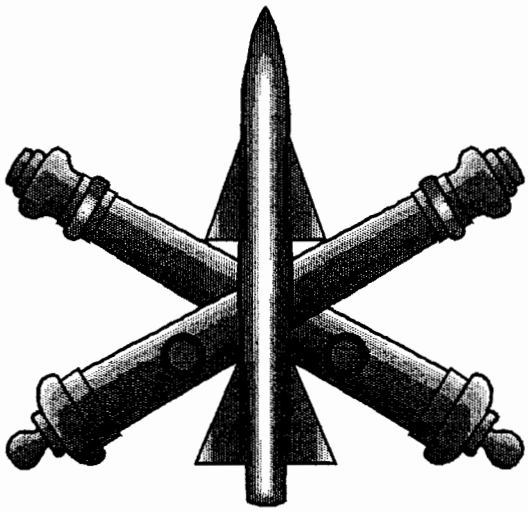
FINAL
COMPLIANCE SAMPLING RESULTS REPORT
SECOND 1996

FOR

PART B PERMIT
OPEN DETONATION (OD) UNIT



FORT BLISS/McGREGOR RANGE
OTERO COUNTY, NEW MEXICO

FEBRUARY 1997

COMPLIANCE SAMPLING RESULTS REPORT
SECOND 1996

PART B PERMIT
OPEN DETONATION (OD)
TREATMENT UNIT

McGREGOR RANGE
FORT BLISS, TX

Prepared for:

United States Army Corps of Engineers
Tulsa District
Tulsa, OK

Delivery Order 1, Modification 3
Contract No. DACA 56-93-D-0008

Submitted by:

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February 1997

COMPLIANCE SAMPLING RESULTS REPORT
SECOND 1996
PART B PERMIT
OD TREATMENT UNIT INVESTIGATION
FORT BLISS, TX

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SECTION 1
INTRODUCTION

In June 1995, a Final Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Operational Permit (Permit) (NMED, 1995) was issued to the U.S. Army Air Defense Artillery Center, Fort Bliss, Texas, by the New Mexico Environment Department (NMED). This Permit, EPA ID No. NM4213720101-01, authorizes treatment of hazardous waste (munitions) by open detonation at the Open Detonation Treatment Unit (OD Unit). Roy F. Weston, Inc. (WESTON®) was contracted by the U.S. Army Corps of Engineers (USACE) (Contract No. DACA 56-93-D-0008, Delivery Orders 01 and 19) to perform initial characterization and semi-annual compliance sampling at the OD Unit according to the requirements of the aforementioned Permit.

This document represents the Compliance Sampling Results Report for the OD Unit (second semi-annual 1996 event) and was prepared in accordance with the specifications provided in the USACE, Tulsa District Scope of Work (SOW), dated 22 March 1996 (USACE, 1995). An initial OD Unit characterization was conducted in August 1995, with the first compliance sampling event following in April 1996. Final reports of the initial OD Unit characterization and first compliance sampling event were submitted in March 1996 (WESTON, 1996a) and October 1996 (WESTON, 1996b), respectively.

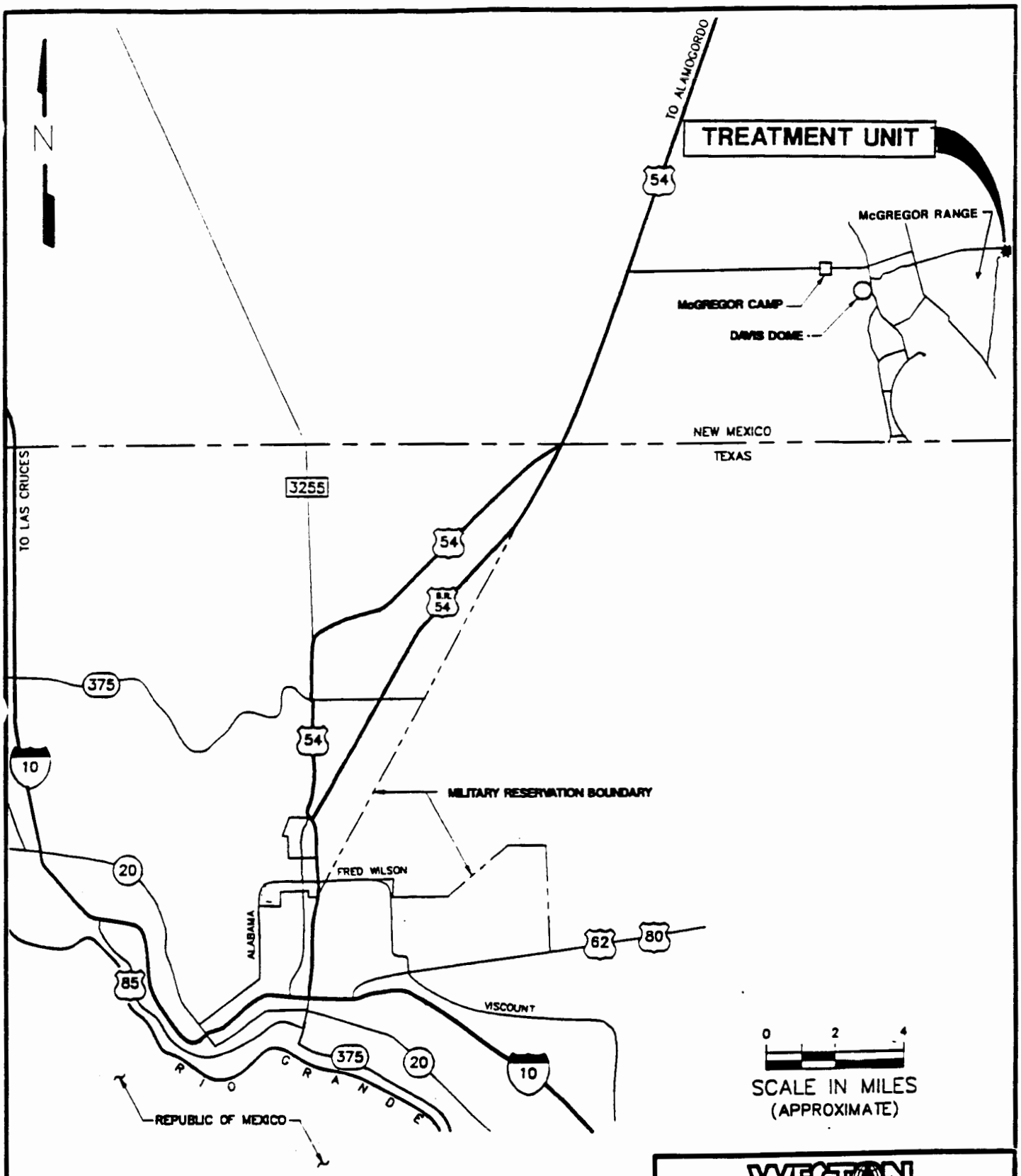
1.1 OBJECTIVE OF COMPLIANCE SAMPLING

WESTON provided technical assistance to USACE and Fort Bliss by conducting the OD Unit compliance sampling at Fort Bliss on 27 August 1996. Compliance sampling is required by the Permit to evaluate site conditions with respect to ongoing and future treatment activities conducted at the OD Unit. The semi-annual compliance sampling results will be compared to historical sampling results to determine if changes in the presence, magnitude, or location of site related contaminants has occurred as a result of continued treatment activities.

1.2 SITE BACKGROUND AND DESCRIPTION

The OD Unit is located in the northern portion of the Fort Bliss Military Reservation on McGregor Range. A facility location map is presented in Figure 1-1. The OD Unit is on an active portion of the McGregor Guided Missile Range within the impact area for ballistic aerial targets, large-caliber munitions, and guided rockets. There are no structures within approximately four miles of the OD Unit. Operations at the OD Unit are only conducted when McGregor Range is inactive.

The U.S. Army Air Defense Artillery Center currently operates an Explosive Ordnance Detachment (EOD) that performs work at the OD Unit. This OD Unit has been in operation



WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1-1

U.S. ARMY CORPS OF ENGINEERS
FORT BLISS
FACILITY LOCATION MAP
FORT BLISS, TEXAS

DATE	PROJECT NO.	SCALE
JUN 96	03886121002	AS SHOWN

since 1965. The 41st EOD conducts explosives demolition at the OD Unit approximately 3 to 4 times per year (generally every quarter) or on an emergency basis as needed. The OD Unit was historically operated under RCRA interim status as a hazardous waste thermal treatment facility until the Operational Permit was granted and issued in 1995. The unit is now utilized according to the requirements specified in the Part B Permit. Quantities of explosives (net explosive weight) that are currently allowed for treatment (detonation) according to the Permit (modification dated 9 May 1996) are 2,500 pounds or 1,135 kilograms (kg) per quarter. Military chemical warfare agents and related compounds or materials contaminated with or suspected of being contaminated with these agents or compounds are not destroyed (treated) at this unit.

The OD Unit is a manmade excavation and the dimensions are approximately 500 feet by 200 feet by 20 feet deep. All structures at the OD Unit are earthen. Prior to the first compliance sampling event, the bottom of the OD Unit was regraded to remove vegetation and provide for an emergency exit road for trucks that carry the munitions to the OD Unit. A 6-foot chain link fence with lockable gates was constructed around the OD Unit to control access. In June 1996, a stormwater diversion and control system was constructed to prevent stormwater accumulation within the Unit. A site plan of the OD Unit is illustrated in Figure 1-2.

As required by the Permit, WESTON completed an initial site investigation at the OD Unit in September 1995. Surface, near-surface, and subsurface soil samples were collected and submitted for metals, inorganics, and organics analyses. Results of the initial investigation indicated the presence of site-related constituents, particularly in the western portion of the pit and along the western perimeter of the OD Unit. Once the initial characterization of the OD Unit was completed, WESTON received approval from USACE and Fort Bliss personnel to conduct the semi-annual compliance sampling, after which the results would be compared to those of the initial characterization. The first of the semi-annual compliance sampling events was conducted in April 1996 and this report presents the results of the second semi-annual compliance sampling event of 1996 that occurred in August 1996.

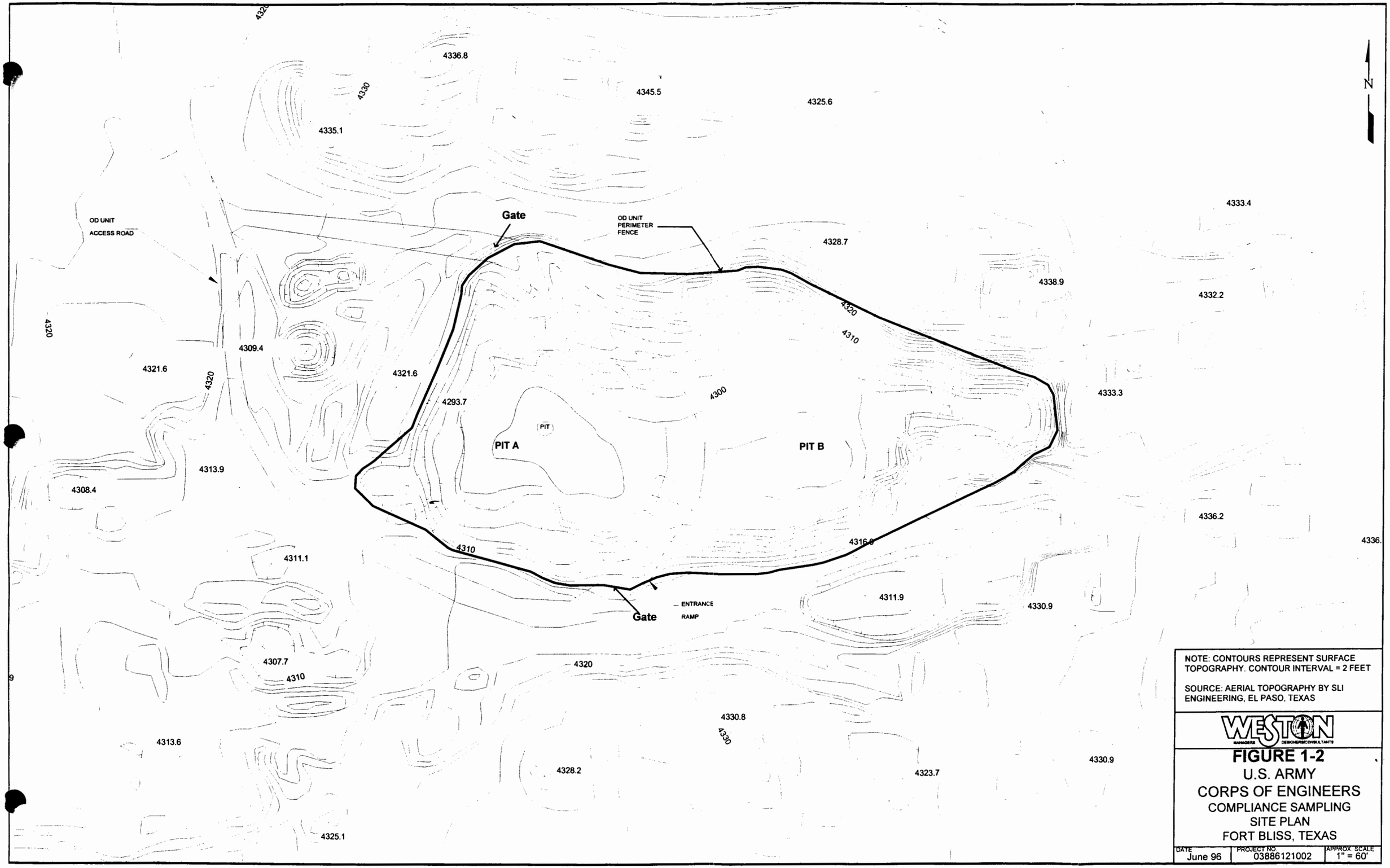
1.3 REPORT FORMAT

The Report of Findings for the OD Unit compliance sampling has been organized in the following format:

- Section 1—Introduction
- Section 2—Investigation Activities
- Section 3—Nature and Extent of Contamination
- Section 4—Conclusions and Recommendations
- Section 5—References

Appendices to this Report of Findings include the following:

- Appendix A-Chain-of-Custody Forms and Federal Express Airbill Receipts
- Appendix B-Investigation-Derived Waste (IDW) Tracking Form
- Appendix C-Data Validation Reports
- Appendix D-Analytical Data Summary Tables



NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY. CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1-2

U.S. ARMY
CORPS OF ENGINEERS
COMPLIANCE SAMPLING
SITE PLAN
FORT BLISS, TEXAS

DATE	PROJECT NO.	APPROX. SCALE
June 96	03886121002	1" = 60'

SECTION 2
COMPLIANCE SAMPLING ACTIVITIES

The OD Unit compliance sampling included the following activities:

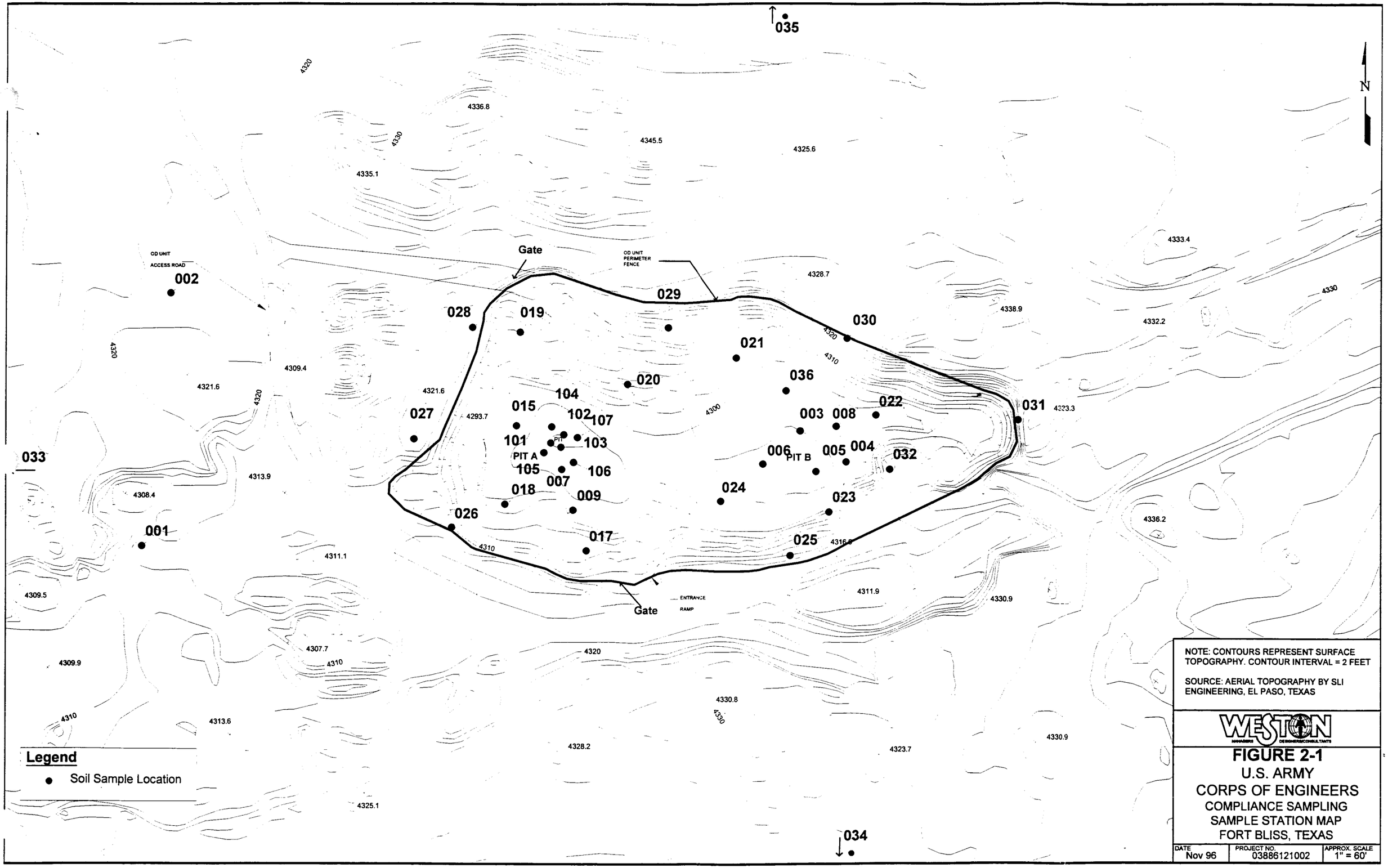
- Collecting surface and near-surface soil samples in and around the OD Unit.
- Completing one deep soil boring and collecting subsurface soil samples.
- Managing and sampling IDW.

These activities were conducted in accordance with WESTON's approved Final Work Plan for the OD Unit Investigation (Work Plan) (WESTON, 1995) and Work Plan Addendum (WESTON, 1996c), and are described in the following subsections. The overall sampling strategy was specified in the Permit and adopted for the Work Plan. The samples collected at the OD Unit were labeled in accordance with the requirements specified in Subsection B2.2.5 (Soil Sample Identification) of the Work Plan (WESTON, 1995). For brevity, samples are identified in this report using only the sample station number (e.g., 001).

2.1 SOIL SAMPLE LOCATIONS

WESTON collected soil samples from 36 locations in and around the OD Unit. Figure 2-1 shows the approximate locations of the sample stations. The locations were not surveyed after sampling but have been placed on the figure based on measurements from semi-permanent features such as fence corner posts. The sample stations shown in Figure 2-1 approximate those specified in the Permit (NMED, 1995), the USACE SOW (USACE, 1995), and the Work Plan Addendum (WESTON, 1996c). The locations were established in the field by measuring each location from stationary landmarks around the perimeter of the OD Unit.

Prior to the first compliance sampling event, the bottom of the OD Unit was regraded to remove vegetation in the bottom of the OD Unit (as required by the Permit), to provide an emergency exit road for EOD trucks, and to fill old blast pits for personnel safety considerations. Therefore, the historical "pits" identified during the initial OD Unit characterization were no longer discernible. Furthermore, the sampling stations established during the initial characterization could not be located because many of the site features and markings (station stakes) changed or were no longer present. Only one OD blast pit was present in the former Pit A area; therefore the discrete sampling stations required in and around the OD Pits (as stated on pages 14 and 15, Section J of the Permit) were adjusted to provide coverage in the former Pit B area. Since an OD Blast Pit was not present in the former Pit B area, discrete samples from the bottom and sides of each Pit were not collected. Additionally, three sample stations were adjusted from the original unit characterization to fill data gaps that were identified from the initial characterization results. These included two sample stations (001 and 002) from the former Pit B area on the eastern side of the OD Unit and the eastern background location (station 032). The two samples were removed from the former



NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY. CONTOUR INTERVAL = 2 FEET

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2-1

U.S. ARMY
CORPS OF ENGINEERS
COMPLIANCE SAMPLING
SAMPLE STATION MAP
FORT BLISS, TEXAS

DATE	PROJECT NO.	APPROX. SCALE
Nov 96	03886121002	1" = 60'

Pit B area due to the lack of OD activities conducted in this portion of Unit. The OD activities have for several years and is currently conducted in the former Pit A area, the western portion of the OD Unit. Therefore, these locations were moved to beyond the western perimeter of the Unit to investigate the extent of explosives identified in the Initial Characterization.

With a few exceptions noted below, the sample station utilized during the second compliance sampling event were generally the same as the first compliance sampling event. Several station adjustments were again made to allow a better characterization of the Unit. A summary of the sample stations and rationale (and corresponding sample station numbers shown on Figure 2-1 are as follows:

- Fifteen discrete surface soil samples were collected from the former Pit A and Pit B areas (003, 004, 005, 006, 007, 008, 009, 015, 101, 102, 103, 104, 105, 106, 107).

  During this compliance sampling event, a recent blast pit was present in the western portion of the OD Unit, the former Pit A area. This pit was sampled as originally specified in the Permit and Work Plan. To distinguish between the stations sampled for the first compliance sampling event (where a pit was not discernible), the stations were designated as 101 through 107 and replaced stations 010 through 016. One additional surface soil sample (015) was collected from the former Pit A area.

- Eight discrete random surface and near-surface soil samples were collected from the interior of the OD Unit (017, 018, 019, 020, 021, 022, 023, 024).

- Eight discrete random surface and near-surface soil samples were collected from the OD Unit perimeter (025, 026, 027, 028, 029, 030, 031, 032).

- Two discrete surface soil samples (001, 002) were collected from approximately 200 feet west of the OD Unit perimeter to assess the area west of sample stations 026, 027, and 028, which contained reportable levels of explosive compounds during the initial characterization. These samples were originally collected from the bottom and sides of the former Pit B. Because of the lack of EOD activities in the Pit B area, the lack of site-related constituents reported during the initial characterization, and the regrading, these samples were relocated. This change in sample locations was specified and approved in the Work Plan Addendum (WESTON, 1996c).

  Three discrete background surface soil samples (033, 034, 035) were collected from areas away from the OD Unit that appeared not to have been affected by operations from the OD activities. These three samples were located approximately 700 feet from the center of the OD Unit excavation as specified by the Permit. After the initial characterization, station 033 (formerly positioned east of the OD Unit) was moved to a position west of the OD Unit, since this area was not investigated during the initial characterization sampling and most of the recent treatment activities have occurred in the western portion of the OD Unit (Pit A area). This change in

sampling location was specified and approved in the Work Plan Addendum (WESTON, 1996c).

- Ten subsurface soil samples were collected from the deep soil boring (036). The soil boring was relocated from the center of the former Pit A area to a location north of the former Pit B area (replacing station 007). Station 007 was relocated to the former location of station 036. This relocation of the deep soil boring was performed to obtain subsurface information in the eastern portion of the OD Unit and provide a more complete assessment of the conditions beneath the OD Unit.

2.2 SAMPLING PROCEDURES

2.2.1 Surface and Near-Surface Soil Samples

According to Fort Bliss personnel, the 41st EOD personnel cleared the area inside and around the OD Unit following the treatment activities that occurred just prior to the sampling activities. As a result, EOD support was not required during the compliance sampling. Soil from each of the surface and near-surface sample stations were collected using disposable plastic scoops. Soil for surface samples was collected from a depth interval of approximately 0 to 6 inches, and soil for near-surface samples was collected from a depth interval of approximately 6 to 12 inches. In the case of the near surface soil samples, a shovel was used to remove the surface material to the desired depth and then disposable scoops were used to collect the soil sample. After sample collection, the material removed from each hole was used as backfill.

After collection, the sample containers were sealed and labeled with the sample identification number (as specified in Section B2.2.5 [Soil Sample Identification] of the Work Plan [WESTON, 1995]), date, time, required analyses, and the company name (WESTON). The sample containers were then placed in plastic bags on ice in a cooler. The analytical approach for the soil samples is discussed below in Subsection 2.3.

2.2.2 Subsurface Soil Samples—Completion of Deep Soil Boring

The deep soil boring was completed with hollow-stem auger drilling techniques and terminated at a depth of 50 feet. During the initial characterization, the soil boring was completed in the center of the OD Unit. During the First Compliance Sampling Event, the boring was relocated near the center of the former Pit A area because of the frequency of OD activities in this area. To better characterize the subsurface conditions beneath the Unit, the deep boring was completed north of the former Pit B area during the second compliance sampling event (Figure 2-1). Continuous lithologic samples were collected using a 5-foot split barrel sampler throughout the boring. The lithologic samples were visually logged and classified using the Unified Soil Classification System (USCS). The visual description and the USCS classification were used to construct the geologic boring log presented as Figure 2-2.

WESTON did not observe visually affected material in any samples. Therefore, soil samples were collected at the specified 5-foot intervals for laboratory analyses. A 6" section of the soil core

GEOLOGIC DRILL LOG	PROJECT NAME/LOCATION	PAGE NO.	BORING NO.
	FORT BLISS OPEN DETONATION UNIT	1 of 1	036B

DATE STARTED	DATE FINISHED	DRILLER	DRILL METHOD	BOREHOLE DIA. (in)	TOTAL DEPTH (ft)
8/27/96	8/27/96	Tierra Drilling	HSA	7	50.00

GEOLOGIST	GROUND ELEV. (ft. MSL)	STATE PLANAR COORDINATES (ft) SITE COORDINATES
Greg Braddy	4299.00	

ELEVATION	SAMPLE INTERVAL	RECOVERY (%)	SAMPLE TYPE	SAMPLE ID	MINIRAM	USCS	BLOW COUNTS	DEPTH	GRAPHICS LOG	VISUAL DESCRIPTION
		75		36-51-10		ML				Silty Sand: tan, loose, very fine grained, with roots and debris, dry
										some dense portions at 3'
4294		80	A	36-51-1				5		becoming loose to moderately dense, dry
						GP				Gravel and Sand: dense, with thin layers of sandy silt, dry.
4289		30	A	36-51-2				10		dry thin silty zone at 9.5'
4284		30	A	36-51-3				15		Gravelly Sand: brown, loose, moist, with some silt in matrix Pebbles range from few mm to cobbles >3" in diameter.
4279		66						20		
		66	A	36-51-4						
4274		75						25		becoming more uniform, pebbles range from few mm to 1 cm, large cobbles absent, moist
		100	A	36-51-5		ML				Sandy Silt: light brown, loose, with occassional pebbles and small cobbles, moist
4269		80				GP		30		Sandy gravel: brown, moist, loose to moderately dense, pebbles to cobble size gravel
		80	A	36-51-6		ML				Silt: pale brown, moderately dense, moist to wet, some plasticity
4264		80				GP		35		Sandy Gravel: light brown, moist at top
		80	A	36-51-7						same as above, brownish yellow to yellowish brown sand matrix, dark gray sandstone rock cobbles, moist
4259		80	A	36-51-8				40		becoming more uniform, pebble size gravel, moist to wet
		70				ML GP				Silt: pale brown, moderately dense to dense, moist to wet, low plasticity some gravel at 41' Sandy Gravel: moist to wet, dense, with pebbles and large cobbles
4254		50	A	36-51-9				45		
		75								thin silt zone at 48.5, wet, moderately dense, slighly plastic
4249								50		TOTAL DEPTH = 50'

A = ANALYTICAL SAMPLE
G = GEOTECHNICAL SAMPLE
R = ARCHIVED SAMPLE

WESTON

PAGE NO.	BORING NO.
1 of 1	036B

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2-2
U.S. ARMY CORPS OF ENGINEERS
FORT BLISS
GEOLOGIC DRILL LOG
FORT BLISS, TEXAS

DATE	PROJECT NO.	SCALE
DEC 96	03886121002	NONE

H:\COE\FTBLISS\FIG3-5.PB 1=1 (NEWWEST.PCP) 10-13-95

(where appropriate) was peeled or scraped with a clean stainless-steel knife to remove the outer layer in contact with the sampler and placed in the appropriate sample containers. Other selected intervals consisted of gravel and rock debris. These containers were sealed, labeled, and placed in plastic bags. The analytical approach for the subsurface soil samples is discussed below in Subsection 2.3.

Once the boring was completed, bentonite chips were used to seal the borehole to the surface. The bentonite chips were inserted in approximately 5-foot intervals and hydrated with water to allow proper sealing of the borehole. This procedure was repeated until the borehole was sealed to the surface.

The soil cuttings and decontamination water generated during the drilling activities were contained in labeled drums and managed as discussed in Subsection 2.5.

2.2.3 Quality Assurance/Quality Control Samples

WESTON collected additional samples during the investigation for quality assurance/quality control (QA/QC) purposes to verify precision (e.g., the degree of reproducibility) of the laboratory results. At six of the sample locations, three times the normal sample volume was collected as three separate samples for QA/QC purposes, as follows:

- One volume was designated as the normal sample, and was sent to WESTON's Environmental Metrics, Inc. (EMI) Laboratory in University Park, Illinois, or the Lionville Analytical Laboratory in Lionville, Pennsylvania for the required analyses.

- One of the extra sample volumes was sent to WESTON's laboratories as a blind field duplicate QC sample (e.g., the sample was identified in such a way that the laboratory was unaware it was a duplicate sample).

- The other extra sample volume was sent as a QA sample to the USACE Southwestern Division (SWD) laboratory in Dallas, Texas, for analysis to obtain independent results to compare to those produced by the WESTON laboratories.

Since visual observations did not result in identifying contamination, the six QA and six QC samples were collected at a rate of approximately one QA/QC sample per ten normal samples. Soil for the QA/QC samples was placed in a clean plastic bag, mixed with a plastic scoop, then divided into the appropriate sample jars to make sure each split portion represented the sampled interval.

The laboratory performed matrix spike/matrix spike duplicate (MS/MSD) analyses on three soil samples. In addition, WESTON prepared one equipment rinsate blank during the investigation to verify completeness of the decontamination procedures. The rinsate blank was prepared by pouring distilled water over a decontaminated split-barrel sampler used in completing the deep soil boring and collecting the rinse water in the appropriate sample containers. The rinsate blank was labeled 036-43-1.

2.2.4 Decontamination Procedures

Decontamination activities were performed in the field at a location approved by Fort Bliss personnel. Nondisposable sampling equipment was decontaminated before and between each use. Small nondisposable equipment (e.g., shovels, stainless-steel knives, and split-barrel samplers) was scrubbed in a mixture of phosphate-free detergent (e.g., Liquinox) and potable water, then rinsed with potable water. Large nondisposable equipment (e.g., drill rods, drilling tools, and split-barrel samplers) was steam-cleaned with a pressure washer in a clean 55-gallon drum before use and after completion of the deep soil boring. Fluids generated during the decontamination process were managed as discussed in Subsection 2.5.

2.3 ANALYTICAL APPROACH

The available data and information used to prepare the Permit application and subsequently contained in the Permit dictated the analytical approach for the Semi-Annual Compliance Sampling events. The specified analyses and the associated analytical methods are summarized in Table 2-1. It should be noted that there are no approved methods for analysis of picric acid and nitroglycerin. Prior to the initial characterization, WESTON's Lionville Laboratory conducted a method detection limit (MDL) study involving a modification to the standard EPA SW-846 Method 8330 using high performance liquid chromatography (HPLC). The results of the MDL study and the proposed methodology were submitted to USACE on 11 August 1995 and approved on 7 September 1995.

The explosives analyses were conducted by WESTON's Lionville laboratory and the remaining analyses were conducted by WESTON's EMI laboratory. All of the collected soil samples were submitted for inorganic, metals, and explosives analyses. The duplicate (QC) samples were submitted for the same analyses as the normal samples, and the QA samples were submitted to the USACE SWD laboratory requesting the same analyses as the normal and QC samples. The rinsate blank was submitted for explosives and metals analyses only.

To comply with the analytical approach in the Permit, six stations were sampled for additional characterization purposes. These six sample stations consisted of the background stations (033, 034, and 035) and stations exhibiting high total explosive concentrations (020, 026, and 036) from the historical sampling. The samples collected were submitted for PCBs and dioxins/furans as required by the Permit. PCBs analysis was performed by WESTON EMI in accordance with EPA SW846 Method 8081, and dioxins/furans analysis was performed by WESTON's Lionville laboratory in accordance with EPA SW846 Method 8280.

2.4 SAMPLE HANDLING AND MANAGEMENT

As previously stated, samples for chemical analyses were placed in clean sample containers and labeled with information including the date and time of collection, company name (WESTON), sample identification, and required analysis. Sample nomenclature followed the guidelines listed in Subsection B2.2.5 of the approved Work Plan (WESTON, 1995). The sample containers were then individually bagged, sealed, and placed in a cooler full of ice and packing material. The coolers were then sealed and delivered to Federal Express for overnight shipment to the appropriate

TABLE 2-1
ANALYTICAL METHODS AND COLLECTED SAMPLES

OD UNIT INVESTIGATION
FORT BLISS, TX

PARAMETER	ANALYTICAL METHODS[1]	NUMBER OF COLLECTED SAMPLES[2]
METALS		
Antimony	SW846 6010A	74 - Soil 2 - Water
Arsenic	SW846 7060	
Barium	SW846 6010A	
Cadmium	SW846 6010A	
Chromium	SW846 6010A	
Copper	SW846 6010A	
Iron	SW846 6010A	
Lead	SW846 6010A	
Mercury	SW846 7471	
Potassium	SW846 6010A	
Selenium	SW846 7740	
Silver	SW846 6010A	
Strontium	SW846 6010A	
Zinc	SW846 6010A	
INORGANICS		
Free Liquids (paint filter)	SW846 9095	74 - Soil
Ignitibility	SW846 1010	
pH	SW846 9045C	
Nitrate-Nitrite (as N)	EPA 353.2	
ORGANICS (EXPLOSIVES)		
Picric Acid	SW846 8330[3]	74 - Soil 2 - Water
HMX	SW846 8330	
RDX	SW846 8330	
Nitroglycerin	SW846 8330[3]	
2,4,6 trinitrotoluene (2,4,6 TNT)	SW846 8330	
2,4 dinitrotoluene (2,4 DNT)	SW846 8330	
2,6 dinitrotoluene (2,6 DNT)	SW846 8330	
PCBs	SW846 8081	6 - Soil
Dioxins/Furans	SW846 8280	6 - Soil

1 SW846 = "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods," Environmental Protection Agency, SW846.
EPA600 = "Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency.

2 The sample numbers are maximum values and include QA and QC samples.

3 Picric acid and nitroglycerin methods based on MDL study constituting an adaptation of method 8330 that was approved by USACE on 7 September 1995.

laboratories. Proper chain-of-custody (COC) procedures were implemented for all collected samples, and COC documentation accompanied each sample shipment. Copies of the COC forms and Federal Express airbill receipts for each shipment are included in Appendix A.

2.5 WASTE MANAGEMENT

Soil cuttings and decontamination water derived from completion of the deep soil boring were contained in DOT-approved 55-gallon drums that were temporarily staged inside the OD Unit. Once filled, the drums were sealed and labeled as "Unclassified Waste" by WESTON personnel. Disposable sampling equipment and used gloves were placed in garbage bags and disposed of in appropriate solid waste containers on Post. Information such as site and drum number, media, date generated, quantity, date sampled, and staging location is provided on the IDW tracking form included in Appendix B. A copy of this form was submitted to the appropriate Fort Bliss personnel following completion of investigation activities.

WESTON personnel collected one IDW sample from the decontamination water and one IDW sample from the soil cuttings contained in the IDW drums. The water IDW sample (labeled 036-76-1W) was submitted to WESTON's EMI and Lionville laboratories for metals and explosives analyses, and the soil IDW sample (labeled 036-76-1S) was submitted for inorganics, metals, and explosives analyses. Disposal options for the IDW will be evaluated from the results of the IDW samples.

SECTION 3
NATURE AND EXTENT OF CONTAMINATION

A brief summary of the nature and extent of site-related constituents, based on the results of the compliance sampling at the OD Unit, is presented in this section. As previously stated, samples are referred to using only the sample station number (e.g., 001).

Prior to compiling this Compliance Sampling Results Report, WESTON submitted two copies of the complete raw analytical data (grouped by laboratory batch numbers) for the samples collected at the OD Unit to USACE for comparison to their QA samples. Laboratory summary sheets are included in the data validation reports in Appendix C, and raw data summary tables are provided in Appendix D. To assist in data management and production of the summary tables contained in Appendix D, the designation "A" has been added to the sample station numbers to represent stations that changed locations between the initial characterization and first compliance sampling event, and "B" representing stations that changed twice between the initial characterization and second compliance sampling event. Each data validation report has an assigned laboratory batch number that corresponds to the raw analytical data batch number. A table is provided in Appendix C that lists the batch numbers and analytical data they contain.

3.1 EVALUATION METHODS

The analytical results were evaluated by comparison to established background values that were calculated from background soil samples. It should be noted that two of the three background sample stations (034 and 035) have not changed during the three sampling events. For the initial characterization, sample station 033 was located approximately 700 feet east of the OD Unit. For the compliance sampling events, sample station 033 was relocated approximately 700 feet west of the OD Unit. From the three sampling events, a total of nine different and discrete background samples have been collected and used to calculate new background values that were used to evaluate the sample results from this sampling event. The results are very similar even when the background samples for a given sampling event are evaluated separately. It should be noted that in some cases, the new background values (with respect to metals) are slightly higher than those established during the Initial Unit Characterization.

The organic results (explosives, PCBs, dioxins/furans) were compared directly to the laboratory detection limits because reportable concentrations were not detected in any of the background samples. As such, the laboratory detection limit is the background value. Shaded entries in the summary tables (Appendix D) indicate concentrations at or greater than the laboratory detection limit.

Metals and nitrate-nitrite results were compared to three times the maximum background concentration of each associated constituent (see Tables D00 and D06 in Appendix D). In addition, published ranges of naturally occurring metal concentrations were used to evaluate the significance

of the metals results that were reported above the defined background values. A table showing naturally occurring concentrations of metals in soils (common range and average concentration) is included in Appendix D (Table D17). Shaded entries in the summary tables indicate concentrations equal to or above the established background values.

3.2 ORGANIC RESULTS

Three explosive compounds were detected in the soil samples collected from the OD Unit during the Second Semi-Annual Compliance Sampling Event. Nitroglycerin and 2,4-dinitrotoluene (2,4-DNT) were reported at concentrations ranging from below the detection limit to 16 mg/kg (028), and from below the detection limit to 230 mg/kg (018), respectively. The explosive compound RDX was reported for the first time in two surface soil samples at concentrations of 1.4 mg/kg (036) and 3.2 mg/kg (102). Most of the sample stations with reportable concentrations of explosives were in the vicinity of the former Pit A area and the western perimeter of the OD Unit. As previously mentioned, explosives were not reported in the background samples. The sample stations that contained reported concentrations of explosive compounds are summarized in Table 3-1 and shown on Figure 3-1.

Explosive compounds were detected in the surface sample collected from the deep soil boring (036). Explosive compounds were not detected in any other samples collected from the boring. The sample results from the deep soil boring suggest that vertical or downward migration of explosive compounds has not occurred.

Nitrate-nitrite concentrations ranged from 1.0 mg/kg (030) to 131 mg/kg (015). Soil samples collected from the deep soil boring contained nitrate-nitrite concentrations ranging from 23.4 mg/kg (5 feet) to 105 mg/kg (surface). The maximum reported nitrate-nitrite concentration for the nine background samples was 2.5 mg/kg (035 - First Compliance Sampling Event, April 1996). Sample stations that contained concentrations of nitrate-nitrite exceeding three times this background concentration (7.5 mg/kg) are included in Table 3-1 and shown in Figure 3-2. All of these stations are located within the OD Unit perimeter.

Reportable concentrations of PCBs were not reported in any of the soil samples collected from the OD Unit. Four dioxin/furan species were detected in one near-surface soil sample (027) and its duplicate collected from the OD Unit. The species include OCDD, OCDF, total HpCDD, and total HpCDF, and these were reported at low nanogram/gram (ng/g) concentrations.

Reportable concentrations of explosives were not reported in the equipment rinsate blank nor the composite IDW sample that was collected from the soil boring drill cuttings. The explosive compound 2,4,6-trinitrotoluene (2,4,6 TNT) was reported at a concentration of 1.3 microgram per liter (ug/L) in the composite water IDW sample collected from the decontamination water.

TABLE 3-1
SUMMARY OF REPORTED EXPLOSIVES AND NITRATE-NITRITE CONCENTRATIONS

OD Treatment Unit Compliance Sampling
Fort Bliss, Texas

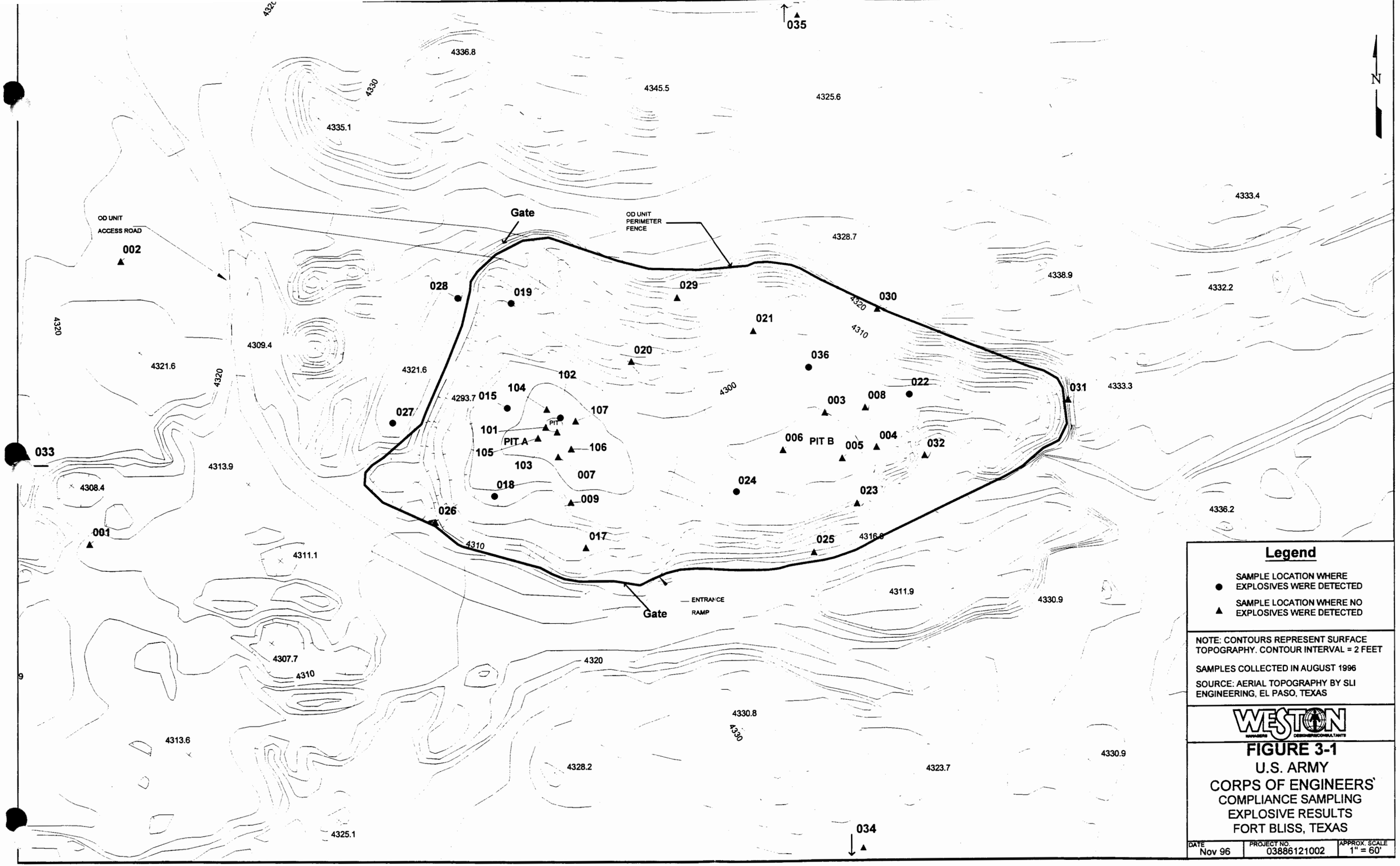
Sample Station	Analyte Detected and Concentration (mg/kg)				
	2,4 Dinitrotoluene	2,4,6 Trinitrotoluene	Nitroglycerin	Nitrate-Nitrite	RDX
960827-004-51-1	ND	ND	ND	103	ND
960827-005-51-1	ND	ND	ND	ND	ND
960827-008-51-1	ND	ND	ND	28.7	ND
960827-015-51-1	ND	ND	ND	131	ND
960827-016-52-1	ND	ND	ND	2.4	ND
960827-017-51-1	ND	ND	ND	64.1	ND
960827-017-51-2	ND	ND	ND	67.6	ND
960827-018-51-1	230	ND	ND	2.4	ND
960827-018-51-2	ND	ND	ND	14.4	ND
960827-019-51-1	0.31J	ND	ND	2.3	ND
960827-019-51-2	ND	ND	ND	2.7	ND
960827-020-51-1	ND	ND	ND	2.8	ND
960827-020-51-2	ND	ND	ND	18.5	ND
960827-022-51-1	ND	ND	ND	2.8	ND
960827-022-51-2	ND	ND	3.7J	7.3	ND
960827-023-51-2	ND	ND	ND	1.1	ND
960827-024-51-1	ND	ND	ND	2.1	ND
960827-024-51-2	ND	ND	ND	91.3	ND
960827-025-51-1	ND	ND	ND	2.2	ND
960827-025-51-2	ND	ND	ND	5.8	ND
960827-026-51-2	ND	ND	ND	1.6	ND
960827-027-51-1	ND	ND	6.8J	ND	ND
960827-027-52-2	ND	ND	3.6	ND	ND
960827-028-51-2	0.56J	ND	16	ND	ND
960827-029-51-2	ND	ND	ND	2.5	ND
960827-031-51-1	ND	ND	ND	1.5	ND
960827-031-51-2	ND	ND	ND	1.3	ND
960827-032-51-1	ND	ND	ND	1.4	ND
960827-032-51-2	ND	ND	ND	1.4	ND
960827-033-51-1	ND	ND	ND	1.1	ND
960827-034-51-1	ND	ND	ND	2.2	ND
960827-036-51-1	ND	ND	ND	23.4	ND
960827-036-51-10	ND	ND	ND	105	1.4
960827-101-51-1	ND	ND	ND	1.8	ND
960827-102-51-1	ND	ND	ND	ND	3.2
960827-104-51-1	ND	ND	ND	68	ND
960827-105-51-1	ND	ND	ND	8.7	ND
960827-106-51-1	ND	ND	ND	1.3	ND

* The established background value for nitrate-nitrite is 7.5 mg/kg. Nitrate-nitrite results exceeding 7.5 mg/kg are shaded.

ND = Not detected above the laboratory detection limit.

NA = Not analyzed.

J = Result qualified and estimated.



Legend

- ● SAMPLE LOCATION WHERE EXPLOSIVES WERE DETECTED
- ▲ SAMPLE LOCATION WHERE NO EXPLOSIVES WERE DETECTED

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY. CONTOUR INTERVAL = 2 FEET

SAMPLES COLLECTED IN AUGUST 1996

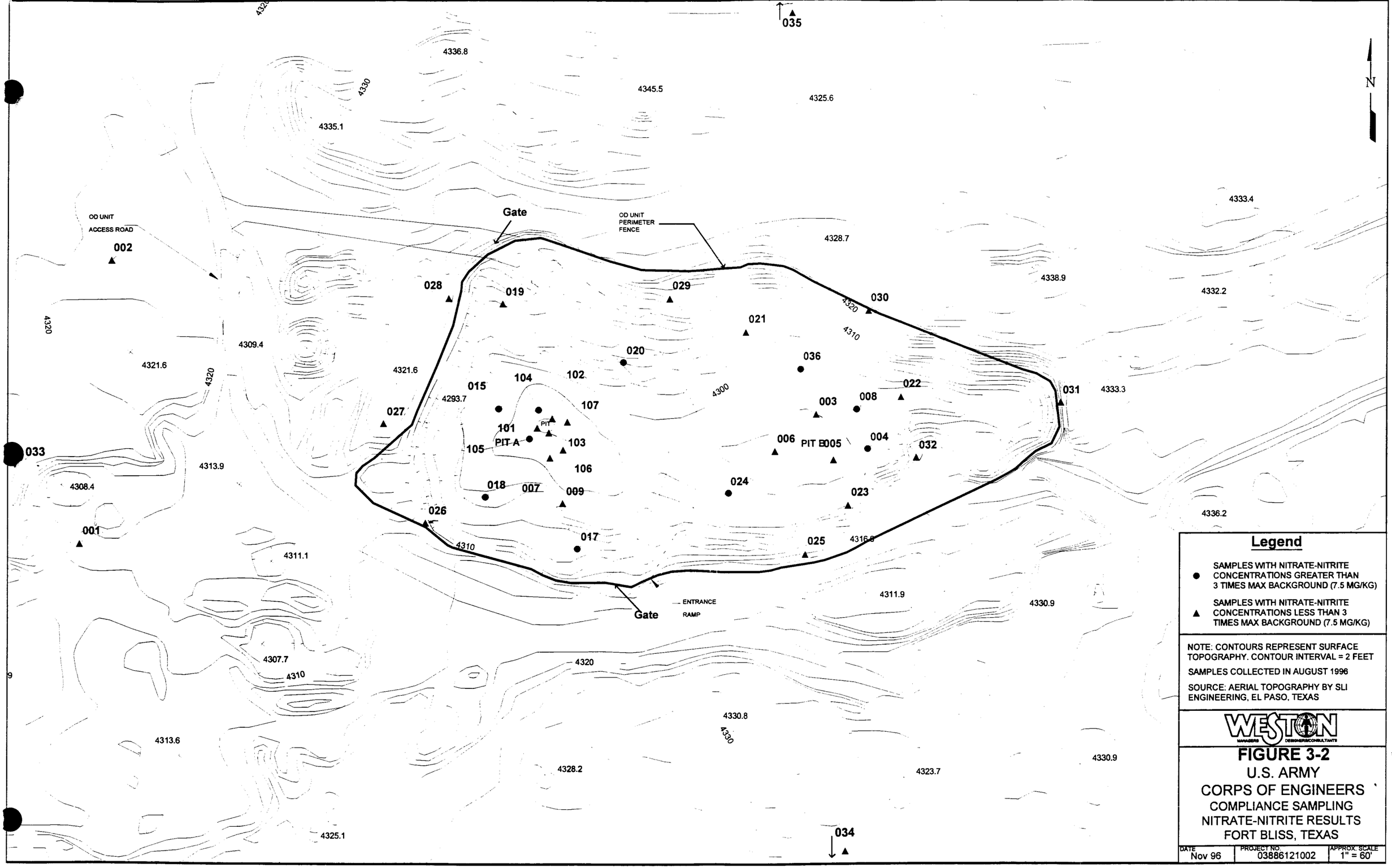
SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

WESTON MANAGERS DESIGNERS CONSULTANTS

FIGURE 3-1

U.S. ARMY
CORPS OF ENGINEERS'
COMPLIANCE SAMPLING
EXPLOSIVE RESULTS
FORT BLISS, TEXAS

DATE	PROJECT NO.	APPROX. SCALE
Nov 96	03886121002	1" = 60'



Legend

- ● SAMPLES WITH NITRATE-NITRITE CONCENTRATIONS GREATER THAN 3 TIMES MAX BACKGROUND (7.5 MG/KG)
- ▲ SAMPLES WITH NITRATE-NITRITE CONCENTRATIONS LESS THAN 3 TIMES MAX BACKGROUND (7.5 MG/KG)

NOTE: CONTOURS REPRESENT SURFACE TOPOGRAPHY. CONTOUR INTERVAL = 2 FEET

SAMPLES COLLECTED IN AUGUST 1996

SOURCE: AERIAL TOPOGRAPHY BY SLI ENGINEERING, EL PASO, TEXAS

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3-2

U.S. ARMY
CORPS OF ENGINEERS
COMPLIANCE SAMPLING
NITRATE-NITRITE RESULTS
FORT BLISS, TEXAS

DATE	PROJECT NO.	APPROX. SCALE
Nov 96	03886121002	1" = 60'