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FINAL INSTALLATION RESTORATION RCRA FACILITY INVESTIGATION SAMPLING AND
ANALYSIS PLAN FOR REMOVAL OF DRUMS NAS FORT WORTH TX
2/1/1994
LAW ENGINEERING AND ENVIRONMENTAL

188000



**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

**ADMINISTRATIVE RECORD
COVER SHEET**

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INSTALLATION RESTORATION PROGRAM (IRP)
FIELD INVESTIGATION, SAMPLING, AND REMOVAL OF IRP DRUMS

SAMPLING AND ANALYSIS PLAN ADDENDUM

Carswell Air Force Base, Fort Worth, Texas

February 1994

Final



PREPARED FOR

AIR FORCE BASE CONVERSION AGENCY (AFBCA/OL-H)
CARSWELL AIR FORCE BASE, TEXAS 76127

UNITED STATES AIR FORCE
AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE
BASE CLOSURE RESTORATION DIVISION (HQAFCEE/ESB)
BROOKS AIR FORCE BASE, TEXAS 78235-5328



LAW

ENGINEERING AND ENVIRONMENTAL SERVICES

188002

February 23, 1994

Air Force Center for Environmental Excellence
HQAFCEE/ESB
8001 Inner Circle Drive, Suite 2
Brooks Air Force Base, TX 78235-5328

Attention: Mr. Chris Hobbins (Team Chief)

Subject: **Carswell Air Force Base**
Field Investigation, Sampling, and Removal of IRP Drums
Final Sampling and Analysis Plan Addendum
Contract No. F33615-90-D-4008
Delivery Order No. 0015
Law Project No. 11-3517-0115

Dear Mr. Hobbins:

Law Environmental, Inc., Government Services Division is pleased to submit the enclosed eight copies of the Final Sampling and Analysis Plan Addendum to the Air Force Center for Environmental Excellence (AFCEE) for approval.

If you have questions or comments, please contact us at (404) 499-6800.

Sincerely,

LAW ENVIRONMENTAL, INC.

John F. O'Brien
Project Manager

E. Fred Sharpe, Jr., P.E.
Principal

JFO/EFS:dcl

3517-0115.06

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INSTALLATION RESTORATION PROGRAM (IRP)
FIELD INVESTIGATION, SAMPLING, AND REMOVAL OF IRP DRUMS
FINAL SAMPLING AND ANALYSIS PLAN ADDENDUM
FOR
CARSWELL AFB
FORT WORTH, TEXAS 76127-5000

February, 1994

Prepared by:
Law Environmental, Inc.
114 TownPark Drive
Kennesaw, Georgia 30144

CONTRACTOR CONTRACT NO. F33615-90-D-4008 DELIVERY ORDER NO. 0015

United States Air Force
Air Force Center for Environmental Excellence
Base Closure Restoration Division (HQAFCEE/ESB)
Brooks Air Force Base, Texas 78235-5328
Mr. Chris Hobbins (HQAFCEE/ESB)

PURPOSE OF DOCUMENT

This Sampling and Analysis Plan (SAP) Addendum for Carswell Air Force Base (Carswell AFB) has been developed for the Field Investigation, Sampling, and Removal of 106 investigation derived waste (IDW) storage drums at Building 1337, and disposal of 71 storage drums of oil/water separator sludge located at Buildings 1190 and 1347. Procedures outlined in this plan are designed to describe the collection of environmental samples, laboratory analysis of those samples for potential contaminants, evaluation of the analytical results and field measurements, with respect to quality control data, and the interpretation and analysis of QA/QC reviewed data. The plan will be effective after final approval by the Air Force Center for Environmental Excellence (AFCEE).

The success of Carswell AFB's Installation Restoration Program depends on team effort and total dedication from parties involved. Therefore, efforts will be focused on achieving and maintaining compliance with this Sampling and Analysis Plan Addendum and pertinent regulations.

The point of contact for this investigation is as follows:

Mr. Chris Hobbins
Team Chief
HQAFCEE/ESB
8001 Inner Circle Drive, Suite 2
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Phone: (210) 536-5261

**SAMPLING AND ANALYSIS PLAN (SAP) ADDENDUM
DISCLAIMER NOTICE**

This Sampling and Analysis Plan Addendum has been prepared for the United States Air Force by Law Environmental, Inc. for the purpose of aiding in the implementation of a final remedial action plan under the Air Force Installation Restoration Program (IRP). As the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this plan and the ongoing nature of the IRP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this report, since subsequent facts may become known which may make this plan premature or inaccurate. Acceptance of this Sampling and Analysis Plan addendum in performance of the contract under which it is prepared does not mean that the United States Air Force adopts the conclusions, recommendations or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force.

Copies of this plan may be purchased from:

Government agencies and their contractors registered with the Defense Technical Information Center (DTIC) should direct their requests for copies of this work plan to:

Defense Technical Information Center
Cameron Station
Alexandria, VA 22304-6145

Non-government agencies may purchase copies of this document from:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161

**SAMPLING AND ANALYSIS PLAN (SAP)
PREFACE**

Law Environmental, Inc. (Law) was contracted by the U.S. Air Force Center For Environmental Excellence (AFCEE) to perform a field investigation and disposal of stored fifty-five-gallon drums containing materials from oil/water separator maintenance and subsurface investigations at Carswell AFB, Texas. The primary objectives of this drum disposal and field investigation are to:

1. Sample and characterize for disposal the contents of 106 storage drums located at the Building 1337 storage yard. These drums contain investigation-derived waste (IDW) generated from past Installation Restoration Program (IRP) investigations.
2. Dispose of the same 106 IDW storage drums located at Building 1337 storage yard as sampled and characterized by Objective No. 1.
3. Drill 3 soil borings from the ground surface to the saturation zone to sample underlying soil to assess whether constituents of concern have been released at the Building 1337 storage yard.
4. Dispose of the oil/water separator sludge contained within 65 storage drums located at Building 1190.
5. Dispose of the benzene contaminated oil/water separator sludge contained within 6 storage drums located at Building 1347.
6. Provide a written report to discuss the results of the field investigation.

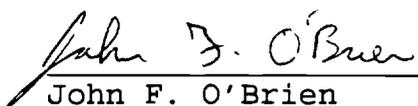
The SAP Addendum is composed of two documents - the Quality Assurance Project Plan (QAPP) Addendum and the Field Sampling Plan (FSP) Addendum.

The QAPP Addendum consists of detailed information on defining and assuring that the Data Quality Objectives (DQOs) are achieved. DQOs are considered through various project tasks, including writing of plans, field work, and laboratory analysis. The QAPP delineates the procedures necessary to achieve DQO goals.

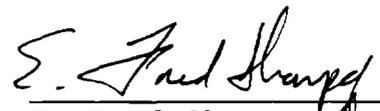
The FSP Addendum describes field tasks necessary for implementing the project objectives. Field tasks are described in detail to ensure that the DQOs are achieved during field activities.

Mr. John O'Brien is the Project Manager for this investigation. Members of the field investigation team will be selected prior to commencement of field activities.

This SAP Addendum was prepared by Mr. Tom McComb and reviewed by Mr. Jerry Preston and Mr. Fred Sharpe. The effort of Mr. Chris Hobbins (AFCEE Team Chief) and personnel at Carswell AFB are greatly appreciated.



John F. O'Brien
Project Manager



E. Fred Sharpe, Jr., P.E.
Principal



Louis S. Karably, P.E.
Program Manager

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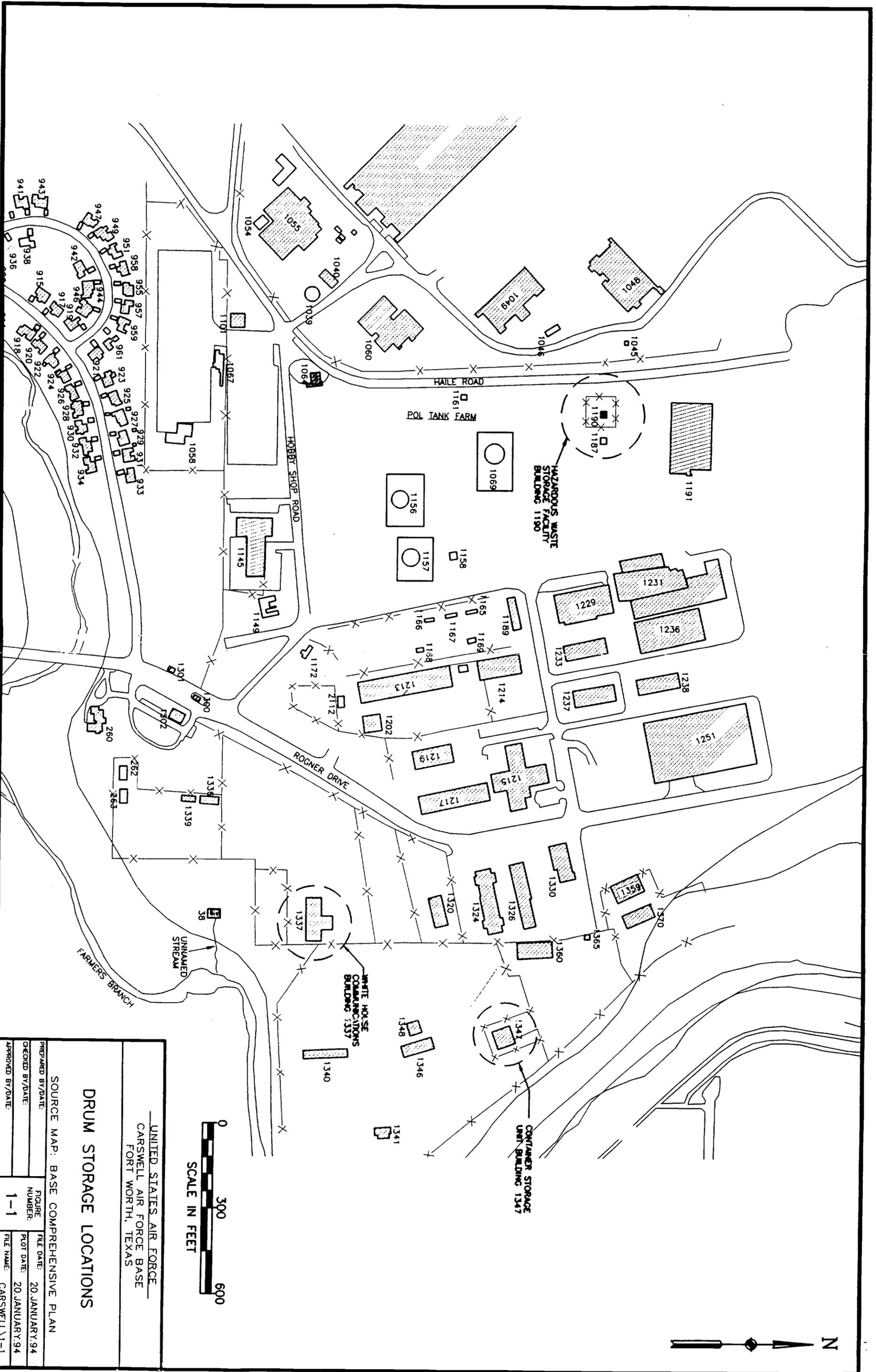
1.0 QUALITY ASSURANCE PROJECT PLAN

1.1 INTRODUCTION

This addendum to the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan (SAP) for the Carswell Air Force Base, prepared by Law Environmental, Inc., dated February 1994, has been developed for additional work at the Carswell Air Force Base (Carswell AFB), in Fort Worth, Texas. This addendum was prepared by Law Environmental, Inc., Government Services Branch (LAW), in response to the Scope of Work (SOW) dated September 14, 1993, under Contract No. F33615-90-D-4008 issued by the Air Force Center for Environmental Excellence (AFCEE).

The sampling and analysis plan addendum summarizes the proper disposal of 106 IRP storage drums of investigation-derived waste (IDW) located at the storage yard of Building 1337, 65 storage drums containing oil/water separator sludge located at Building 1190, and 6 storage drums containing benzene contaminated oil/water separator sludge located at Building 1347. Routine maintenance of the oil/water separators generated the sludge drums, and the IDW drums were generated during Installation Restoration Program (IRP) investigations at Carswell AFB. Figure 1-1 shows the location of Buildings 1337, 1347, and 1190.

The sampling and analysis plan addendum also summarizes the proper sampling and characterization, for disposal purposes, of the IDW drums stored at Building 1337, as well as, the placement of three soil borings at the Building 1337 storage yard (Figure 1-2) to sample underlying soils for contaminants of concern possibly released by the IDW drums.



DRUM STORAGE LOCATIONS

UNITED STATES AIR FORCE
 CARSWELL AIR FORCE BASE
 FORT WORTH, TEXAS



SOURCE MAP: BASE COMPREHENSIVE PLAN

PREPARED BY/DATE:	FIGURE NUMBER:	FILE DATE:
CHECKED BY/DATE:	1-1	20 JANUARY 94
APPROVED BY/DATE:	FILE NAME:	20 JANUARY 94
	CARSWELL\1-1	

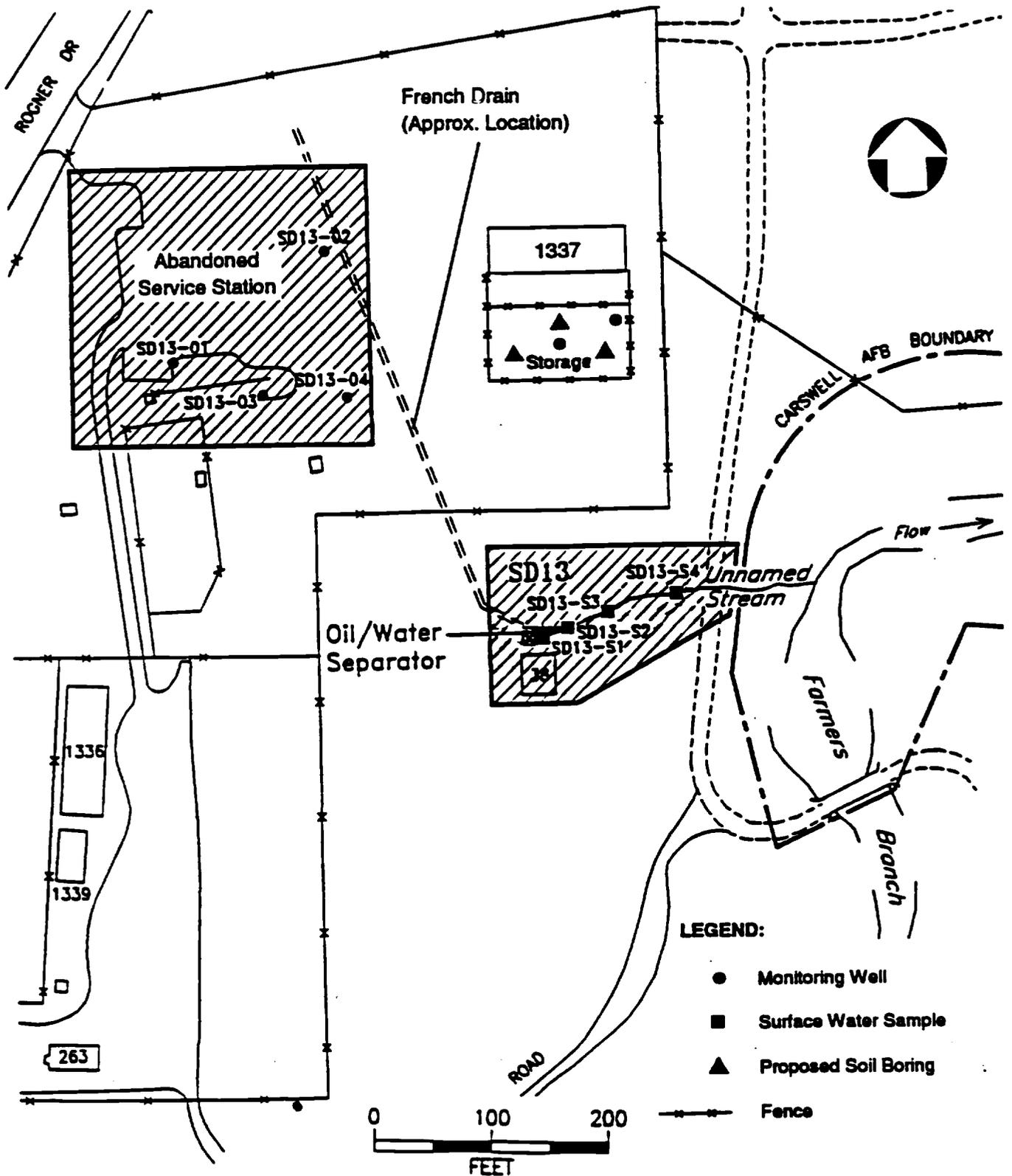
FIGURE 1-2

188014

BUILDING 1337 STORAGE YARD LOCATION OF PROPOSED SOIL BORINGS

(AFTER RADIAN, 1991a)

CARSWELL AIR FORCE BASE, TEXAS



1.2 PROJECT DESCRIPTION

This section describes the project with respect to objectives, scoping documents, and the role of subcontractors.

1.2.1 Project Background

During past IRP investigations conducted at Carswell AFB, approximately 106 storage drums of investigation derived waste were generated and reported by Carswell AFB to consist of soil cuttings and equipment decontamination wash water. Also, routine maintenance operations have generated approximately 71 storage drums of sludge removed from oil/water separators located throughout the base.

1.2.2 Project Scope and Objectives

The objective of this project is to:

1. Sample and characterize for disposal the contents of 106 storage drums stored at the Building 1337 storage yard which contain investigation-derived waste (IDW) generated from past IRP investigations.
2. Dispose of the same 106 IDW storage drums located at Building 1337 storage yard as sampled and characterized by Objective No. 1.
3. Drill 3 soil borings from the ground surface to the saturation zone to sample underlying soil to assess whether constituents of concern have been released at the Building 1337 storage yard.

4. Dispose of the oil/water separator sludge contained within 65 storage drums located at Building 1190.
5. Dispose of the benzene contaminated oil/water separator sludge contained within 6 storage drums located at Building 1347.
6. Provide a written report to discuss the results of the field investigation.

1.2.3 Subcontractors

Law will manage the project and provide services related to field sampling, data analysis, site characterization, and reporting. At this stage of the investigation the following subcontractors have been identified.

ENSITE, Inc. will perform drum samples, characterization, authorization, and disposal activities.

ATEC Environmental Services of Dallas, Texas, will be the subcontractor to perform the drilling services.

Law Environmental National Laboratories of Pensacola (LENL) is the Law Environmental, Inc. production chemical testing laboratory. LENL will provide sample shipping containers, chain of custody documentation, chemical analysis and reporting, and laboratory quality assurance/quality control (QA/QC). LENL has integrated QA/QC Procedures into their laboratory design and standard operating procedures. LENL has been approved for USAF analytical work via U.S. Air Force Performance Audits conducted by the MITRE Corporation, in support of AFCEE.

Details of the project organization, personnel, and subcontractor responsibility are provided in the Sampling and Analysis Plan (SAP) Addendum for this project.

1.3 PROJECT ORGANIZATION AND RESPONSIBILITIES

Refer to Section 1.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.4 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

Refer to Section 1.4 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.5 SAMPLING PROCEDURES

Refer to Section 1.5 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.6 SAMPLE CUSTODY

Refer to Section 1.6 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.7 FIELD EQUIPMENT CALIBRATION PROCEDURES

Refer to Section 1.7 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.8 ANALYTICAL PROCEDURES

The following sections identify the analytical methods to be utilized.

1.8.1 Identification of Methods

The analytical methods to be utilized for the soil samples are presented in Table 1-1. Based on chemical analysis of soil samples, a back calculation will be performed to determine if Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit would be exceeded. If the back calculated concentration of a given parameter exceeds the TCLP limit, TCLP will be performed for that parameter.

1.8.2 Detection and Quantitation Criteria

Refer to Section 1.8.2 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.8.3 Method Calibration

Refer to Section 1.8.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and

TABLE 1-1

SAMPLING AND ANALYSES PLAN SUMMARY: DISPOSAL OF IRP DRUMS
RCRA FACILITY INVESTIGATION - CARSWELL AIR FORCE BASE, TEXAS

PARAMETER	TOTAL NO. FIELD LOCATION		SAMPLES PER LOCATION		FIELD EQUIPMENT		FIELD QC SAMPLES		TRIP		TOTAL NO. FIELD SAMPLES		LAB QC SAMPLES		2ND (c) COLUMN CONFIRM ANALYSES		TOTAL LAB SAMPLES	
	DUPLICATE	BLANK	BLANK	AMB COND	BLANK	BLANK(b)	MSD	MS	MSD	DUPLICATE	LAB	MSD	MS	MSD	DUPLICATE	LAB		MSD
Soil Borings ICP Screen for Metals SW 3050/SW6010	3	2	1	1	0	0	0	0	0	0	8	1	1	0	0	0	0	11
Soil Borings Volatile Organic Compounds SW 8240	3	2	1	1	1	1	1	1	1	1	10	1	1	0	0	0	0	13
Drums - Soil TCLP	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRPH (418.1)	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Drums - Water POTW Requirements (d) TRPH (418.1)	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

(a) Volatile organics only; number to be initiated will depend upon number of shipments
(b) Estimated; number to be determined by batch preparation
(c) Method SW8240 will have 2nd column confirmation performed on all samples exhibiting positive results
(d) Requirements as specified by the publically owned treatment works (POTW) permit

Total Analyzes

- Metals
- Herbicides
- Pesticides
- Semi-Volatiles
- Volatiles

Note:

Unknown Substances Other Than IDW	TEST METHOD	FREQUENCY
Field Hazardous Characteristics		One test/drum
pH		
Water Reactivity/Solubility		
Reduction - Oxidation Potential		
Specific Gravity		
Cyanide Determination		
Sulfide Determination		
Oxidizer Determination		
Peroxide Determination		
Halogen Determination		
Ignitability		
TCLP		One test per 50 cy per compatible group
Total Recoverable Petroleum		One test per 50 cy per compatible group
Hydrocarbons EPA Method 418.1		One test per 50 cy per compatible group

100010

PREPARED BY/DATE: 1/30/22 FEB/14
CHECKED BY/DATE: 1/30/22 JAF/14
APPROVED BY/DATE: _____

Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.9 DATA REDUCTION, VALIDATION, AND REPORTING

Refer to Section 1.9 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.10 INTERNAL QUALITY CONTROL CHECKS

Refer to Section 1.10 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

The types and numbers of laboratory quality control samples to be used are presented in Table 1-1 by matrix and parameter.

1.11 PERFORMANCE AND SYSTEM AUDITS

Refer to Section 1.11 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.12 PREVENTIVE MAINTENANCE

Refer to Section 1.12 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.13 FIELD AND LABORATORY PROCEDURES USED TO ASSESS DATA QUALITY INDICATORS

Refer to Section 1.13 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.14 CORRECTIVE ACTION

Refer to Section 1.14 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

1.15 QUALITY ASSURANCE REPORTS

Refer to Section 1.15 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.0 FIELD SAMPLING PLAN

The field tasks for this addendum to be conducted at Carswell AFB sites are explained in detail in the following text.

2.1 FIELD OPERATIONS

The location of the drums at Buildings 1337, 1190 and 1347 was observed during two site visits on June 30, and October 1, 1993, by representatives of Law Environmental, AFCEE, and Carswell AFB.

After drums have been removed from the yard at Building 1337, proposed drilling locations at the storage yard (Figure 1-2) will be verified for access and staked. Site preparation will include removal of obstructions, if necessary, and utility clearances by base personnel.

Upon completion of the field activities, each site will be restored to a condition that approximates the condition of the site prior to field activities.

2.1.1 Soil Boring and Soil Sampling

Each soil boring will be drilled from the ground surface to the ground-water surface or to auger refusal to allow the collection of sub-surface soil samples and to provide subsurface information on the site stratigraphy. The drilling operations will be monitored by a qualified geologist or geotechnical engineer. The geologist/engineer will log the subsurface conditions encountered in each boring, and record the information on a soil boring log. An example of a soil boring log is shown on Figure 2-1. Soils will be classified using the Unified Soil Classification System (ASTM D 2488-69).

The soil borings will be advanced using hollow-stem augering techniques. The augers will have a maximum inside diameter of 6.25 inches to allow collection of soil samples with a split barrel sampler. It is not anticipated that drilling fluids will be required for drilling the soil borings; however, if drilling fluids are utilized, a sample of the fluids will be analyzed to evaluate potential constituents introduced into the boring. Upon completion of the soil sampling activities, the boring will be sealed from the boring termination depth to the ground surface with a cement-bentonite grout. The cement grout will consist of Portland cement (ASTM-C150), and water added in the proportion of no less than five gallons to no more than seven gallons per 94-pound bag of cement. Additionally, three percent, by weight, of bentonite powder will be added to the mixture to reduce shrinkage. The grout will be placed into the boring using a tremie pipe equipped with a side discharge.

2.1.2 Surveying

Soil borings associated with the oil/water separator assessment will be located using compass bearings and taped measurements from buildings and other landmarks.

2.1.3 Equipment Decontamination

Refer to Section 2.1.8 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.1.4 Waste Handling

Refer to Section 2.1.9 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.2 ENVIRONMENTAL SAMPLING

The field sampling activities for this addendum only include the collection of soil samples. The collection methods including sample handling, sample custody, QC samples, and sample analysis are presented in the following sections.

2.2.1 Procedures for Collection of Soil Samples

This section presents the planned program for collection of soil samples for chemical analysis. The types and numbers of field quality control samples are presented in Table 1-1 by matrix and parameter.

Prior to sampling, field instruments will be calibrated, files containing sample information will be processed and labels will be prepared. Sample bottles will be sorted for each sample location according to analyses. Conditions and sampling information will be recorded in the field sampling books and used to assess sampling procedures in relation to the sample data. The field team leader will brief the sampling team on safety, decontamination stations, and any other sampling protocols necessary. Each sampling team member will wear the appropriate level of safety gear as specified for each site in the addendum to the Health and Safety Plan.

Two soil samples will be collected from each soil boring using the following procedures. The hollow-stem auger will encase an 24-inch long, carbon steel split barrel sampler which will, in turn, encase four 6-inch California brass rings. After the soil sample has been retrieved from the boring, the split barrel sampler will be placed on a sheet of aluminum foil. Each end of the split barrel sampler will be opened by unscrewing the end caps. A portable photoionization detector (PID) will be used to field screen the soil at the end of each brass ring. After the soil samples have

been field screened, the brass rings will be sealed with a Teflon patch and plastic cap encasing the sample in the brass ring. Based on the field screening results, the sample from the interval with the highest PID reading will be retained for laboratory analysis along with the soil sample from the boring termination.

For the soil samples retained for laboratory analysis, the middle 6-inch brass ring sample will be sent to the laboratory for volatile organic compound analysis. In the event that soil recoveries are low, the selection of the brass ring used for volatile analysis will be made on the basis of which brass ring contains 100% recovery. If none of the brass rings have 100% recovery, the sample with the highest recovery will be capped and labelled indicating the percent recovery. Soil from the remaining two brass rings will be removed and placed into a stainless-steel mixing bowl. The soil sample will be thoroughly mixed with a stainless-steel spoon and placed into the appropriate laboratory sample containers. All sampling equipment will be decontaminated following the procedures in Section 2.1.9 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.2.2 Drum Identification Sampling and Analyses

The following procedures will be followed to identify, mark, sample, and analyze the contents of drums stored at Building 1337.

INVENTORY, IDENTIFICATION, AND LABELING

- Review existing chemical data for constituents.
- Identify any drums having existing chemical data.

- Determine whether existing chemical data are adequate to achieve disposal for identifiable drums.
- Identify chemical analysis to satisfy any missing disposal information for identifiable drums.
- At the storage site, use the existing inventory to provide the basis for a working inventory for remaining unidentified and/or unlabeled drums.
- Place a unique identifying mark on each drum.
- Verify condition of drum, contents, and volume. Add to inventory accessibility for sampling, need for mechanical lift to gain access, opening difficulties, and expectation of rupture during opening or movement.
- Unstable drums that must be moved will be overpacked to prevent spills. Because it is the intent to ultimately consolidate all the material into one container, movement of unstable drums will only be performed if necessary and overpacking containers will be reused.
- Identify drums containing investigation-derived waste (IDW) - (soil cuttings, drill mud, purge water, decon water, PPE, etc.) and label and prepare for laboratory sample collection.
- Identify drums containing unknown substances and label and prepare for hazardous characterization analysis in the field.

SAMPLE COLLECTION

- From each IRP drum collect one sample of liquid and solid as appropriate.

- Composite each medium in field
- Ship samples to laboratory for analysis.

One sample of soil for each 50 cubic yards of IDW soil will be collected. For the 106 IRP storage drums there will be one proportionate composite sample of soil and liquid collected.

- Perform field hazardous characterization on each drum containing unknown substances.
- Review data in field and group drums containing compatible contents.
- Collect composite sample from each compatible group and ship to laboratory for analysis.

Analyses that will be performed are Toxicity Characteristic Leaching Procedures (TCLP) and Total Recoverable Petroleum Hydrocarbons (EPA Method 418.1), but may be modified based on findings.

- If any drums are found containing non compatible materials, they will be conspicuously identified and if necessary restaged in a remote area within the compound.

SAMPLE COLLECTION OF IDW

The procedure for the aliquot collection from drums containing IDW will be as follows:

- Open drum with non-sparking wrench.
- Remove drum lid and log contents on drum log form. Label and prepare drum for sampling.

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- With sampling tool collect aliquot from drums of solid and liquid. Place liquid aliquot in composite sample for all liquids. Place solid aliquot in composite sample for the soil.
- Ship each composite sample of water and soil to laboratory for analysis.
- Place lid back on drum and secure.

SAMPLE COLLECTION FROM UNKNOWN SUBSTANCES

The procedure for the aliquot collection from drums containing unknown substances will be as follows:

- Open drum with nonsparking wrench.
- Remove drum lid and log contents on drum log form. Label and prepare drum for sampling.
- With decontaminated sampling tool collect aliquot from drum for solid and liquid.
- Analyze in field to determine the hazardous characteristics of each unknown substance.
- Place lid back on drum and secure.
- Review hazardous characteristic data and identify contents that are compatible and may be grouped for disposal.
- From previously collected aliquots create proportionate composite samples for each compatible group

- Ship each group composite sample to laboratory for analysis.

The analysis for the program is shown in Table 1-1 and the sampling rate will be a minimum of one sample per 50 cubic yards per compatible group.

2.2.3 Sample Handling

Refer to Section 2.2.2 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.2.4 Sample Custody

Refer to Section 2.2.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.2.5 QC Samples

Refer to Section 2.2.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.2.6 Sample Analysis Summary

Table 1-1 summarizes the environmental samples and the proposed QC samples to be analyzed by parameter for the soil sampling described in this addendum.

2.3 FIELD MEASUREMENTS

Refer to Section 2.3 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.4 FIELD QA/QC PROGRAM

Refer to Section 2.4 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.5 RECORD KEEPING

Refer to Section 2.5 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

2.6 SITE MANAGEMENT

Refer to Section 2.6 of the Installation Restoration Program (IRP) RCRA Facility Investigation Revised Final Sampling and Analysis Plan for Carswell AFB, Fort Worth, Texas, dated February 1994, prepared by Law Environmental.

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