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**REPAIR 17 UNDERGROUND STORAGE TANKS**
**(EMERGENCY GENERATOR TANKS)**
**ELMENDORF AFB, ALASKA**

**CONTRACT NO. F41624-94-D-8070**
**DELIVERY ORDER NO. 0002**

# *UST DECOMMISSIONING AND SITE ASSESSMENT-AFID 755, 381st IS SITE*

**NOVEMBER, 1995**

**PREPARED FOR:**

**UNITED STATES AIR FORCE**
**AFCEE/ERD-AK**
**BLDG. 9-824, ROOM 234**
**ELMENDORF AFB, ALASKA 99506**

**PREPARED BY:**

**ASRC CONTRACTING COMPANY, INC. (ACCI)**
**301 ARCTIC SLOPE AVENUE, SUITE 100**
**ANCHORAGE, ALASKA 99518**

**DRAFT**
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**UST DECOMMISSIONING AND SITE ASSESSMENT**
**AIR FORCE IDENTIFICATION NUMBER 755, 381st IS SITE**
**ELMENDORF AIR FORCE BASE, ALASKA**

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# 1.0 INTRODUCTION

## 1.1 GENERAL DISCUSSION

ASRC Contracting Company Incorporated (ACCI) was retained by the United States Air Force Center for Environmental Excellence (AFCEE) to perform an underground storage tank (UST) removal at UST AFID 755, 381st IS site, located on Elmendorf Air Force Base, Alaska. This project was performed in accordance with the statement of work for Delivery Order (DO) No. 0002, AFCEE Contract No. F41624-94-D-8070, Project No. FXSB-95-1012Z1, entitled "Repair 17 Underground Storage Tanks (Emergency Generator Tanks), Elmendorf Air Force Base, Alaska."

On August 7, 1995, ACCI performed an UST removal at the 381st IS building. The UST, identified as AFID 755, was a 3,000 gallon capacity steel UST that had been used to store "J-8" (diesel fuel) for the emergency generator at Building 41-755. UST AFID 755 removal activities included the following tasks:

- Verification of the location of utilities present on site,
- Excavation and removal of UST AFID 755,
- Removal of associated UST piping,
- Performance of site assessment services limited to soil screening by PID and soil sampling for laboratory analysis,
- Removal and remediation of contaminated soil,
- Installation of a new 4,000 gallon UST,
- Restoration of the original site grade through backfill and compaction.

Soil samples were field screened and samples were collected and analyzed for the presence of Diesel Range Organics (DRO). Sample collection, handling, and documentation was performed in accordance with ACCI's Standard Quality Assurance Program Plan (QAPP) approved by, and on file with, the Alaska Department of Environmental Conservation (ADEC).

## 1.2 PURPOSE

The primary purposes of this program were to remove and decommission UST AFID 755, perform a limited assessment of the site, and install a new UST at the 381st IS building (Building 41-755) on Elmendorf Air Force Base. The area index map is shown

on Figure 1. The UST AFID 755 site is located west of Building 41-755, as displayed on Figure 2.

## 1.3 REPORT CONTENTS AND FORMAT

This report documents the decommissioning procedures performed by ACCI for UST AFID 755, located at the 381st IS on Elmendorf Air Force Base. It consists of the following:

- Project scope and execution,
- Field operations description,
- Laboratory testing description,
- Conclusions and recommendations,
- Site location maps,
- Laboratory analyses results,
- Site photographs,
- ADEC Matrix Score Sheet,
- Chain of Custody documentation,
- Field notes, and
- Contaminated soil remediation documentation.

A tabular summary of laboratory analytical results is presented in Table 1. The laboratory analysis results documentation comprises Appendix A, selected site photographs are presented in Appendix B, ADEC's Matrix Score Sheet and supporting documentation are presented in Appendix C, Chain of Custody documentation is presented in Appendix D, field notes comprise Appendix E, and soil remediation documentation is presented in Appendix F.

# 2.0 PROJECT SCOPE AND EXECUTION

The UST AFID 755 site is located south of 381st IS building (Building 41-755) on Elmendorf Air Force Base, Alaska, which lies north, of and proximate to, Anchorage, Alaska (Figures 1 and 2). The purposes of this project were to remove the UST, analyze soil samples for contamination, install a new UST, backfill the excavation, and make recommendations for further action, as required.

## 2.1 FIELD OPERATIONS

### 2.1.1 Excavation

Before excavation of UST AFID 755 on August 7, 1995, Air Force personnel performed utility locates at the site. ACCI personnel verified the utility locate markings using a metal detector prior to the commencement of excavation.

Excavation consisted of the following activities:

- Confirming utility locates prior to commencement of excavation,
- Inerting UST AFID 755 with 100 pounds of dry ice to an LEL of less than 3%,
- Excavation of tank using hydraulic excavator,
- Hand excavation of piping,
- Cutting of piping at tank, and
- Sealing of piping at building.

Excavated soil was stockpiled on a 20 mil thick Novathane liner laid on the ground surface away from the excavation. During excavation of the site, the UST was rendered inert using 100 pounds of dry ice. A Scientific Corporation LTX Multigas Monitoring instrument was used to measure $O_2$ and lower explosive limits (LEL) in the UST throughout the excavation and removal process. Distribution piping was excavated by hand using shovels to avoid damaging lines and spilling any residual fuel. Piping attached to Building 41-755 was abandoned in place by crimping and taping the ends. An undocumented pipe was exposed during the excavation that crossed above UST AFID 755. This pipe was determined to be out of service and was removed with the hydraulic excavator.

### 2.1.2 Tank Removal

Upon completion of the excavation and removal of associated piping, UST AFID 755 was removed from the excavation using a hydraulic excavator. A hole was cut in one end of the UST and the tank was marked with the date and building number. The tank was transferred to ACCI's Cedar Street storage yard located on Elmendorf AFB. There it was cleaned with degreaser, scrubbed, rinsed and cut into pieces, four foot square. The cut tank pieces were then delivered to the Elmendorf Defense Reutilization Marketing Office (DRMO) facility. Delivery of the tank pieces was documented utilizing Department of Defense FORM 1348-1.

### 2.1.3 Site Assessment

In accordance with ACCI's QAPP, the stockpiled excavated soil was field screened for the presence of contaminants. The stockpile consisted of approximately 65 cubic yards of excavated soil. Field screening was performed with a Photovac HL 2000 photoionization detector (PID) in accordance with Section 4.4 of ACCI's QAPP. PID readings obtained during field screening of the stockpile ranged from 314 parts per million (PPM) to 980 PPM.

The UST excavation measured approximately 12 feet wide by 24 feet long by 8 feet deep. PID measurements of the excavation samples ranged from 3.1 PPM to 920 PPM. Four soil samples were collected for laboratory analysis, one from the floor and three from sidewalls of the excavation. These sample locations, shown on Figure 3, had the highest PID readings from the field screenings.

### 2.1.4 New Tank Installation

On October 22, 1995, a JOOR 4,000 gallon capacity Plasteel UST was installed in the UST AFID 755 excavation at Building 41-755. The new UST was backfilled with clean, uncontaminated soil. The area was then compacted with a vibratory roller to restore the original site grade. The JOOR tank is equipped with interstitial space monitors, leak detection and overflow prevention equipment.

### 2.1.5 Remediation of Contaminated Soil

Stockpiled soil from the excavation of UST AFID 755 was transferred to Alaska Soil Recycling for thermal remediation.

# 3.0 LABORATORY ANALYSIS AND RESULTS

## 3.1 LABORATORY ANALYSIS

Four soil samples collected from the UST AFID 755, 381st IS site were delivered to Analytica Alaska Inc. under Chain of Custody (COC) on September 5, 1995. Ten day turnaround for laboratory analysis was specified on the COC. Soil samples were tested in the laboratory for DRO concentrations using EPA method 8100\3550.

Analytical results from the soil samples collected in conjunction with the removal of UST AFID 755 are summarized in Table 1. DRO concentrations in the soil samples ranged from 42 mg/Kg to 9700 mg/Kg. Analytical results are included in Appendix A.

## 3.2 ADEC MATRIX SCORE

An ADEC matrix score range of 30 to 39 was computed for the UST AFID 755 381st IS site. The complete ADEC Matrix Score Sheet and supporting documentation is presented in Appendix C. This matrix score range is based on the following information.

- Depth to subsurface water estimated from Elmendorf Air Force Base Monthly Water Level Program Data Package for August, 1993 and the Department of the Air Force Master Plan, Base Plan, Elmendorf Air Force Base Map, Anchorage, Alaska, October 30, 1994. The water table elevation at this site is approximately 184 feet and the surface elevation is approximately 203 feet. Ground water is approximately 19 feet below ground level. ACCI estimates depth of contaminated soil ranges from 5 feet to 13 feet above the water table.
- Mean annual precipitation data prepared by the National Weather Service reports a mean annual precipitation for Anchorage of 15.91 inches.
- Soil type was estimated from Department of the Army, North Pacific Division, U. S. Army Engineering District, Alaska soil borings AP-2980 and AP-2983 located approximately 2400 feet northwest of this site. The records from these soil borings report poorly to well graded gravel (GW and GP Unified Soil Classification).
- Potential receptors from Elmendorf Air Force Base Monthly Water Level Program Data Package for August, 1993. The closest active water well (Base Well 29) is approximately 3040 feet from this site.

- Volume of contaminated soil is estimated from the volume of excavated material and level of contamination observed in laboratory analytical results from the site soil samples. Approximately 65 cubic yards of contaminated soil were excavated at this site. Estimates for the volume of contaminated soil range from 65 cubic yards to greater than 100 cubic yards.

Based on an ADEC matrix score range from 30 to 39, a soil cleanup level of B is indicated, as follows:

| | | |
|---|---|---|
| • Diesel Range Petroleum Hydrocarbon | 200 | mg/Kg |
| • Gasoline Range Petroleum Hydrocarbon | 100 | mg/Kg |
| • Benzene | 0.5 | mg/Kg |
| • BTEX | 15 | mg/Kg |

Laboratory DRO analysis results for soil samples from this site vary from 42 to 9700 mg/Kg. These DRO contamination levels are above the cleanup limit of 200 mg/Kg specified by the ADEC Matrix Score Sheet presented in Appendix C.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on field PID screening and laboratory DRO analysis of soil samples collected from the UST AFID 755, 381st IS site, ACCI has prepared the following conclusions and recommendations.

On October 16, 1995, UST AFID 755, located at the 381st IS, was removed. Field PID screening and laboratory analysis indicated that approximately 65 cubic yards of soil excavated during the UST removal were contaminated with diesel range organics. The contaminated soil was transferred to Alaska Soil Recycling for thermal remediation. A new, 4000 gallon, UST was installed in the excavation and clean, uncontaminated soil was hauled, placed, and compacted to restore the site to its original grade.

Laboratory analyses of four soil samples obtained from UST AFID 755 381st IS site produced DRO concentrations ranging from 42 to 9700 mg/Kg (Table 1). These DRO concentrations exceed the ADEC clean-up limit of 200 mg/Kg established for a "level B" site clean-up (Appendix C). They indicate that clean closure can not be obtained and that remediation is required for this site.

ACCI recommends exploring thermal, intrinsic, or bioventing remediation programs for the AFID 775 381st IS site. Thermal remediation would involve excavation and removal of contaminated soil from this site to two stockpiles. Field screening of soil during excavation would be accomplished using a PID meter. Soil displaying no response on the PID meter would be placed in a "clean" stockpile. Soil displaying PID readings above non-detectable limits would be placed in a "questionable" stockpile and soil samples from both stockpiles would be analyzed to accurately determine contamination levels. Excavation would continue until the PID meter indicated all contaminated and questionable soil was removed from the ground. Contaminated soil could then be remediated through burning by a qualified contractor. Only clean, non-contaminated soil would be used to backfill the excavation.

If the contaminated soil can not be safely or economically removed from the site, intrinsic remediation should be considered. This technique is best suited for total petroleum hydrocarbon (TPH) levels lower than 25,000 PPM at sites that are far from potential receptors. The site must be evaluated for soil permeability, pH, moisture content, nutrient levels, elevation, grade, and distance to the nearest active well. A long-term commitment will be required to adequately monitor the progress of intrinsic

remediation. This program could consist of conventional soil sampling coupled with ground resistivity and thermistor measurements. Insitu resistivity monitoring can be accomplished by placing metal electrodes in the soil at the site and measuring the soil resistivity. As the hydrocarbon content of the soil decreases, so will the resistivity of the soil. Thermistors installed at the site will aid in correction of resistivity readings for temperature variations. Soil sampling can be performed after the resistivity values from the soil indicate a decrease in hydrocarbon levels at the site.

Bioventing is the third remediation option for this site. As with intrinsic remediation, each candidate site must be evaluated for soil permeability, pH, moisture content, nutrient levels, elevation, grade, and distance to the nearest active well. Bioventing is optimal in highly permeable soils containing TPH levels of less than 25,000 PPM. Bioventing requires placement of wells to facilitate the remediation process. An ongoing soil sampling program is required to monitor the remediation process. As with intrinsic remediation, insitu resistivity measurements could be combined with soil sampling to optimize monitoring of remediation progress.

An existing fuel oil tank is located east of, and adjacent to the UST AFID 755 excavation site. The adjacent UST should be pressure tested to ensure an ongoing hydrocarbon release is not occurring from this. If the adjacent UST fails the pressure test, ACCI recommends removal and replacement of this tank. A remediation plan can then incorporate site assessment results from both sites.

Sincerely,

James C. Bates, P.E.
Regional Program Manager

**TABLE 1**
**AFID NO. 775, 381st IS SITE**
**LABORATORY SAMPLE RESULTS**

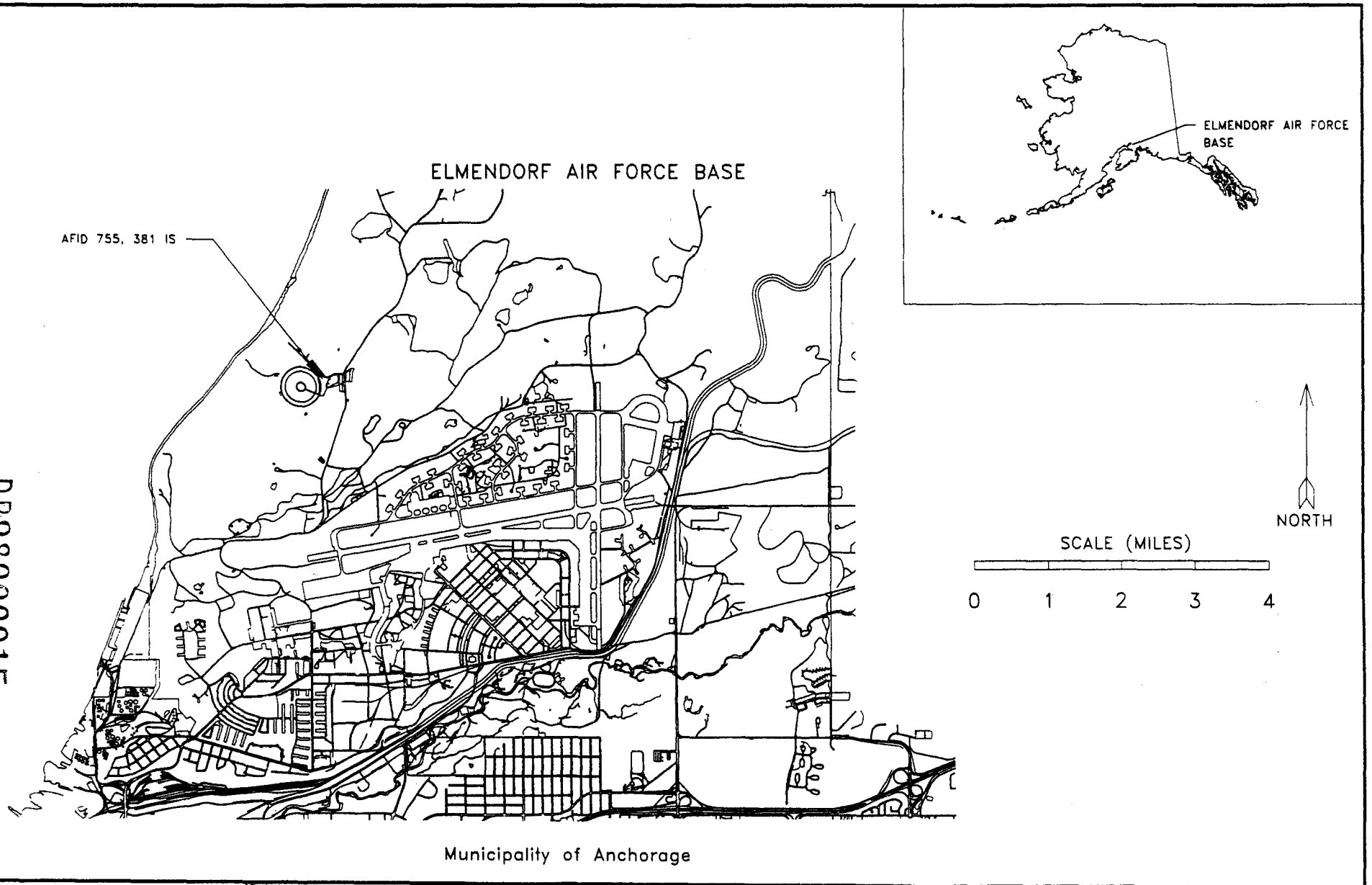
TABLE 1
AFID 755, 381st IS SITE
LABORATORY SAMPLE RESULTS

| Sample No. and Location | Analyte | Method | Result | Units | Sub-Analyte |
|---|---|---|---|---|---|
| EAFB-765-EX-01 | DRO | EPA 8100M\3550 | 1430 | mg/Kg | |
| EAFB-765-EX-02 | DRO | EPA 8100M\3550 | 42 | mg/Kg | |
| EAFB-765-EX-03 | DRO | EPA 8100M\3550 | 2320 | mg/Kg | |
| EAFB-765-EX-04 | DRO | EPA 8100M\3550 | 9700 | mg/Kg | |

DRO = DIESEL RANGE ORGANICS
ND = NOT DETECTED (BELOW METHOD DETECTION LIMIT)

SAMPLE NUMBERS WERE INCORRECTLY LABELED AS SITE 765.
SAMPLES WERE COLLECTED AT AFID 755 381st IS SITE.

**FIGURES**

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| Client: UNITED STATES AIR FORCE | Scale: N/A | Figure 1 | |

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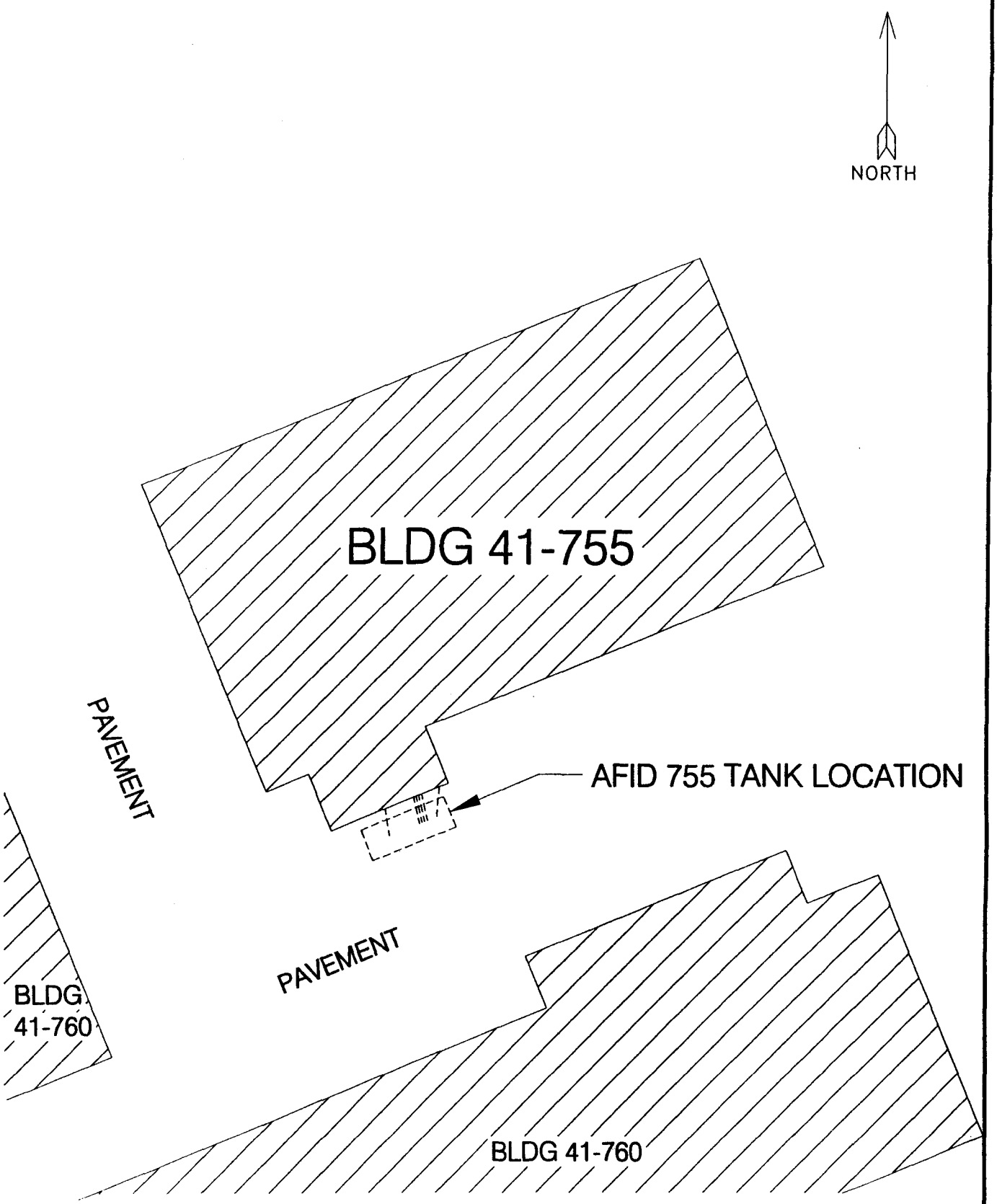
REPAIR 17 UNDERGROUND STORAGE TANKS
ELMENDORF AIR FORCE BASE, ALASKA

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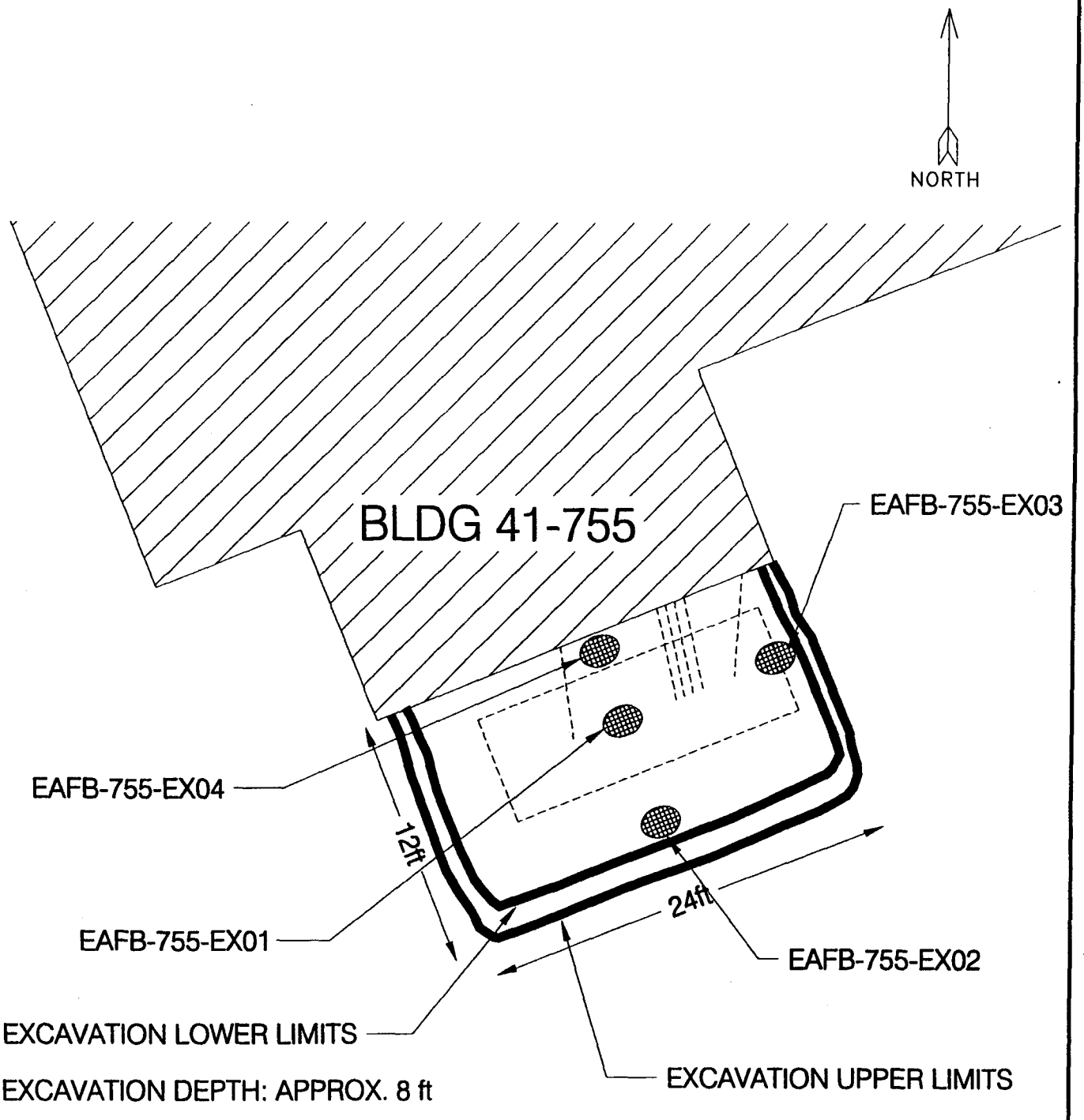
| | Checked: DH | Date: 11/22/95 | File Path: SUNO\PROJECTS 95-0134\755\ DWG\ 755SITE.DWG |
| Client: UNITED STATES AIR FORCE | Scale: N/A | Figure 2 | |




-SAMPLE SITE LOCATIONS

| | | | | |
|---|---|---|---|---|
| Project: SOIL SAMPLE LOCATION MAP<br>AFID 755, 381 IS<br>ELMENDORF AIR FORCE BASE, ALASKA | By: JGB | Date: 11/22/95 | Project No: 95-0134 |
| | Checked: DH | Date: 11/22/95 | File Path: SUND\PROJECTS 95-0134\755\ DWG\ 755SAMP.DWG |
| Client: UNITED STATES AIR FORCE | Scale: N/A | Figure 3 | |