 30	2,485,282 04	21 93	20 23
157	356 225 75	2,485,289 21	22 63	20 03
158	356 208 32	2,485,298 15	21 83	20 93
159	356 198.77	2,485,292 91	21 93	20 53
160	356.203 51	2,485,283 17	21 93	20.53
161	356 274 03	2,485,289 19	20 63	19 63
162	356.291.16	2,485,300 14	20 63	19 83
163	356,285 17	2,485,185 39	17 99	15 99
164	356,268 48	2,485,298 29	20 53	19 23
165	356,293.13	2,485,315 64	20 63	19 63
166	356,299.36	2,485,305 76	20 93	19 83
167	356,307 36	2,485,311 29	20 93	19.53
168	356,303 05	2,485,320 52	20 83	20 03
169	356,300.49	2,485,304 50	20 83	19.83
170	356,321.58	2,485,307 71	20 93	19.93
171	356,312.20	2,485,302.15	20 73	20.03
172	356,304.96	2,485,308.52	20 73	19.73

OHM Remediation Services Corp.
NORCROSS, GEORGIA
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DRAWN BY	J LANGE	8/18/96
CHECKED BY	J DUNN	/18 96
FILE	D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\FIG2-2 DWG	
REV 0	SHEET # –	PROJECT NO 18319

FIGURE 2.2

LIMITS OF EXCAVATION
SURVEY POINTS SITE 80

D.O. #100
MCB CAMP LEJEUNE

PREPARED FOR
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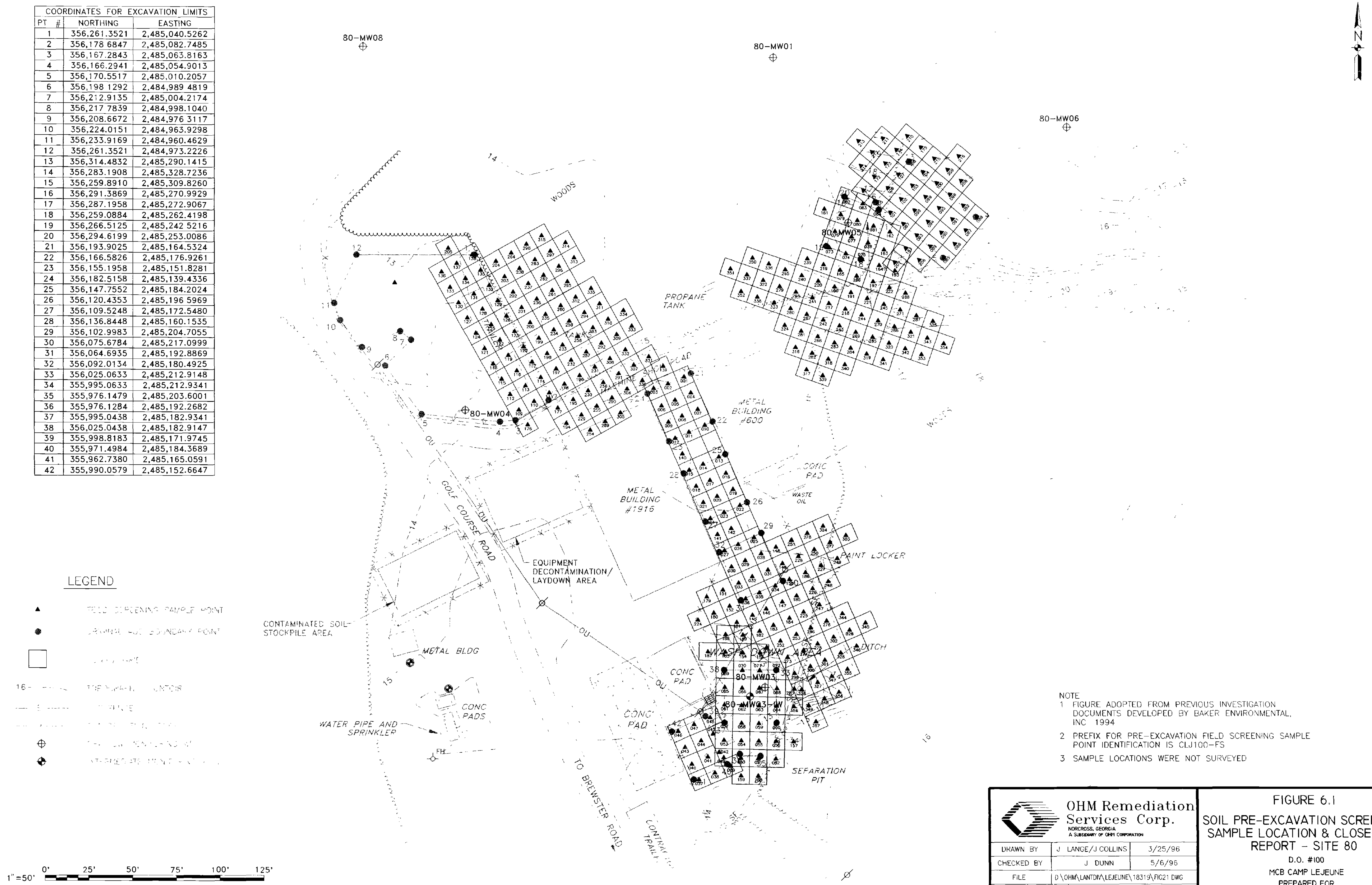
D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\FIG2A DWG

COORDINATES FOR EXCAVATION LIMITS		
PT #	NORTHING	EASTING
1	356,261.3521	2,485,040.5262
2	356,178 6847	2,485,082.7485
3	356,167.2843	2,485,063.8163
4	356,166.2941	2,485,054.9013
5	356,170.5517	2,485,010.2057
6	356,198 1292	2,484,989 4819
7	356,212.9135	2,485,004.2174
8	356,217 7839	2,484,998.1040
9	356,208.6672	2,484,976 3117
10	356,224.0151	2,484,963.9298
11	356,233.9169	2,484,960.4629
12	356,261.3521	2,484,973.2226
13	356,314.4832	2,485,290.1415
14	356,283.1908	2,485,328.7236
15	356,259.8910	2,485,309.8260
16	356,291.3869	2,485,270.9929
17	356,287.1958	2,485,272.9067
18	356,259.0884	2,485,262.4198
19	356,266.5125	2,485,242 5216
20	356,294.6199	2,485,253.0086
21	356,193.9025	2,485,164.5324
22	356,166.5826	2,485,176.9261
23	356,155.1958	2,485,151.8281
24	356,182.5158	2,485,139.4336
25	356,147.7552	2,485,184.2024
26	356,120.4353	2,485,196 5969
27	356,109.5248	2,485,172.5480
28	356,136.8448	2,485,160.1535
29	356,102.9983	2,485,204.7055
30	356,075.6784	2,485,217.0999
31	356,064.6935	2,485,192.8869
32	356,092.0134	2,485,180.4925
33	356,025.0633	2,485,212.9148
34	355,995.0633	2,485,212.9341
35	355,976.1479	2,485,203.6001
36	355,976.1284	2,485,192.2682
37	355,995.0438	2,485,182.9341
38	356,025.0438	2,485,182.9147
39	355,998.8183	2,485,171.9745
40	355,971.4984	2,485,184.3689
41	355,962.7380	2,485,165.0591
42	355,990.0579	2,485,152.6647

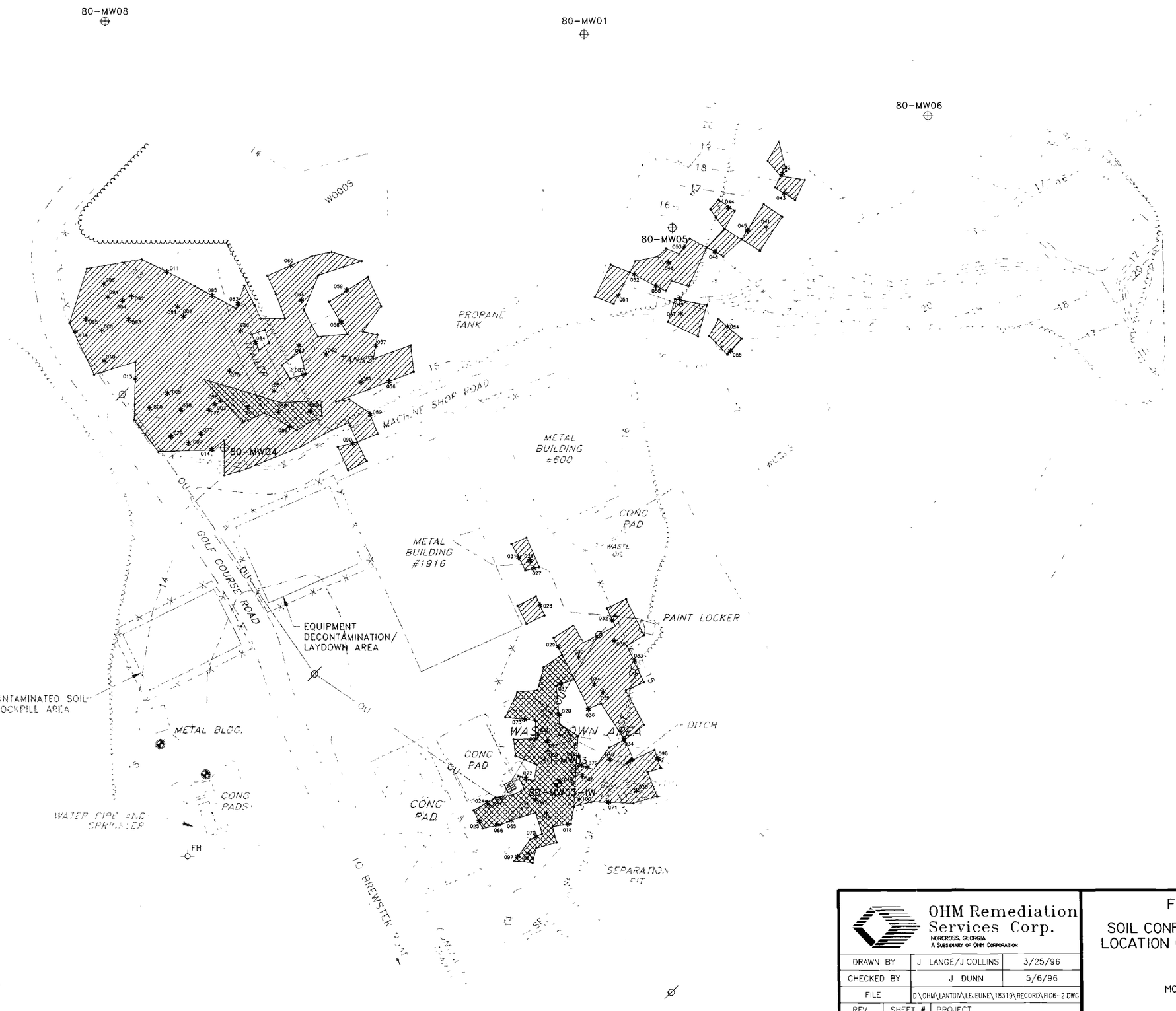


NOTE
1 FIGURE ADOPTED FROM PREVIOUS INVESTIGATION DOCUMENTS DEVELOPED BY BAKER ENVIRONMENTAL, INC 1994
2 PREFIX FOR PRE-EXCAVATION FIELD SCREENING SAMPLE POINT IDENTIFICATION IS CLJ100-FS
3 SAMPLE LOCATIONS WERE NOT SURVEYED

OHM Remediation Services Corp.
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

DRAWN BY	J LANGE/J COLLINS	3/25/96
CHECKED BY	J DUNN	5/6/96
FILE	D:\OHM\LANTDIV\LEJEUNE\18319\FIG21 DWG	
REV 0	SHEET #	PROJECT NO 18319

FIGURE 6.1
SOIL PRE-EXCAVATION SCREENING SAMPLE LOCATION & CLOSEOUT REPORT - SITE 80
D.O. #100
MCB CAMP LEJEUNE
PREPARED FOR
LANTDIV



LEGEND

- * SOIL CONFIRMATION SAMPLE POINT
- 10'x10' GRID
- 16 TOPOGRAPHIC CONTOIR
- SF SILT FENCE
- X CONTAMINATED SOIL STOCKPILE AREA

1" =50' 0' 25' 50' 75' 100' 125'

OHM Remediation Services Corp. NORCROSS, GEORGIA A SUBSIDIARY OF OHM CORPORATION		
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CHECKED BY	J DUNN	5/6/96
FILE	D:\OHM\LANTDIV\LEJEUNE\18319\RECORD\FIG6-2.DWG	
REV 0	SHEET # –	PROJECT NO 18319

FIGURE 6.2
SOIL CONFIRMATION SAMPLE LOCATION CLOSEOUT REPORT
SITE 80
D.O. #100
MCB CAMP LEJEUNE
PREPARED FOR
LANTDIV

Appendix B

Photographic Documentation

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Preliminary photo

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 13-16
Description: Preliminiary photo

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 17-20
Description: Preliminary photo

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 21-24 and 25-28
Description: Preliminary photo

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38
Description: Preliminary photo

Project No. 18319 Date: 4/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 29-32
Description: Field screen sampling

Project No. 18319 Date: 5/28/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Initial excavation of soil to a depth of 1 foot

Project No. 18319 Date: 5/29/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38 and 39-42
Description: Delineation of AOCs

Project No. 18319 Date: 5/29/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 13-16
Description: Initial excavation of soil to a depth of 1 foot

Project No. 18319 Date: 5/29/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38
Description: Soil loadout

Project No. 18319 Date: 6/3/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 13-16 and 17-20
Description: Excavation area

Project No. 18319 Date: 6/3/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 25-28
Description: Excavation area

Project No. 18319 Date: 6/3/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 29-32
Description: Excavation area

Project No. 18319 Date: 6/3/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38
Description: Confirmation sampling

Project No. 18319 Date: 6/6/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Loading of contaminated soils

Project No. 18319 Date: 6/12/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Backfill operations

Project No. 18319 Date: 6/13/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: Borrow Pit
Description: Staging backfill material

Project No. 18319 Date: 6/13/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 17-20
Description: Backfill operations

Project No. 18319 Date: 6/13/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Final grade

Project No. 18319 Date: 6/18//96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 1-12
Description: Area seeded and mulched

Project No. 18319 Date: 6/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38 and 39-42
Description: Area seeded and mulched

Project No. 18319 Date: 6/18/96
Contract No. N62470-93-D-3032
Delivery Order: 100
Location: AOC 33-38
Description: Area seeded and mulched