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REMOVAL OF SOIL DEBRIS ACTIVITY AT OFF SITE WEAPONS STORAGE AREA NAS FORT WORTH TX
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NAVAL AIR STATION FORT WORTH JRB CARSWELL FIELD TEXAS

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 346

REPORT

REPORT OF SOIL/DEBRIS REMOVAL ACTIVITY

at the

OFF-SITE WEAPONS STORAGE AREA

CARSWELL AFB, TEXAS

OCTOBER 1993

Metcalf & Eddy

October 11, 1993

AFCEE/ESB
Attn: Mr. Christopher D. Hobbins
8001 Inner Circle Drive
Building 624W, Suite 2
Brooks AFB, Texas 78235-5328

Dear Mr. Hobbins:

Metcalf & Eddy, Inc. is pleased to present six copies of the report for the Soil/Debris Removal Activity at the Off-Site Weapons Storage Area at Carswell AFB, Texas.

If you have any questions, please do not hesitate to contact me.

Sincerely,

METCALF & EDDY, INC.

J. E. Bentkowski
Project Hydrogeologist

Enclosure

cc: Phil Smith/M&E, Houston

1201 Peachtree St., N.E., 400 Colony Square, Suite 1101, Atlanta, GA 30361
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AWT Affiliates of Air & Water Technologies Corporation

REPORT OF SOIL/DEBRIS REMOVAL ACTIVITY

at the

OFF-SITE WEAPONS STORAGE AREA

CARSWELL AFB, TEXAS

OCTOBER 1993

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REPORT OF SOIL/DEBRIS REMOVAL ACTIVITY
OFFSITE WEAPONS STORAGE AREA
CARSWELL AIR FORCE BASE, TEXAS

1.0 INTRODUCTION

1.1 Project Scope

Metcalf & Eddy (M&E) was tasked by the Air Force Center for Environmental Excellence (AFCEE) under Contract No. F41625-92-0-8002 Delivery Order 0002, to remove debris located at the Waste Dump at the off-base Weapons Storage Area (WSA) located at Carswell Air Force Base (AFB), Texas. The debris included non-hazardous material such as wooden pallets, used bomb crates, scrap metal, newspapers, loose sand, and other materials (see Photo 1).

The scope of work included sampling of surface soils upgradient, downgradient, and within the debris pile for potential contaminants and migration of potential contaminants from the debris pile. Soils were analyzed by a subcontractor laboratory to determine the presence or absence of hazardous constituents. After removal of the debris, underlying soils were sampled and analyzed to confirm clean closure of the Waste Dump area.

1.2 Site Description

The Weapons Storage Area (WSA) is an off-base facility that exists under the ownership and control of Carswell AFB. The WSA is located about 4 miles west of Carswell AFB, just north of White Settlement Road. The facility, built in 1956, consists of 247 acres of fee-owned land surrounded by an additional 264 acres of easements.

Facilities at the WSA include two munitions inspection shops, 16 ordnance storage buildings (including 11 igloos), one entry control building, an emergency power plant, an EOD range, a small radioactive waste disposal facility, a water storage tank, and two water wells. The area is depicted on Figure 1.1.

1.3 Current Investigation/Removal Action

This investigation took place in two phases: (1) the initial characterization of the debris, and (2) the removal of the debris and confirmatory sampling. Prior to the initial characterization, a set of work plans were developed which detailed the activities associated with the field work. These plans included a Sampling and Analysis Plan, a Construction Quality Plan, and a Health and Safety Plan. These plans were reviewed and approved by AFCEE prior to the initiation of the field work.

The initial characterization took place on July 20, 1993. A team of M&E employees, with oversight provided by AFCEE, took three soil samples (upgradient, downgradient, and within the debris) and associated field Quality Control (QC) samples. Sampling procedures are detailed in Section 3. The samples were analyzed for selected parameters and resultant analytical data was validated (Section 4).

The data were evaluated and determined that no hazardous or radionuclear constituents were detected above background values. The debris was then removed to a local, nonhazardous landfill and a confirmation sample was taken from the cleaned, cleared area. These procedures are discussed in Section 5. A Summary of Results and Conclusions is presented in Section 6.

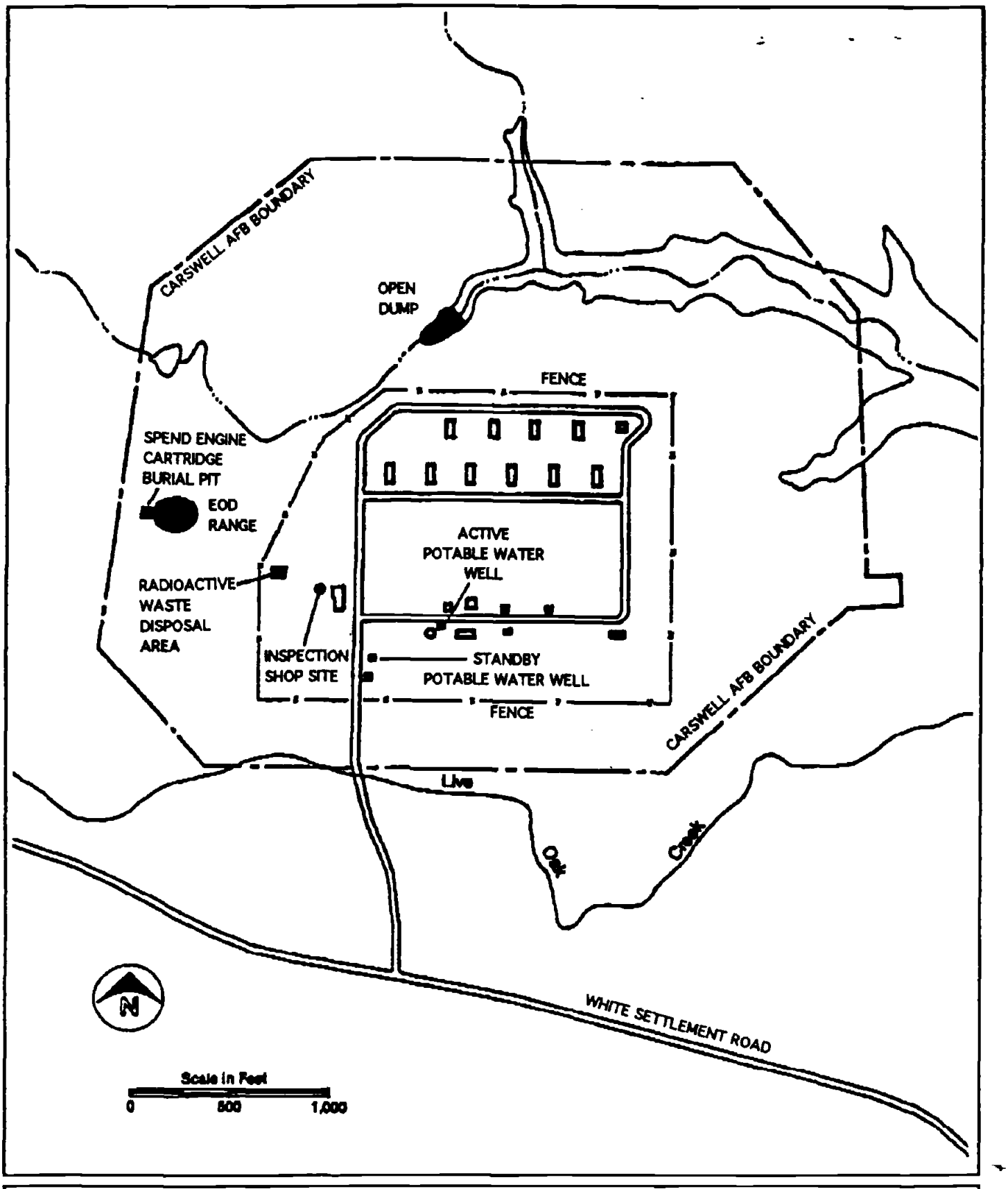


FIGURE 1.1
SITE MAP OF WEAPONS STORAGE AREA
CARSWELL AFB

2.0 ENVIRONMENTAL SETTING

The WSA is located within the Grand Prairie section of the central lowlands physiographic province. Soils in the area generally consist of the Aledo-Bolar-Sanger Association which is defined as gently sloping to moderately steep, very shallow to deep, loamy and clayey soils on uplands. Soil permeabilities range from less than 4.2 x 10^{-5} to 9 x 10^{-4} cm/sec. The WSA is located in an area where the Fredericksburg and Washita Groups outcrop. In some areas, this formation has been eroded away, exposing the underlying Paluxy sand.

The WSA is located between two forks of Live Oak Creek, which flows east, discharging into Lake Worth. All surface runoff discharges to this creek. Elevations in the area range from 720 to 800 feet above mean sea level (msl).

Potable water is supplied by two wells (one is standby), each reported to be 218 feet deep. It is probable that these wells develop water from the Paluxy and Twin Mountains Aquifers.

Ecology

The WSA is located on gently rolling land in the Cross Timbers and Prairies Region of Texas. Most of this land is in unimproved pasture and is heavily grazed by beef cattle. Also, part of the WSA area is in natural, xeric, oak woodlands, especially on hillsides and in ravines. Wildlife populations are similar to those on Carswell AFB, with the addition of some larger mammals such as white-tailed deer and coyotes.

Open Waste Dump

This site is located outside of the fenced area but within the WSA property boundary. According to Carswell AFB personnel, the site was occasionally used by WSA personnel for disposal of debris (wood, metal, paper, etc.) and was not used for

disposal of hazardous or other liquid wastes. An inspection of the site by the record search team during the base visit seemed to substantiate the above. The site, however, is still of some concern due to two factors: (1) the public has access to the site and has used it on occasion and (2) the site is in a gorge that drains into a tributary to Live Oak Creek which flows into Lake Worth. The site should be closed to prevent its possible use for disposal of hazardous materials. The site was not rated since hazardous materials were not suspected of being present at the site.

3.0 FIELD PROCEDURES AND EQUIPMENT

3.1 Field Monitoring

Field instruments used during the field sampling at Carswell AFB waste dump area were the Foxboro Organic Vapor Analyzer (OVA) 128 and the Victoreen Model 190 Survey and Count Rate Meter. The OVA 128 was used to monitor for the presence of organic vapors that may have been encountered during sampling. The Survey and Count Rate Meter was used to monitor for total radiation above background.

3.2 Decontamination

Sampling Equipment. Reusable sampling equipment was decontaminated prior to use at each sampling point, and before the equipment was transported offsite. The procedure for decontamination of sampling equipment is outlined below:

1. The equipment was washed thoroughly with phosphate-free laboratory detergent and tap water. A brush was used to remove any particulate matter or surface film.

2. A tap water rinse.

3. Deionized water rinse.

4. Final rinse with pesticide-grade isopropanol.

5. Equipment was then allowed to air dry.

3.3 Sample Collection Procedures

3.3.1 Soil Samples

The sampling procedure was modified for the surface soil sampling because most of the soil type at the facility was limestone. Protective gloves were worn while sampling. The surface vegetation and debris was removed with a stainless steel spoon. The volatile organic sample was collected first. The soil was scooped up with a spoon and placed directly into the sample container. The soil was packed into the container, so that there were no air spaces left and capped tightly. After volatile organics were collected sufficient soil was collected in a pyrex bowl and mixed to be homogeneous. The other sample containers were filled with a stainless steel spoon and capped tightly. The bottles were labeled and logged into the field log book. Samples were placed in a cooler on ice with a completed chain-of-custody form. The cooler was shipped to the laboratory for analysis. A photograph of each sample location was taken.

3.3.2 Quality Control Samples

During the sampling episode, a number of QC samples were collected and submitted for laboratory analysis. The types of QC samples that were collected are described in the following paragraphs.

Trip Blanks

A trip blank was used in the chemical analysis of volatile organics. The analytical results served as a baseline measurement of volatile organic contamination that sample containers may be exposed to during transport and laboratory storage prior to analysis.

The trip blank originated in the laboratory. It was comprised of organic-free reagent water, which was placed in sample containers by the laboratory, transported to the site location, handled along with the samples, and returned to the laboratory along with samples of water and soil collected for volatile organic analysis.

One trip blank was included in the shipping container for volatile organics analysis. The trip blank was stored in the laboratory with the samples, and analyzed by the laboratory (for volatile organics only).

Equipment Rinsate

An equipment rinsate was collected for equipment used in the collection of soil samples. The analysis of this rinsate served to verify the cleanliness of the sampling equipment and the effectiveness of the decontamination procedure.

The equipment rinsate was comprised of organic-free water supplied by the laboratory, which was transported to the sample collection site, opened, poured onto the stainless steel spoon and pyrex bowl following equipment decontamination procedures, and transferred to a sample bottle. One equipment rinsate was collected prior to the soil sampling event. The equipment rinsate was analyzed for the same parameters as the associated samples.

Field Duplicate

The field duplicate for VOC analyses was collected independently of the original sample at the same location during a single sampling episode. The remaining samples for analysis were collected from a single sampling location. The soil was mixed to be homogenous, and then split equally between the remaining sample bottles. The duplicate analysis provided statistical information relating to sample variability and served as a check on the precision of any sample collection method.

One surface soil duplicate sample was submitted for laboratory analysis. The field duplicate was labeled in such a manner that persons performing laboratory analyses were not able to distinguish duplicates from other collected samples.

3.4 Sampling Handling Procedures

All samples were preserved immediately following collection.

Liquid Samples. Samples to be analyzed for volatile organics were collected in a 40 ml volatile organic analysis (VOA) vial. Vials were pre-preserved with 4 drops concentrated hydrochloric acid. After filling the vial, it was turned upside-down and tapped lightly to ensure that there were no air bubbles. Other liquid samples were placed into pre-preserved sampling bottles obtained from the laboratory, such as a 1 liter amber glass bottle. The container was filled at least 3/4 full, labeled with the sample ID number, and placed in a sealable plastic bag. All samples were packed with ice in a cooler in a manner such that the containers were not damaged during shipping.

Soil Samples. Samples were collected in the appropriate size bottles provided by the subcontractor laboratory. Containers were filled at least 3/4 full. Each

sample was labeled with the sample ID number. Each sample was placed in a sealable plastic bag. All samples were preserved with ice, and packed in a cooler in a manner such that the contents were not damaged during shipping.

3.4.1 Sample Labeling

Each sample container had a clean label for identification preaffixed to it. The sample identification label was completely filled out in waterproof ink with the following information:

- Sample identification number
- Sample location
- Date of collection
- Time of collection
- Initials of personnel collecting the sample
- Analysis requested
- Types of preservatives (if any)

3.4.2 Sample Custody

Custody of samples was maintained and documented from the time of sample collection to completion of the analysis.

All samples were accompanied to the laboratory by a chain-of-custody record. A separate chain-of-custody record accompanied each sample delivery to the laboratory. A copy of the form was retained by sampling personnel for the project file.

Once received at the laboratory, laboratory custody procedures applied. The laboratory was responsible for maintaining custody records throughout sample preparation and analysis.

Chain-of-Custody Record. A chain-of-custody form was completed for each sample set collected at a sampling location. The form was maintained as a record of sample collection, transfer, shipment, and receipt by the laboratory. The forms also contain pertinent information concerning sampling location, date, and times; signatures of the sampling team members; types of samples collected along with a unique sample identification number; the number of samples collected and shipped for analysis in each lot; the project name and number; and the name of the laboratory to which the samples were being sent.

Transfer of Custody. Samples were accompanied by an approved and completed chain-of-custody form during each step of custody, transfer, and shipment. When physical possession of samples was transferred, both the individual relinquishing the samples and the individual receiving them signed, dated, and recorded the time on the chain-of-custody form. The samples were shipped by an overnight courier, so properly prepared airbill for non-hazardous materials served as an extension of the chain-of-custody form while the samples were in transit.

3.4.3 Sample Packaging and Shipping

Following sample collection, all samples were brought to an on-site location for batching and paperwork checks. At this central location, like sample types were matched (i.e., solids, liquids, etc.) with similar sample types from all sample locations. Labels and log information were checked to be sure there was no error in sample identification. The samples were packaged to prevent breakage and/or leakage, and the shipping containers were labeled in accordance with the DOT regulations for transport.

As soon as field personnel were ready to transport samples from the field, the laboratory was notified by telephone of the shipment along with the estimated

time of arrival. All samples were shipped directly to the laboratory within 24 hours of collection. For each sample shipment to the subcontractor laboratory, an overnight airbill was properly completed.

4.0 ANALYTICAL PROCEDURES

All samples collected at the WSA were analyzed by Toxikon Corporation, the subcontractor laboratory located in Woburn, Massachusetts.

4.1 Analytical Methods

The standard analytical methods that were used in the analyses of the samples collected at the site are summarized in Table 4-1. Further information on the procedural techniques is included in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, U.S. EPA, Third Edition, November 1986.

TABLE 4-1
STANDARD ANALYTICAL METHODS

Parameters	Method
Purgeable Aromatic Hydrocarbons	SW8020
Purgeable Halogenated Volatiles	SW8010
Semivolatile Organic Compounds	SW8270
Total Petroleum Hydrocarbons	SW3550/E418.1
Gross Alpha Radiation	SW9310
Gross Beta Radiation	SW9310
Target Analyte List Metals/Mercury	SW6010/SW7471

SW - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA 3rd Ed., 1987, as amended.

E - Methods for Chemical Analysis of Water and Wastes, USEPA 600/4-79-020.

4.2 Sample Collection Chronology

Table 4-2 lists the sample location and the sequence of collection.

TABLE 4-2
SAMPLE TYPE AND CHRONOLOGY

Sequence	Sample	Type	Location
1	SS-01F	Soil	Upgradient in dry creek bed
2	SS-02F	Soil	Downgradient in dry creek bed
3	SWB-01	Water	Source water - bottled water used for first stage of decontamination
4	EB-01	Water	Equipment rinsate - ASTM Type II water from lab was poured over equipment prior to collection of SS-03F
5	SS-03F	Soil	Taken from sand pile on south end of debris pile
6	SS-50F	Soil	Duplicate of SS-03F
7	SS-04F	Soil	Taken from soil under the limestone lip after the debris was removed

4.3 Data Validation

Validation of the analytical data from the subcontractor laboratory was completed by Metcalf & Eddy according to EPA's "Functional Guidelines for Organic Data Review (June, 1991) and Functional Guidelines for Evaluating Inorganic Analysis (July, 1988)".

The Level III data packages consisted of two separate sample delivery groups: one containing the four surface soil samples and field duplicate, and one containing the equipment blank and trip blank.

Volatiles. Tetrachloroethylene positive result was qualified as estimated (J) for sample SS-04 because the associated continuing calibration percent difference was greater than 15 percent. No other qualifications were required for any other volatile sample results.

Metals. Arsenic, barium, chromium, nickel, lead, selenium, thallium, and vanadium results for sample SS-04 were qualified as estimated (J) because their matrix spike percent recoveries were outside the associated QC limits. No other qualifications were required for any other metal sample results.

The analytical results for semi-volatiles, total petroleum hydrocarbons, gross alpha and gross beta did not require any qualifications.

5.0 DATA EVALUATION AND REMOVAL ACTION

As a screening procedure, four soil samples were taken from three locations at the debris disposal area. The samples were taken from the dry creek bed up- and downgradient of the disposal area and from a sand pile within the disposal area (SS-01F, 02F, 03F, and 50F). These locations are depicted on Figure 5.1. The analytical results for these samples are listed in Tables 5-1 and 5-2. A review of Table 1 shows that there were no compounds detected above method detection limits for any sample for volatile organic compounds, semi-volatile compounds, or BTEX. The measurement for the gross alpha emissions for the soil samples ranged from 6.2± pCi/g to 22± 10 pCi/g. The measurement of gross beta emissions ranged from 3.3± 14.0 pCi/g to 6.2± 4.2 pCi/g. A telephone conversation was held with the Texas Department of Health, Bureau of Radiation Control to discuss the results. The summary of that discussion has three points. Firstly, the State of Texas does not have regulations for gross alpha or beta emissions. Their regulations are radionuclide specific. Secondly, gross alpha and beta are used primarily as screening parameters for the presence of other elements. Finally, given these two points, the levels detected were not beyond the naturally occurring range. The results of the metals

TABLE 5-1
ANALYTICAL SUMMARY TABLE
CARSWELL AFB, TEXAS

	Sample Location							
Analysis Type	**TB-01**	**EB-01**	**SWB-01**	**SS-01**	**SS-02**	**SS-03**	**SS-50F**	**SS-04F**
8010	ND	ND	ND	ND	ND	ND	ND	TCE 4.9J
8020	ND	ND	ND	ND	ND	ND	ND	ND
8270	NA	ND	ND	ND	ND	ND	ND	ND
TPH	ND	ND	ND	ND	ND	ND	ND	ND
Alpha	NA	1.0±1.0	0.4±0.7	6.2±6.1	14±7	22±10	8.2±8.0	0.0±6.7
Beta	NA	0.0±2.3	2.2±2.4	3.5±4.1	6.2±4.2	3.3±14.0	4.0±4.1	6.1±4.2
Metals	NA	Mg 55 Mn 6 Na 1300 Fe 14 Ca 184 Zn 18	Mn 4 Na 1,080 Fe 15 Ca 155 Zn 56	See Table 2	See Table 2	See Table 2	See Table 2	See Table

Units: Alpha and Beta results are in pico curries per gram (pCi/g)
Metals results are in micrograms per liter (ppb) for water samples
Organic compounds are in μg per kilogram for soil samples

TPH: Total petroleum hydrocarbons
ND: No compounds detected above method detection limits
NA: Not analyzed
TCE: Tetrachloroethene

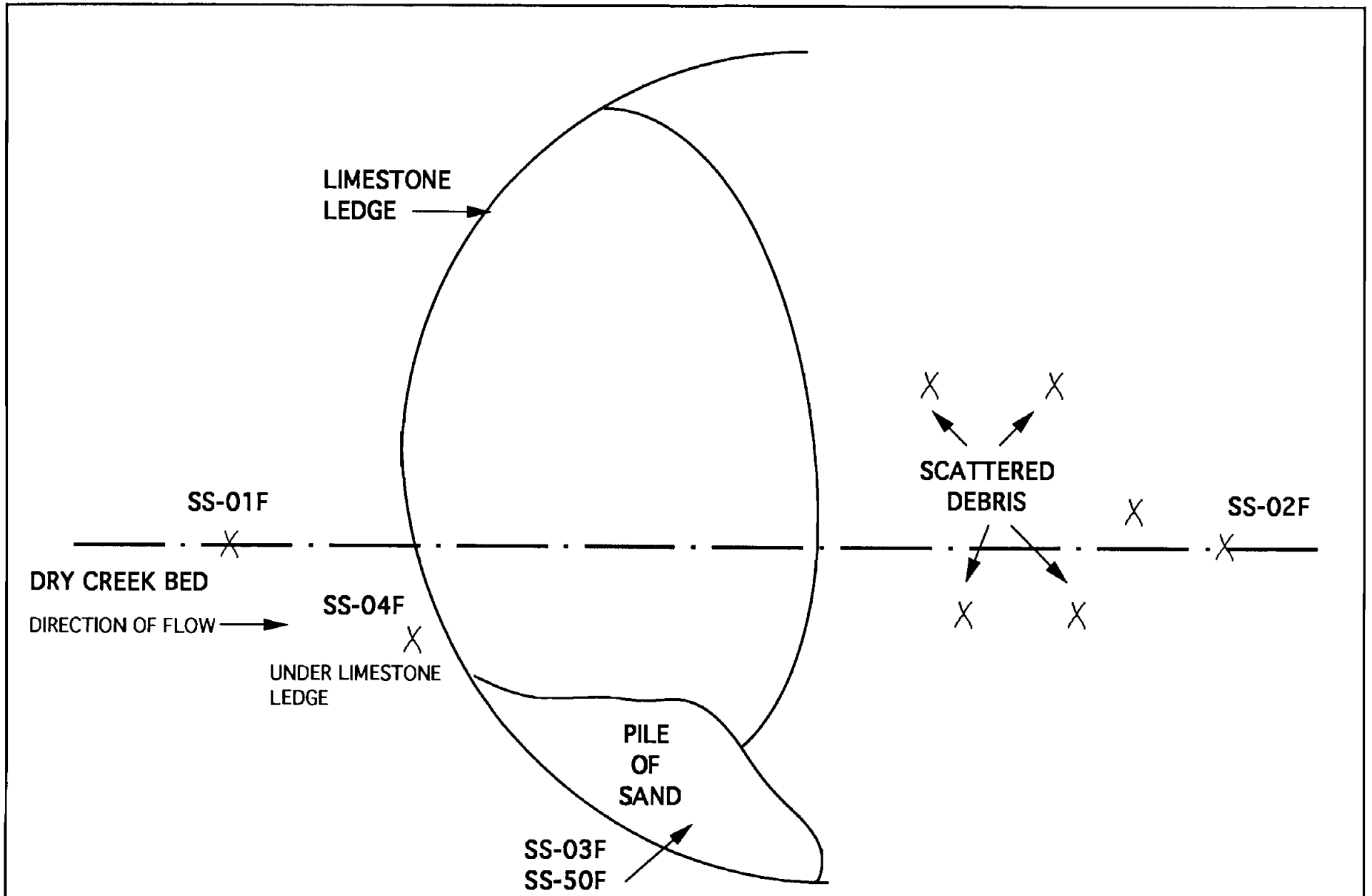
Sample Legend:
TB-01 Trip blank
EB-01 Equipment rinseate blank
SWB-01 Source water blank
SS-01F Upgradient soil sample
SS-02F Downgradient soil sample
SS-03F Onsite soil sample
SS-50F Duplicate sample of SS-03
SS-04F Closure sample

TABLE 5-2
INORGANIC ANALYTICAL RESULTS OF SOIL SAMPLES
CARSWELL AFB, TEXAS

	Sample Location				
Inorganic Compound	**SS01**	**SS02**	**SS03**	**SS50F**	**SS04F**
AG - Silver	-	-	-	-	-
AL - Aluminum	4,510	3,420	2,840	2,730	7,720
AS - Arsenic	-	-	-	-	-
BA - Barium	31.3	32.4	41.8	48.0	57.5J
BE - Beryllium	0.3	1.4	1.7	1.6	0.630
CA - Calcium	186,000	141,000	14,000	39,300	20,200
CD - Cadmium	-	1.3	1.4	1.4	7.17
CO - Cobalt	2.4	14.3	18.4	18.5	6.03
CR - Chromium	13.3	8.9	9.2	10.2	26.3J
CU - Copper	7.1	65.3	22.5	5.1	10.1
FE - Iron	8,330	92,000	102,000	115,000	40,000
HG - Mercury	-	-	-	-	-
K - Potassium	602	259	139	119	820
MG - Magnesium	2,090	1,890	712	902	2.245
MN - Manganese	194	743	886	1,130	721
NA - Sodium	793	648	529	23.1	619
NI - Nickel	7.5	34.4	41.7	40.2	79.2J
PB - Lead	10.4	66.7	26.2	24.0	11.9
SB - Tin	-	-	-	-	-
SE - Selenium	-	-	-	-	-
TL - Thallium	-	-	-	-	-
V - Vanadium	19.6	72.7	72.6	73.8	31.5J
ZN - Zinc	13.3	133	70.0	73.8	46.9

All values are reported in milligrams per kilogram (ppm)

(-) = Below detection limits



SITE LAYOUT AND SAMPLING LOCATIONS
WEAPONS STORAGE ANNEX DISPOSAL AREA
CARSWELL AFB, TEXAS

Metcalf & Eddy

NOT TO SCALE

FIGURE 5.1

results of the metals samples were not remarkable. When the upgradient results were compared with the onsite and downgradient locations, no significant variations were noted.

The Texas Water Commission was contacted regarding the disposal of the debris at a Texas municipal landfill. The contact stated that Texas municipal landfills can not receive hazardous waste as defined by 40 CFR 261.24. This section of the Federal regulations gives the Toxicity Characteristic Leachate Procedure (TCLP) regulatory levels for a number of compounds including seven metals. As the analyses performed were for total metals, not TCLP metals using the leaching procedure, these values were divided by a factor of 20 and then compared to the TCLP regulatory levels. This factor of 20 is based on the ratio of the dry weight of the solid extracted and the weight of the extraction fluid (1:20) as described in TCLP, 40 CFR Part 261, Appendix II. When this factor is applied to the analytical results, all of the results are well below regulatory levels and therefore should not be considered hazardous. Additionally, the non-hazardous nature allowed the use of less stringent health and safety precautions for both the personnel involved in the removal action and the transportation.

A closure sample was taken from the soil under the limestone ledge. The sample procedures for this soil sample are the same as described previously in Section 3. The analytical parameters are the same as described in Section 4. All of the analytical results (see Tables 5-1 and 5-2) for volatile organic compounds, BTEX, and semi-volatile compounds were not detected above the method detection limits with the exception of tetrachloroethene which was detected at 4.9 μg/kg. This is a trace amount present less than 3 ppb above the method detection limit. If one employs the same methodology of dividing by 20 to obtain the TCLP concentration, this trace amount would be non-hazardous. Given the highly volatile nature of this compound and the semi-arid conditions which exist in this portion of Texas, it is doubtful that resampling would be able to detect this compound at this location of the debris to the landfill.

The metals analyses were within the range of the previous metals analyses reported from this location. The gross alpha and beta values also were within the range of the previous radionuclide analyses reported from this location.

The removal action took place on September 30, 1993. Eagle Construction & Environmental Services provided the track-hoe, the 20 cubic yard (yd^3) dump trucks, and manpower to perform the removal. The track hoe was positioned on the edge of the limestone ledge and used its bucket to load the debris into the dump trucks. Chains were used to draw larger pieces to within reach of the track hoe. Smaller pieces which had migrated within 300 feet downstream were picked up by hand and brought to the collection point. The trackhoe was used to dig under the lip of the limestone. Smaller pieces were picked up by hand. A total of six truckloads were taken to the Westside Sanitary Landfill, Ft. Worth, Texas (a Wast Management facility).

6.0 SUMMARY OF RESULTS AND CONCLUSIONS

A waste dump was located in a small ravine on the north side of the off-base Weapons Storage Area for Carswell Air Force Base, Texas. In order to quantify the potential contaminants which may be associated with the debris in the dump, soil samples were taken upgradient, downgradient of the dump and within the dump. These samples plus the appropriate QC samples were analyzed for volatile organic compounds, BTEX, semi-volatile compounds, gross alpha, gross beta, and metals. All analytical results were either below the method detection limits or within normal background levels. Based upon these results, the debris was treated as a non-hazardous waste. Six dump trucks of debris were loaded with a track hoe and the debris was disposed of in the Westside Sanitary landfill. A closure sample was taken after the debris was removed and analyzed for the same parameters as the previous samples. The analytical results indicate that all results were below method detection limits or within normal range with the exception of a trace amount of the volatile organic compound tetrachloroethene.

Based on a visual inspection and the analytical results of the closure sample, this waste dump should be considered clean and closed.

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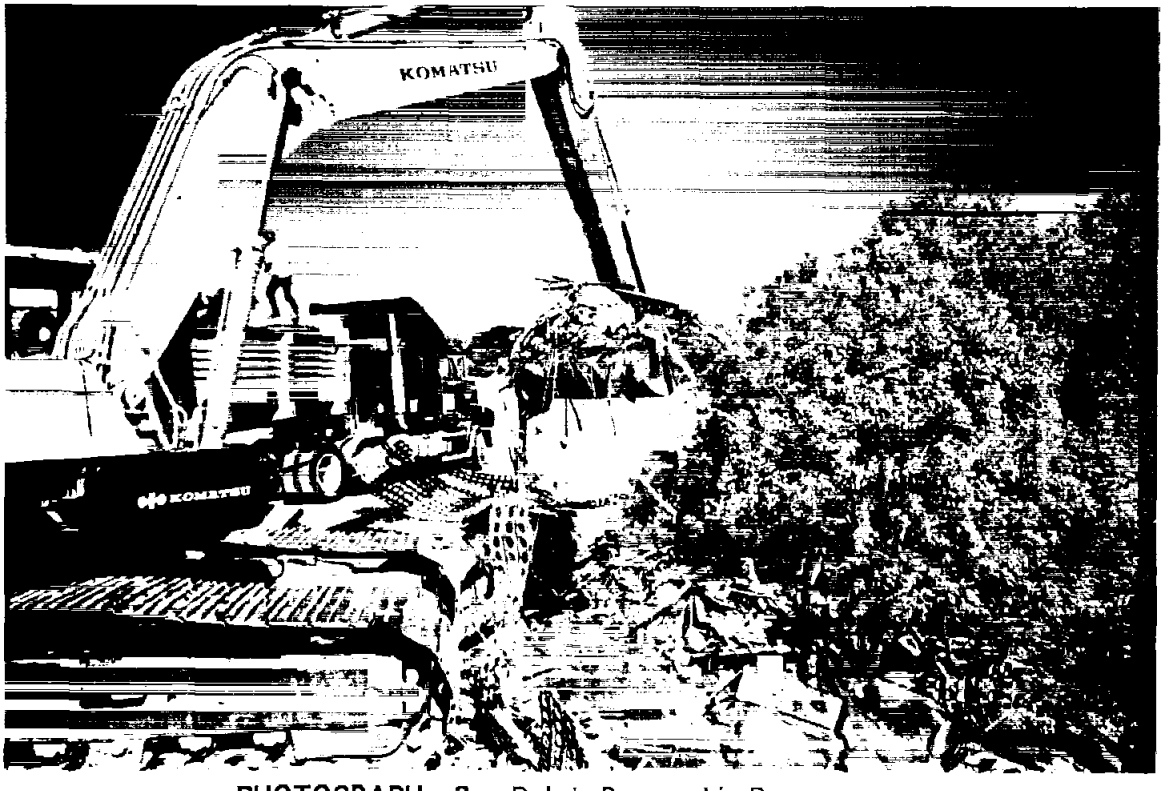
PHOTO LOG OF DEBRIS REMOVAL
CARSWELL AFB, TEXAS

PHOTOGRAPH 1 The Debris



PHOTOGRAPH 2 Debris Removal in Progress

PHOTO LOG OF DEBRIS REMOVAL
CARSWELL AFB, TEXAS

PHOTOGRAPH 3 Loading Debris into the Dump Trucks

PHOTOGRAPH 4 Excavation under the Limestone Ledge

PHOTO LOG OF DEBRIS REMOVAL
CARSWELL AFB, TEXAS

PHOTOGRAPH 6 View along Drainage Pathway

PHOTOGRAPH 5 Debris Removed, Compare with Photograph 1

PHOTO LOG OF DEBRIS REMOVAL
CARSWELL AFB, TEXAS

PHOTOGRAPH 7 View of Cleaned Area up towards the Limestone Ledge

PHOTOGRAPH 8 View of Area Prior to Departure

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ADMINISTRATIVE RECORD

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