COMPREHENSIVE SITE ASSESSMENT REPORT NAS FORT WORTH TX

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COMPREHENSIVE SITE ASSESSMENT R

for

UST FACILITY ID No. 0009696
LPST ID No. 104524
OWNER ID No. 04532

PREPARED FOR:

US AIR FORCE
BASE CONVERSION AGENCY
CARSWELL AIR FORCE BASE
FORT WORTH, TX 76121

PREPARED BY:

US ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

JUNE 1994

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Fort Worth, TX 76121

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US Army Corps of Engineers
Fort Worth District

June 1994

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COMPREHENSIVE SITE ASSESSMENT REPORT

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SECTION I

SECTION I
REPORT SUMMARY

A. Scope. The U.S. Army Corps of Engineers, Fort Worth District (COE), was tasked by the Air Force in December 1992 to perform a Remedial Investigation (RI) under the Air Force Installation Restoration Program (IRP) for the Base Service Station (BSS), Building (Bldg) 1518, at Carswell Air Force Base (CAFB), Texas. The COE scope of work required soil borings, a soil gas survey, monitor well installations, and groundwater sampling to define the nature and extent of the petroleum hydrocarbon contamination originating from the site. Surface water sampling was later added to the scope.

B. Results. This Comprehensive Site Assessment (CSA) report summarizes the 1-year effort of investigations by the COE to characterize the nature and extent of an unknown quantity of gasoline released at various times and rates over a period of possibly 10 years or more from the BSS underground storage tank (UST) system. Results indicate the gasoline release has impacted soil along the extent of the UST system, has impacted the uppermost saturated zone extending approximately 500 feet from the BSS east and downgradient to the West Fork of the Trinity River, and has impacted surface water within drainage ditches adjacent to the BSS. Groundwater contaminated with petroleum hydrocarbons from the release is discharging to the water of the West Fork of the Trinity River along an approximate 65-foot length of its western bank. The river is also threatened by the contaminated surface water drainage from the BSS where drainage paths outfall to the river.

Maximum concentrations of TPH and BTEX found in the soil along the UST system were 630 ppm and 1119 ppm, respectively. This soil

continues to act as a source of contaminants to the groundwater which occurs at depths varying between 5 to 7 feet along the extent of the UST system. The maximum concentrations of dissolved phase TPH and BTEX occur immediately north of and adjacent to the tank excavation, where TPH was found at a concentration of 20 mg/l and BTEX was found at a concentration of 45.88 mg/l, and along a line leading from the former tank location to the seepage area, where TPH was found at 9.8 mg/l and BTEX was found at 46.07 mg/l where groundwater flows downgradient across the installation boundary to the river. Concentrations of TPH and BTEX in soil within the seepage area along the river's western bank are as high as 130 ppm and 1,147 ppm, respectively. The impact on the surface water of the river has not been quantified. Surface water within the drainage ditch adjacent to the BSS contained BTEX at a concentration of 2.257 mg/l, with no TPH detected. Soil within the same drainage ditch contained TPH at a concentration of 210 ppm, with no BTEX detected.

Recommendations are to treat or remove the contaminated soil along the extent of the UST system to reduce any further release of petroleum hydrocarbons to the groundwater, to mitigate off-site migration of groundwater contaminants by installing a treatment system within the installation boundary, and to perform a risk assessment to determine the impact to health and the environment of contaminated surface water along the drainage ditches and along the course of the West Fork of the Trinity River, as well as contaminated groundwater to deeper drinking water aquifers. Results of the risk assessment should be used to determine the degree to which remediation should be performed.

C. **Regulatory Authority**. The BSS has been an IRP site, designated

ST16, since 1988 when it was first investigated under the IRP for known gasoline releases from the station's UST system. The BSS is regulated by the Texas Natural Resource Conservation Commission (TNRCC) under 31 TAC Chapter 334, Underground and Aboveground Storage Tanks. The TNRCC Owner I.D. No. for the BSS site is 04532. The TNRCC Facility I.D. No. is 0009696. The TNRCC Leaking Petroleum Storage Tank (LPST) I.D. No. for the BSS site is 104524.

D. **Report Format**. Several investigations of the site were performed by various contractors to the Air Force from 1988 until December 1992 when the COE began the work addressed in this report. Previous investigations performed by contractors other than the COE or by contracts other than those administered by the COE are briefly summarized in Section II, Chronology of Events. Details from these investigations are discussed in this report where they impacted defining the scope of the work performed or contributed to the conclusions and recommendations.

The remainder of the report is structured as a Comprehensive Site Assessment (CSA) Report following the format required by the TNRCC addressing UST releases. A formal Limited Site Assessment (LSA) has never been performed for the BSS; however, other investigations have addressed many of the LSA requirements. The report entitled Sampling Results, May 1993 (COE, 1993), prepared by the COE in July 1993 and submitted to TNRCC by the Air Force Base Conversion Agency (AFBCA) at a later date, contains a first attempt at consolidating the previous work done at the site. Reference to this document is made often throughout this CSA report.

TAB

SECTION II

SECTION II
CHRONOLOGY OF EVENTS

1972	Base Service Station constructed with four 10,000-gallon fiberglass underground storage tanks and one 600-gallon waste oil tank.
Dec 1983	Leaking flex line in fuel distribution system replaced. Two other leaking flex lines replaced previous to Dec 1983.
Nov 1984	Gasoline discovered in drainage ditch under BSS driveway. Super unleaded gasoline loss of 1900 gallons over 3 weeks in BX record books. Leaking rubber transfer line to one pump discovered and repaired.
Dec 1984	Gasoline discovered again in drainage ditch. Regular and unleaded fuel lines tested and found to be leaking. Approximately 10 to 15 gallons of gasoline per day removed from drainage ditch.
Pre-1988	Base Service Station added to the Installation Restoration Program.
Feb 1988	Soil boring BSS-D drilled and monitor wells BSS-A, BSS-B, and BSS-C installed by Atec Associates under contract to Radian Corporation under Stage 2 IRP.
Apr 1992	Petroleum seep noted occurring along west bank of West Fork of the Trinity River approximately 500 feet downgradient of the BSS and reported to Texas Water Commission (TWC). Notice of Violation (NOV) issued by TWC for release to river.
Aug 1992	Monitor wells MW-1 and MW-2 installed by Maxim Engineers to determine existence of subsurface contamination downgradient of BSS and upgradient of West Fork of the Trinity River seep. Soil contaminated with TPH from water table to total depth of 50 feet in MW-1, and from water table to depth of 20 feet in MW-2. Water samples showed 15.2 ppm TPH and 29.570 ppm BTEX in MW-1 and 4.0 ppm TPH and 6.745 ppm BTEX in MW-2. Magna-Scan investigation performed using electromagnetic offset logging (EOL) technique to measure resistivity changes in geology and fluid content. Identified area of high resistivity indicative of hydrocarbon contamination along top of water table extending east of MW-1 and west of MW-2 in a northeast-southwest direction. 900-gallon variance noted at BSS.
Sep 1992	UST Services, Inc., leak tested tanks. Suspect tank could not be filled and was emptied. Two other tanks failed at rate of .75 gallons per hour. One tank was tight. TWC was notified and visited the site. TWC requested immediate

action on free product (2 inches) in well BSS-B and issued 9-point corrective action letter.

Gasoline sales terminated at BSS.

Monitor well MW-3 installed by Maxim Engineers to determine possible upgradient source for MW-1 and MW-2 contamination and to assess adjacent upgradient aboveground storage tank farm. Soil contained 51.2 ppm at 3 feet and 10.6 ppm at 17.5 feet. Water sample detected no BTEX or TPH.

Oct 1992 Monitor wells MW-4, MW-5, and MW-6 installed by Leak-Tec.

Abandoned Chevron pipeline excavated and inspected by Tarrant County Water Board in three areas along 100 feet of pipeline immediately upslope and upgradient of seepage area. No evidence of release was noted.

Dec 1992 COE tasked with performing Remedial Investigation (RI).

COE drilled and sampled soil borings ST16-1, ST16-2, and ST16-3 along fuel distribution lines.

Jan 1993 CAFB requested COE to pull BSS tanks.

Feb 1993 Soil gas survey was performed by Target Environmental Services, Inc., under contract to COE.

Apr 1993 Wells SAV-1 and SAV-2 were installed by Professional Service Industries, Inc., under contract to Air Force, for purpose of installing recovery system. Completion of recovery system halted at request of TWC.

May 1993 COE surveyed the site and sampled wells SAV-1, SAV-2, BSS-A, BSS-B, and MW-1 through MW-6. COE collected shallow soil sample SED-1 and surface water sample SW-1 at seep area on west bank of the West Fork of the Trinity River. COE also collected surface water samples SW-2 through SW-5 along surface drainage paths leading from the BSS.

Perry Williams, Inc., removed four 10,000-gallon underground storage tanks (USTs) under contract to COE. Fuel lines capped and contaminated soil were returned to the excavation.

Aug 1993 COE Sampling Results report documenting May 1993 sampling event submitted to AFBCA.

Sep 1993 COE collected shallow soil sample SED-1A at seep area on west bank of West Fork of the Trinity River.

Oct 1993 COE collected shallow soil samples and surface water samples along surface drainage paths at SW/SED-2A, SW-3A, SW/SED-4A, and SW/SED-5A.

Dec 1993 COE completed installing monitor wells MW-7 through MW-12,

plugging monitor well BSS-C, and redeveloping and completing wells SAV-1 and SAV-2. New well locations and elevations surveyed.

Jan 1994 COE sampled monitor wells SAV-1, SAV-2, BSS-A, BSS-B, and MW-1 through MW-12.

Jun 1994 COE submitted Comprehensive Site Assessment (CSA) Report to Air Force Base Conversion Agency.

TAB

SECTION III

SECTION III
TEXT

A. Soil Assessment. The procedures used by the COE to determine the horizontal and vertical extent of soil contamination consisted of performing a soil gas survey, drilling and sampling three soil borings, ST16-1, ST16-2, and ST16-3 along the fuel distribution lines leading to the fuel dispenser islands, and soil sampling performed within the tank excavation during the tank removal. Soil samples were also collected during the installation of monitor wells MW-7 through MW-12. A map of the site showing all sample locations is shown on Figure 1. Subsurface profiles for the site are shown on Figures 2 through 5.

1. Soil Borings. The COE drilled three soil borings, ST16-1, ST16-2, and ST16-3, in December 1992 along the fuel lines leading to the fuel dispensers for the purpose of determining if fuel had been released from these lines. A sketch showing the layout of the tank and piping system is shown on Figure 6. The boring locations are shown on Figure 1 and the boring logs are contained in Appendix A. Survey data for the soil borings are shown on Table 1.

a. Drilling and Sampling Plan. All borings were drilled using a Nitco drill rig. Borings were advanced through the asphalt using an 8-inch auger. Each boring was then advanced into groundwater using an 8-inch diameter continuous flight hollow stem auger. Soil samples were collected at 2-foot intervals using a 6-inch diameter split barrel sampler. A grab sample of the groundwater from each boring was collected 24 hours after drilling was complete for the purpose of determining if any release from the lines had impacted groundwater. Each boring was purged of three volumes of water prior

to obtaining the water sample. All drill cuttings and purge water were contained in 55-gallon steel drums.

b. **Soil Sample Analytical Results**. Soil samples from these soil borings were analyzed for total petroleum hydrocarbons (TPH) using EPA Method 418.1, for TCLP lead (Pb) using EPA Methods 1311 and 6010, and for TCLP benzene, TCLP toluene, TCLP ethylbenzene, and TCLP xylenes using the EPA Methods 1311 and 8020. Analytical results for the soil samples are compiled on Table 2. Included on Table 2 are the date each sample was taken, the soil boring number where the sample was collected, the field sample number and corresponding laboratory I.D. number for each sample, the depth of the interval sampled, the analytical method used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix A.

c. **Soil Contamination Map**. The vertical distribution of petroleum hydrocarbon contamination in each soil boring as determined from the laboratory analyses is shown on the chemical boring logs contained in Appendix A. The extent of soil contamination is illustrated on the subsurface profile shown on Figure 4. Results are discussed in Section IV.

d. **Groundwater Sample Analytical Results**. Grab samples of the groundwater collected from each of the soil borings were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020, for Pb using EPA Method 6010, for TPH using EPA Method 418.1, and for total dissolved solids (TDS) using EPA Method 160.1. Analytical results for the groundwater grab samples are compiled on Table 3. Included on Table 3 are the date each sample was taken, the soil boring where the sample was collected, the laboratory I.D. number

for each sample, the analytical method used, and the results obtained. The soil boring number is the same as the field sample number for each sample. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix A. Results are discussed in Section IV.

2. **Soil Gas Survey**. A soil gas survey was performed from 24-26 February and on 1 March 1993 by Target Environmental Services, Inc. (TARGET) under contract to COE. The purpose of the survey was to help determine the areal extent of contaminated groundwater emanating from the BSS. A copy of the soil report containing all of the survey data is contained in Appendix A.

A total of 86 soil gas samples were collected at depths varying from 4 to 9 feet across the survey area. Groundwater had been measured at a depth of 10.5 feet in monitor wells prior to performing the survey. Samples were analyzed for total flame ionization detection (FID) compounds using EPA Method 602 Modified and the standards for benzene, toluene, ethyl benzene, and xylenes. Sample locations were along a 50-foot grid spacing.

Results of the soil gas survey indicated significant levels of petroleum hydrocarbons present along the sewer line east of Rogner Drive and along the western side of Rogner Drive. The chromatogram signature of the samples collected on the western side of Rogner Drive were characteristic of relatively unweathered gasoline, with xylene map patterns consistent with the BSS as the source. The chromatographic data for samples collected along the sewer line suggested vapor phase migration of the volatile hydrocarbons was occurring along this route. Low levels of gasoline hydrocarbons were detected along the eastern boundary of the survey area, which

suggested groundwater contamination extended this far across the survey area; however, no volatile hydrocarbons were detected in samples collected from the central portion of the survey area, which would have connected the release from the BSS to the eastern boundary investigated. It was suspected vertical vapor migration was impeded in this area by clay and silt soils.

3. **UST Removal**. The COE contracted with Perry Williams, Inc. (PWI) from Amarillo, TX, to remove the four 10,000-gallon fiberglass gasoline tanks. Complete documentation of the UST removal is contained in the PWI document entitled Petroleum Storage Tank Removal & Initial Site Assessment for BX Service Station - Site 1518 and Aircraft Generation Equipment Shop - Site 1628, prepared for the COE and submitted to TNRCC by the Air Force on 14 October 1993.

a. **UST Removal and Sampling Plan**. Notice to proceed was given on 30 April 1993. The tanks were exhumed on 11 and 12 May 1993. The two middle tanks, designated as tanks B and C by PWI on Figure 7 and shown on the 1972 as-builts as containing regular gasoline (Tank B) and premium gasoline (Tank C), were noted as being damaged. Tank B had a patch screwed into the bottom of the tank and Tank C had a long slender gash at its southern end. The other two tanks appeared to be in good condition. Once exhumed, approximately 100 gallons total of remaining fluids were removed from the tanks by Mobley Company. A total of 75 feet of associated piping were removed from the tank excavation. All piping was noted by PWI to be in good condition. Remaining fuel lines leading to the fuel dispensers were capped in-place. Samples collected by PWI on 12 May 1993 for chemical analysis consisted of 13 soil samples from the sidewalls of the excavation, three soil samples from the stockpile of excavated soil, and one

groundwater sample from within the excavation. Soil sample locations, as documented by PWI, are shown on Figure 7.

b. Soil Sample Analytical Results. Soil samples collected from the sidewalls of the tank excavation and from the stockpile of excavated soil were analyzed for TPH, BTEX, and total Pb using EPA Methods 418.1, 8020, and 7420, respectively. Analytical results for each sample are shown on Figure 7. Signed laboratory reports, chain of custody forms, and complete documentation for the sampling performed are contained in the July 1993 PWI report submitted to TNRCC in October 1993.

c. Soil Contamination Map. The distribution of petroleum contamination within the tank excavation is shown on Figure 7. The extent of soil contamination is illustrated on the subsurface profile shown on Figure 4.

d. Groundwater Analytical Results. Groundwater was encountered during excavation at a depth of approximately 6 feet. Water within the excavation was notably contaminated with gasoline, exhibiting a very strong fuel odor and becoming very foamy when disturbed. One groundwater sample was collected and analyzed for TPH, BTEX, Pb, total organic halides (TOX), TDS and pH using EPA Methods 418.1, 8020, 7420, 9020, 160.1, and 9040, respectively. Analyses showed the sample to contain 14 mg/l TPH, 25.37 mg/l BTEX, 1.3 mg/l TOX, and 780 mg/l TDS. Lead was not detected above the detection limit of 0.1 mg/l, and the pH was 6.7.

4. Monitor Well Borings. The COE drilled six well borings from 23 November to 9 December 1993 for the purpose of installing groundwater monitor wells MW-7 through MW-12 to define the edge of the groundwater contaminant plume. Well boring locations are shown on

Figure 1. Soil and chemical boring logs are contained in Appendix A. Survey data are shown on Table 1.

a. Drilling and Sampling Plan. All well borings were drilled using 8-inch and 10-inch diameter augers to advance and clean out the borings and 3-inch diameter Shelby tube samplers to obtain continuous samples. All samples were continuously screened using a photoionization detector (PID) in an effort to determine the presence and vertical extent of contamination. Borings were advanced to a final depth not to exceed 8 feet below where groundwater was encountered in MW-7 and not to exceed 18 feet below where groundwater was encountered in the remaining borings for placement of 10- and 20-foot well screens across the top of the water table to account for seasonal fluctuations. Well boring MW-7 was advanced into limestone using a 7-7/8-inch diameter rockbit with no further soil sampling performed. All soil cuttings were placed in 55-gallon drums.

Three soil samples for chemical analysis were taken from each boring. The first sample, FS-1, was taken from the zone of highest contamination above the water table as indicated by the PID. If no contamination was indicated by the field screening, a soil sample for chemical analysis was taken from a representative material of the unsaturated zone. The second soil sample, FS-2, was taken from immediately above the water table. The third sample, FS-3, was taken from the bottom of the boring within the saturated zone. The distribution of these sampling intervals conforms to TNRCC guidance for performing limited site assessments (LSAs) for leaking petroleum storage tanks (LPSTs).

As required by TNRCC LSA guidance, an undisturbed soil sample was taken from each well boring MW-8 and from well boring MW-10 for

determining the soil parameters bulk density, effective porosity, fraction organic carbon, and volumetric water content. Each sample was obtained using a Shelby tube. A 1-foot long sample was taken from 7 to 8 feet in MW-8. This sample was extruded in the field, was wrapped in foil, then was sealed in wax prior to shipping to the COE Southwestern Division Laboratory (SWD Lab) in Dallas, Texas, for analysis. The sample from well boring MW-10 was also obtained using Shelby tube; however, it was not extruded in the field but was sealed in the tube for shipment to SWD Lab.

b. Soil Sample Analytical Results. Analytical results for the soil samples collected from each of the well borings are compiled on Table 4. Included on this table are the date each sample was taken, the boring number where the sample was collected, the field sample number (FS) and corresponding laboratory I.D. number for each sample, the depth of the interval sampled, the analytical method used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix A.

c. Soil Contamination Map. The vertical distribution of petroleum contamination is each soil boring as determined from field screening and from laboratory analyses is shown on the chemical boring logs contained in Appendix A. Results are discussed in Section IV.

d. Physical Soil Parameters. The two Shelby samples obtained from well borings MW-8 and MW-10 were analyzed by SWD Lab for the following parameters: Water Content using ASTM D 2216; Fraction Organic Carbon using ASTM D 2974; Density using ASTM D 2937; and Specific Gravity of Solids using ASTM D 854. Porosity was calculated using the specific gravity value obtained from that analysis. Results

for these analyses are shown on Table 5. A copy of the laboratory report is contained in Appendix A.

B. Groundwater Assessment. The COE installed six monitor wells, MW-7 through MW-12, from 23 November through 9 December and performed a complete round of groundwater sampling for all 16 wells monitoring the site from 3 through 6 January 1994. Existing well BSS-C was plugged, and existing wells SAV-1 and SAV-2 were developed and completed at ground level. A copy of the State of Texas Plugging Report (form TWC-0055) for BSS-C is contained in Appendix B. New survey data for wells SAV-1 and SAV-2 are contained on Table 1. All well locations are shown on Figure 1. A copy of the surveyor's report and surveyed elevation measurements for the site is contained in Appendix B.

1. Plume Delineation Procedures.

a. Monitor Well Locations. Prior to May 1993, a total of eleven groundwater monitoring wells had been installed by various contractors to the Air Force for the purpose of assessing groundwater contamination at the site. Different wells were sampled for various constituents at different times, but all of the wells had never been sampled at one time. The COE performed a complete round of groundwater sampling from 5-14 May 1993 in an attempt to assess the nature and extent of the contaminant plume. Results of this sampling event were compiled and discussed in the COE, 1993 document submitted by the Air Force to TNRCC.

The groundwater information obtained by the COE indicated the horizontal extent of the groundwater contaminant plume had not been defined. The COE proposed five additional monitor wells, MW-7 through MW-11, be installed at the locations shown on Figure 1 and another complete round of groundwater sampling be performed. The proposed

well locations were expected to be along the lateral limits of contamination, with wells MW-9 through MW-11 located to characterize and delineate the contamination leaving the installation and migrating towards the West Fork of the Trinity River. However, during the installation of MW-9, field screening of MW-9 indicated contamination present in the saturated zone, so MW-12 was added to the investigation plan to define the extent of the plume in the northerly direction. The locations of all existing and newly installed wells are shown on Figure 1. Survey data for well locations, ground elevations, and well casing elevations are compiled on Table 1.

b. Monitor Well Installation Procedures. Monitor wells MW-7 through MW-12 were installed by the COE from 23 November to 9 December 1993 using the drilling method described in Section III.A.4.a. Well boring diameters were 10 inches. Well boring depths were determined using subsurface data contained in COE, 1993, and using the water level elevations recorded on Table 6. The increasing thickness of saturated alluvium in the eastern downgradient direction across the site and the recorded fluctuation of groundwater elevations of as much as 7 feet in some of the wells dictated using 20-foot well screens for wells MW-8 through MW-12. Installing 20-foot well screens across the top of the water table required drilling these well borings to depths not to exceed 18 feet below where groundwater was encountered during drilling. The shallow depth to limestone and the resulting thin saturated zone in the area of MW-7 required installing only a 10-foot well screen in this well boring, with a maximum drilling depth not to exceed 8 feet below where groundwater was encountered.

Monitor wells were constructed using new 4-inch diameter PVC pipe

with flush-threaded joints. Well screens were preslotted 0.010 slot size. The well screen installed in MW-7 was 10 feet long. The well screens installed in the remaining five new wells were each 20 feet long. Each well screen was fitted with a plug in the bottom.

Each well screen was set at the bottom of the boring through temporary casing placed after drilling to keep the boring open. Silica sand was placed from the bottom of the boring to 2 feet above the top of the well screen. The sand was placed by hand as the temporary casing was pulled. Two feet of bentonite chips were placed above the filter pack and were hydrated using potable water. The remainder of the well was grouted to the surface and was completed at ground level with a protective casing, a sloped concrete pad, and a locking well cap. A copy of the State of Texas Well Reports (form WWD-012) and the well construction details for monitor wells MW-7 through MW-12 are contained in Appendix B.

Wells were developed at least 24 hours after completion using a bailer. Wells were bailed until the water was clear. All development water was contained in 55-gallon drums.

c. **Depth Groundwater Encountered**. The depth at which groundwater was encountered during drilling was first noted by the driller based on the drilling action. The depth was then verified by observing and measuring the wet portion of the Shelby sample obtained, and measuring the water level in the boring. Water was encountered at 10 feet in MW-7, at 14 feet in MW-8, at 18 feet in MW-9, at 20 feet in MW-10, at 24 feet in MW-11, and at 12 feet in MW-12. All water levels rose anywhere from 2 to 5 feet in the well borings after their completion.

d. **Groundwater Sampling Procedures**. Groundwater sampling

was performed by COE personnel for all 16 monitor wells beginning on 3 January and ending on 6 January 1994. All wells were sampled for BTEX, methyl tertiary butyl ether (MTBE), TPH and Pb. The six newly installed wells were also sampled for TDS. The five wells MW-3, BSS-B, SAV-2, MW-1, and MW-10 were also sampled for volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). The VOC and PAH analyses were selected for these five wells to obtain a greater amount of chemical data along the most direct migration route of the release, including background data from MW-3. The VOC analysis was also selected to determine if trichloroethene (TCE) or any of its degradation products was present because a TCE plume is currently being investigated west and upgradient of the BSS site.

Historical groundwater sampling data from the May 1993 COE sampling event were used to develop the sampling plan to sample all wells in as short a time as possible. All well sampling information was recorded on both a Well Sampling Daily Worksheet and a Water Samples Field Data Form. Completed forms are contained in Appendix B.

Prior to purging, each well was checked for floating free product using gasoline gauging paste. No free product was found in any of the wells. Water levels were then measured and were recorded to the nearest 0.01 foot.

Purging was performed using a portable hand bailer for all wells except MW-1 and MW-2, which were purged using a portable purge pump. Purge water was collected in 55-gallon drums. A minimum of three casing volumes of water were removed from each well prior to sampling. If a well purged dry prior to removing three volumes of water and was slow to recover, the well was sampled as soon as recharge was adequate to fill all sample containers. Most wells recharged quickly enough to

allow for 3 volumes of water to be removed in a relatively short period of time (i.e., less than 30 minutes). Quick recharge allowed for most wells to be sampled within 6 hours of purging. Only two wells, SAV-1 and SAV-2, were allowed to set overnight after purging and prior to sampling.

2. **Groundwater Analytical Data Table**. Water samples were analyzed using EPA Methods 8020 for BTEX and MTBE, 8240 for VOCs (including BTEX and MTBE), 418.1 for (TPH), 7421 for Pb, 160.1 for TDS, and 8310 for PAH. The analytical results and their distribution for the 16 wells sampled are shown on Table 7. Included in this table are the date each sample was collected, the well sample number and corresponding laboratory I.D. number for each sample, the analytical method used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix B. Analytical results are discussed in Section IV.

3. **Groundwater Elevation and Phase-Separated Product Thickness Measurements**. Besides the two groundwater sampling events performed by the COE in May 1993 and in January 1994, water level measurements were recorded by the COE twice in October 1993. The first round of measurements in October were recorded after a heavy rainfall at the beginning of the month. The second round in October was recorded while surface water and shallow soil sampling were being performed for the site. The October measurements were made to help determine how much fluctuation could be expected to design the length of setting of well screens properly. All four rounds of groundwater elevation measurements are shown on Table 6.

4. **Groundwater Gradient Map**. A groundwater gradient map for

water level measurements recorded for the January 1994 groundwater sampling event is shown on Figure 8. The predominant direction of groundwater flow is to the east-southeast across the site. The groundwater gradient is about 1 foot per 25 feet, or 0.04, across most areas of the site, but is steepest in the area adjacent to the BSS at 4 feet per 25 feet, or 0.16.

5. **Hydrocarbon Distribution Map**. Two figures are provided to show the dissolved phase hydrocarbon distribution across the site. Figure 9 depicts the BTEX in the groundwater. Figure 10 shows the TPH distribution.

C. **Surface Water Assessment**. The groundwater gradient determined during the May 1993 sampling event indicated groundwater to be discharging to the West Fork of the Trinity River at the petroleum hydrocarbon seep location. A shallow soil sample obtained by the COE at the river seepage area in May 1993 showed TPH and PAH contamination, therefore making the river a threatened surface water body. Results from the surface water sampling performed by the COE in May 1993 also confirmed surface water in the ditches adjacent to the service station to be contaminated with petroleum hydrocarbons.

To better characterize the nature of the surface water contamination occurring at the BSS site, the COE selected three locations along surface drainage paths for collecting both a surface water sample and a shallow soil sample in an attempt to determine if contaminated groundwater from the BSS release was discharging and impacting surface water leaving the site. The COE also collected another shallow soil sample from the seepage area along the West Fork of the Trinity River.

1. **Description of Threatened or Impacted Surface Water Bodies.**

a. **West Fork of the Trinity River.** A seepage area along the west bank of the West Fork of the Trinity River where petroleum hydrocarbons were bubbling into the water was first noted by Air Force personnel in April 1992. This seepage area is shown on Figures 1 and 11. Beginning at the dam on Lake Worth, the river flows southward past the Fort Worth National Fish Hatchery immediately downstream of the dam, past the YMCA Camp Carter, and past the spring-fed Burger Lake Recreation Area, where it then begins to flow along the eastern edge of CAFB for a distance of approximately 1 mile. Past CAFB, the river eventually turns eastward towards downtown Fort Worth where the Clear Fork of the Trinity River feeds into it. The West Fork of the Trinity River continues to flow eastward to Irving, where it converges with the Elm Fork of the Trinity River. The West Fork of the Trinity River in Tarrant County is under the jurisdiction of the Tarrant County Water Control and Improvement District.

b. **Surface Drainage Ditches.** Surface drainage ditches border the eastern and southern ends of the BSS, as shown on Figure 1. The eastern ditch runs parallel to and along the western edge of Rogner Drive, and the southern ditch runs along the northern side of Jennings Drive. The eastern ditch begins north of the BSS area and flows south. The southern ditch begins west of the BSS area and flows east. The flow from both of these ditches converge with the flow from other surface drainage ditches at the intersection of Rogner Drive and Jennings Drive. The combined flows are then diverted eastward for approximately 500 feet, where they leave CAFB and discharge into the West Fork of the Trinity River. A map illustrating these flow paths on a larger scale is shown on Figure 11.

The eastern ditch begins collecting surface runoff north of the BSS as well as from the BSS and adjacent Rogner Drive as it flows southward. The ditch is unlined in the immediate vicinity of the BSS except for a metal culvert which runs under the eastern driveway of the station. It is along the gravel bed underlying this culvert where groundwater begins to surface, seeping into the culvert at the metal seams and collecting towards the southern end. An odor of gasoline is almost always present within this culvert. It is not unusual during dry periods to find no water present in the northern end of this drainage ditch but to find the southern end saturated or ponded with water smelling of gasoline or exhibiting a sheen. Groundwater surfaces in the unlined portion of the southern end of the ditch, where there is frequently an orange slime on the soil and vegetation, presumably due to bacteria feeding on the petroleum hydrocarbons.

The southern ditch begins collecting surface runoff west of the BSS as well as from the BSS and adjacent Jennings Drive as it flows eastward. The ditch runs underground west of the BSS and emerges immediately south of the service station into a concrete-lined basin. Groundwater along the northern bank of this basin can be observed discharging above the limits of the concrete lining.

Groundwater can also be observed seeping in the driveway and within the surface drainage ditch adjacent to the driveway of Bldg. 1501, located northwest of the intersection of A Street and Knights Lake Road, as shown on Figure 11. There is typically orange staining and orange slime present along the surface of the asphalt where the groundwater is emerging through cracks and within the unlined portion of the ditch north of the driveway. This water flows eastward along the unlined ditch to a drop culvert which directs the flow underground

to the southern drainage ditch at the BSS.

2. **Surface Water Impact Delineation Procedures.**

a. **West Fork of the Trinity River.** The seepage area along the river bank was sampled by the COE in May 1993 at locations SW-1 and SED-1 to verify the nature of the contamination occurring. The soil sample SED-1 was not obtained at depth at a location approximately 5 feet above the surface of the river at that time. The location was selected based on the strong gasoline odor emanating from the soil. Riprap covering the slope made it difficult to obtain a sample at depth. The sample was analyzed for BTEX, TPH and PAH. TPH and some PAH compounds were detected. The water sample SW-1 was collected immediately downslope of SED-1 and was analyzed for BTEX, MTBE, and TPH. There was no evidence of petroleum contamination in the water at the time of sampling, and no contaminants were detected in the laboratory analyses.

Only one sample was collected at the river seepage area by the COE during this sampling effort. This was a shallow soil sample was collected on 28 September 1993 3 days after a heavy rain. It was taken from a depth of 1 foot at a location immediately above the water surface of the river where a very strong petroleum odor was noted. This location is shown on Figure 1. The Soil Sampling Field Data Sheet documenting sample location conditions at the time of sampling is contained in Appendix C.

No bubbling was ever observed during the several visits made to the river by COE personnel to observe the seepage area. A black oily sheen could be generated in the water by poking the soil river bottom with a stick. A rainbow sheen was occasionally noted in very small isolated areas along the river bank where there was standing water;

however, there was never enough of a sheen present to sample. During every visit to the seepage area, a gasoline odor was noted and the current seepage location could be identified by disturbing the soil along the bank. There were no visible impacts to biota present. Seepage was always noted occurring within the approximate 65-foot length of bank shown on Figure 1 at or just above the current level of the river.

b. **Surface Drainage Ditches**. Surface water sampling was performed by the COE in May 1993 along the surface drainage paths leaving the BSS to determine if the surface water was contaminated by the release. Surface water samples were collected at locations SW-2 through SW-5, which are shown of Figure 1. Results for BTEX, MTBE, and TPH analyses showed only the SW-2 and SW-3 locations to be contaminated. The source of contamination for SW-2 was likely groundwater contaminated by the BSS release discharging into the eastern drainage ditch. The source of TPH contamination detected at the SW-3 location, however, was not known because the SW-3 water sample was taken at the mouth of the drainage pipe and represented surface water collected upstream of the site. No soil samples were taken by the COE in May 1993 in any of the surface drainage ditches.

Four locations were selected for surface water and shallow soil sampling by the COE during this study to better determine how contaminated groundwater from the BSS was affecting surface drainage from the site. Surface water samples were designated with the prefix "SW" and shallow soil samples, obtained at a depth of 1 foot, were designated with the prefix "SED." All SW and SED sample locations except for SW-5A and SED-5A are shown on Figure 1. Locations SW-5A and SED-5A are shown on Figure 11. Soil Sampling and Surface Water

Sampling Field Data Sheets documenting sample location conditions at the time of sampling are contained in Appendix C.

Sample location SW-2A was located in the unlined portion of the eastern ditch where groundwater was observed seeping into the ditch and leaving an orange slime on the vegetation. A shallow soil sample, SED-2A, was also collected at this location. Sample location SW-3A was once again at the eastern end of the culvert where it discharges into the southern drainage ditch. This sample was collected to determine the degree of contamination occurring in runoff collected west of the site and to verify May 1993 test results. There was no shallow soil sample SED-3A collected because the location of SW-3A was concrete-lined. Surface water sample location SW-4A was selected on the northern bank of the southern drainage ditch to collect groundwater from the BSS which was discharging into the ditch. A shallow soil sample SED-4A was also collected at this location immediately above the concrete lining on the bank. Sample locations SW-5A and SED-5A were taken upstream of the drainage collected in the southern drainage ditch to determine if the seepage occurring at Bldg. 1501 was contaminated and was contributing to the contamination found in May 1993 in SW-3.

Sampling of these areas was performed on 22 October 1993 after a heavy rain in an attempt to capture a higher concentration of contaminants which would be migrating due to recharge. Water samples were collected directly into the sample containers. Soil samples were collected at a depth of 1 foot using a clean sharpshooter shovel. Other than the orange slime noted at the groundwater seeps at SED-2A and SED-5A, no visible impacts to the biota were noted.

3. **Surface Water and Shallow Soil Analytical Results**. The shallow soil sample SED-1A was collected from the bank of the West Fork of the Trinity River on 28 September 1993. This sample was analyzed using EPA Methods 8240 for VOCs and BTEX, 418.1 for TPH, 7421 for Pb, and 8310 for PAH. The results for these analyses are shown on Table 8. Included on this table is the date the sample was collected, the field sample number and corresponding laboratory I.D. number for each sample, the analytical methods used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and the chain of custody form are contained in Appendix C. Analytical results are discussed in Section IV.

Surface water samples were collected by COE personnel on 22 October 1993 at locations SW-2A, SW-3A, SW-4A, and SW-5A. These water samples were analyzed using EPA Method 8240 for VOCs and BTEX, 418.1 for TPH, 7421 for Pb, and 8310 for PAH. The analytical results and are shown on Table 9. Included in this table are the date each sample was collected, the location number and corresponding laboratory I.D. number for each sample, the analytical method used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix C. Analytical results are discussed in Section IV.

Shallow soil samples were collected on 22 October 1993 at locations SED-2A, SED-4A, and SED-5A. These soil samples were also analyzed using EPA Methods 8240 for VOCs and BTEX, 418.1 for TPH, 7421 for Pb, and 8310 for PAH. The analytical results are shown on Table 10. Included in this table are the date each sample was collected, the location number and corresponding laboratory I.D. number for each

sample, the analytical method used, and the results obtained. All concentrations above detection limits are shaded. Signed copies of the laboratory reports and chain of custody forms are contained in Appendix C. Analytical results are discussed in Section IV.

4. **Surface Water Impact Map**. A map showing the surface water sample locations and corresponding analytical data for both surface water and shallow soil samples collected during this sampling effort is shown on Figure 12. The areas where contaminated groundwater is discharging to surface water are also delineated on Figure 12. The analytical results for samples SW-5A and SED-5A are shown on Figure 11.

D. **Waste Management and Disposition**.

1. **Storage, Treatment, or Disposition Methods**. All investigative-derived wastes (IDW) generated by the COE as part of this investigation were containerized in clean 55-gallon steel drums. Soil was contained in open-topped drums. Development and purge water were contained in close-topped drums. Each drum containing soil or water was labeled with the project name, boring number(s), and date the waste was contained.

Drums containing IDW generated during the soil boring investigation in December 1992 were temporarily stored at the COE facilities at the Federal Center on Felix Street in Fort Worth. The soil was disposed of at the City of Garland Municipal Landfill on 1 June 1993 by Innovative Support Group, Inc. The purge water was disposed by Mobley Company at the Mobley Company Corsicana Fuel Facility on 7 July 1993. Copies of the manifests are contained in Appendix D.

Drums containing IDW generated during the installation of wells

MW-7 through MW-12 were moved to the Bldg 1190 hazardous waste storage yard on CAFB for temporary storage on wooden pallets until test results were received for determining final disposition. The COE contracted with Innovative Support Group, Inc., in Dallas, TX, to dispose of all containers of waste generated from this investigation. The well water was disposed by Mobley Company at the Mobley Company Corsicana Fuel Facility on 6 May 1994. The soil was disposed at CSC Disposal and Landfill, Inc., in Avalon, TX, on 9 May 1994. Copies of the manifests are contained in Appendix D. Manifests contain additional quantities of soil and water from a LSA investigation recently performed for Bldg 1628 (LPST ID No. 106684) at CAFB.

2. **Volume and Disposition of Contaminated Soil**. Three 55-gallon drums of contaminated soil were generated during the drilling and sampling of soil borings ST16-1, ST16-2, and ST16-3. A total of 17 55-gallon drums of contaminated soil were generated from the drilling of well borings MW-7 through MW-12.

3. **Volume and Disposition of Contaminated Groundwater**. Five 55-gallon drums of petroleum contaminated groundwater were generated from the purging of soil borings ST16-1, ST16-2, and ST16-3 prior to obtaining groundwater grab samples. A total of 14 55-gallon drums of petroleum contaminated groundwater were generated from the development and purging of wells BSS-A, BSS-B, SAV-1, SAV-2, and MW-1 through MW-12.

4. **Volume and Disposition of Phase-Separated Product**. No phase-separated product was found in any of the wells installed or sampled.

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TAB

SECTION IV

SECTION IV
CONCLUSIONS AND RECOMMENDATIONS

A. Summary of Findings.

1. Magnitude and Extent of Soil Contamination. Results from soil sampling performed during the UST removal, during the drilling and sampling of soil borings ST16-1, ST16-2, and ST16-3, and during the drilling and sampling of well borings MW-7 through MW-12 indicate the source of petroleum hydrocarbon contamination for the BSS site was the entire UST system at the BSS.

Soil samples from the tank excavation found TPH as high as 630 ppm and BTEX as high as 1119 ppm along the southeast wall in sample 1518-D-SEW. The distribution of TPH and BTEX contaminants within the excavation indicated no petroleum hydrocarbons present along the western (NW) wall (samples 1518-A-SWW and 1518-A-NWW) and the northwestern corner (sample 1518-A-NW) of the excavation, and the highest concentrations of both TPH and BTEX along the eastern wall of the excavation. The approximately 150 cubic yards of excavated soil had a maximum concentration of TPH at 47 ppm and a maximum concentration of BTEX at 34.6 ppm. The contaminated soil removed from the tank excavation was used to backfill the tankhold, and therefore continues to provide a source of contaminants.

The soil samples collected from the three soil borings located along the fuel lines leading to the fuel dispensers indicated TPH present at concentrations as high as 79 ppm at the depth ranging from 2 to 3 feet (soil sample ST16-3-1) and as high as 216 ppm at the depth ranging from 4 to 4.7 feet in the same boring (ST16-3-2). All soil samples were obtained from the vadose zone and all detected TPH above the detection limit of 20 ppm. The TCLP analyses performed for the

BTEX compounds for the samples obtained from the vadose zone found no TCLP benzene concentrations exceeding the maximum concentration of contaminants for the toxicity characteristic of 0.5 mg/l; however, all soil samples exhibited detectable concentrations for the BTEX compounds using the TCLP method for analysis.

Soil samples obtained during the drilling and sampling of well borings MW-7 through MW-12 found no additional sources of petroleum hydrocarbon contamination. The vertical distribution of TPH and BTEX concentrations in the soil samples collected from these borings generally coincided with the depth groundwater occurred in each of the borings. Trace amounts of BTEX compounds were detected in the soil samples obtained from the vadose zone. The exception was well boring MW-11 in which TPH was detected not only in the vadose zone at 52.7 ppm, but also at 48.6 ppm at the groundwater interface and at 51.7 ppm at the final depth of the boring. Soil samples taken from the saturated zone at the final depth in well borings MW-7 and MW-8 also detected TPH at concentrations of 30.5 and 33.9 ppm, respectively, just above the detection limit of 30 ppm. A false positive TPH reading can occur using EPA Method 418.1 if TCE is present.

The soil sample analytical data indicate soil contamination from the UST release extends from the areal extent of the tank excavation along all associated fuel lines to the shallow depth at which groundwater occurs in the immediate area of the BSS. The full lateral extent of soil contamination, although not investigated, likely does not extend much further than the physical extent of the UST system. Concentrations of TPH are as high as 630 ppm within the tank excavation and as high as 216 ppm along the fuel lines. Concentrations of BTEX are as high as 1119 ppm within the limits of

the tank excavation and are present in the vadose zone along the fuel lines.

2. **Impact on Groundwater**. Groundwater occurs at the shallow depth of 5 to 7 feet along the extent of the UST system. The tanks were situated within ground water, and the fuel distribution lines are within 2 to 3 feet of the groundwater surface. Releases along the fuel lines and from the USTs directly impacted groundwater creating a groundwater contaminant plume which extends westward past the installation boundary to the West Fork of the Trinity River.

The lateral extent of the groundwater contaminant plume is defined by monitor wells MW-3 in the upgradient direction, MW-7 north and cross-gradient to the former tank locations, MW-12 northeast of and cross-gradient to the former UST system, MW-11 east-southeast and downgradient of the UST release, and MW-8 south-southeast in a cross-gradient direction of the release. Petroleum hydrocarbon concentrations, except for MTBE, were below detection limits in each of these wells. Well MW-8 detected MTBE at a concentration of 200 ug/l, but found no BTEX or TPH.

Direction of groundwater flow is east-southeast at a gradient of about 1 foot per 25 feet, or 0.04, across much of the area encompassed by the plume, but is steepest in the area adjacent to the former tank location at a gradient of 4 feet per 25 feet, or 0.16.

Two areas of high concentrations of dissolved TPH and BTEX are defined within the extent of the plume. The highest concentrations of each of these constituents occur north of and adjacent to the tank excavation, where TPH was found at a concentration of 20 mg/l in BSS-B and BTEX was found at a concentration of 45.88 mg/l in the same well. According to CAFB records, this well once contained several inches of

free-phase product. No free-phase product was found during any sampling performed during this investigation.

The other area of high concentration for both of these constituents is along a line directly downgradient from the former tank location. This area of high concentrations of dissolved TPH and BTEX extends roughly from the location of well SAV-2 eastward and downgradient to the location of well MW-10. The concentrations of TPH in wells SAV-2 and MW-10 within this high were 9.0 and 9.8 mg/l, respectively. The concentrations of BTEX in each of these wells was 11.540 mg/l in SAV-2 and 46.070 mg/l in MW-10. These contaminant concentration contours configure to the direction of groundwater flow from the former tank location and line up directly with the seepage area at the river. Groundwater elevations strongly indicate recharge to the river is occurring where the contaminated seepage has been observed.

Other parameters analyzed were Pb, PAHs, and VOCs. Concentrations of Pb were elevated as high as 41 ug/l in wells exhibiting the highest concentrations of petroleum hydrocarbons. The PAH compounds acenaphthylene and naphthalene were found in the four downgradient wells sampled for this parameter (BSS-B, SAV-2, MW-1, and MW-10) at the maximum concentrations of 454 ug/l and 713 ug/l, respectively. No VOC compounds were found in the same four downgradient wells sampled; however, the high concentrations of BTEX compounds present in these wells required dilution of the samples which may have masked lower concentrations of VOCs if present. The parameters pH and conductivity were measured in the field during sampling. The range of pH was 7.31 to 9.12. Conductivity ranged from 793 to 1222 umhos/cm.

3. **Impact on Surface Water**. Groundwater is discharging to surface water at two locations within the limits of the BSS study area. One area is south-southeast of the fuel islands and the other area is along the west bank of the West Fork of the Trinity River.

Groundwater grab samples from the three soil borings drilled along the fuel distribution lines were contaminated with BTEX as high as 4.770 mg/l and TPH as high as 14 mg/l. The vertical distribution of soil contamination in the soil borings indicated the groundwater at the fuel line locations was impacted by releases along these lines. This impacted groundwater is discharging to the surface water drainage the area south-southeast of the fuel islands which is in a cross-gradient direction from the tank excavation but in a locally downgradient direction from the fuel distribution lines.

The groundwater discharging in this seepage area was contaminated with BTEX at a concentration of 225.7 ug/l where it was discharging at the south end of the BSS culvert (SW-2A). Soil at two locations (SED-2A and SED-4A) within this seepage area contained TPH as high as 210 ppm and several PAH compounds ranging from below detection limits to as high as 6.240 ppm. No BTEX was found in the soil samples collected, and no TPH was found in the water samples collected.

Investigation of a possible upgradient source to the 1.1 mg/l of TPH previously identified in sample SW-3 in May 1993 indicated no petroleum hydrocarbons present in either the surface water sample or soil sample collected upstream near Bldg. 1501. No TPH was identified in SW-3A during this investigation, indicating the TPH identified by the COE in the July 1993 report may be questionable.

Previous surface water sampling in May along the surface drainage path further downstream of the BSS indicated no petroleum hydrocarbon

contamination was present (SW-4 and SW-5). These locations are along the surface drainage path which ultimately discharges to the West Fork of the Trinity River. It is unlikely the surface water discharging to the West Fork of the Trinity River along this surface drainage path is remains impacted by the BSS release.

The one shallow soil sample collected from the seepage area at the West Fork of the Trinity River exhibited an extremely high concentration of BTEX at 1,147 ppm. The highest constituent concentration of total BTEX was xylenes at 742 ppm. Naphthalene was the only PAH compound detected at 36 ppm. The TPH concentration was 130 ppm. Observations at various river levels over several months indicate the elevation of the seepage area rises and falls with the groundwater levels across the site. No observations were made indicating contaminated surface water in the river other than being able to generate a black oily sheen when poking the river sediment, when attainable, with a stick.

Although high concentrations of petroleum hydrocarbons within the shallow soil from the river seepage indicate groundwater contamination from the BSS extends as far east as the West Fork of the Trinity River, it is not known at what concentrations the groundwater is discharging to the river itself to be able to determine the impact on this surface water body. The concentrations of TPH and BTEX in MW-10, the closest upgradient well to the seepage area, indicate groundwater contaminant concentrations could be as high or higher than 9.8 mg/l for TPH and 46.070 mg/l for BTEX.

4. **Other Potential Impacts and Future Risks**. It has been determined groundwater contaminated by the gasoline release from the BSS is discharging to the West Fork of the Trinity River. It has also

been determined groundwater contaminated by the release is discharging to surface drainage paths which ultimately drain to the river. The greatest risk appears to be exposure to contaminated surface water within the surface drainage ditch at the BSS and along the flow of the West Fork of the Trinity River.

Although the horizontal extent of the petroleum hydrocarbon contaminant plume has been defined, the vertical extent of contamination has not been determined to verify whether the groundwater contamination poses a threat to any drinking supply wells in the area. It appears contamination extends only to the base of the upper groundwater zone occurring in the alluvial deposits on CAFB and not to the much greater depths within the Paluxy Formation where the area's drinking supply wells are developed. The closest drinking water supply wells to the BSS are situated approximately 0.5 mile east of the site on the other side of the river.

B. Recommendations. Further actions at the site should address reducing or eliminating remaining sources of contaminants, mitigating off-site migration of contaminants, determining the vertical extent of groundwater contamination, verifying the presence or absence of VOCs other than BTEX compounds in the groundwater, and performing a risk assessment to determine final cleanup levels for the site.

1. Contaminant Sources. Contaminated soil within the tank excavation and along the abandoned fuel distribution lines contains high concentrations of petroleum hydrocarbon contaminants which continue to be released to the shallow groundwater in this area of the site. The amount of contaminated soil is of limited horizontal and vertical extent. This continuing source of groundwater contamination should be removed or treated to aid in mitigating off-site migration

of contaminants. Removal or treatment will also aid in reducing the contaminant levels of groundwater discharging to surface drainage on-site.

2. **Off-Site Migration**. Groundwater flow is the primary migration pathway leading from the source at the UST system off-site to the West Fork of the Trinity River, where petroleum contaminants are being released to surface water. Contaminant concentrations in the groundwater are high along the installation boundary. These concentrations should be reduced. Removal or treatment of contaminated soil acting as a source of groundwater contamination should be performed in conjunction with treatment of groundwater migrating across the installation boundary.

3. **Vertical Extent**. The installation and sampling of cluster monitor wells at the site should define the vertical extent of groundwater contamination to determine if there is any threat to deeper aquifer drinking water supply wells in the area. Information from these wells will also aid in designing a system to best treat contaminants migrating off-site.

4. **Volatile Organic Compounds**. A TCE plume underlies the western portion of CAFB. The easternmost extent of the plume has not been fully delineated. Other potential TCE sources on CAFB are being investigated as part of the effort to fully delineate the extent of the TCE plume(s). The presence or absence of TCE at the BSS site should be verified by sampling wells which have exhibited no or low concentrations of BTEX compounds and analyzing for VOCs using EPA Method 8240. Wells to be sampled should include MW-7, MW-8, and MW-11 where TPH was found in soil samples collected at depth within the saturated zone.

5. **Risk Assessment**. Once the source of contamination is eliminated or reduced, concentrations of contaminants migrating off-site are mitigated, and all contaminant migration pathways are verified, a risk assessment should be performed to determine the impact of reduced contaminant concentrations on health and the environment. Information obtained from the risk assessment should then be used to determine the extent to which the site should be remediated.

TAB

SECTION V

Photo 1. Tank excavation with groundwater. Looking SE. May 93.

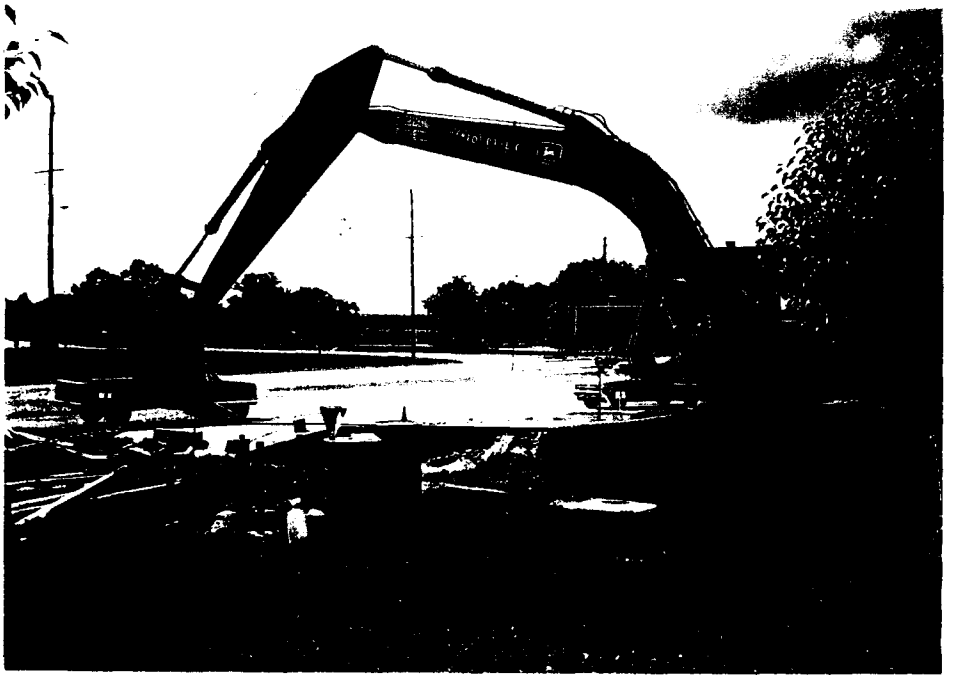


Photo 2. Tank removal and groundwater sampling. Monitor well BSS-B (left) and MW-4 (right at concrete pad). Looking SE. May 1993.

Photo 3. Seepage area along west bank of West Fork of the Trinity River. Location shown by beached boom. Looking W. July 93.

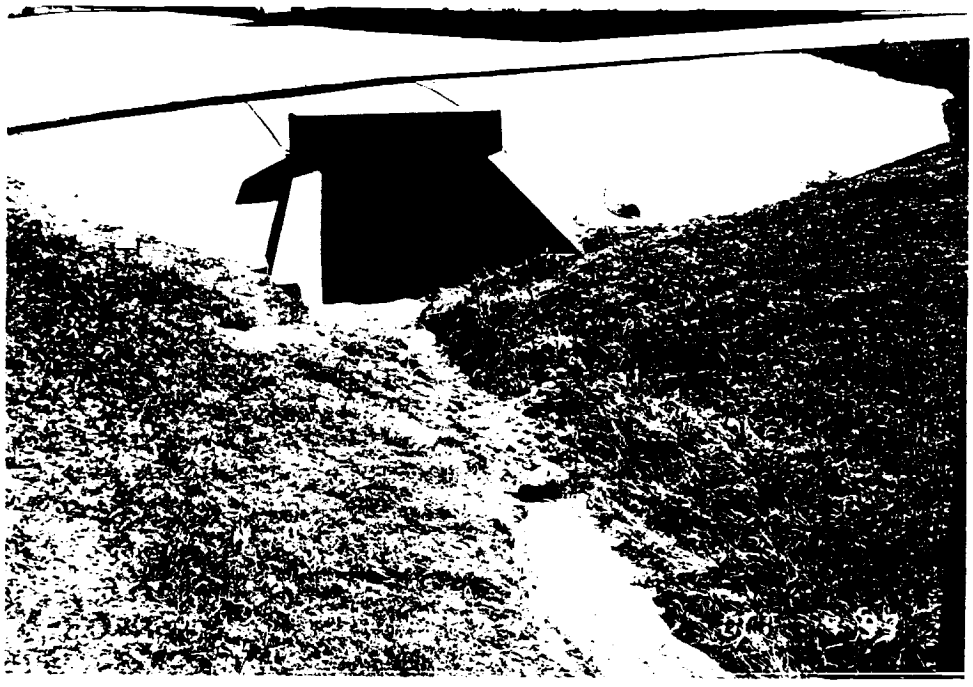


Photo 4. Looking S from well MW-5 into northern end of culvert. Note dry conditions and Photos 5 and 6. 4 Oct 93.

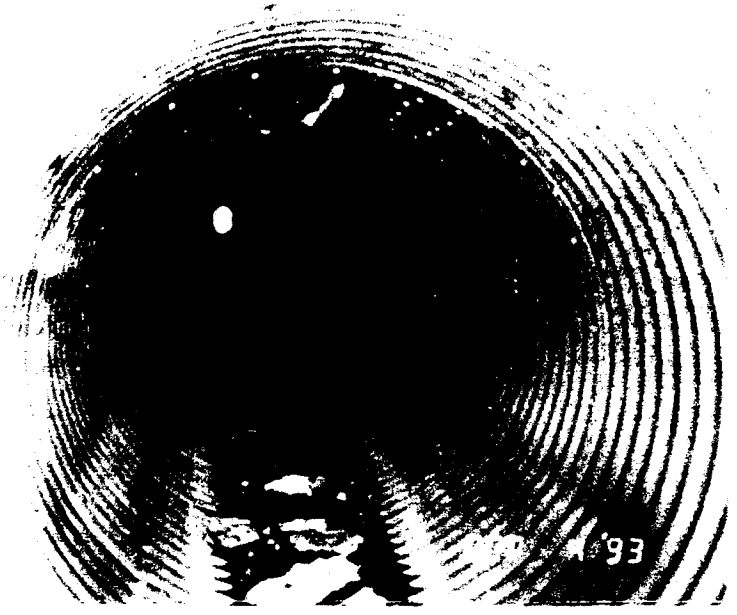


Photo 5. Looking S through culvert. Groundwater seepage begins in culvert approximately halfway. 4 Oct 93.

Photo 6. Looking N towards southern end of culvert. Groundwater seepage with orange slime and oily sheens. 4 Oct 93.

Photo 7. Sampling at locations SW-2A and SED-2A. 22 Oct 93.

Photo 8. Sampling at locations SW-3A (north of culvert), SW-4A, and SED-4A. Groundwater seepage along northern bank. Looking SW. 22 Oct 93.

Photo 9. Groundwaer seep at Bldg. 1501. SED-5A located immediately west of driveway off pavement. Looking W. July 93.

Photo 10. Oily sheen on groundwater seep at SED-5A. 4 Oct 93.

Photo 11. Sampling SED-5A. 22 Oct 93.

Photo 12. Location SW-5A at drop culvert in lower right corner. Looking S. 4 Oct 93.

TAB

SECTION VI

SECTION VI
QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

A. Sample Collection Procedures.

1. **Soil Borings**. Quality assurance/quality control (QA/QC) procedures followed for obtaining soil samples and groundwater grab samples from soil borings ST16-1 through ST16-3 consisted of obtaining one duplicate soil sample from ST16-1 for sample ST16-1-1 from 2 to 3 feet for QC analysis, obtaining one duplicate soil sample from ST16-2 for sample ST16-2-1 from 2 to 3 feet for QA analysis, obtaining one rinsate sample, and preparing one trip blank which accompanied the shipment of soil samples to the laboratory. There were no QA/QC procedures followed for obtaining the three groundwater grab samples from the soil borings the day after the borings were completed. The laboratory report discussing the validity of the soil and groundwater analyses based on the QA/QC data obtained for these three soil borings is provided in Appendix A.

2. **Soil Gas Survey**. The QA/QC procedures followed by TARGET for collecting soil gas samples are documented in the soil gas survey report contained in Appendix A.

3. **UST Removal**. Quality assurance/quality control procedures followed for collecting soil samples and the groundwater sample for the UST removal consisted of taking one triplicate soil sample at location CAFB-1518-B-NW, taking one rinsate sample, and preparing one trip blank to accompany the single shipment of samples to the laboratory. The QA soil sample was shipped to the COE SWD Lab in Dallas, TX, as a check on the contractor's laboratory results. The QA report for sample CAFB-1518-B-NW/QC is contained in Appendix A. The rest of the QA/QC data for the UST samples are contained in the PWI

1993 report.

4. Well Boring, Groundwater, Surface Water, and Shallow Soil Samples. Quality assurance/quality control (QA/QC) procedures followed for collecting soil and water samples for the monitor well installation, groundwater sampling, and surface water sampling portions of this investigation were developed in accordance with Department of the Army, US Army Corps of Engineers, ER 1110-1-263, Chemical Data Quality Management for Hazardous Waste Remedial Activities, dated 1 October 1990. Standard QA/QC procedures for collecting these samples require one duplicate/split for every 10 samples taken per analytical parameter per matrix for both QA and QC. All QA and QC samples were labeled as blind samples when sent to the laboratory for analysis. Rinsate samples (equipment blanks) for non-dedicated equipment are required to be taken at a frequency of once per every 20 samples per analytical parameter per matrix. Trip blanks are prepared at a frequency of one per shipping cooler per day, and accompany water samples only. If possible, it is always desirable that the QA, QC and rinsate samples all be prepared for a single contaminated field sample to provide the most QA/QC data as possible.

Following these standard procedures, a QA/QC sampling plan for each sampling event was developed. A total of 18 soil samples were collected from the drilling of well borings MW-7 through MW-12. Therefore, two triplicate samples were taken for performing QA and QC analyses for each parameter . One rinsate sample was also collected for each of the triplicate samples taken. No trip blanks were prepared for the soil samples. The sampling plan for soil sampling showing the distribution of QA/QC samples for the well borings is shown on Table 11.

Obtaining true replicates of soil samples is always difficult because of the non-homogeneity of the material. It was more difficult during this investigation because of the number of containers to be filled from a small diameter sampler. Therefore, only one parameter was split at a time, as shown in Table 11. Replicate samples for a given sampled interval were taken by splitting the sample core into equal sections lengthwise for the required number of jars. Replicate samples for BTEX/MTBE were obtained in boring MW-7 for FS-2 from 6.5 to 8.0 feet, and in boring MW-11 for FS-2 from 20 to 22 feet. Replicate samples for TPH were obtained in well boring MW-8 for FS-2 from 10 to 12 feet, and in boring MW-10 for FS-2 from 16 to 18 feet. Because the sampling was performed at 2-foot intervals, it was necessary to anticipate when a soil sample would be retained for analysis; therefore rinsate samples were not always prepared for the run made to collect the replicate soil sample. A rinsate sample was prepared by running distilled water over the decontaminated sampler and collecting it in the appropriate container(s) to be analyzed. The laboratory report discussing the validity of the soil sample analyses based on the QA/QC data obtained is provided in Appendix A.

A total of 16 groundwater samples were collected from the 16 monitor wells sampled. Therefore, two triplicate samples were taken for performing QA and QC analyses. These were collected from well MW-1, known to be contaminated, and from well MW-10, suspected to be contaminated. No rinsates were collected during ground-water sampling because new disposable equipment was used to sample each well. Four trip blanks accompanied the four shipments of groundwater samples to the laboratory. The groundwater sampling plan showing the distribution of QA/QC samples for the groundwater sampling event is

shown on Table 12. The laboratory report discussing the validity of the groundwater sample analyses based on the QA/QC data obtained is provided in Appendix B.

The single shallow soil sample SED-1A collected from the seepage area along the West Fork of the Trinity River had no replicate samples taken for QA and QC analyses because it was a single soil sample which was hand delivered to the SWD Lab the same day it was collected. A discussion of the internal QA/QC laboratory information for this soil sample is contained in Appendix C.

A total of four surface water samples were collected during the surface water sampling event. Therefore, one triplicate sample was taken for QA and QC analyses. This sample was taken from the known contaminated SW-2A location. No rinsates were prepared because the water sample was collected directly into the sampling container. One trip blank accompanied the one shipment of water samples to the laboratory. The sampling plan showing the distribution of QA/QC samples for the surface water sampling event is shown on Table 13. The laboratory report discussing the validity of the surface water sample analyses based on the QA/QC data obtained is provided in Appendix C.

A total of four shallow soil samples were collected during the surface water sampling event. Again, one triplicate sample was taken for QA and QC analyses. This sample was also taken from the known contaminated SW-2A location. One rinsate was prepared prior to obtaining soil sample SED-2A. No trip blanks were necessary for soil samples. The sampling plan showing the distribution of QA/QC samples for the soil samples collected during the surface water sampling event is shown on Table 14. The laboratory report discussing the validity

of the surface water sample analyses based on the QA/QC data obtained is provided in Appendix C.

B. Sample Handling Procedures.

1. Soil Borings.

a. Soil Samples. Soil samples were taken using a clean 5-foot long 6-inch diameter split barrel sampler. The sampler was steam-cleaned prior to entering the boring. Each soil sample was placed in two 8-ounce glass jars with teflon-lined lids. One jar was labeled for TPH analysis and one jar was labeled for TCLP Pb and BTEX analyses. All jars were filled completely, disturbing the soil as little as possible. Each jar was labeled with the project name, boring number, sample number, sample interval, date and time of sampling, analysis, analytical test method number, and signature of the sampler. Samples were placed on ice, sealed in ice chests with appropriate chain of custody forms, and were hand delivered to SWD Lab in Dallas, TX, within 24 hours of being taken.

A rinsate sample was collected in one 40-ml glass vial at some time during drilling and sampling of the soil borings. The sample was labeled for BTEX analysis. A trip blank was also prepared for shipment with the soil samples which consisted of one 40-ml glass vial of water labeled for BTEX analysis. No other information is available for how and when these blanks were prepared.

There were several problems with preservation and documentation procedures for the handling and shipment of these samples to the laboratory. These problems are noted in the laboratory QA/QC discussion in Appendix A.

b. Groundwater Grab Samples. Prior to obtaining a grab sample of the groundwater in each of the soil borings, three volumes

of groundwater were purged from each boring using a clean bailer. Once groundwater had recovered enough to obtain the required samples, samples were collected using a clean disposable teflon bailer. Each sample consisted of two 40-ml glass vials labeled for BTEX analysis, one 1-liter plastic bottle labeled for TDS analysis, one 1-liter amber glass bottle labeled for TPH analysis, and one 1-liter plastic bottle labeled for Pb analysis. The TPH samples were preserved with HCl added to lower the pH to <2. The Pb samples were preserved with HNO3 added to lower the pH to <2. All containers were labeled with the project name, boring number, analysis, analytical test method number, preservation used, data and time of sampling, and signature of sampler. Containers were placed on ice and were hand delivered to SWD Lab in Dallas, TX, the same day as they were taken.

The groundwater grab samples were delivered together with the soil samples to SWD Lab and experienced the same types of preservation and documentation problems noted in the laboratory QA/QC report contained in Appendix A.

2. **Soil Gas Survey**. Sample handling procedures used by TARGET in performing the soil gas survey are documented in the soil gas survey report contained in Appendix A.

3. **UST Removal**. Each soil sample taken within the tank excavation was placed in a 4-ounce glass jar. Each jar was labeled for BTEX, TPH and Pb analyses. All jars were stored on ice until delivered to Chemron Incorporated in San Antonio, TX.

The one groundwater sample was taken using two 40-ml glass vials labeled for BTEX analysis, one 1-liter amber glass bottle labeled for TPH analysis, one 250-ml plastic bottle labeled for Pb analysis, one 250-ml amber glass bottle labeled for TOX analysis, and one 40-ml

glass vial labeled for pH and TDS analyses. The BTEX and TPH samples were each preserved by adding HCL to lower the pH to <2. A trip blank consisting of two 40-ml glass vials was prepared for BTEX analysis and accompanied the shipment of water samples. Included in this shipment was a rinsate sample prepared for sample location CAFB-1518-D-NW consisting of two 40-ml glass vials labeled for BTEX analysis and preserved with HCl to pH<2, one 1-liter amber glass bottle labeled for TPH analysis and preserved with HCl to pH<2, and one 250-ml plastic bottle labeled for Pb analysis. All water samples were stored on ice until delivered to Chemron Incorporated in San Antonio, TX, for analysis.

4. Well Boring, Groundwater, Surface Water, and Shallow Soil Samples.

a. Soil Samples from Well Borings. Soil samples were taken using a clean 5-foot long 6-inch diameter split barrel sampler. The sampler was steam-cleaned prior to entering the boring. Each soil sample was placed in two 8-ounce pre-cleaned glass jars with teflon-lined lids. One jar was labeled for BTEX/MTBE analysis, and one jar was labeled for TPH analysis. All jars were filled completely, disturbing the soil as little as possible.

Equipment blanks were prepared by running deionized water over the cleaned sampling tool prior to obtaining a soil sample. The water was collected in three 40-ml glass vials labeled for BTEX and MTBE analyses and in two 1-liter amber glass bottles labeled for TPH analysis. Water samples were preserved using HCL added to lower the pH<2.

Each sample container was labeled with the project name, boring number, sample number, sample interval, date and time of sampling,

analysis, analytical test method number, and signature of the sampler. Sample containers and preservation procedures are shown on Table 15. Samples were placed on ice, sealed in ice chests with appropriate chain of custody forms, and were delivered to the COE SWD Lab in Dallas, TX, within 24 hours of being taken.

b. **Groundwater Samples from Monitor Wells**. Each day, prior to sampling the wells, a travel blank was prepared for a VOC analysis using deionized water. The sample was labeled as a travel blank and was placed in the ice chest to accompany the day's shipment of samples.

A new clean disposable teflon bailer with a VOA tip was used to sample each well. Samples were collected from the top of the water column in the well in the order shown on Table 12. The number of containers for each sample, the type of containers for each sample, and the preservation procedures used are shown on Table 16. All containers were labeled with the project name, well number, analysis, analytical test method number, preservation used, date and time of sampling, and signature of the sampler. Containers were placed on ice and were shipped by bus to SWD Lab in Dallas, TX. Samples arrived at the lab within 24 hours of being taken.

c. **Surface Water and Shallow Soil Samples**. Prior to collecting surface water samples, a travel blank was prepared for a VOC analysis using deionized water. The sample was labeled as a travel blank and was placed in the ice chest in which the samples were shipped.

Surface water samples were collected directly into the appropriate sample container for the analysis to be performed. Sample containers and preservation procedures are shown on Table 17.

Soil samples were obtained using a clean sharpshooter shovel. The sampler was cleaned with soap and potable water prior to obtaining each sample. Each soil sample was then placed in three 8-ounce pre-cleaned glass jars with teflon-lined lids. One jar was labeled for BTEX/MTBE analysis, one jar was labeled for TPH analysis, and one jar was labeled for PAH analysis. All jars were filled completely, disturbing the soil as little as possible. Container and preservation procedures are shown on Table 17.

Equipment blanks were prepared by running deionized water over the cleaned blade of the shovel to obtaining a soil sample. The water was collected in three 40-ml glass vials labeled for VOC analysis, two 1-liter amber glass bottles labeled for TPH analysis, one 1-liter amber glass bottle labeled for PAH analysis, and one 1-liter plastic bottle labeled for Pb analysis. Preservation was performed in accordance with the procedures shown on Table 17.

Each sample container was labeled with the project name, boring number, sample number, sample interval, date and time of sampling, analysis, analytical test method number, and signature of the sampler. Samples were placed on ice, sealed in ice chests with appropriate chain of custody forms, and were delivered to the COE SWD Lab in Dallas, TX, within 24 hours of being taken.

C. **Laboratory Procedures**.

1. **Soil Borings**. The analytical methods used for soil samples obtained from soil borings ST16-1, ST16-2, and ST16-3 were EPA Method 1311 and 8020 for BTEX (TCLP), EPA Method 1311 and 6010 for Pb (TCLP), and EPA Method 418.1 for TPH. The maximum holding time for TCLP analyses for soil samples is 7 days for extraction and 6 months for the analysis. The maximum holding time for TPH is 28 days after

sampling.

The analytical methods used for the water samples obtained for these borings were EPA Method 8020 for BTEX, EPA Method 6010 for Pb, EPA Method 418.1 for TPH, and EPA Method 160.1 for TDS. The maximum holding times for these test methods are 14 days for BTEX, 6 months for Pb, 28 days for TPH, and 28 days for TDS.

2. **Soil Gas Survey**. The analytical method used for the soil gas samples obtained during the soil gas survey was EPA Method 602 Modified standardized for BTEX compounds. Procedures are explained in the soil gas report contained in Appendix A.

3. **UST Removal**. The analytical methods used for the soil samples collected during the UST removal were EPA Method 8020 for BTEX, EPA Method 9071/418.1 for TPH, and EPA Method 3050/7421 for Pb. The maximum holding times for these procedures is 14 days for BTEX, 14 days for TPH, and 6 months for Pb.

The analytical methods used for the water samples obtained for the UST removal were EPA Method 8020 for BTEX, EPA Method 418.1 for TPH, EPA Method 3005/7421 for Pb, EPA Method 160.1 for TDS, and EPA Method 9020 for TOX. The maximum holding time is 14 days for BTEX, 28 days for TPH, 6 months for Pb, 28 days for TDS, and 28 days for TOX. The EPA-approved methods used by the laboratory to analyze the groundwater samples taken were EPA Method 8240 to quantify VOCs, BTEX, and MTBE, EPA Method 418.1 for TRPH, EPA Method 8310 for PAH, and EPA Method 610.1 for TDS. The extraction method used for PAH was EPA Method 3520. The maximum holding times for these test methods are 14 days for VOCs, 28 days for TRPH, 40 days for PAH with extraction performed within 7 days of sampling, and 28 days for TDS.

4. **Well Boring, Groundwater, Surface Water, and Shallow Soil**

Samples. The analytical methods used for all soil samples collected during these sampling events were EPA Method 5030/8020 for BTEX and MTBE, EPA Method 8240 for VOC and MTBE, EPA Method 9071/418.1 for TPH, EPA Method 3051/7421 for Pb, and EPA Method 3520/8310 for PAH. The maximum holding times for these test methods is 14 days for BTEX/MTBE, 14 days for VOC/MTBE, 28 days for TPH, 6 months for Pb, and 40 days for PAH with extraction to be performed within 14 days of sampling.

The analytical methods used for all water samples collected during these sampling events were EPA Method 5030/8020 for BTEX and MTBE, EPA Method 8240 for VOCs and MTBE, EPA method 418.1 for TPH, EPA Method 7421 for Pb, EPA Method 160.1 for TDS, and EPA Method 3510/8310 for PAH. The maximum holding times for these test methods is 14 days for BTEX/MTBE, 14 days for VOC/MTBE, 28 days for TPH, 28 days for TDS, and 40 days for PAH with extraction to be performed within 7 days of sampling.

TAB

TABLES

Table 1. Survey Data for Wells and Boreholes

Hole No.	East Coordinate	North Coordinate	Ground Elevation m.s.l.	Ref. Pt. Elevation m.s.l.
BSS-A	2,024,357.67	402,068.71	567.03	566.65
BSS-B	2,024,331.56	402,390.19	566.84	569.72
BSS-C	2,024,565.39	402,254.10	559.88	568.05
MW-1	2,024,591.26	402,429.15	561.06	560.86
MW-2	2,024,800.28	402,278.44	558.30	557.81
MW-3	2,023,990.22	401,823.77	576.96	576.76
MW-4	2,024,335.22	402,380.68	567.19	566.92
MW-5	2,024,384.37	402,380.86	561.32	563.90
MW-6	2,024,418.34	402,311.95	563.53	563.11
MW-7	2,024,301.74	402,544.99	567.91	567.88
MW-8	2,024,734.61	402,159.14	556.73	556.91
MW-9	2,024,576.11	402,577.41	560.44	560.30
MW-10	2,024,787.20	402,409.94	559.28	559.53
MW-11	2,025,036.48	402,277.97	558.88	558.90
MW-12	2,024,390.28	402,726.49	560.20	560.38
SAV-1	2,024,543.93	402,352.06	561.62	561.51
SAV-2	2,024,525.75	402,383.47	561.66	561.25
ST16-1	2,024,382.27	402,307.72	565.38	NA
ST16-2	2,024,405.13	402,248.69	565.39	NA
ST16-3	2,024,426.72	402,190.24	565.33	NA

Notes:

1. Wells SAV-1 and SAV-2 re-surveyed in Jan 1994 after redevelopment and surface completion.
2. NA = Not applicable (soil borings)
3. Survey report is contained in Appendix C.

Table 2. Analytical Results for Soil Samples from Soil Borings

Soil Boring No.	ST16-1						ST16-2						ST16-3			
Date Sampled	1 Dec 92						1 Dec 92						1 Dec 92			
Field Sample No.	ST16-1-1		ST16-1-1-QC		ST16-1-2		ST16-2-1		ST16-2-1-QA		ST16-2-2		ST16-3-1		ST16-3-2	
Depth	2.0-3.0'		2.0-3.0'		3.5-4'		2-3'		2-3'		4-5'		2-3'		4-4.7'	
Lab I.D. No.	2-4252		2-4253		2-4254		2-4255		2-4256		2-4257		2-4258		2-4259	
Analyses	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 1311/8020	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/l	ug/l	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TCLP Benzene	0.005	0.010	0.005	0.022	0.005	0.012	0.005	0.006	0.5	1.0	0.005	0.044	0.005	0.008	0.005	0.044
TCLP Ethylbenzene	0.005	0.036	0.005	0.041	0.005	0.007	0.005	0.021	0.5	7.2	0.005	0.180	0.005	0.023	0.005	0.090
TCLP Toluene	0.005	0.024	0.005	0.075	0.005	0.041	0.005	<0.005	0.5	1.2	0.005	0.100	0.005	0.041	0.005	0.140
TCLP Xylenes	0.005	0.084	0.005	0.130	0.005	0.032	0.005	0.023	0.5	7.7	0.005	0.130	0.005	0.086	0.005	0.550
TCLP BTEX (total)	NA	0.154	NA	0.268	NA	0.092	NA	0.050	NA	17.1	NA	0.454	NA	0.158	NA	0.824
EPA Method 1311/6010	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TCLP Lead	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.05	<0.05	0.02	<0.02	0.02	<0.02	0.02	<0.02
EPA Method 418.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Total petroleum hydrocarbons	20	42	20	81	20	45	20	39	20	<20	20	200	20	79	20	216

Shading indicates concentration detected above detection limit. Complete laboratory results are contained in Appendix A.

Table 3. Analytical Results for Water Samples from Soil Borings

Field Sample No.	ST16-1		ST16-1-2		ST16-1-3	
Date Sampled	2 Dec 92		2 Dec 92		2 Dec 92	
Lab I.D. No.	2-4260		2-4261		2-4262	
Analyses	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 8020	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l
Benzene	250	310	25	920	25	460
Toluene	250	2800	25	210	25	520
Ethyl benzene	250	300	25	390	25	790
Xylenes	250	1300	25	860	25	3000
BTEX (total)	NA	4710	NA	2380	NA	4770
EPA Method 6010	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Lead	0.02	<0.02	0.02	0.15	0.02	0.04
EPA Method 418.1	mg/l	mg/l	mg/kg	mg/kg	mg/kg	mg/kg
Total petroleum hydrocarbons	0.4	14	0.4	12	0.4	6
EPA Method 160.1	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total dissolved solids	10	530	10	536	10	560

Shading indicates concentration detected above detection limit.
Complete laboratory analytical results are contained in Appendix A.

Table 4. Analytical Results for Soil Samples from Well Borings (p. 1 of 3)

Well Boring No.		MW-7					MW-8				
Date Sampled		7 Dec 93					6 Dec 93				
Field Sample No.		FS-1	FS-2	FS-2QC	FS-2QA	FS-3	FS-1	FS-2	FS-2QC	FS-2QA	FS-3
Depth		2-3'	6.5-8'	6.5-8'	6.5-8'	9-10'	6-7'	10-12'	10-12'	10-12'	26-27'
Lab I.D. No.		3-9616	3-9617	3-9619	3-9620	3-9618	3-9577	3-9578	3-9581	3-9582	3-9579
Analyses	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA Method 8020	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzene	4.8	<4.8	<4.8	<4.8	<2.0	<4.8	<4.8	<4.8	NA	NA	<4.8
Toluene	4.9	6.5	5.8	5.4	<2.0	5.4	5.2	6.2	NA	NA	5.6
Ethyl benzene	4.7	<4.7	<4.7	<4.7	<2.0	<4.7	<4.7	<4.7	NA	NA	<4.7
Xylenes	5.1	<5.1	<5.1	<5.1	<2.0	<5.1	<5.1	<5.1	NA	NA	<5.1
BTEX (total)	NA	6.5	5.8	5.4	NA	5.4	5.2	6.2	NA	NA	5.6
Methyl tertiary butyl ether	5	5.4	<5.0	6.2	<10.0	<5.0	<5.0	5.6	NA	NA	11.4
EPA Method 418.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Total petroleum hydrocarbons	30	<30.0	30.5	NA	NA	31.2	<30.0	<30.0	<30.0	<10.0	33.9

Shading indicates concentration detected above detection limit.
Detection limits for QA samples are 2.0 ug/kg for BTEX constituents and 10.0 mg/kg for TPH.
NA = Not analyzed.
Complete laboratory analytical results are contained in Appendix A.

Table 4. Analytical Results for Soil Samples from Well Borings (p. 2 of 3)

Well Boring No.		MW-9			MW-10				
Date Sampled		23 Nov 93			9 Dec 93				
Field Sample No.		FS-1	FS-2	FS-3	FS-1	FS-2	FS-2QC	FS-2QA	FS-3
Depth		5-6'	14-15'	28-29	8-9'	16-18	16-18	16-18'	31-32'
Lab I.D. No.		3-9296	3-9297	3-9298	3-9754	3-9755	3-9757	3-9758	3-9756
Analyses	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result
EPA Method 8020	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzene	4.8	<4.8	<4.8	<4.8	7.4	93.6	NA	NA	43.4
Toluene	4.9	<4.9	<4.9	5.2	9.1	779	NA	NA	37.2
Ethyl benzene	4.7	<4.7	<4.7	<4.7	<4.7	1900	NA	NA	111
Xylenes	5.1	<5.1	<5.1	<5.1	5.9	5250.1	NA	NA	399
BTEX (total)	NA	NA	NA	5.2	22.4	8022.1	NA	NA	590.6
Methyl tertiary butyl ether	5	<5.0	<5.0	<5.0	<5.0	39.2	NA	NA	91.1
EPA Method 418.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Total petroleum hydrocarbons	30	<30.0	<30.0	<30.0	<30.0	32.0	39.1	56	<30.0

Shading indicates concentration detected above detection limit.
Detection limits for QA samples are 2.0 ug/kg for BTEX constituents and 10.0 mg/kg for TPH.
NA = Not analyzed.
Complete laboratory analytical results are contained in Appendix A.

Table 4. Analytical Results for Soil Samples from Well Borings (p. 3 of 3)

Well Boring No.		MW-11					MW-12		
Date Sampled		29 Nov 93					13 Dec 93		
Field Sample No.		FS-1	FS-2	FS-2QC	FS-2QA	FS-3	FS-1	FS-2	FS-3
Depth		7-8'	20-22'	20-22'	20-22'	37-38'	7-8'	8-9'	26-27'
Lab I.D. No.		3-9424	3-9425	3-9428	3-9429	3-9426	3-9800	3-9801	3-9802
Analyses	Detection Limit	Result	Result	Result	Result	Result	Result	Result	Result
EPA Method 8020	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzene	4.8	4.8	<4.8	<4.8	<2.0	<4.8	<4.8	<4.8	<4.8
Toluene	4.9	5.2	<4.9	6.1	<2.0	5.7	<4.9	<4.9	<4.9
Ethyl benzene	4.7	<4.7	<4.7	<4.7	<2.0	<4.7	<4.7	<4.7	<4.7
Xylenes	5.1	<5.1	<5.1	<5.1	<2.0	<5.1	<5.1	<5.1	<5.1
BTEX (total)	NA	10.0	NA	6.1	NA	5.7	NA	NA	NA
Methyl tertiary butyl ether	5	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0
EPA Method 418.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Total petroleum hydrocarbons	30	52.7	48.6	NA	NA	51.7	<30.0	<30.0	<30.0

Shading indicates concentration detected above detection limit.
Detection limits for QA samples are 2.0 ug/kg for BTEX constituents and 10.0 mg/kg for TPH.
NA = Not analyzed.
Complete laboratory analytical results are contained in Appendix A.

Table 5. Soil Parameter Results

Well Boring No.		MW-8	MW-10
Depth Sampled		7-8'	2-4'
Date Sampled		6 Dec 94	9 Dec 94
Lab I.D. No.		93/4753	93/4752
PARAMETER	TEST METHOD	RESULT	RESULT
Water Content	ASTM D 2216	12.1%	14.2%
Wet Density	ASTM D 2937	134.8 pcf	110.2 pcf
Dry Density	ASTM D 2937	120.3 pcf	96.5 pcf
Specific Gravity of Solids	ASTM D 854	2.64	2.67
Organic Matter	ASTM D 2974	2.1%	1.8%
Porosity	calculated	27.0%	42.1%

Analytical results contained in Appendix A.

Table 6. Groundwater Surface Elevation Data (p 1 of 2)

Well No.	Date	Reference Point	Ref. Pt. Elevation (msl)	Depth to Groundwater (ft)	Groundwater Elevation (msl)
SAV-1	10 May 93	Well csg	564.54	11.64	552.90
	5 Oct 93			18.78	545.76
	26 Oct 93			17.60	546.94
	4 Jan 94		561.51	13.43	548.08
SAV-2	10 May 93	Well csg	563.80	10.80	553.00
	5 Oct 93			17.90	545.90
	26 Oct 93			16.68	547.12
	4 Jan 94		561.25	12.97	548.28
MW-1	11 May 93	Well csg	560.86	7.97	552.89
	5 Oct 93			15.34	545.52
	26 Oct 93			13.96	546.90
	4 Jan 94			13.37	547.49
MW-2	11 May 93	Well csg	557.81	10.14	547.67
	5 Oct 93			15.24	542.57
	26 Oct 93			14.00	543.81
	4 Jan 94			13.36	544.45
MW-3	13 May 93	Well csg	576.76	10.83	565.93
	5 Oct 93			10.40	566.36
	26 Oct 93			10.60	566.10
	5 Jan 94			11.25	565.51
MW-4	12 May 93	Well csg	566.92	6.63	560.29
	5 Oct 93			6.79	560.13
	26 Oct 93			6.38	560.54
	6 Jan 94			6.65	560.27
MW-5	12 May 93	Well csg	563.90	4.75	559.15
	5 Oct 93			5.09	558.81
	26 Oct 93			4.84	559.06
	6 Jan 94			5.02	558.88
MW-6	12 May 93	Well csg	563.11	2.33	560.78
	5 Oct 93			5.09	558.81
	26 Oct 93			2.22	560.89
	6 Jan 94			2.52	560.59

Table 6. Groundwater Surface Elevation Data (p 2 of 2)

Well No.	Date	Reference Point	Ref. Pt. Elevation (msl)	Depth to Groundwater (ft)	Groundwater Elevation (msl)
MW-7	5 Jan 94	Well csg	567.88	8.36	559.52
MW-8	5 Jan 94	Well csg	556.91	9.80	547.11
MW-9	3 Jan 94	Well csg	560.30	10.74	549.56
MW-10	3 Jan 94	Well csg	559.53	15.05	544.48
MW-11	3 Jan 94	Well csg	558.90	26.45	532.45
MW-12	3 Jan 94	Well csg	560.38	9.62	550.76
BSS-A	13 May 93	Well csg	566.65	5.15	561.50
	5 Oct 93			5.20	561.45
	26 Oct 93			4.85	561.80
	5 Jan 94			5.40	561.25
BSS-B	12 May 93	Well csg	569.72	9.63	560.09
	5 Oct 93			10.00	559.72
	26 Oct 93			9.40	560.32
	6 Jan 94			9.81	559.91
BSS-C	5 Oct 93	Well csg	568.05	9.36	558.69
	26 Oct 93			11.08	556.97
	1 Dec 93	Plugged			

Note: Wells SAV-1 and SAV-2 were re-completed to ground level. New well casing elevations were surveyed in Jan 94. Well plugging report for BSS-C is contained in Appendix B.

Table 7. Analytical Results for Groundwater Samples from Monitor Wells (p1 of 2)

Well No.	MW-9		MW-10		QC-A (MW-10QC)		QA-A (MW-10QA)		MW-11		MW-12		MW-1		QC-B (MW-1QC)		QA-B (MW-1QA)		MW-2	
Lab I.D. No.	4-0002		4-0003		4-0006		4-0007		4-0004		4-0005		4-0010		4-0012		4-0013		4-0011	
Date Sampled	3 Jan 94		3 Jan 94		3 Jan 94		3 Jan 94		3 Jan 94		3 Jan 94		4 Jan 94		4 Jan 94		4 Jan 94		4 Jan 94	
Analytical Method	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 8020	ug/l	ug/l							ug/l	ug/l	ug/l	ug/l							ug/l	ug/l
Benzene	1.0	16.0							1.0	<1.0	1.0	<1.0							10	31
Toluene	1.0	3.8							1.0	<1.0	1.0	<1.0							10	<10
Ethyl benzene	1.0	<1.0							1.0	<1.0	1.0	<1.0							10	700
Xylenes	1.0	3.4							1.0	<1.0	1.0	<1.0							10	1500
Total BTEX	NA	23.2							NA	NA	NA	NA							NA	2230
MTBE	10.0	<10.0							10.0	<10.0	10	<10.0							100	1400
EPA Method 8240			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l					ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
Benzene			500	5260	500	5480	5	4480					125	1010	125	1020	250	1320		
Toluene			1000	21600	1000	21800	5	21400					125	2850	125	2500	250	3010		
Ethyl benzene			500	4850	500	4790	5	4100					125	4610	125	4450	250	5500		
Xylenes			500	13900	500	14000	5	13100					125	9610	125	9210	250	11700		
Total BTEX			NA	45610	NA	46070	NA	43080					NA	17880	NA	17180	NA	21530		
MTBE			500	6090	500	6790	10	6540					125	270	125	277	500	<500		
EPA Method 418.1	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TPH	0.5	1.8	0.5	9.8	0.5	9.4	1	20.7	0.5	<0.5	0.5	<0.5	0.5	8.0	0.5	9.0	1.0	17.1	0.5	2.5
EPA Method 7421	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Lead	0.002	0.004	0.002	0.019	0.002	0.028	0.001	0.037	0.002	0.004	0.002	0.002	0.002	0.016	0.002	0.016	0.001	0.015	0.002	0.004
EPA Method 160.1	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l								
TDS	1.0	898	1.0	847	1.0	843	2	1035	1.0	671	1.0	789								
EPA Method 8310			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l					ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
Acenaphthylene			10	300	10	66	2.300	<2300					10	355	10	360	2.300	<2300		
Naphthalene			10	704	10	144	180.000	890J					10	700	10	713	180.000	710J		

NA = Not applicable. J = Estimated value, above method detection limit (MDL), but below practical quantiation limit. Shading indicates constituent detected above MDL. Black headings indicate analysis not performed. Only organic compounds detected above MDLs are shown for Methods 8240 and 8310. Complete laboratory analytical reports are contained in Appendix B.

Table 7. Analytical Results for Groundwater Samples from Monitor Wells (p2 of 2)

Well No.	SAV-1		SAV-2		MW-7		MW-8		MW-3		BSS-A		MW-4		MW-5		MW-6		BSS-B	
Lab I.D. No.	4-0018		4-0019		4-0020		4-0021		4-0022		4-0023		4-0033		4-0034		4-0035		4-0036	
Date Sampled	5 Jan 94		5 Jan 94		5 Jan 94		5 Jan 94		5 Jan 94		5 Jan 94		6 Jan 94		6 Jan 94		6 Jan 94		6 Jan 94	
Analytical Method	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 8020	ug/l	ug/l			ug/l	ug/l	ug/l	ug/l			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
Benzene	10	1200			1.0	<1.0	1.0	<1.0			1.0	<1.0	50	910	10	1600	1.0	8.2		
Toluene	10	230			1.0	<1.0	1.0	<1.0			1.0	<1.0	50	6800	10	450	1.0	<1.0		
Ethyl benzene	10	290			1.0	<1.0	1.0	<1.0			1.0	<1.0	50	1100	10	970	1.0	<1.0		
Xylenes	10	790			1.0	<1.0	1.0	<1.0			1.0	<1.0	50	2500	10	1500	1.0	<1.0		
Total BTEX	NA	2510			NA	NA	NA	NA			NA	NA	NA	11300	NA	4520	NA	8.2		
MTBE	100	700			10.0	<10.0	10.0	220			10.0	<10.0	100	<100	100	700	10.0	290		
EPA Method 8240			ug/l	ug/l					ug/l	ug/l									ug/l	ug/l
Benzene			250	4340					5.0	<5.0									500	10800
Toluene			50	1700					5.0	<5.0									500	25200
Ethyl benzene			50	1710					5.0	<5.0									500	2290
Xylenes			50	3790					5.0	<5.0									500	7590
Total BTEX			NA	11540					NA	NA									NA	45880
MTBE			50	1830					5.0	<5.0									50	617
EPA Method 418.1	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TPH	0.5	5.2	0.5	9.0	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	8.5	0.5	9.0	0.5	<0.5	5	20
EPA Method 7421	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Lead	0.002	0.005	0.002	0.041	0.002	<0.002	0.002	0.009	0.002	0.005	0.002	0.013	0.002	0.003	0.002	0.016	0.002	<0.002	0.002	<0 002
EPA Method 160.1					mg/l	mg/l	mg/l	mg/l												
TDS					1.0	855	1.0	546												
EPA Method 8310			ug/l	ug/l					ug/l	ug/l									ug/l	ug/l
Acenaphthylene			10	454					10	<10									10	109
Naphthalene			10	591					10	<10									10	207

NA = Not applicable. J = Estimated value, above method detection limit (MDL), but below practical quantiation limit. Shading indicates constituent detected above MDL. Black headings indicate analysis not performed.
Only organic compounds detected above MDLs are shown for Methods 8240 and 8310. Complete laboratory analytical reports are contained in Appendix B.

Table 8. Analytical Results for West Fork Trinity River Shallow Soil Sample

Field Sample No.		SED-1A
Depth		0-1'
Lab I.D. No.		3-5919
Analyses	Detection Limit	Result
EPA Method 8240	ug/kg	ug/kg
Benzene	50,000	<50,000
Toluene	50,000	287,000
Ethyl benzene	50,000	118,000
Xylenes	50,000	742,000
BTEX (total)	NA	1,147,000
EPA Method 8310	ug/kg	ug/kg
Naphthalene	1,210	36,000
EPA Method 418.1	mg/kg	mg/kg
Total Petroleum Hydrocarbons	10	130
EPA Method 7421	mg/kg	mg/kg
Lead	1	6.9

Sample collected on 9-28-93.
Shading indicates constituent detected above detection limit.
Complete laboratory analytical results are contained in Appendix C.

Table 9. Analytical Results for Surface Water Samples Collected on 22 October 1993.

Sample Location No.	SW-2A		SW-2AQC		SW-2AQA		SW-3A		SW-4A		SW-5A	
Lab I.D. No.	3-6711		3-6712		3-6713		3-6709		3-6708		3-6707	
Analytical Method	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 8240	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Benzene	5.0	<5.0	5.0	<5.0	5	73	5.0	<5.0	5.0	<5.0	5.0	<5.0
Toluene	5.0	112	5.0	95.6	5	82	5.0	<5.0	5.0	<5.0	5.0	<5.0
Ethyl benzene	5.0	10.7	5.0	7	5	8	5.0	<5.0	5.0	<5.0	5.0	<5.0
Xylenes	5.0	106	5.0	88.3	5	103	5.0	<5.0	5.0	<5.0	5.0	<5.0
BTEX (total)	NA	225.7	NA	191.1	NA	264	NA	NA	NA	NA	NA	NA
EPA Method 418.1	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TPH	0.5	[illegible]	0.5	[illegible]	1.0	[illegible]	0.5	<0.5	0.5	<0.5	0.5	<0.5
EPA Method 7421	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Lead	0.002	0.002	0.002	0.035	0.001	<0.001	0.002	<0.002	0.002	<0.002	0.002	0.002
EPA Method 8310												
No PAH compounds detected above detection limits.												

Shading indicates constituent detected above detection limits.

NA = Not applicable.

Complete laboratory analytical results are contained in Appendix D.

Table 10. Analytical Results for Shallow Soil Samples Collected on 22 October 1993.

Sample Location No.	SED-2A		SED-2AQC		SED-2AQA		SED-4A		SED-5A	
Lab I.D. No.	3-6703		3-6704		3-6705		3-6702		3-6701	
Analytical Method	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result	Detection Limit	Result
EPA Method 8240	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzene	5.0	<5.0	5.0	<5.0	5	<5	5.0	<5.0	5.0	<5.0
Toluene	5.0	<5.0	5.0	<5.0	5	<5	5.0	<5.0	5.0	<5.0
Ethyl benzene	5.0	<5.0	5.0	<5.0	5	<5	5.0	<5.0	5.0	<5.0
Xylenes	5.0	<5.0	5.0	<5.0	5	<5	5.0	<5.0	5.0	<5.0
BTEX (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA Method 418.1	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TPH	10	110	10	210	30	231	10	66	10	<10
EPA Method 7421	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lead	10	52	10	55	0.05	55.3	2	35	10	64
EPA Method 8310	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acenaphthene	1210	<1210	1210	<1210	1.8	<1,800	1210	4340	1210	<1210
Acenaphthylene	1540	<1540	1540	<1540	2.3	670J	1540	<1540	1540	<1540
Anthracene	442	629	442	<442	0.66	400J	442	506	442	<442
Benzo(a)anthracene	8.7	2040	8.7	769	0.013	410	8.7	2630	8.7	<8.7
Benzo(b)fluoranthene	12.1	1450	12.1	<12.1	0.018	954	12.1	2500	12.1	<12.1
Benzo(k)fluoranthene	11.4	<11.4	11.4	<11.4	0.017	<0.017	11.4	1840	11.4	<11.4
Benzo(g,h,l)perylene	50.9	1540	50.9	653	0.076	505J	50.9	2420	50.9	<50.9
Benzo(a)pyrene	15.4	1580	15.4	602	0.023	460	15.4	2570	15.4	<15.4
Chrysene	101	2040	101	789	0.15	1147	101	2740	101	<101
Dibenzo(a,h)anthracene	20.1	<20.1	20.1	<20.1	0.03	128J	20.1	<20.1	20.1	<20.1
Fluoranthene	141	6240	141	2090	0.21	2450	141	4150	141	<141
Fluorene	141	<141	141	<141	0.21	<0.210	141	<141	141	<141
Indeno(1,2,3-cd)pyrene	28.8	665	28.8	240	0.043	390	28.8	1390	28.8	<28.8
Naphthalene	1210	3910	1210	1360	1.8	<1,800	1210	2190	1210	<1210
Phenanthrene	429	1780	429	590	0.64	1030J	429	994	429	<429
Pyrene	181	9570	181	1400	0.27	<0.270	181	4340	181	<181

Shading indicates constituent detected above detection limit.

NA = Not applicable.

J = Estimated value.

Complete laboratory analytical results are contained in Appendix C.

Table 11. Distribution of QA/QC Soil Samples Collected for Chemical Analyses from Well Borings

WELL BORING	ZONE TO BE SAMPLED	DEPTH SAMPLED	BTEX/MTBE				TPH			
			FS	QA	QC	EB	FS	QA	QC	EB
MW-7	Unsaturated/Contaminated	2-3'	X				X			
	Rinsate	6.0-8.0'				X				
	Immediately Above Saturated	6.5-8.0'	X	X	X		X			
	Total Depth	9-10'	X				X			
MW-8	Unsaturated/Contaminated	6-7'	X				X			
	Rinsate	8-10'								X
	Immediately Above Saturated	10-12'	X				X	X	X	
	Total Depth	26-27'	X				X			
MW-9	Unsaturated/Contaminated	5-6'	X				X			
	Immediately Above Saturated	14-15'	X				X			
	Total Depth	28-29'	X				X			
MW-10	Unsaturated/Contaminated	8-9'	X				X			
	Rinsate	14-16'								X
	Immediately Above Saturated	16-18'	X				X	X	X	
	Total Depth	31-32'	X				X			
MW-11	Unsaturated/Contaminated	7-8'	X				X			
	Rinsate	16-18'				X				
	Immediately Above Saturated	20-22'	X	X	X		X			
	Total Depth	37-38'	X				X			
MW-12	Unsaturated/Contaminated	7-8'	X				X			
	Immediately Above Saturated	8-9'	X				X			
	Total Depth	37-38'	X				X			

FS = Field sample
X = Field sample taken
QA = Quality assurance sample (replicate)
QC = Quality control sample (replicate)
EB = Equipment blank/rinsate

Table 12. Distribution of QA/QC Groundwater Samples Collected for Chemical Analysis from Monitor Wells

Parameter / Sample No.	BTEX/MTBE Method 8020	TPH Method 418.1	TDS Method 160.1	PAH Method 8310	VOC/MTBE Method 8240	Lead (Pb) Method 7421	Field pH/Cond/Temp
TB-1					x		
MW-9	x	x	x			x	x
MW-10		x	x	x	x	x	x
MW-10QA		x	x	x	x	x	x
MW-10QC		x	x	x	x	x	x
MW-11	x	x	x			x	x
MW-12	x	x	x			x	x
TB-2					x		
MW-1		x		x	x	x	x
MW-1QA		x		x	x	x	x
MW-1QC		x		x	x	x	x
MW-2	x	x				x	x
TB-3					x		
SAV-1	x	x				x	x
SAV-2		x		x	x	x	x
MW-7	x	x	x			x	x
MW-8	x	x	x			x	x
MW-3		x		x	x	x	x
BSS-A	x	x				x	x
TB-4					x		
MW-4	x	x				x	x
MW-5	x	x				x	x
MW-6	x	x				x	x
BSS-B		x		x	x	x	x

Sampling was performed in the order listed.

TB = Travel blank prepared at beginning of each sampling day.

Table 13. Distribution of QA/QC Surface Water Samples

Sample Nos.	VOC Method 8240	TPH Method 418.1	PAH Method 8310	Lead Method 7421
TB1A	X	-	-	-
SW-2A	X	X	X	X
SW-2AQA	X	X	X	X
SW-2AQC	X	X	X	X
SW-3A	X	X	X	X
SW-4A	X	X	X	X
SW-5A	X	X	X	X

TB = Travel blank prepared at beginning of each sampling day.

Table 14. Distribution of QA/QC Shallow Soil Samples for Surface Water Sampling

Sample Nos.	VOC Method 8240	TPH Method 418.1	PAH Method 8310	Lead Method 7421
EB-2A	X	X	X	X
SED-2A	X	X	X	X
SED-2AQA	X	X	X	X
SED-2AQC	X	X	X	X
SED-4A	X	X	X	X
SED-5A	X	X	X	X

EB = Equipment blank prepare after sampling equipment decontaminated and prior to taking sample.

Table 15. Containers and Preservation for Soil Samples from Well Borings

SOIL			
Parameter	No.	Type Container	Preservation
BTEX/MTBE	1	8-ounce wide mouth glass jar	Full; 4 C
TPH	1	8-ounce wide mouth glass jar	Full; 4 C
WATER (Equipment Blank)			
BTEX/MTBE	3	40-ml glass vial	Full;HCl pH<2;4 C
TPH	2	1-liter amber glass bottle	HCl pH<2;4 C

Table 16. Containers and Preservation for Groundwater Samples

WATER			
Parameter	No.	Type Container	Preservation
VOC	3	40-ml glass vial	Full; HCl pH<2
BTEX/MTBE	3	40-ml glass vial	Full; HCl pH<2
TPH	2	1-liter amber glass bottle	HCl pH<2
PAH	1	1-liter amber glass bottle	Full
TDS	1	1-liter plastic bottle	None
Lead	1	1-liter plastic bottle	HNO3 pH<2

Table 17. Containers and Preservation for Surface Water and Shallow Soil Samples

WATER			
Parameter	No.	Type Container	Preservation
VOC	3	40-ml glass vial	Full; HCl pH<2
TPH	2	1-liter amber glass bottle	HCl pH<2
Lead	1	1-liter plastic bottle	HNO3 pH<2
PAH	1	1-liter amber glass bottle	Full
SOIL			
VOC	2	40-ml glass vial or 4-oz ja	Full
TPH & Lead	1	8-oz wide mouth glass jar	Full
PAH	1	8-oz wide mouth glass jar	Full

TAB

FIGURES

226091

N

100 50 0 100

SCALE IN FEET

LEGEND

MW-1 ● EXISTING MONITOR WELL AND NUMBER

SW-1 ● SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER

SED-1 ■ SHALLOW SOIL SAMPLE LOCATION AND NUMBER

SURFACE WATER FLOW DIRECTION

BG BACKGROUND SAMPLE LOCATION

ST16 1 ⊕ SOIL BORING LOCATION AND NUMBER

APPROXIMATE LIMITS OF CONTAMINATED GROUNDWATER SEEPAGE

FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)

WEST FORK TRINITY RIVER

ROGNER

JENNINGS DR.

MW-12 MW-9 MW-7 MW-1 MW-10 MW-5 MW-4 MW-6 MW-2 MW-11 MW-8 MW-3

BSS-B BSS-C (PLUGGED) BSS-A

SAV-2 SAV-1

ST16-1 ST16-2 ST16-3

SW-1 SED-1A SED-1 SW-2 SW-2A SW-4A SW-3 SW-3A SW-4 SW-5

A A' B B' C C' D D' BG

CONCRETE FLUME, ASPHALT PARKING, GRASS, GAS STATION FF-568.62, WASTE OIL TANK, VAPOR TESTER, VENT PIPE, GUARD HOUSE, PIPE LINE MARKER, TREES

NOTES:

1. FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
2. SED-2A, SED-3A, AND SED-4A SHALLOW SOIL SAMPLE LOCATIONS SAME AS SW-2A, SW-3A, AND SW-4A, RESPECTIVELY.

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

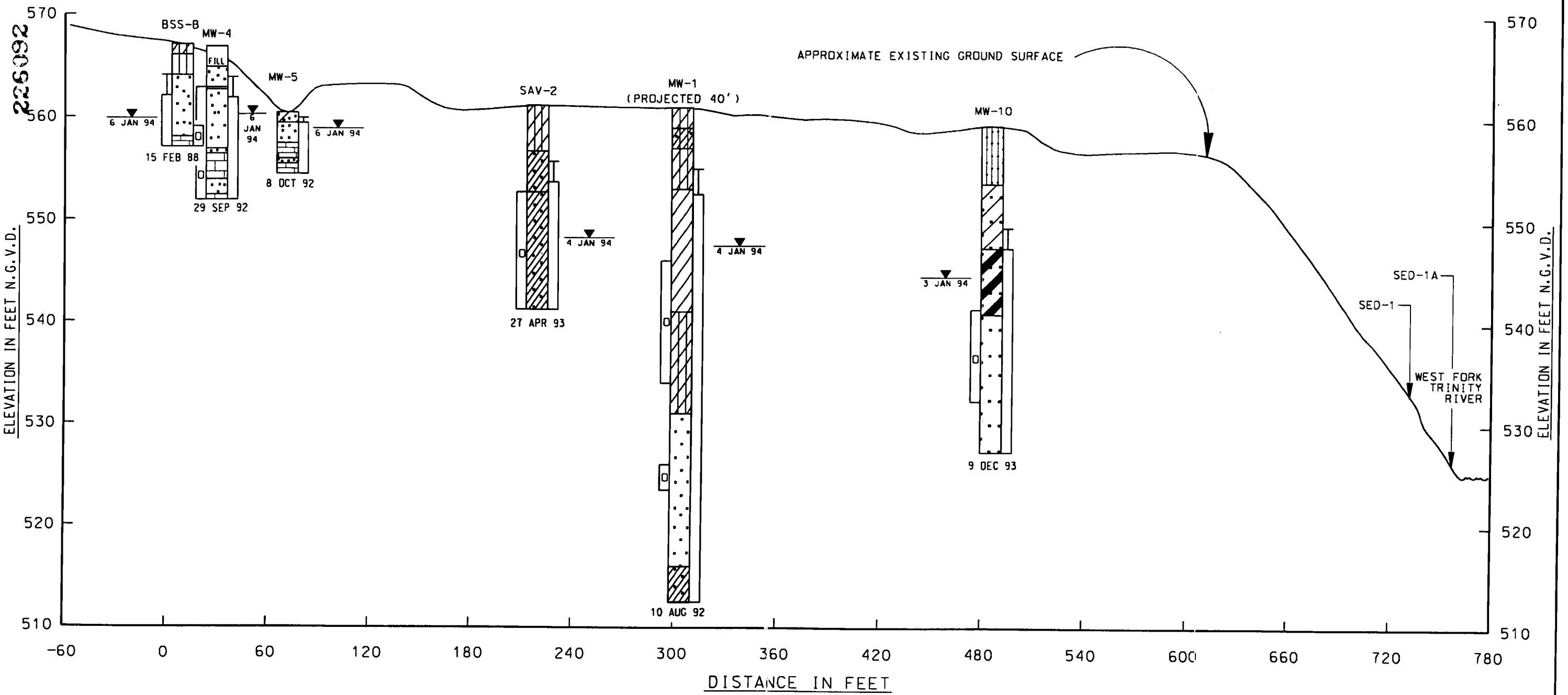
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SITE MAP AND SAMPLE LOCATIONS

DATE: JUNE 1994 | FIGURE 1

/ed/drawing/carswell/bss/sitebas May. 19, 1994 07:56:34

226092



LEGEND

10 MAY 93 — GROUNDWATER ELEVATION AND DATE

I — SANDED INTERVAL

▯ — SCREENED INTERVAL

D — ODOR DETECTED DURING DRILLING

GENERAL NOTES:

1. FOR LOGS OF BORINGS, SEE APPENDIX A.
2. FOR WELL CONSTRUCTION DETAILS, SEE APPENDIX B.
3. FOR LOCATION OF PROFILES, SEE FIGURE 1, SITE MAP AND SAMPLE LOCATIONS.
4. STRATIGRAPHIC SYMBOLS SHOWN ARE IN ACCORDANCE WITH DESCRIPTION OF MATERIALS ON THE FIELD LOGS.

US ARMY CORPS
OF ENGINEERS
FORT WORTH DISTRICT

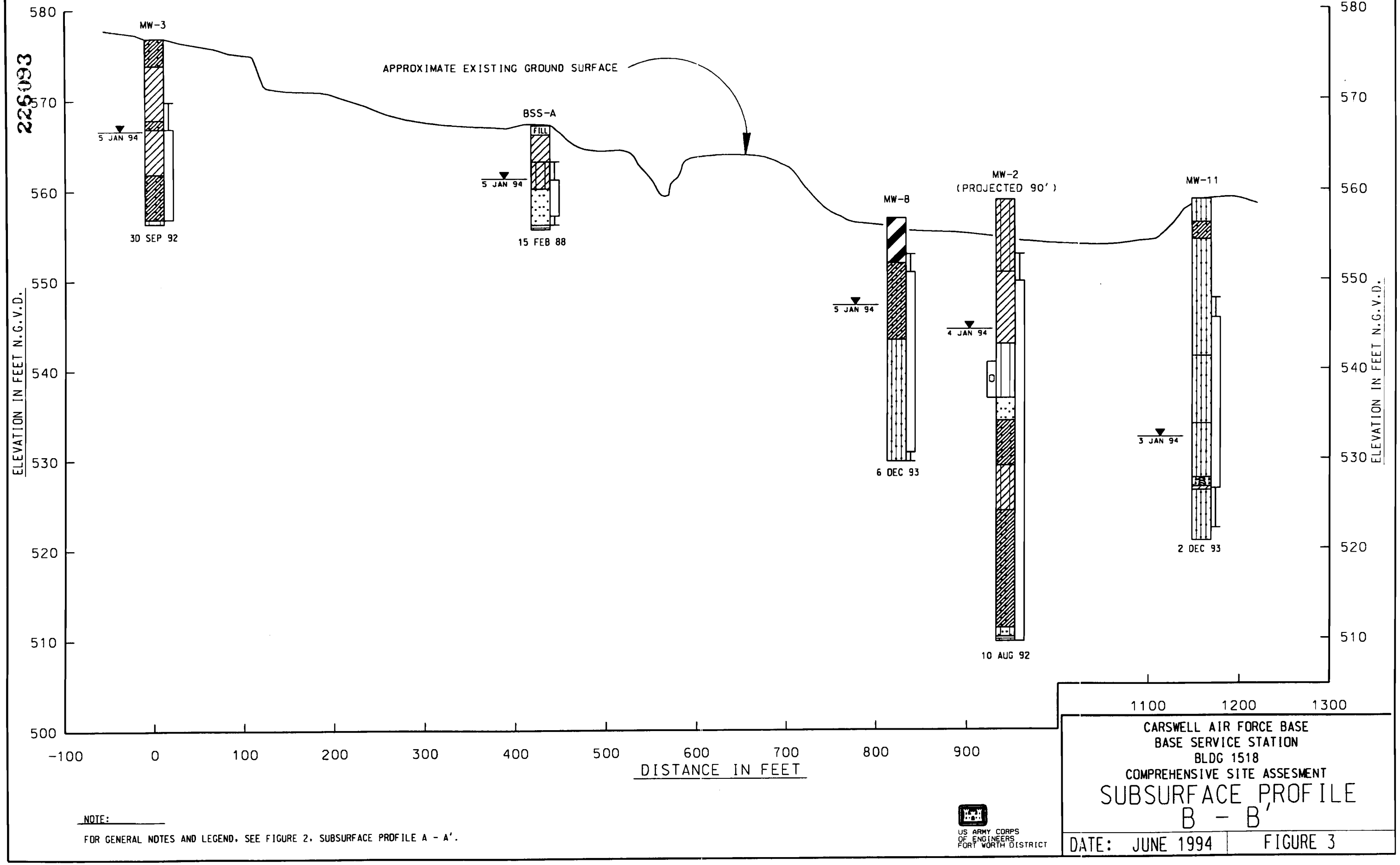
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SUBSURFACE PROFILE
A – A′

DATE: JUNE 1994 | FIGURE 2

drawing/carswell/bss/bssprof May. 23, 1994 10:44:14

226093



NOTE:

FOR GENERAL NOTES AND LEGEND, SEE FIGURE 2, SUBSURFACE PROFILE A - A'.

US ARMY CORPS
OF ENGINEERS
FORT WORTH DISTRICT

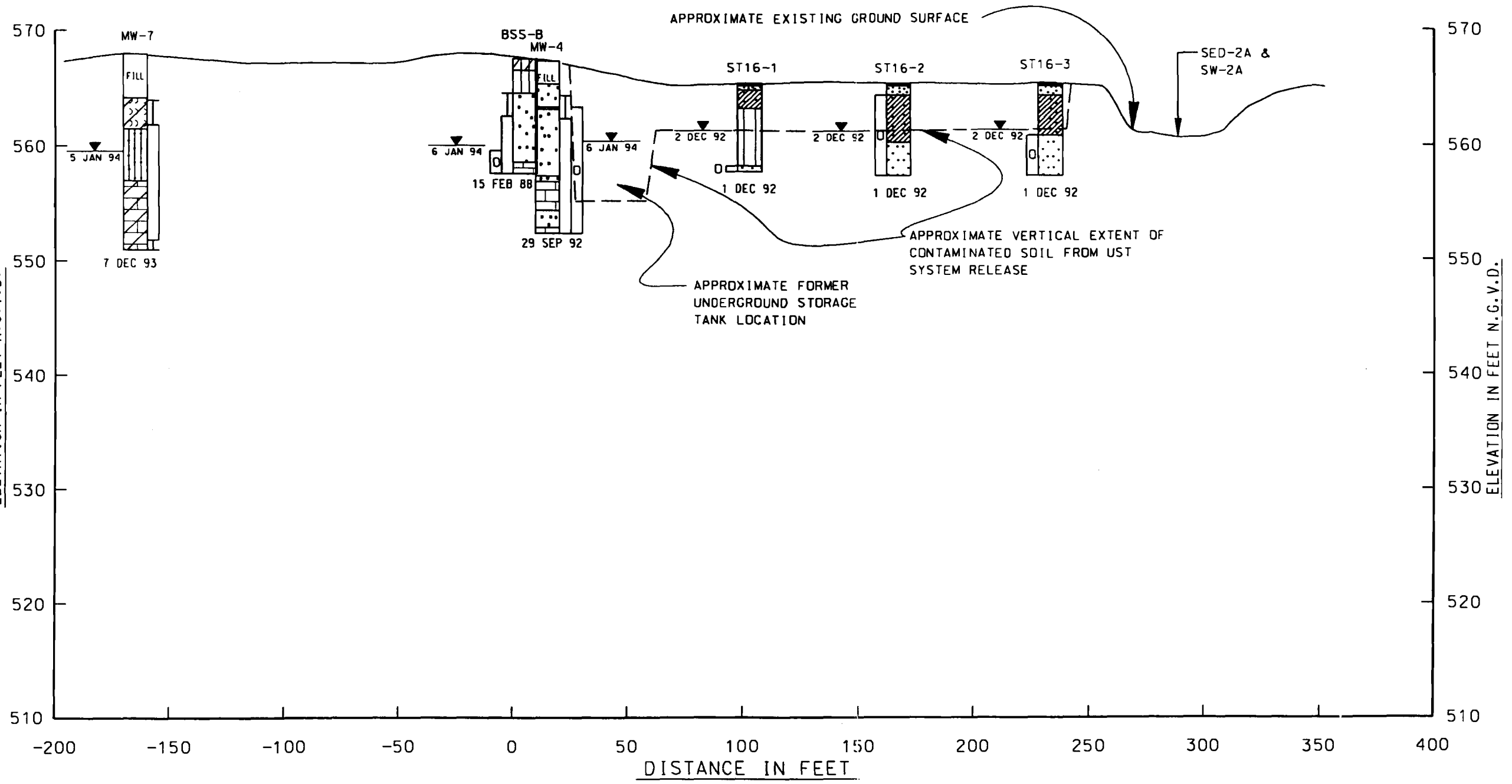
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SUBSURFACE PROFILE B - B'

DATE: JUNE 1994

FIGURE 3

/ed/drawing/carswell/bss/bssprof May. 23, 1994 10:46:53



NOTE:

1. FOR GENERAL NOTES AND LEGEND, SEE FIGURE 2, SUBSURFACE PROFILE A - A'.
2. FOR DEPTHS AND CONCENTRATIONS OF PETROLEUM HYDROCARBON CONTAMINANTS, SEE FIGURE 7, TABLE 2, AND BORING LOGS IN APPENDIX A.

US ARMY CORPS
OF ENGINEERS
FORT WORTH DISTRICT

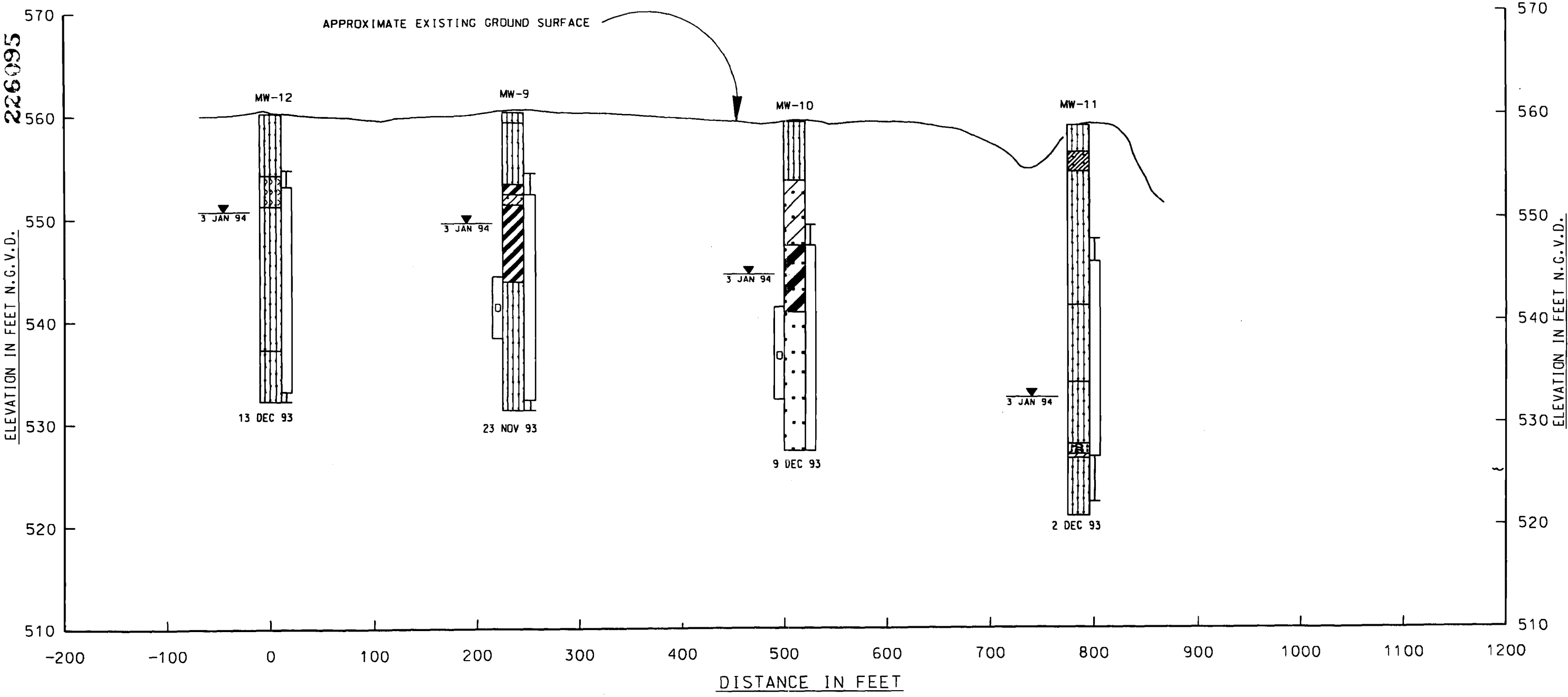
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SUBSURFACE PROFILE C - C'

DATE: JUNE 1994 | FIGURE 4

drawing/carswell/bss/bssprof May. 23, 1994 11:23:25

226095



NOTE:

FOR GENERAL NOTES AND LEGEND, SEE FIGURE 2, SUBSURFACE PROFILE A - A'.

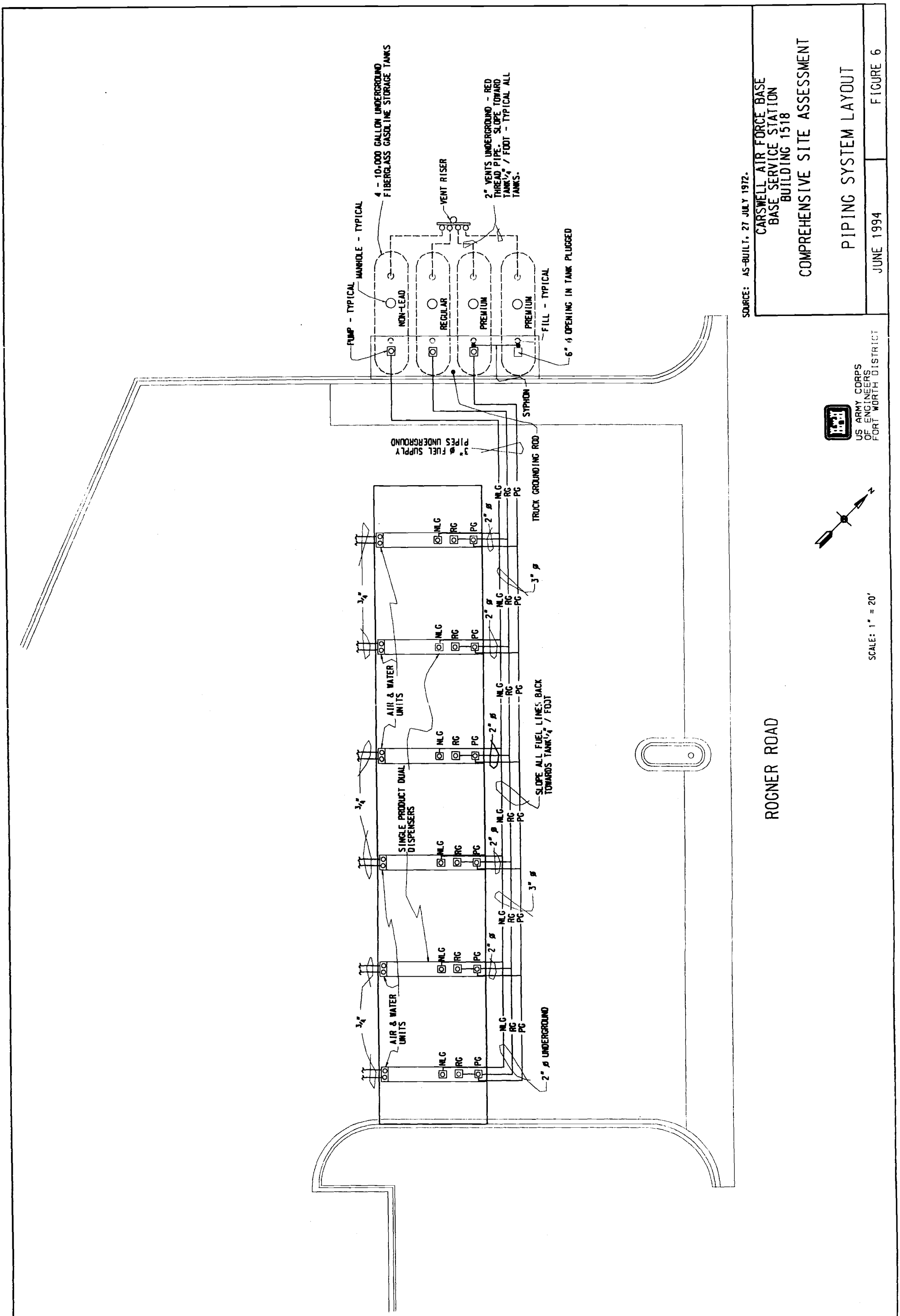
US ARMY CORPS
OF ENGINEERS
FORT WORTH DISTRICT

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SUBSURFACE PROFILE D - D'

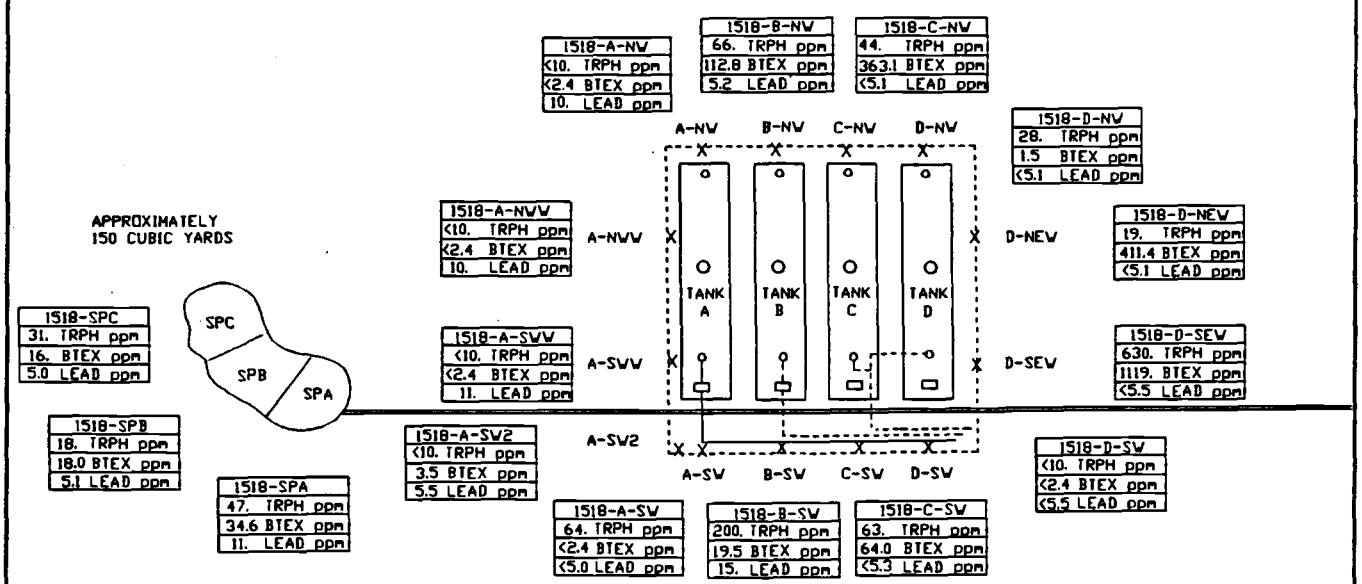
DATE: JUNE 1994 | FIGURE 5

i/drawing/carswell/bss/bssprof May. 23, 1994 11:17:18


4 - 10,000 GALLON UNDERGROUND FIBERGLASS GASOLINE STORAGE TANKS
VENT RISER
2" VENTS UNDERGROUND - RED THREAD PIPE. SLOPE TOWARD TANK 1/4" / FOOT - TYPICAL ALL TANKS.
PUMP - TYPICAL
MANHOLE - TYPICAL
NON-LEAD
REGULAR
PREMIUM
PREMIUM
FILL - TYPICAL
6" ø OPENING IN TANK PLUGGED
SYPHON
3" ø FUEL SUPPLY PIPES UNDERGROUND
GROUNDING ROD
TRUCK GROUNDING
NLG
RG
PG
2" ø
3" ø
3/4"
AIR & WATER UNITS
SINGLE PRODUCT DUAL DISPENSERS
SLOPE ALL FUEL LINES BACK TOWARDS TANK 1/4" / FOOT
2" ø UNDERGROUND
ROGNER ROAD
SCALE: 1" = 20'
N
SOURCE: AS-BUILT, 27 JULY 1972.
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BUILDING 1518
COMPREHENSIVE SITE ASSESSMENT
PIPING SYSTEM LAYOUT
JUNE 1994
FIGURE 6
US ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

226096

226097



SOURCE: PWI PETROLEUM STORAGE TANK REMOVAL & INITIAL SITE ASSESSMENT, JULY 1993.

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BUILDING 1518
COMPREHENSIVE SITE ASSESSMENT

SAMPLE LOCATION TANKHOLD MAP

DRAWING NOT TO SCALE

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT

JUNE 1994 | Figure 7

226098

N

100 50 0 100

SCALE IN FEET

MW-12
550.76

PIPE LINE MARKER

WEST FORK TRINITY RIVER

FLOW

MW-7
559.52

MW-9
549.56

MW-5
558.88

BSS-B
559.91

MW-4
560.27

MW-1
547.49

SAV-2
548.28

SAV-1
548.08

MW-10
544.48

FORMER LOCATION OF 4 UNDERGROUND
PETROLEUM STORAGE TANKS (PST's)

MW-6
560.59

MW-2
544.45

MW-
53?.

MW-8
547.11

BSS-A
561.25

MW-3
565.51

BG

JENNINGS DR.

TUGMER DR.

GAS STATION FF=568.52

GUARD HOUSE

ASPHALT PARKING

CONCRETE

GRASS

ASPHALT

CONCRETE ISLAND

CONCRETE FLUME

PIPE LINE MARKER

VAPOR TESTER

WASTE OIL TANK

VENT PIPE

555 560 550 545 540 535

LEGEND

MW-1 547.49 — EXISTING MONITOR WELL NUMBER AND GROUNDWATER ELEVATION. JANUARY 1994

SW-1 — SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER

SB-1 — SHALLOW SOIL SAMPLE LOCATION AND NUMBER

SURFACE WATER FLOW DIRECTION

BG — BACKGROUND SAMPLE LOCATION

SB-1 — SOIL BORING LOCATION AND NUMBER

SEEPAGE AREAS

GROUNDWATER FLOW DIRECTION

550 — GROUNDWATER SURFACE ELEVATION. JANUARY 1994

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

NOTE:

FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.

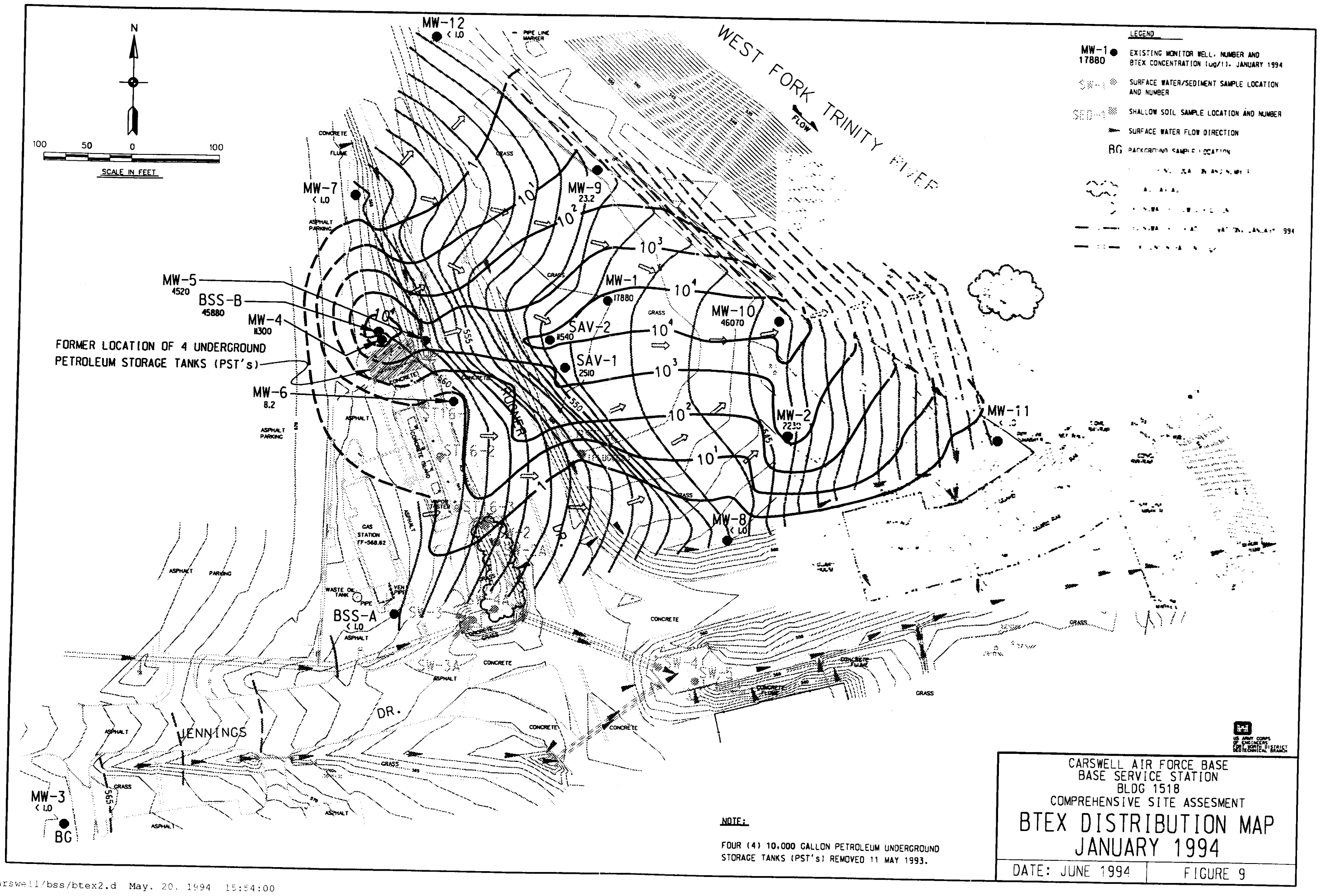
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

GROUNDWATER GRADIENT MAP JANUARY 1994

DATE: JUNE 1994 FIGURE 8

f:/ed/drawing/carswell/bss/plume2. May. 18, 1994 15:35:12

226099



NOTE:

FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

BTEX DISTRIBUTION MAP JANUARY 1994

DATE: JUNE 1994 | FIGURE 9

f:/ed/drawing/carswell/bss/btex2.d May. 20. 1994 15:54:00

226190

N

100 50 0 100

SCALE IN FEET

MW-12 < 0.5

PIPE LINE MARKER

WEST FORK TRINITY FLOW

MW-7 < 0.5

MW-9 1.8

MW-5 9.0

BSS-B 20.0

MW-4 8.5

FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)

MW-6 < 0.5

MW-1 9.0

SAV-2 9.0

SAV-1 5.2

MW-10 4.8

MW-2 2.9

MW-11 < 0.5

MW-8 < 0.5

BSS-A < 0.5

MW-3 < 0.5

BG

JENNINGS DR.

ROCKMER DR.

GAS STATION FF-568.62

CONCRETE FLUME

ASPHALT PARKING

GRASS

CONCRETE

ASPHALT

LEGEND

MW-1 9.0 EXISTING MONITOR WELL, NUMBER AND TPH CONCENTRATION (mg/l), JANUARY 1994

SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER

SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER

SURFACE WATER FLOW DIRECTION

BG BACKGROUND SAMPLE LOCATION AND NUMBER

NOTE:

FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

TPH DISTRIBUTION MAP JANUARY 1994

DATE: JUNE 1994 | FIGURE 10

f:/ed/drawing/carswell/bss/tph2.dg May. 20, 1994 16:00:18

226191

N

100 50 0 100

SCALE IN FEET

LEGEND

MW-1 ● EXISTING MONITOR WELL AND NUMBER

SW-1 ● SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER

SED-1 ■ SHALLOW SOIL SAMPLE LOCATION AND NUMBER

SURFACE WATER FLOW DIRECTION

BG BACKGROUND SAMPLE LOCATION

ST16-1 SOIL BORING LOCATION AND NUMBER

APPROXIMATE LIMITS OF CONTAMINATED GROUNDWATER SEEPAGE

WEST FORK TRINITY RIVER

FLOW

ROGNER DR.

JENNINGS DR.

FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)

SED-1A		
BTEX	1147	mg/kg
TPH	130	mg/kg
Naphthalene	36	mg/kg
Other PAHs	ND	

SW-2A	
BTEX	225.7 ug/l
TPH	<0.5 mg/l
PAHs	ND

SED-2A	
BTEX	<5.0 ug/kg
TPH	210 mg/kg
PAHs	ND-6240 ug/kg

SW-3A	
BTEX	<5.0 ug/l
TPH	<0.5 mg/l

SW-4A	
BTEX	<5.0 ug/L
TPH	<0.5 mg/l
PAHs	ND

SED-4A	
BTEX	<5.0 mg/kg
TPH	65 mg/kg
PAHs	ND-4340 ug/kg

NOTES:

1. FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST'S) REMOVED 11 MAY 1993.
2. SED-2A, SED-3A, AND SED-4A SHALLOW SOIL SAMPLE LOCATIONS SAME AS SW-2A, SW-3A, AND SW-4A, RESPECTIVELY.
3. ANALYTICAL RESULTS ARE FOR SAMPLES COLLECTED 22 OCT 93. SED-1A COLLECTED 28 SEP 93.
4. SEE TABLE 10 AND APPENDIX C FOR INDIVIDUAL PAH COMPOUND CONCENTRATIONS AND DETECTION LIMITS.

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

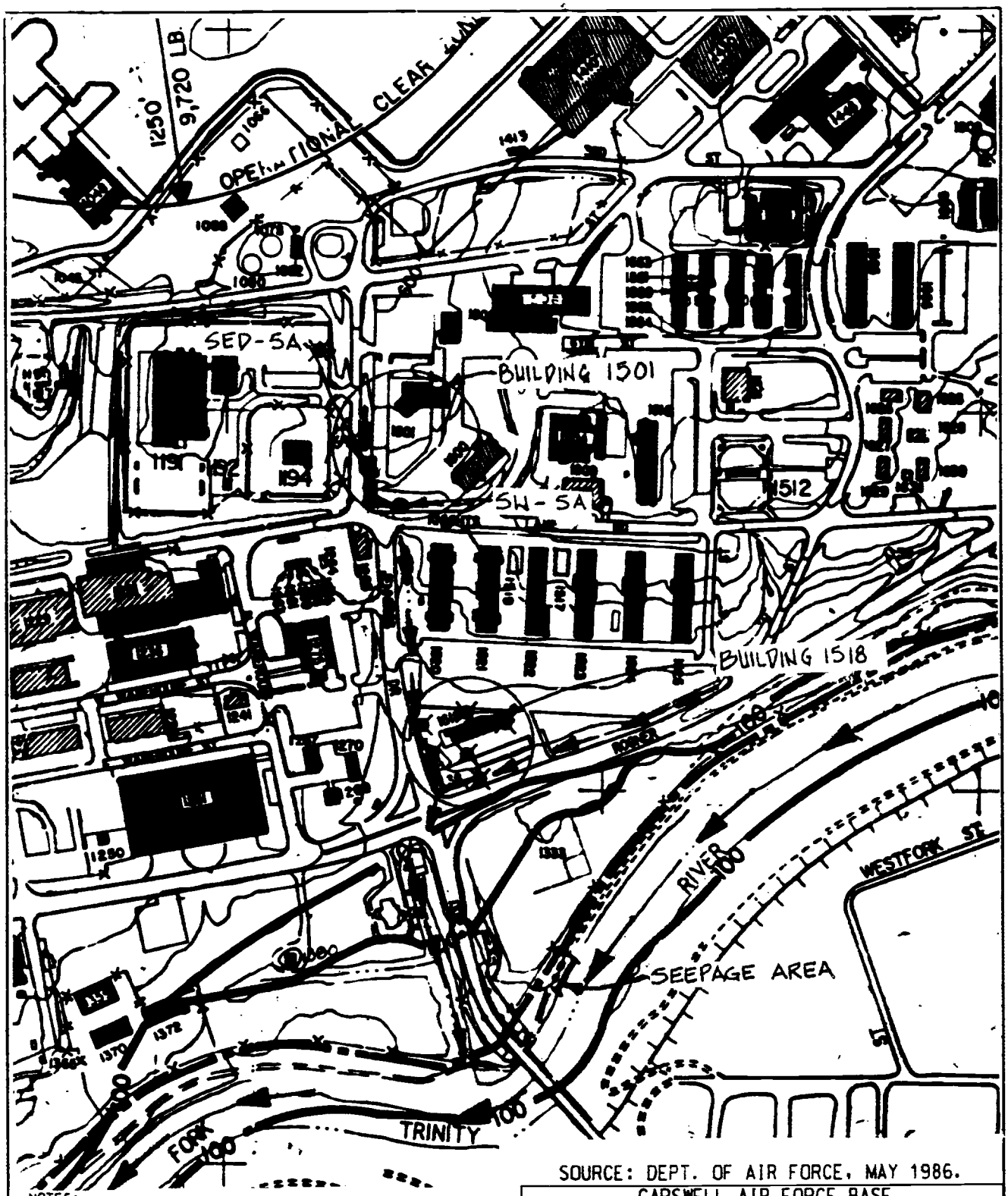
CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BLDG 1518
COMPREHENSIVE SITE ASSESMENT

SURFACE WATER IMPACT MAP

DATE: JUNE 1994 | FIGURE 12

d/drawing/carswell/bss/swimpac May. 20, 1994 16:05:08

226102



SOURCE: DEPT. OF AIR FORCE, MAY 1986.

NOTES:
1. SAMPLES SW-5A AND SED-5A WERE NON-DETECT FOR BTEX, TPH, PAH ANALYSES.
2. SEE FIG. 12 FOR ALL OTHER SURFACE WATER AND SHALLOW SOIL SAMPLE LOCATIONS.

SCALE: 1" = 400'

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BUILDING 1518
COMPREHENSIVE SITE ASSESSMENT

SURFACE WATER DRAINAGE MAP

JUNE 1994 | Figure 11

TAB

APPENDIX A

Soil Boring Logs

ST16-1, ST16-2, and ST16-3

Hole No. ST16-1

226105

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT CARSWELL A.F.B.		10. SIZE AND TYPE OF BIT 8" AUGER/6" SPLIT BAR.	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and File number) ST16-1		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED N/A
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.28 @ 24 HRS	
		16. DATE HOLE STARTED 1 DEC 92	COMPLETED 1 DEC 92
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 565.38	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 8.0'		19. SIGNATURE OF INSPECTOR BOB MCVEY	

% MOISTURE CONTENT a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		0.0' TO 0.25' ASPHALT.			1. NOTES ALL SAMPLES COLLECTED AS DESCRIBED IN DRILL INSTRUCTIONS. WATER AT 4.10' AT 0805 HOURS, ON 2 DECEMBER, 1992. HOLE GROUTED UP AFTER WATER SAMPLED ON 2 DECEMBER, 1992. NOTE: THE 7.5' DEPTH WAS DERIVED FROM THE FACT THAT ONLY 0.5' OF SAND WAS ON ROCK, AND HOLE WAS OPEN TO 8.0'. SAND CONTACT MIGHT BE HIGHER? 2. SOIL SAMPLES 1. & QC. - 2.0' TO 3.0' 2. - 3.5' TO 4.0'
	2		0.25' TO 0.6' GRAVEL - BASE, COARSE TO FINE, CHEMICAL ODOR, WHITE, CLAYEY/SANDY.		ST16-1-1 & QC	
			0.6' TO 2.2' CLAY - HIGH PLASTICITY, STIFF, MOIST, BLACK, SANDY/GRAVELLY, CALCAREOUS, FILL-? CHEMICAL ODOR.		ST16-1-2	
	4					
			2.2' TO 7.5'-? SILT/CALICHE - LOW TO NO PLASTICITY, VERY STIFF TO HARD, DRY, VERY PALE BROWN, NUMEROUS FOSSIL SHELLS.			
	6					
			7.5' TO 8.0' SAND - FINE TO COARSE, WET, STRONG BROWN, GRAVELLY, CEMENTATION. CHEMICAL ODOR.			
	8		TD 8.0'			
	10					
	12					
	14					
	16					
	18					
	20					

2 DEC 92 (▼)

1 DEC 92 (▽)

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT MONITOR WELL @ BSS

HOLE NO. ST16-1

Hole No. ST16-1

226196

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT CARSWELL AFB		10. SIZE AND TYPE OF BIT 8" AUG/6" SPLIT BAR.	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (MSL or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and File number) ST16-1		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED N/A	
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.28 @ 24 HRS.	
		16. DATE HOLE STARTED 1 DEC 92; COMPLETED 1 DEC 92	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 565.38	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 8.0'		19. SIGNATURE OF INSPECTOR BOB McVEY	

DEPTH a	SYMBOL b	CLASSIFICATION OF MATERIALS (Description) c	SAMPLE*	TPH PPM	TCLP Pb PPM	TCLP B PPM	TCLP T PPM	TCLP E PPM	TCLP X PPM
0		0.0' TO 0.25' ASPHALT.	ODOR						
2		0.25' TO 0.6' GRAVEL - BASE, COARSE TO FINE, CHEMICAL ODOR, WHITE, CLAYEY/SANDY.	ST16-1-1 & DC	81	<0.02	0.022	0.075	0.041	0.130
4 ▼ 2 DEC 92		0.6' TO 2.2' CLAY - HIGH PLASTICITY, STIFF, MOIST, BLACK, SANDY/GRAVELLY, CALCAREOUS, FILL-? CHEMICAL ODOR.		45	<0.02	0.012	0.041	0.007	0.032
6		2.2' TO 7.5'-? SILT/CALICHE - LOW TO NO PLASTICITY, VERY STIFF TO HARD, DRY, VERY PALE BROWN, NUMEROUS FOSSIL SHELLS.	ST16-1-2						
1 DEC 92 ▽ 8		7.5' TO 8.0' SAND - FINE TO COARSE, WET, STRONG BROWN, GRAVELLY, CEMENTATION. CHEMICAL ODOR.	0						
		TD 8.0'							
10									
12									
14									
16									
18									
20									

SWL 350
SEP 80

PROJECT MONITOR WELL @ BSS

HOLE NO. ST16-1

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:47:29

Hole No. ST16-2

226197

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT CARSWELL A.F.B.		10. SIZE AND TYPE OF BIT 8" AUGER/6" SPLIT BARREL	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION, BLDG 1518		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and file number) .ST16-2		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED N/A	
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.28 @ 24 HRS	
7. THICKNESS OF OVERBURDEN -		16. DATE HOLE STARTED 1 DEC 92; COMPLETED 1 DEC 92	
8. DEPTH DRILLED INTO ROCK -		17. ELEVATION TOP OF HOLE 565.39	
9. TOTAL DEPTH OF HOLE 8.0		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR BOB MCVEY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			0.0' TO 0.2' ASPHALT.			1. NOTES ALL SAMPLES COLLECTED AS PER DRILL INSTRUCTIONS. HOLE GROUTED UP AFTER WATER SAMPLES ON 2 DECEMBER, 1992. WATER AT 4.11', ON 2 DECEMBER, 1992.
	2		0.2' TO 1.0' GRAVEL - BASE, COARSE TO FINE, WHITE, GRAY, CLAYEY/SANDY, CALCAREOUS.		ST16-2-1 & QA	
2 DEC 92	4		1.0' TO 5.1' CLAY - HIGH PLASTICITY, STIFF, MOIST, BLACK TO VERY DARK BROWN, GRAVELLY AND SANDY, CALCAREOUS, CHEMICAL ODOR, FILL, NAIL FOUND.		ST16-2-2	2. SOIL SAMPLES 1. & QA. - 2.0' TO 3.0' 2. - 4.0' TO 5.0'
1 DEC 92	6		5.1' TO 8.0' SAND - MOSTLY FINE WITH A THIN ZONE OF FINE MEDIUM GRAIN NEAR TOP, WET, GRAY TO LIGHT BROWN TO OLIVE WITH SOME BLACK, GRAVEL ZONE AT 8.0', CHEMICAL ODOR.			
	8		TD 8.0'			
	10					
	12					
	14					
	16					
	18					
	20					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT MONITOR WELL @ BSS | HOLE NO. ST16-2

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 08:08:09

Hole No. ST16-2

225108

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FT WORTH DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT CARSWELL AFB		10. SIZE AND TYPE OF BIT 8" AUGER/6" SPLIT BARREL	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION, BLDG 1518		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and File number) ST16-2		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED N/A
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.28 @ 24 HRS	
		16. DATE HOLE STARTED 1 DEC 92	COMPLETED 1 DEC 92
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 565.39	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 8.0'		19. SIGNATURE OF INSPECTOR BOB McVEY	

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	SAMPLE	TPH PPM	TCLP Pb PPM	TCLP B PPM	TCLP T PPM	TCLP E PPM	TCLP X PPM
		0.0' TO 0.2' ASPHALT.	ST16-2-1 & QA						
2		0.2' TO 1.0' GRAVEL - BASE, COARSE TO FINE, WHITE, GRAY, CLAYEY/SANDY, CALCAREOUS.		39	<0.02	0.006	<0.005	0.021	0.023
4		1.0' TO 5.1' CLAY - HIGH PLASTICITY, STIFF, MOIST, BLACK TO VERY DARK BROWN, GRAVELLY AND SANDY, CALCAREOUS, CHEMICAL ODOR, FILL, NAIL FOUND.	ODOR	200	<0.02	0.044	0.100	0.180	0.130
2 DEC 92									
1 DEC 92		5.1' TO 8.0' SAND - MOSTLY FINE WITH A THIN ZONE OF FINE MEDIUM GRAIN NEAR TOP, WET, GRAY TO LIGHT BROWN TO OLIVE WITH SOME BLACK, GRAVEL ZONE AT 8.0', CHEMICAL ODOR.	ST16-2-2						
6									
8		TD 8.0'							
10									
12									
14									
16									
18									
20									

SWL 350
SEP 80

PROJECT MONITOR WELL @ BSS

HOLE NO. ST16-2

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 08:05:32

Hole No. ST16-3

226109

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT CARSWELL A.F.B.		10. SIZE AND TYPE OF BIT 8" AUGER/6" SPLIT BARREL	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION, BLDG 1518		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and file number) .ST16-3		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED N/A	
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.04 @ 24 HRS	
		16. DATE HOLE STARTED 1 DEC 92; COMPLETED 1 DEC 92	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 565.33	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 8.0'		19. SIGNATURE OF INSPECTOR BOB MCVEY	

% MOISTURE CONTENT	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0		0.0' TO 0.2' ASPHALT.			1. NOTES ALL SAMPLES COLLECTED AS PER DRILL INSTRUCTIONS. HOLE GROUTED UP AFTER WATER SAMPLES COLLECTED ON 2 DECEMBER, 1992. WATER AT 4.29' ON 2 DECEMBER, 1992.
	2		0.2' TO 1.2' GRAVEL - BASE, COARSE TO FINE, MOIST TO VERY MOIST, CHEMICAL ODOR, LIGHT GRAY, VERY CLAYEY, SANDY, CALCAREOUS.		ST16-3-1	
	4		1.2' TO 4.7' CLAY - FILL-?, HIGH PLASTICITY, MEDIUM STIFF, MOIST, CHEMICAL ODOR, SANDY/GRAVELLY, BLACK TO VERY DARK BROWN, CALCAREOUS.		ST16-3-2	2. SOIL SAMPLES 1. 2.0' TO 3.0' 2. 4.0' TO 4.7'
	6		4.7' TO 8.0' SAND - FINE, VERY MOIST TO WET, DARK BROWN TO LIGHT GRAY TO STRONG BROWN, SOME CHEMICAL ODOR STRONG AT TOP AND SEEMS TO DECREASE WITH DEPTH, CEMENTATION AT 7.8' TO 8.0'.			
	8		TD 8.0'			
	10					
	12					
	14					
	16					
	18					
	20					

2 DEC 92 (▽)

1 DEC 92 (▽)

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PROJECT MONITOR WELL @ BSS

HOLE NO. ST16-3

Hole No. ST16-3

226110

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FT WORTH DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT CARSWELL AFB		10. SIZE AND TYPE OF BIT 8" AUGER/6" SPLIT BARREL	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION, BLDG 1518		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL NITCO	
4. HOLE NO. (As shown on drawing title and File number) ST16-3		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 2	UNDISTURBED N/A
5. NAME OF DRILLER BREWER		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 561.04 @ 24 HRS	
		16. DATE HOLE STARTED 1 DEC 92	COMPLETED 1 DEC 92
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 565.33	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A	%
9. TOTAL DEPTH OF HOLE 8.0'		19. SIGNATURE OF INSPECTOR BOB McVEY	

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	SAMPLE*	TPH PPM	TCLP Pb PPM	TCLP B PPM	TCLP T PPM	TCLP E PPM	TCLP X PPM
a	b	c							
		0.0' TO 0.2' ASPHALT.							
2		0.2' TO 1.2' GRAVEL - BASE, COARSE TO FINE, MOIST TO VERY MOIST, CHEMICAL ODOR, LIGHT GRAY, VERY CLAYEY, SANDY, CALCAREOUS.	S16-3-1	79	<0.02	0.008	0.041	0.023	0.086
4		1.2' TO 4.7' CLAY - FILL-?, HIGH PLASTICITY, MEDIUM STIFF, MOIST, CHEMICAL ODOR, SANDY/GRAVELLY, BLACK TO VERY DARK BROWN, CALCAREOUS.	ODOR	216	<0.02	0.044	0.140	0.090	0.550
2 DEC 92									
1 DEC 92			S16-3-2						
6		4.7' TO 8.0' SAND - FINE, VERY MOIST TO WET, DARK BROWN TO LIGHT GRAY TO STRONG BROWN, SOME CHEMICAL ODOR STRONG AT TOP AND SEEMS TO DECREASE WITH DEPTH, CEMENTATION AT 7.8' TO 8.0'.							
8		TD 8.0'							
10									
12									
14									
16									
18									
20									

Signed Laboratory Reports

for

Soil Samples from Soil Borings

226112

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

SUBMITTAL OF SWDED-GL REPORT 15728-1

PROJECT: CARSWELL AFB - FTW Feature: BASE SERVICE STATION	Contract No.
TEST REQUEST NO.: E87930087 Dated: 09 DECEMBER 1992 Received: 14 DECEMBER 1992	From: CHIEF, GEOTECHNICAL BRANCH

MATERIAL: Six Soil Samples, Four Water Samples, One Quality Assurance Sample, One Quality Control Sample, and One Travel Blank

Travel Blank
Rinsate Blank
ST16-1 (WATER)
ST16-2 (WATER)
ST16-3 (WATER)
ST16-1-1 2'-3'
ST16-1-1-QC 2'-3'
ST16-1-2 3.5'-4'
ST16-2-1 2'-3'
ST16-2-2 4'-5'
ST16-3-1 2'-3'
ST16-3-2 4'-4.7'

Date Received: 3 December 1992

Remarks:

Report sent to: FORT WORTH DISTRICT	Copy furnished:

Date: JAN 12 1993	Name and title: WILLIAM R. TANNER Director SWD Laboratory	Signature William R. Tanner

NDRC LABORATORIES, INC.

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226113

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT **DALLAS** **HOUSTON**

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-1
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : Travel Blank 2-4250
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
ANALYSIS METHOD : EPA 8020
ANALYZED BY : RJD
ANALYZED ON : 15-DEC-1992
DILUTION FACTOR : 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	107 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

NDRC LABORATORIES, INC.

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226114

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BEAUMONT **DALLAS** **HOUSTON**

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-2
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : Rinsate Blank 2-4251
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
ANALYSIS METHOD : EPA 8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	98.0 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226115

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1-1 2'-3'
Date received: 2 December 1992
SWD Number: 2-4252
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010
Duplicate		< 0.02			
RPD		0%			

226116

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1 1-2'to 3'
Date received: 2 December 1992
SWD Number: 2-4252
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	42	mg/kg	12/09/92	1	418.1

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226117

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-3
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-1-1 2'-3' 2-4252
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.010 mg/L
Ethylbenzene	0.005 mg/L	0.036 mg/L
Toluene	0.005 mg/L	0.024 mg/L
Xylenes	0.005 mg/L	0.084 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	104 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226118

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1-1/QC 2'-3'
Date received: 2 December 1992
SWD Number: 2-4253
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226119

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1 QC 1-2'to 3'
Date received: 2 December 1992
SWD Number: 2-4253
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	81	mg/kg	12/09/92	1	418.1

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226120

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BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-4
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-1-1-QC 2'-3' 2-4253
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.022 mg/L
Ethylbenzene	0.005 mg/L	0.041 mg/L
Toluene	0.005 mg/L	0.075 mg/L
Xylenes	0.005 mg/L	0.130 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	101 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226121

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1-2 3.5'-4'
Date received: 2 December 1992
SWD Number: 2-4254
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226122

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-1 2-3.5' to 4'
Date received: 2 December 1992
SWD Number: 2-4254
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	45	mg/kg	12/09/92	1	418.1

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226123

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BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-5
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-1-2 3.5'-4' 2-4254
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.012 mg/L
Ethylbenzene	0.005 mg/L	0.007 mg/L
Toluene	0.005 mg/L	0.041 mg/L
Xylenes	0.005 mg/L	0.032 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	102 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226124

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-2-1 2'-3'
Date received: 2 December 1992
SWD Number: 2-4255
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226125

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-2 1-2'to 3'
Date received: 2 December 1992
SWD Number: 2-4255
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	39	mg/kg	12/09/92	1	418.1
Duplicate		37				
RPD		5%				

NDRC LABORATORIES, INC.

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226126

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT **DALLAS** **HOUSTON**

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-6
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-2-1 2'-3' 2-4255
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.006 mg/L
Ethylbenzene	0.005 mg/L	0.021 mg/L
Toluene	0.005 mg/L	< 0.005 mg/L
Xylenes	0.005 mg/L	0.023 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	104 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226127

METALS (TCLP)
EPA METHOD 6010

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No.: 92-12-042
Hazardous Waste Testing
Certification: 1165

CLIENT: U.S. ARMY CORPS OF ENGINEERS SWD LABORATORY		DATE SAMPLED:	12/01/92
PROJECT: CARSWELL AFB - BASE SERVICE STATION		DATE RECEIVED:	12/04/92
CONTRACT #: DACW63-91-D-0033		DATE EXTRACTED:	12/04/92
FIELD ID: ST16-2-1-QA		DATE ANALYZED:	12/08/92
SWD NO.: 2-4256		EXTRACTION/PREPARATION PROCEDURE:	EPA METHOD 1311/3005 Mod.
		INSTRUMENT ID:	JA 9000
		MATRIX:	TCLP-EXTRACT
		% MOISTURE:	NA
		REPORT WT.:	NA
		SAMPLE VOL./WT.:	10 ml
ELI SAMPLE ID: 9212042-01A		DILUTION FACTOR:	1

METALS	RESULT [mg/L (ppm)]	D/L [mg/L (ppm)]
Lead	<0.5	0.5

Ralph Burpee
Chemist

January 4, 1993
Date

226128

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS
EPA METHOD 418.1

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No.: 92-12-042
Hazardous Waste Testing
Certification: 1165

CLIENT: U.S. ARMY CORPS OF ENGINEERS SWD LABORATORY	DATE SAMPLED:	12/01/92
PROJECT: CARSWELL AFB - BASE SERVICE STATION	DATE RECEIVED:	12/04/92
CONTRACT #: DACW63-91-D-0033	DATE EXTRACTED:	12/10/92
FIELD ID: ST16-2-1-QA	DATE ANALYZED:	12/11/92
SWD NO.: 2-4256	EXTRACTION/PREPARATION PROCEDURE:	EPA METHOD 9071
	INSTRUMENT ID:	FTIR
	MATRIX:	SOLID
	% MOISTURE:	NA
	REPORT WT.:	WET
	SAMPLE VOL./WT.:	10 g
ELI SAMPLE ID: 9212042-01A	DILUTION FACTOR:	1

CONCENTRATION [mg/Kg (ppm)]	DETECTION LIMIT [mg/Kg (ppm)]
<20	20

Ren Zheng — Chemist
December 17, 1992 — Date

226129

PURGEABLE AROMATICS
EPA METHOD 8020

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No.: 92-12-042
Hazardous Waste Testing
Certification: 1165

CLIENT: U.S. ARMY CORPS OF ENGINEERS SWD LABORATORY	DATE SAMPLED: 12/01/92
PROJECT: CARSWELL AFB - BASE SERVICE STATION	DATE RECEIVED: 12/04/92
CONTRACT #: DACW63-91-D-0033	DATE EXTRACTED: 12/07/92
FIELD ID: ST16-2-1-QA	DATE ANALYZED: 12/11/92
SWD NO.: 2-4256	EXTRACTION/PREPARATION PROCEDURE: EPA METHOD 1311/5030
	INSTRUMENT ID: VG-4
	MATRIX: TCLP-EXTRACT
	% MOISTURE: NA
	REPORT WT.: NA
	SAMPLE VOL./WT.: 5 ml
ELI SAMPLE ID: 9212042-01A	DILUTION FACTOR: 1

COMP NO.	COMPOUND	CONC. ug/L (ppb)	D/L ug/L (ppb)
V1	Benzene	1.0	0.5
V2	Chlorobenzene	<0.5	0.5
V3	1,2-Dichlorobenzene	<0.5	0.5
V4	1,3-Dichlorobenzene	<0.5	0.5
V5	1,4-Dichlorobenzene	<0.5	0.5
V6	Ethyl benzene	7.2	0.5
V7	Toluene	1.2	0.5
V8	Xylenes (Dimethyl benzenes)	7.7	0.5

	RECOVERY
Surrogate: Fluoro-benzene	75%

Note: All positively identified compounds were second column or second detector confirmed.

Huey-Chen Chow — Chemist
December 17, 1992 — Date

226130

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-2-2 4'-5'
Date received: 2 December 1992
SWD Number: 2-4257
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226131

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-2 2-4'to 5'
Date received: 2 December 1992
SWD Number: 2-4257
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	200	mg/kg	12/09/92	1	418.1

NDRC LABORATORIES, INC.

A member of Inchcape Environmental

226132

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-7
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-2-2 4'-5' 2-4257
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.044 mg/L
Ethylbenzene	0.005 mg/L	0.180 mg/L
Toluene	0.005 mg/L	0.100 mg/L
Xylenes	0.005 mg/L	0.130 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	96.0 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226133

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-3-1 2'-3'
Date received: 2 December 1992
SWD Number: 2-4258
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226134

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-3 1-4/2'to 3'
Date received: 2 December 1992
SWD Number: 2-4258
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	79	mg/kg	12/09/92	1	418.1

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226135

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-8
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-3-1 2'-3' 2-4258
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.008 mg/L
Ethylbenzene	0.005 mg/L	0.023 mg/L
Toluene	0.005 mg/L	0.041 mg/L
Xylenes	0.005 mg/L	0.086 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	93.0 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226136

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 4 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-3-2 4'-4.7'
Date received: 2 December 1992
SWD Number: 2-4259
Sample Matrix: Soil
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
TCLP:					
Lead	0.02	< 0.02	mg/l	12/21/92	6010

226137

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 1 December 1992
Location: Base Service Station
Field Number: ST16-3 2-4/4'to 4.7'
Date received: 2 December 1992
SWD Number: 2-4259
Sample Matrix: Soil
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	20	216	mg/kg	12/09/92	1	418.1

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226138

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BEAUMONT **DALLAS** **HOUSTON**

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-9
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : ST16-3-2 4'-4.7' 2-4259
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
PREPARATION METHOD : EPA 1311
PREPARED BY : TLR
PREPARED ON : 7-DEC-1992
ANALYSIS METHOD : EPA 1311/8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 1

TCLP VOLATILES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	0.005 mg/L	0.044 mg/L
Ethylbenzene	0.005 mg/L	0.090 mg/L
Toluene	0.005 mg/L	0.140 mg/L
Xylenes	0.005 mg/L	0.550 mg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	94.0 %

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226139

Chain of Custody Forms

for

Soil and Water Samples

from

Soil Borings

226140

COOLER RECEIPT FORM

Date Received 12-2-92 Project CARSWELL AFB

Number of Coolers 3 District FT. WORTH

Date Checked in 12-2-92 By (sign) Shirley A. Johns

1. Shipping bill number HAND DELIVERED
2. Custody seals on cooler NO
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....(Yes) No
5. Chain-of-Custody filled out properly.....Yes (No) (1)
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERTS IN 2 COOLERS, ONE COOLER W/O ICE
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) (No) (2)
11. Labels agree with COC.....Yes (No) (3)
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....Yes (No)
15. Bubbles absent from VOA.....(Yes) No
16. Client called.....Yes (No)

Details:

17. Comments: TWO COOLERS ~~DELIVERED~~ DELIVERED BY BOB BEHM, ONE COOLER DELIVERED BY MCVEY (THIS ONE DID NOT HAVE ANY ICE). (1) MAI TRAN CALLED FRANK GREY TO FIND OUT WHAT THEY REALLY WANTED. (2) ALSO SAMPLE # MISSING ON ONE C.O.C. (3) ONE LABEL FOR ALL SOIL SAMPLES SAY TCLP BUT NOT ON C.O.C.

I TALK TO FRANK GREY (15:10 pm) HE WANT TCLP / Pb, TCLP / BTEX, T ~~and~~ NO TDS)

226141

MIPR#NS93-0053	SWD LAB# 2-4258	CHEST# C-15	TEMP. 4°C

CHAIN OF CUSTODY
SOIL SAMPLES
PAGE 1 OF 1

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 1 Dec 92 Time: 0915
Site: Base Service Station	Boring No. N/A
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Jars (each)	Sample No.(s) & Depths	Total	C/Seal No.
	TRAVEL BLANK (1-40mL vial)	1	

* [] = 8-oz.Jar () = Vials-40 ml

PARAMETERS

	Parameter	Test Method	*
	TRPH	418.1	[6]
	BTEX	8020	(12)
	TCLP (lead)	1311	[6]
	TCLP (benzene)	1311	[6]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
M Cley	Behm	2Dec.92	0800
	RD Smith	2DEC92	1430

226142

MIPR#NS93-0053	SWD LAB# X-4251	CHEST# C-15	TEMP. 4°C

CHAIN OF CUSTODY
SOIL SAMPLES
PAGE 1 OF 1

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 1 Dec 92 Time: 0923
Site: Base Service Station	Boring No. ~~[illegible]~~ N/A
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Jars (each)	Sample No.(s) & Depths	Total	C/Seal No.
	RINSATE (1-40mL vial)	1	C-15

* [] = 8-oz.Jar () = Vials-40 ml

PARAMETERS

	Parameter	Test Method	*
	TRPH	418.1	[6]
	BTEX	8020	(12)
	TCLP (lead)	1311	[6]
	TCLP (benzene)	1311	[6]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVay	Behn	2 Dec. 92	0800
	R D Smith	2 DEC 92	1430

226143

MIPR#NS93-0053	SWD LAB# 2-4252	CHEST# C-15	TEMP. 4°C

2-4253
2-4254

CHAIN OF CUSTODY
SOIL SAMPLES
PAGE 1 OF 1

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 12-1-92 Time: Var.
Site: Base Service Station	Boring No. ST16 - 1
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Jars	Sample No.(s) & Depths	Total	C/Seal No.
2-4252 (each) 2-4253	1@ 2-3' 2-40ml (BTEX), 1-~~½ liter (TOC)~~, 1-½ liter (TRPH) QC- as above	12	
*	[] = 8-oz.Jar () = Vials-40 ml		
2-4254	2@ 3.5-4.0' - samples as above		

PARAMETERS

	Parameter	Test Method	*
	TRPH	418.1	[6]
	BTEX	8020	(12)
✓	TCLP (lead)	1311	[6]
✓	TCLP (benzene)	1311	[6]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McCoy	Behn	2 Dec. 92	0800
	R.D. Smith	2DEC92	1430

226144

MIPR#NS93-0053	SWD LAB# 2-4255 2-4256 2-4257	CHEST# C-15	TEMP 4° C

CHAIN OF CUSTODY
SOIL SAMPLES
PAGE 1 OF 1

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 1 Dec 92 Time: various
Site: Base Service Station	Boring No. ST16-2
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Jars	Sample No.(s) & Depths	Total	C/Seal No.
2-4255 (each)	1-2'to3'; 2-40ml(BTEX), 1-½lit(TDS), 1-½lit(TRPH)	12	
2-4256	QA-- all as above		
*	= 8-oz.Jar () = Vials-40 ml		
2-4257	2-4'to5', as above		

PARAMETERS

	Parameter	Test Method	*
	TRPH	418.1	[6]
	BTEX	8020	(12)
	TCLP (lead)	1311	[6]
	TCLP (benzene)	1311	[6]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey	Behn	2 Dec 92	0800
	RD Smith	2DEC92	1430

226145

2-4258
2-4259

MIPR#NS93-0053	SWD LAB# Yes	CHEST# C-15	TEMP. 4°C

CHAIN OF CUSTODY
SOIL SAMPLES
PAGE 1 OF 1

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 1 Dec. 92 Time: Various
Site: Base Service Station	Boring No. ST16-3
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Jars	Sample No.(s) & Depths	Total	C/Seal No.
2-4258 each 2-4259	1-4 @ 2 to 3 (2-40 ml BTEX)(1-½ l. TDS)(1-½ Lit TRPH)	8	C-15
	2-4 @ 4 to 4.7 " " "		

* [] = 8-oz.Jar () = Vials-40 ml

PARAMETERS

	Parameter	Test Method	*
	TRPH	418.1	[6]
	BTEX	8020	(12)
	TCLP (lead)	1311	[6]
	TCLP (benzene)	1311	[6]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVay	Behm	2 Dec 92	0800
	RD Smith	2DEC92	1430

MIPR# NS93-0053	SWD LAB# 2-4264	CHEST# C-92	TEMP. 4°C

226146

CHAIN OF CUSTODY
GROUNDWATER SAMPLE

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 2-12-92 Time: 1130
Site: BASE SERVICE STATION	Well No. ST16-1
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Glass	Plastic	Vial	~~Chest No.~~ Parameter	Custody Seal# 20
—	—	2	BTEX	
—	1	—	TDS	
1	—	—	TRPH HCl to PH<2	
—	1	—	total lead HNO to PH<2	

PARAMETERS

	Parameter	Test Method	*
	BTEX	8020	{6}
	TRPH	418.1	(3)
	Total Lead **Filter immedi-**	6010A	<3>
	ately & add HNO3 to pH < 2		
	Total Dissolved Solids	160.1	[3]

*Containers: [] = Plastic-500 ml {} = Vials () = Amber
< >= Plastic-1 liter

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey	SW lab	2-12-92	
	Shirley A. Johns	12-2-92	1325

E 8793008?

MIPR# NS93-0053	SWD LAB# Z-4261	CHEST#	TEMP.

226147

CHAIN OF CUSTODY
GROUNDWATER SAMPLE

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date:_____ Time: _____
Site: BASE SERVICE STATION	Well No. ST16-2
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Glass	Plastic	Vial	~~Sheet No.~~ Parameter	Custody Seal#
—	—	2	BTEX	
	1		TDS	
1	—	—	TRPH - HCL to PH<2	
—	1	—	TOTAL LEAD - HNO to PH<2	

PARAMETERS

	Parameter	Test Method	*
	BTEX	8020	{6}
	TRPH	418.1	(3)
	Total Lead **Filter immedi-**	6010A	<3>
	ately & add HNO3 to pH < 2		
	Total Dissolved Solids	160.1	[3]

*Containers: [] = Plastic-500 ml {} = Vials () = Amber
< >= Plastic-1 liter

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey	SWD	12-12-92	
	Shirley A. Johns	12-2-92	1325

MIPR# NS93-0053	SWD LAB# 7-4262	CHEST# 92	TEMP. 4°C

226148

CHAIN OF CUSTODY
GROUNDWATER SAMPLE

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

Location: CARSWELL AFB	Date: 2-12-92 Time: 1015
Site: BASE SERVICE STATION	Well No. ST16-3
Proj. Engineer: Frank Grey	Phone No. 817-334-9924

CONTAINERS

Glass	Plastic	Vial	~~Chest No.~~ Parameters	~~Custody Seal #~~
—	—	2	BTEX	
—	1	—	TDS	
1	—	—	TRPH - HCL to PH<2	
—	1	—	TOTAL LEAD - HNO to PH<2	

PARAMETERS

	Parameter	Test Method	*
	BTEX	8020	{6}
	TRPH	418.1	(3)
	Total Lead **Filter immedi-**	6010A	<3>
	ately & add HNO3 to pH < 2		
	Total Dissolved Solids	160.1	[3]

*Containers: [] = Plastic-500 ml {} = Vials () = Amber
< >= Plastic-1 liter

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey	SWL Lab	2.12.92	
	Shirley A. Johns	12-2-92	1325

226149

Signed Laboratory Reports

for

Soil and Water Samples

from

Soil Borings

226150

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 5 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-1
Date received: 2 December 1992
SWD Number: 2-4260
Sample Matrix: Water
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
Lead	0.02	< 0.02	mg/l	01/04/93	6010
Duplicate		< 0.02			
RPD		0%			

226151

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-1
Date received: 2 December 1992
SWD Number: 2-4260
Sample Matrix: Water
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	0.4	14	mg/L	12/10/92	2	418.1
TDS	10	530	mg/L	12/04/92	1	160.1
Duplicate		516				
RPD		3%				

NDRC LABORATORIES, INC.

A member of Inchcape Environmental

226152

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-10
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : ST16-1 (Liquid) 2-4260
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
ANALYSIS METHOD : EPA 8020
ANALYZED BY : JCA
ANALYZED ON : 14-DEC-1992
DILUTION FACTOR : 250

BTEX ANALYSIS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Benzene	250	µg/L	310	µg/L	
Toluene	250	µg/L	2800	µg/L	
Ethyl benzene	250	µg/L	300	µg/L	
Xylenes	250	µg/L	1300	µg/L	
BTEX (total)			4710	µg/L	#

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
Bromofluorobenzene(SS)	50.0	µg/L	101	%

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226153

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 5 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-2
Date received: 2 December 1992
SWD Number: 2-4261
Sample Matrix: Water
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
Lead	0.02	0.15	mg/l	01/04/93	6010

226154

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-2
Date received: 2 December 1992
SWD Number: 2-4261
Sample Matrix: Water
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	0.4	12	mg/L	12/10/92	2	418.1
TDS	10	536	mg/L	12/04/92	1	160.1

NDRC LABORATORIES, INC.

A member of Inchcape Environmental

226155

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-11
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : ST16-2 (Liquid) 2-4261
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
ANALYSIS METHOD : EPA 8020
ANALYZED BY : BSR
ANALYZED ON : 11-DEC-1992
DILUTION FACTOR : 25

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Benzene	25	µg/L	920	µg/L
Toluene	25	µg/L	210	µg/L
Ethyl benzene	25	µg/L	390	µg/L
Xylenes	25	µg/L	860	µg/L
BTEX (total)			2380	µg/L #

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
Bromofluorobenzene(SS)	50.0	µg/L	89.0	%

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226156

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 5 January 93

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-3
Date received: 2 December 1992
SWD Number: 2-4262
Sample Matrix: Water
Analyst: JRA, FR

Parameter	Detection Limit	Results	Units	Date Analyzed	Method
Lead	0.02	0.04	mg/l	01/04/93	6010

226157

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
4815 Cass Street
Dallas, Texas 75235
214/905-9130

Report Date: 23 December 1992

District: Fort Worth
Project: Carswell AFB
Date Sampled: 2 December 1992
Location: Base Service Station
Field Number: ST16-3
Date received: 2 December 1992
SWD Number: 2-4262
Sample Matrix: Water
Analyst: CP

Parameter	Detection Limit	Results	Units	Date Analyzed	Dilution Factor	Method
TRPH	0.4	6	mg/L	12/10/92	2	418.1
TDS	10	560	mg/L	12/04/92	1	160.1

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1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT **DALLAS** **HOUSTON**

DATE RECEIVED : 3-DEC-1992

REPORT NUMBER : D92-13813-12
REPORT DATE : 17-DEC-1992

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : ST16-3 (Liquid) 2-4262
: Base Service Station
PROJECT : Carswell AFB (4250-4262)
DATE SAMPLED : 1-DEC-1992
ANALYSIS METHOD : EPA 8020
ANALYZED BY : RJD
ANALYZED ON : 10-DEC-1992
DILUTION FACTOR : 25

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	25 µg/L	460 µg/L
Toluene	25 µg/L	520 µg/L
Ethyl benzene	25 µg/L	790 µg/L
Xylenes	25 µg/L	3000 µg/L
BTEX (total)		4770 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	97.0 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin v 2

David R. Godwin, Ph.D.
Chief Executive Officer

226159

QA/QC Report

for

Soil and Water Samples

from

Soil Borings

226160

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

CASE NARRATIVE

Six soil samples, four water samples, one Quality Assurance sample, one Quality Control sample, and one Travel Blank arrived at the Southwestern Division Laboratory on 2 December 1992 from Carswell Air Force Base - Base Service Station. The samples arrived with incomplete chain-of-custody forms. Sample numbers were missing, and the labels were mismatched with the chain-of-custody forms. SWD Lab contacted Frank Grey of Fort Worth District to verify the tests. Also, one cooler did not have any ice. The Quality Assurance sample was contracted out to a Corps of Engineers' validated laboratory, Eureka. The BTEX and TCLP/BTEX analyses were performed at a Corps of Engineers' validated laboratory, NDRC. All other analyses were performed at SWD Laboratory.

The data package from Eureka Laboratories, Inc. was received complete with all required internal quality control and quality assurance information. All analyses were performed using specified methods within proper holding times. All method blanks appear to have been free of contamination. All surrogate, duplicate, blank spike, and matrix spike recoveries were within control limits.

The data package from NDRC Laboratories, Inc. was received complete with all required internal quality control and quality assurance information. All analyses were performed using specified methods within proper holding times. All method blanks appear to have been free of contamination. All surrogate, duplicate, blank spike, and matrix spike recoveries were within control limits.

SWD Laboratory performed all analyses using specified methods within proper holding times. All method blanks appear to have been free of contamination. All duplicate, blank spike, and matrix spike recoveries were within control limits.

Following is a synopsis of the quality assurance samples and their related QC and field samples:

Customer Sample No: ST16-2-1 2'-3', ST16-2-1/QA 2'-3'
SWD Lab Sample No: 2-4255 and 4256

Parameter	Field	QC	QA	Units	Comment
TCLP:					
Lead	< 0.02		< 0.5	mg/L	Agree
TRPH	39		< 20	mg/kg	Agree
TCLP:					
Benzene	6		1	µg/L	Agree
Ethylbenzene	21		7	µg/L	Agree
Toluene	< 5		1	µg/L	Agree
Xylenes	23		8	µg/L	Agree

Customer Sample No: ST16-1-1 2'-3', ST16-1-1/QC 2'-3'
SWD Lab Sample No: 2-4252 and 4253

Parameter	Field	QC	QA	Units	Comment
TCLP:					
Lead	< 0.02	< 0.02		mg/L	Agree
TRPH	42	81		mg/kg	Agree
TCLP:					
Benzene	10	22		µg/L	Agree
Ethylbenzene	36	41		µg/L	Agree
Toluene	24	75		µg/L	Disagree
Xylenes	84	130		µg/L	Agree

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: Travel Blank
SWD Lab Sample No: 2-4250

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
BTEX	8020	NA	14 d	1	Good

Laboratory Comments: None.

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: Rinsate Blank
SWD Lab Sample No: 2-4251

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
BTEX	8020	NA	9 d	1	Good

Laboratory Comments: None.

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Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-1-1 2'-3'
SWD Lab Sample No: 2-4252

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-1-1/QC 2'-3'
SWD Lab Sample No: 2-4253

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

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Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-1-2 3.5'-4'
SWD Lab Sample No: 2-4254

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

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Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-2-1 2'-3'
SWD Lab Sample No: 2-4255

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

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Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-2-1/QA 2'-3'
SWD Lab Sample No: 2-4256

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	3 d	7 d	1	NA
TRPH	418.1	9 d	10 d	1	NA
TCLP: BTEX	8020	6 d	10 d	1	Good

Laboratory Comments: None.

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Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-2-2 4'-5'
SWD Lab Sample No: 2-4257

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

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U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-3-1 2'-3'
SWD Lab Sample No: 2-4258

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 1 December 1992
Customer Sample No: ST16-3-2 4'-4.7'
SWD Lab Sample No: 2-4259

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
TCLP: Lead	6010	NA	20 d	1	NA
TRPH	418.1	NA	8 d	1	NA
TCLP: BTEX	8020	6 d	9 d	1	Good

Laboratory Comments: None.

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U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 2 December 1992
Customer Sample No: ST16-1
SWD Lab Sample No: 2-4260

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
Lead	6010	NA	33 d	1	NA
TRPH	418.1	NA	8 d	2	NA
TDS	160.1	NA	2 d	1	NA
BTEX	8020	NA	12 d	250	Good

Laboratory Comments: None.

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U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 2 December 1992
Customer Sample No: ST16-2
SWD Lab Sample No: 2-4261

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
Lead	6010	NA	33 d	1	NA
TRPH	418.1	NA	8 d	2	NA
TDS	160.1	NA	2 d	1	NA
BTEX	8020	NA	10 d	25	Good

Laboratory Comments: None.

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U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB
Date Sample Taken: 2 December 1992
Customer Sample No: ST16-3
SWD Lab Sample No: 2-4262

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
Lead	6010	NA	33 d	1	NA
TRPH	418.1	NA	8 d	2	NA
TDS	160.1	NA	2 d	1	NA
BTEX	8020	NA	9 d	25	Good

Laboratory Comments: None.

226174

Soil Gas Survey Report

BLANK

PAGE

SOIL GAS SURVEY

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

PREPARED FOR

U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT
819 TAYLOR STREET
FORT WORTH, TEXAS

PREPARED BY

TARGET ENVIRONMENTAL SERVICES, INC.
9180 RUMSEY ROAD
COLUMBIA, MARYLAND 21045
(410) 992-6622

MARCH 1993

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Figure 2. Total FID Volatiles

Figure 3. Benzene

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APPENDICES

APPENDIX A - Field Procedures

APPENDIX B - Laboratory Procedures

APPENDIX C - Detectability & Terminology

EXECUTIVE SUMMARY

On February 24-26 and March 1, 1993, **TARGET Environmental Services, Inc. (TARGET)** conducted a soil gas survey at **Site ST-16, Base Service Station**, Carswell Air Force Base, Texas, where petroleum hydrocarbons have impacted the ground water. A total of 86 soil gas samples were collected from depths of 4 to 9 feet. The samples were analyzed on a gas chromatograph equipped with a flame ionization detector (GC/FID) for petroleum hydrocarbons. The objective of the survey was to help determine the areal extent of the contaminated ground water plume emanating from the Base Service Station.

High levels of Total FID Volatiles were present along the sewer line east of Rogner Drive. Moderate levels occurred along the western side of Rogner Drive and in a sample collected south of the sewer line. All of these samples were collected from a depth of 4 feet. Low levels were observed in three isolated areas along the eastern and southern survey boundaries. Significant levels of volatile hydrocarbons were not present at a depth of 9 feet throughout the grassy area in the central portion of the survey area.

The chromatogram signatures of the samples collected on the western side of Rogner Drive are characteristic of **relatively unweathered gasoline**. Early eluting peaks representing the most volatile and mobile gasoline hydrocarbons are observed in the signatures of the samples collected along the sewer line.

Soil gas data support the introduction of gasoline hydrocarbons into the subsurface at the base service station. Chromatographic data suggests that the sewer line may be providing a conduit for vapor migration in this area. The low levels of gasoline hydrocarbons observed along the eastern survey boundary may be the result of revolatilization of hydrocarbons dissolved in the ground water, suggesting that the ground water plume may extend this far. The connection between the source at the base service station and the low levels at the eastern site boundary were

not determined by this survey. Vertical vapor migration may have been impeded in the central portion of the survey area by the clay/silt soils.

Introduction

The U.S. Army Corps of Engineers, Fort Worth District contracted Target Environmental Services, Inc. (TARGET) to conduct a soil gas survey at Site ST-16, Base Service Station, Carswell Air Force Base, Texas. Petroleum products have entered the subsurface at the service station and have impacted the shallow water table aquifer in the vicinity of the station. The purpose of the soil gas survey is to help determine the areal extent of the contaminated ground water plume emanating from the Base Service Station.

The survey was designed to cover the area to the east of the existing service station with a grid spacing of approximately 50 feet between samples. Ground water was determined to be at 10.5 feet below grade in the monitoring wells and soil gas sampling was planned for a depth of 9 feet. The site is bordered on the east by the West Fork of the Trinity River. Additional site information was not provided. The field phase of the soil gas survey was conducted on February 24-26 and March 1, 1993.

Sample Collection and Analysis

Soil gas samples were collected at a total of 86 locations at the site, as shown in Figure 1. The planned sampling depth of 9 feet had to be modified following heavy rains on February 24 and 25. Soft ground and saturated soils then hampered vehicle access to some sampling locations, which were sampled using manual equipment at a depth of 4 feet. Sampling depths are reported in Table 1. Shallow ground water prevented the collection of a sample at location 73. All samples were screened in the field using a Microtip photoionization detector. A detailed explanation of the sampling procedure is provided in Appendix A.

All of the samples collected during the field phase of the survey were analyzed according to EPA Method 602 (modified) on a gas chromatograph equipped with a flame ionization detector (GC/FID), and using direct injection. Analytes selected for standardization were:

benzene
toluene
ethylbenzene
meta- and para- xylene
ortho- xylene

These compounds were chosen because of their utility in evaluating the presence of petroleum products such as fuels, lubricating oils, and non-halogenated solvents. An explanation of the laboratory procedures is provided in Appendix B.

The tabulated results of the laboratory analysis of the soil gas samples are reported in micrograms per liter (µg/l) in Table 1. Although "micrograms per liter" is equivalent to "parts per billion (v/v)" in water analyses, they are not equivalent in gas analyses, due to the difference in the mass of equal volumes of water and gas matrices. The xylenes concentrations reported in the data table are the sum of the m- and p-xylene and the o-xylene concentrations for each sample.

Quality Assurance/Quality Control (QA/QC) Evaluation

Field QA/QC Samples

Field control samples were collected at the beginning and end of each day's field activities and after every twentieth soil gas sample. These QA/QC samples were obtained by filtering ambient air through a dust and organic vapor filter cartridge and encapsulating as described in the "Field Procedures" in Appendix A. The laboratory results are reported in Table 1. Concentrations of all analytes were below the reporting limit in all field control samples,

indicating that the QA/QC measures employed were sufficient to prevent cross-contamination of the samples during collection.

Laboratory QA/QC Samples

To document analytical repeatability, a duplicate analysis was performed on every tenth field sample. Laboratory blanks of nitrogen gas were also analyzed after every tenth field sample. The results of these analyses are reported in Table 1. The duplicate analyses were within acceptable limits. Concentrations of all analytes were below the reporting limit in all laboratory blanks.

Results

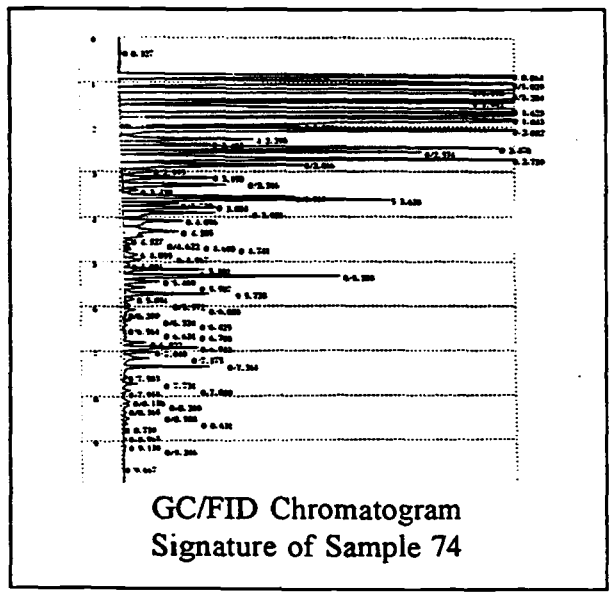
In order to provide graphic presentation of the results, selected individual data sets in Table 1 have been mapped and contoured to produce Figures 2 through 5. Dashed contours are used where patterns are extrapolated into areas of less complete data, or as auxiliary contours. Map sample points with no data shown indicate that the analyte concentrations in the sample were below the reporting limit. An explanation of the terminology used in this report is provided in Appendix C.

The Total FID Volatiles map (Figure 2) reveals high levels along the sewer line east of Rogner Drive. The highest level is present in Sample 80. Moderate levels occur along the western side of Rogner Drive and in Sample 76, collected south of the sewer line. All of these samples were collected from a depth of 4 feet. Low levels are observed in three isolated areas along the northeastern, southeastern and southern survey boundaries. Significant levels of volatile hydrocarbons were not present at a depth of 9 feet throughout the grassy area in the central

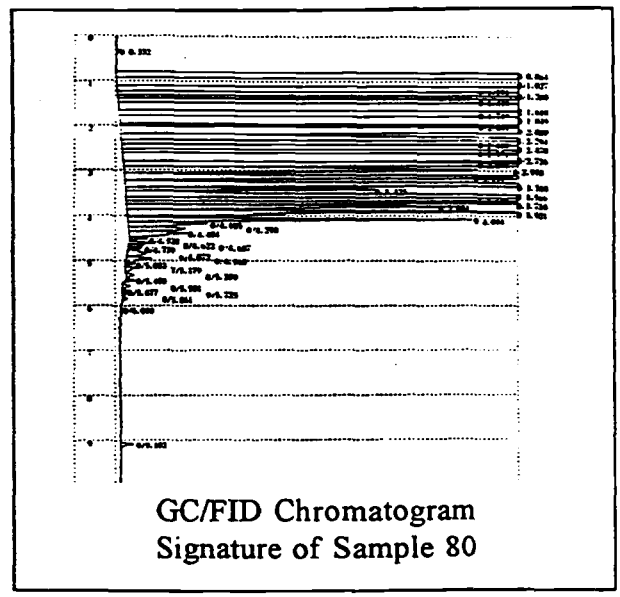
portion of the survey area. Volatile hydrocarbons were not present at a depth of 7 feet along the western boundary of the survey area.

Except for a low level of benzene in Sample 91, collected along the northeastern survey boundary, benzene was present only in samples collected along the sewer line and on the western side of Rogner Drive, as shown in Figure 3. The toluene occurrence is mapped in Figure 4. Both benzene and toluene were highest in Sample 80, which had the highest level of Total FID Volatiles. In contrast, ethylbenzene and xylenes were highest in Sample 74, collected on the western side of Rogner Drive, as exemplified by the xylenes map (Figure 5).

Interpretation



GC/FID Chromatogram
Signature of Sample 74



GC/FID Chromatogram
Signature of Sample 80

Significant levels of petroleum hydrocarbons are present along the sewer line east of Rogner Drive and along the western side of Rogner Drive. The chromatogram signatures of the samples collected on the western side of Rogner Drive are characteristic of **relatively unweathered gasoline**, as exemplified by the signature of Sample 74 (above left). The xylenes are less

volatile and less soluble than the other analytes, adsorb more readily to the soil particles, and tend to remain nearer to the source. As a result, the xylenes are usually good indicators of source locations. The xylene map patterns are consistent with the expected source at the base service station. Early eluting peaks representing the most volatile and mobile gasoline hydrocarbons are observed in the signatures of the samples collected along the sewer line, as shown by the signature of Sample 80 (previous page, right). This pattern is suggestive of vapor phase migration. It appears that the sewer line may be providing a conduit for migration in this area. Low levels of gasoline hydrocarbons are depicted in the signatures of samples from the eastern survey boundary. The pattern seen in these signatures is sometimes observed when the source of the hydrocarbons is revolatilization of hydrocarbons dissolved in the ground water.

It is interesting to note that except at location 52 from the southern boundary, volatile hydrocarbons were not present at a depth of 9 feet throughout the central portion of the survey area, but low levels did occur at a depth of 4 feet at a few locations along the eastern site boundary. The connection between the source at the base service station and the low levels at the eastern site boundary were not determined by this survey. Vertical vapor migration may have been impeded in this area by the clay/silt soils.

Conclusions

- Significant levels of petroleum hydrocarbons are present along the sewer line east of Rogner Drive and along the western side of Rogner Drive.

- The chromatogram signatures of the samples collected on the western side of Rogner Drive are characteristic of **relatively unweathered gasoline**. The xylene map patterns are consistent with the expected source at the base service station.

- Chromatographic data suggests that the volatile hydrocarbons observed along the sewer line are the result of vapor phase migration into this area.

- The low levels of gasoline hydrocarbons observed along the eastern survey boundary may be the result of revolatilization of hydrocarbons dissolved in the ground water, suggesting that the ground water plume may extend to the eastern site boundary.

- The connection between the source at the base service station and the low levels at the eastern site boundary were not determined by this survey. Vertical vapor migration may have been impeded in the central portion of the survey area by the clay/silt soils.

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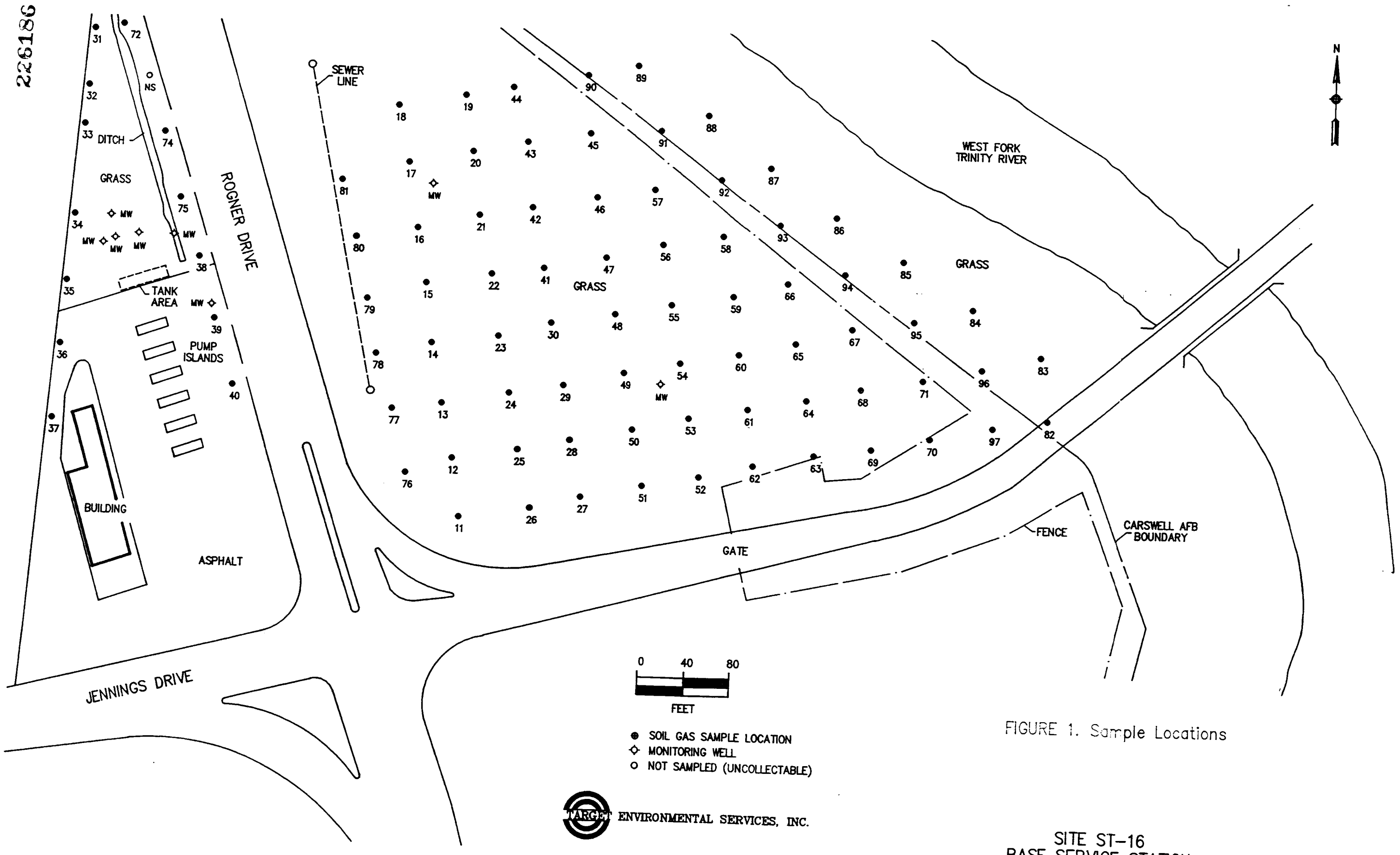


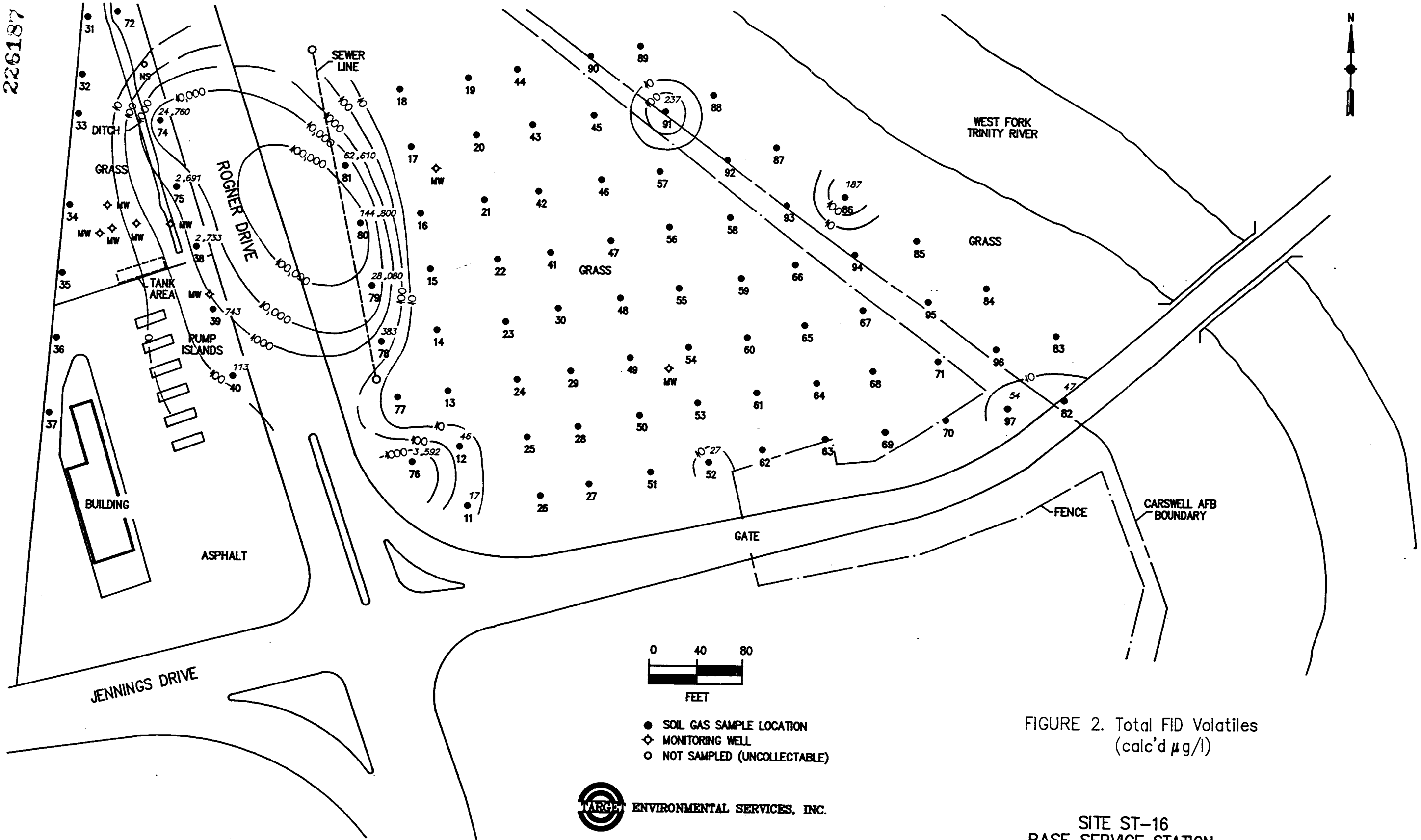
FIGURE 1. Sample Locations

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

226187



TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

FIGURE 2. Total FID Volatiles (calc'd μg/l)

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

226188

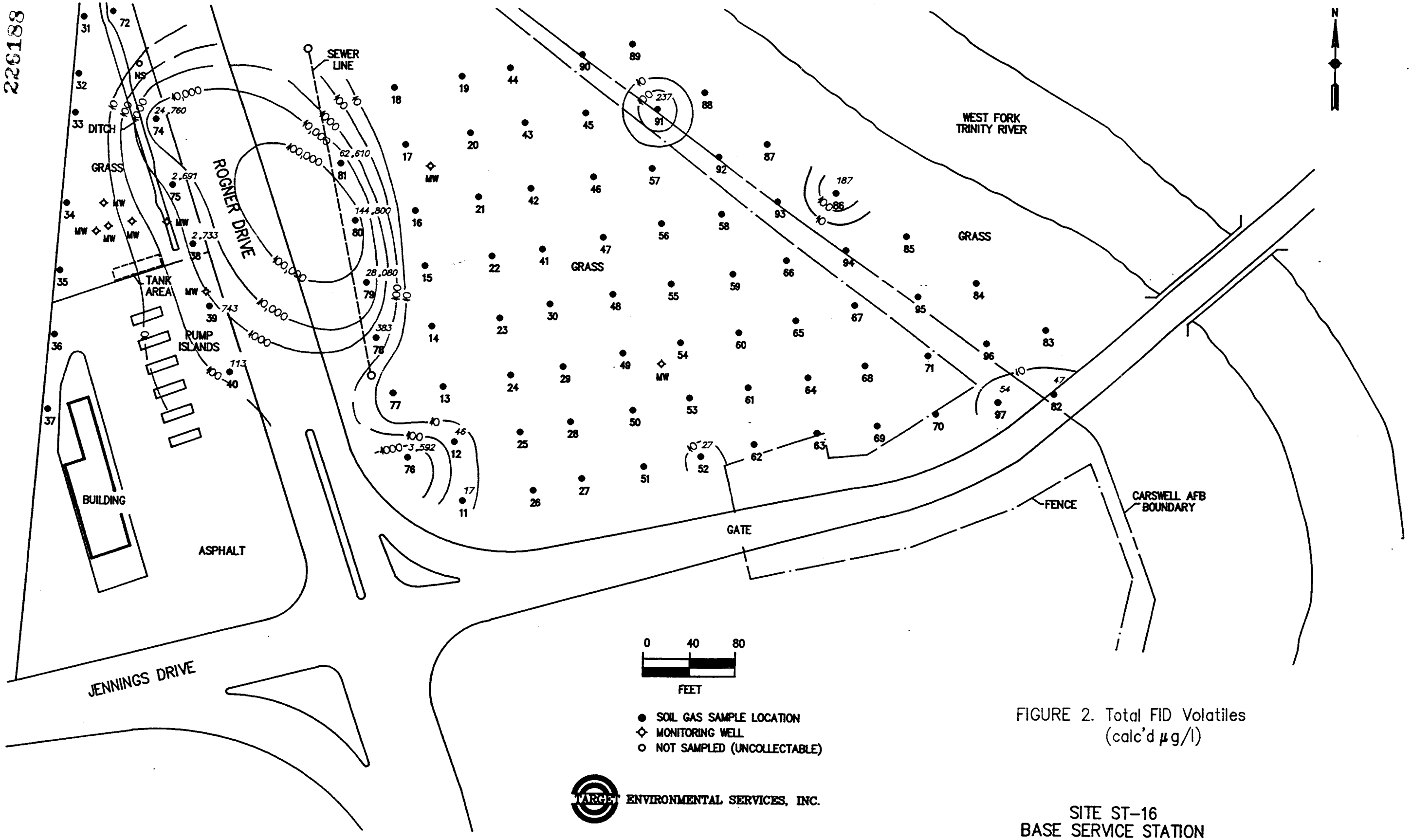


FIGURE 2. Total FID Volatiles
(calc'd μg/l)

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

226189

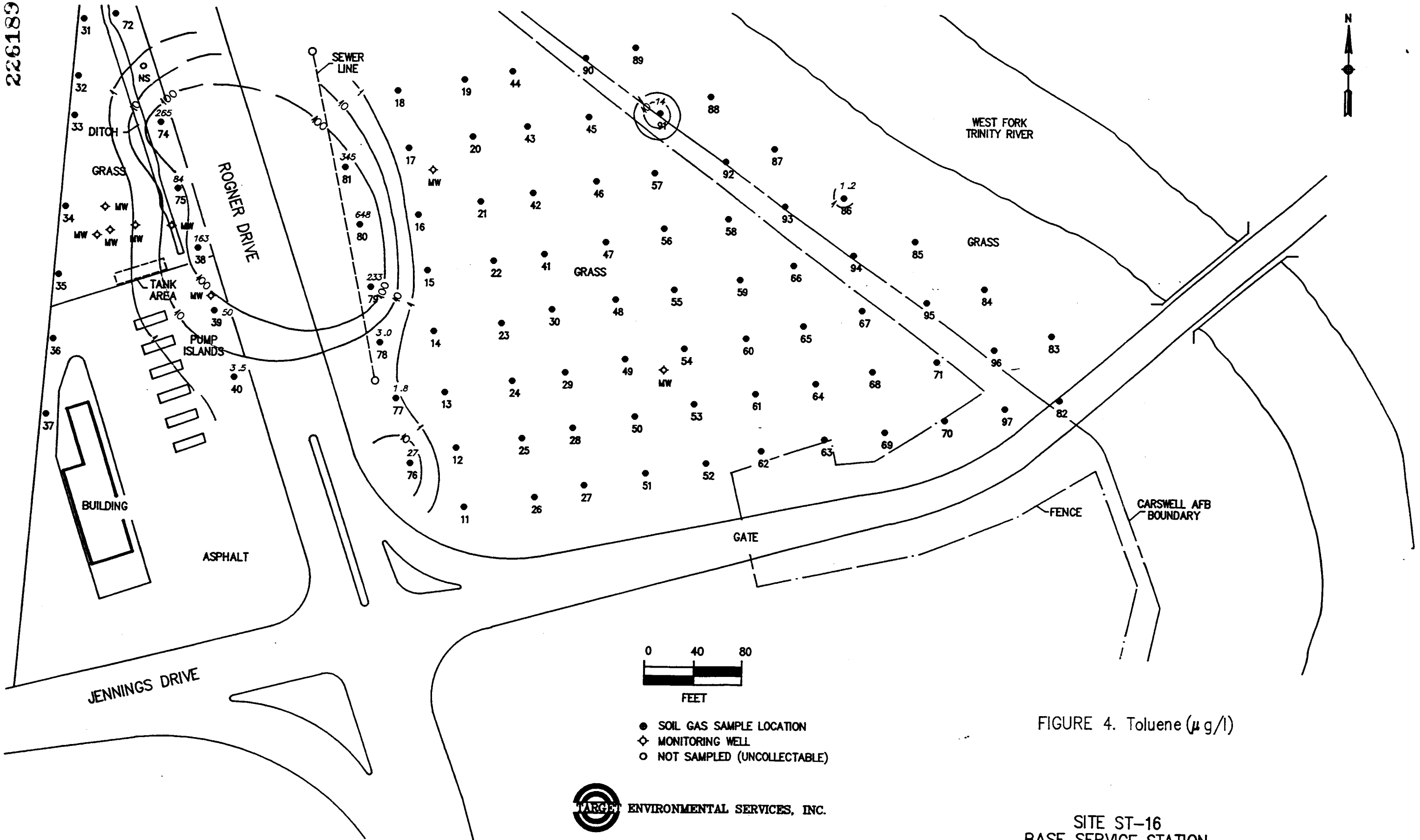


FIGURE 4. Toluene (μg/l)

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

226190

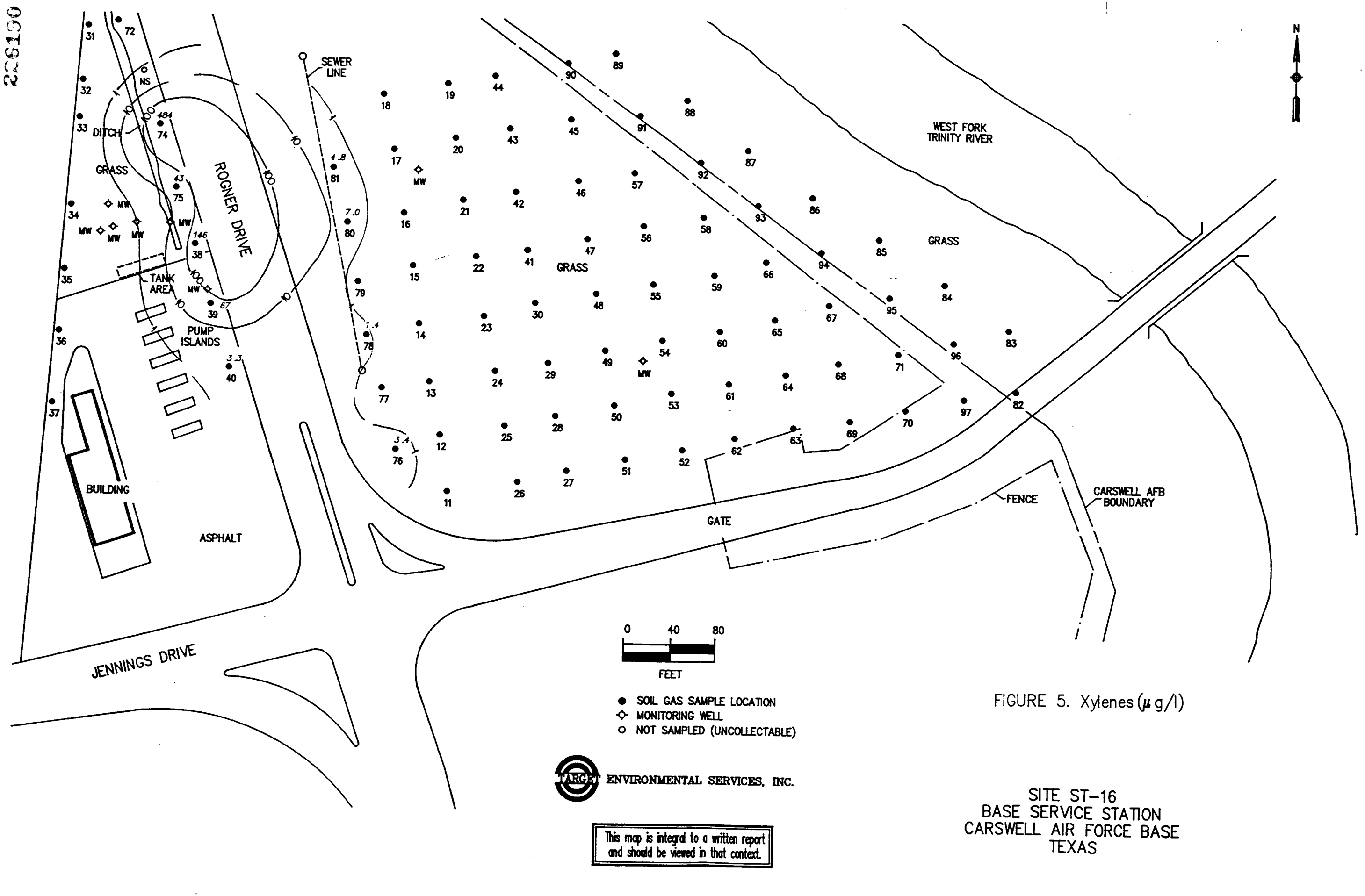


FIGURE 5. Xylenes (μg/l)

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

SITE ST-16
BASE SERVICE STATION
CARSWELL AIR FORCE BASE
TEXAS

TARGET Project DCBS

TABLE 1

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES*
REPORTING LIMIT		1.0	1.0	1.0	1.0	10
11	6	<1.0	<1.0	<1.0	<1.0	17
12	6	<1.0	<1.0	<1.0	<1.0	46
13	6	<1.0	<1.0	<1.0	<1.0	<10
14	9	<1.0	<1.0	<1.0	<1.0	<10
15	9	<1.0	<1.0	<1.0	<1.0	<10
16	9	<1.0	<1.0	<1.0	<1.0	<10
17	9	<1.0	<1.0	<1.0	<1.0	<10
18	9	<1.0	<1.0	<1.0	<1.0	<10
19	9	<1.0	<1.0	<1.0	<1.0	<10
20	9	<1.0	<1.0	<1.0	<1.0	<10
21	9	<1.0	<1.0	<1.0	<1.0	<10
22	9	<1.0	<1.0	<1.0	<1.0	<10
23	9	<1.0	<1.0	<1.0	<1.0	<10
24	9	<1.0	<1.0	<1.0	<1.0	<10
25	9	<1.0	<1.0	<1.0	<1.0	<10
26	9	<1.0	<1.0	<1.0	<1.0	<10
27	9	<1.0	<1.0	<1.0	<1.0	<10
28	9	<1.0	<1.0	<1.0	<1.0	<10
29	9	<1.0	<1.0	<1.0	<1.0	<10
30	9	<1.0	<1.0	<1.0	<1.0	<10
31	9	<1.0	<1.0	<1.0	<1.0	<10
32	7	<1.0	<1.0	<1.0	<1.0	<10
33	7	<1.0	<1.0	<1.0	<1.0	<10
34	7	<1.0	<1.0	<1.0	<1.0	<10
35	7	<1.0	<1.0	<1.0	<1.0	<10
36	7	<1.0	<1.0	<1.0	<1.0	<10
37	7	<1.0	<1.0	<1.0	<1.0	<10
38	4	92	163	44	146	2,733
39	4	13	50	13	67	743
40	4	5.3	3.5	2.2	3.3	113
41	9	<1.0	<1.0	<1.0	<1.0	<10
42	9	<1.0	<1.0	<1.0	<1.0	<10
43	9	<1.0	<1.0	<1.0	<1.0	<10
44	9	<1.0	<1.0	<1.0	<1.0	<10
45	9	<1.0	<1.0	<1.0	<1.0	<10

** CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE*

TABLE 1 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES*
REPORTING LIMIT		1.0	1.0	1.0	1.0	10
46	9	<1.0	<1.0	<1.0	<1.0	<10
47	9	<1.0	<1.0	<1.0	<1.0	<10
48	9	<1.0	<1.0	<1.0	<1.0	<10
49	9	<1.0	<1.0	<1.0	<1.0	<10
50	9	<1.0	<1.0	<1.0	<1.0	<10
51	9	<1.0	<1.0	<1.0	<1.0	<10
52	9	<1.0	<1.0	<1.0	<1.0	27
53	9	<1.0	<1.0	<1.0	<1.0	<10
54	9	<1.0	<1.0	<1.0	<1.0	<10
55	9	<1.0	<1.0	<1.0	<1.0	<10
56	9	<1.0	<1.0	<1.0	<1.0	<10
57	9	<1.0	<1.0	<1.0	<1.0	<10
58	9	<1.0	<1.0	<1.0	<1.0	<10
59	9	<1.0	<1.0	<1.0	<1.0	<10
60	9	<1.0	<1.0	<1.0	<1.0	<10
61	9	<1.0	<1.0	<1.0	<1.0	<10
62	9	<1.0	<1.0	<1.0	<1.0	<10
63	9	<1.0	<1.0	<1.0	<1.0	<10
64	9	<1.0	<1.0	<1.0	<1.0	<10
65	9	<1.0	<1.0	<1.0	<1.0	<10
66	9	<1.0	<1.0	<1.0	<1.0	<10
67	9	<1.0	<1.0	<1.0	<1.0	<10
68	9	<1.0	<1.0	<1.0	<1.0	<10
69	9	<1.0	<1.0	<1.0	<1.0	<10
70	9	<1.0	<1.0	<1.0	<1.0	<10
71	9	<1.0	<1.0	<1.0	<1.0	<10
72	6	<1.0	<1.0	<1.0	<1.0	<10
74	4	120	265	98	484	24,760
75	4	24	84	7.2	43	2,691
76	4	4.5	27	<1.0	3.4	3,592
77	4	<1.0	1.8	<1.0	<1.0	<10
78	4	<1.0	3.0	<1.0	1.4	383
79	4	32	233	1.0	<1.0	28,080
80	4	461	648	5.4	7.0	144,800
81	4	195	345	3.5	4.8	62,610

** CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE*

TABLE 1 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES*
REPORTING LIMIT		1.0	1.0	1.0	1.0	10
LABORATORY DUPLICATE ANALYSIS (CONT.)						
34		<1.0	<1.0	<1.0	<1.0	<10
34R		<1.0	<1.0	<1.0	<1.0	<10
44		<1.0	<1.0	<1.0	<1.0	<10
44R		<1.0	<1.0	<1.0	<1.0	<10
55		<1.0	<1.0	<1.0	<1.0	<10
55R		<1.0	<1.0	<1.0	<1.0	<10
65		<1.0	<1.0	<1.0	<1.0	<10
65R		<1.0	<1.0	<1.0	<1.0	<10
78		<1.0	3.0	<1.0	1.4	383
78R		1.1	3.5	<1.0	1.4	399
88		<1.0	<1.0	<1.0	<1.0	<10
88R		<1.0	<1.0	<1.0	<1.0	<10
97		<1.0	<1.0	<1.0	<1.0	54
97R		<1.0	<1.0	<1.0	<1.0	46
LABORATORY BLANKS						
18B		<1.0	<1.0	<1.0	<1.0	<10
28B		<1.0	<1.0	<1.0	<1.0	<10
34B		<1.0	<1.0	<1.0	<1.0	<10
44B		<1.0	<1.0	<1.0	<1.0	<10
55B		<1.0	<1.0	<1.0	<1.0	<10
65B		<1.0	<1.0	<1.0	<1.0	<10
78B		<1.0	<1.0	<1.0	<1.0	<10
88B		<1.0	<1.0	<1.0	<1.0	<10
97B		<1.0	<1.0	<1.0	<1.0	<10

** CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE*

TABLE 1 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES*
REPORTING LIMIT		1.0	1.0	1.0	1.0	10
82	4	<1.0	<1.0	<1.0	<1.0	47
83	4	<1.0	<1.0	<1.0	<1.0	<10
84	4	<1.0	<1.0	<1.0	<1.0	<10
85	4	<1.0	<1.0	<1.0	<1.0	<10
86	4	<1.0	1.2	<1.0	<1.0	187
87	4	<1.0	<1.0	<1.0	<1.0	<10
88	4	<1.0	<1.0	<1.0	<1.0	<10
89	4	<1.0	<1.0	<1.0	<1.0	<10
90	4	<1.0	<1.0	<1.0	<1.0	<10
91	4	6.3	14	<1.0	<1.0	237
92	4	<1.0	<1.0	<1.0	<1.0	<10
93	4	<1.0	<1.0	<1.0	<1.0	<10
94	4	<1.0	<1.0	<1.0	<1.0	<10
95	4	<1.0	<1.0	<1.0	<1.0	<10
96	4	<1.0	<1.0	<1.0	<1.0	<10
97	4	<1.0	<1.0	<1.0	<1.0	54
FIELD CONTROL SAMPLES						
1		<1.0	<1.0	<1.0	<1.0	<10
2		<1.0	<1.0	<1.0	<1.0	<10
3		<1.0	<1.0	<1.0	<1.0	<10
4		<1.0	<1.0	<1.0	<1.0	<10
5		<1.0	<1.0	<1.0	<1.0	<10
6		<1.0	<1.0	<1.0	<1.0	<10
7		<1.0	<1.0	<1.0	<1.0	<10
8		<1.0	<1.0	<1.0	<1.0	<10
9		<1.0	<1.0	<1.0	<1.0	<10
10		<1.0	<1.0	<1.0	<1.0	<10
LABORATORY DUPLICATE ANALYSIS						
18		<1.0	<1.0	<1.0	<1.0	<10
18R		<1.0	<1.0	<1.0	<1.0	<10
28		<1.0	<1.0	<1.0	<1.0	<10
28R		<1.0	<1.0	<1.0	<1.0	<10

** CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE*

APPENDIX A

FIELD PROCEDURES

Two sampling procedures were employed. For both methods, the entire sampling system was first purged with ambient air drawn through an organic vapor filter cartridge. In general, deep (>4 foot) samples were collected using a van-mounted hydraulic probe to advance connected 3 foot sections of 1 inch diameter threaded steel casing down to the sampling depth. A teflon line was inserted into the casing to the bottom of the hole, and the bottom-hole line perforations were isolated from the up-hole annulus by an inflatable packer. Shallow samples (4 feet or less) were collected manually using a drive rod to produce a 1/2 inch hole. A stainless steel probe was inserted to the full depth of the hole and sealed off from the atmosphere. Where pavement was present, a rotary hammer was employed for penetration prior to using the drive rod.

Following isolation of the sampling zone, a sample of in-situ soil gas was then withdrawn through the probe or line and used to purge atmospheric air from the sampling system. A second sample of soil gas was withdrawn through the probe and encapsulated in a pre-evacuated glass vial at two atmospheres of pressure (15 psig). The self-sealing vial was detached from the sampling system, packaged, labeled, and stored for laboratory analysis.

Prior to the day's field activities all sampling equipment, slide hammer rods and probes were decontaminated by washing with soapy water and rinsing thoroughly. Internal surfaces were flushed dry using pre-purified nitrogen or filtered ambient air, and external surfaces were wiped clean using clean paper towels.

LABORATORY PROCEDURES

The analytical equipment was calibrated using a 3-point instrument-response curve and injection of known concentrations of the target analytes. Retention times of the standards were used to identify the peaks in the chromatograms of the field samples, and their response factors were used to calculate the analyte concentrations.

Total FID Volatiles values were generated by summing the areas of all integrated chromatogram peaks and calculated using the instrument response factor for toluene. Injection peaks, which also contain the light hydrocarbon methane, were excluded to avoid the skewing of Total FID Volatiles values due to injection disturbances and biogenic methane. For samples with low hydrocarbon concentrations, the calculated Total FID Volatiles concentration is occasionally lower than the sum of the individual analytes. This is because the response factor used for the Total FID Volatiles calculation is a constant, whereas the individual analyte response factors are compound specific. It is important to understand that the Total FID Volatiles levels reported are relative, not absolute, values.

APPENDIX C

DETECTABILITY & TERMINOLOGY

Detectability

The soil gas survey data presented in this report are the result of precise sampling and measurement of contaminant concentrations in the vadose zone. Analyte detection at a particular location is representative of vapor, dissolved, and/or liquid phase contamination at that location. The presence of detectable levels of target analytes in the vadose zone is dependent upon several factors, including the presence of vapor-phase hydrocarbons or dissolved or liquid concentrations adequate to facilitate volatilization into the unsaturated zone.

Terminology

In order to prevent misunderstanding of certain terms used in **TARGET**'s reports, the following clarifications are offered:

Analyte refers to any of the hydrocarbons standardized for quantification in the chromatographic analysis.

Anomaly refers to an area where hydrocarbons were measured in excess of what would normally be considered "natural" or "background" levels.

Elevated and **significant** are used to describe concentrations of analytes which indicate the existence of a potential problem in the soil or ground water.

Feature is used in reference to a discernible pattern in the contoured data. It denotes a contour form rather than a definite or separate chemical occurrence.

Indicates is used when evidence dictates a unique conclusion. **Suggests** is used when several explanations of certain evidence are possible, but one in particular seems more likely. As a result, "indicates" carries a higher degree of confidence in a conclusion than does "suggests."

Occurrence is used to indicate an area where chemical compounds are present in sufficient concentrations to be detected by the analysis of soil vapors. The term is not indicative of any specific mode of occurrence (vapor, dissolved, etc.), and does not necessarily indicate or suggest the presence of "free product" or "phase-separated hydrocarbons."

Reporting Limit refers to the minimum concentration reported for each analyte.

Vadose zone represents the unsaturated zone between the ground water table and the ground surface.

226199

Signed Laboratory Report

for

UST Removal QA Soil Sample

226200

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

CASE NARRATIVE

Three Quality Assurance soil samples arrived at the Southwestern Division Laboratory on 14 and 20 May 1993 from Carswell AFB - Bldg.'s 1518 and 1628. The samples arrived in good condition with complete chain of custody forms. Sample CAFB-1518-B-NW QA was contracted out to a Corps of Engineers' validated laboratory, NDRC. Samples CAFB-1628-B-BH QA and CAFB-1628-FL-C2-33' QA were contracted out to a Corps of Engineers' validated laboratory, Eureka Laboratory.

The data package from NDRC Laboratory was received complete with all required internal quality control and quality assurance information. All analysis were performed using specified methods within proper holding times. All method blanks appear to have been free of contamination. All surrogate, duplicate, blank spike and matrix spike recoveries were within control limits for the samples.

The data package from Eureka Laboratory was received complete with all required internal quality control and quality assurance information. All analysis were performed using specified methods within proper holding times. All method blanks appear to have been free of contamination. All surrogate, duplicate, blank spike and matrix spike recoveries were within control limits for the samples.

226291

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section

DATA CHECK SHEET

Project: Carswell AFB - Bldg. 1518
Date Sample Taken: 12 May 1993
Customer Sample No: CAFB-1518-B-NW QA
SWD Lab Sample No: 3-2593

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
Lead	6010	NA	9 d	1	NA
TRPH	418.1	NA	9 d	1	NA
BTEX	8020	NA	8 d	1	Good

Laboratory Comments: Ethyl benzene and xylenes were detected in the BTEX analysis.

Project: Carswell AFB - Bldg. 1628
Date Sample Taken: 18 May 1993
Customer Sample No: CAFB-1628-B-BH QA
SWD Lab Sample No: 3-2632

Parameter	Method	Holding Time Extracted	Holding Time Analyzed	Dilution Factor	Surrogate
Lead	6010	NA	10 d	1	NA
TRPH	418.1	NA	16 d	1	NA
BTEX	8020	NA	11 d	1	Good

Laboratory Comments: Ethyl benzene, toluene, and xylenes were detected in the BTEX analysis.

NDRC LABORATORIES, INC.

A member of Inchcape Environmental

226202

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 17-MAY-1993

REPORT NUMBER : D93-5715-1
REPORT DATE : 27-MAY-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : CAFB-1518-B-NW/QA 3-2593
PROJECT : Carswell AFB 3-2593
DATE SAMPLED : 12-MAY-1993

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead	1.0 mg/Kg	< 1.0 mg/Kg

Dilution Factor : 1
Prepared using EPA 3051 on 19-MAY-1993 by CCM
Analyzed using EPA 6010 on 21-MAY-1993 by KJS

NDRC Laboratories, Inc. David R. Godwin

David R. Godwin, Ph.D.
Chief Executive Officer

NDRC LABORATORIES, INC.

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226203

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BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 17-MAY-1993

REPORT NUMBER : D93-5715-1
REPORT DATE : 27-MAY-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : CAFB-1518-B-NW/QA 3-2593
PROJECT : Carswell AFB 3-2593
DATE SAMPLED : 12-MAY-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : TLR
PREPARED ON : 18-MAY-1993
ANALYSIS METHOD : EPA 418.1
ANALYZED BY : MTR
ANALYZED ON : 21-MAY-1993
DILUTION FACTOR : 1

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	470 mg/Kg

NDRC Laboratories, Inc. David R. Godwin, Ph.D.

David R. Godwin, Ph.D.
Chief Executive Officer

NDRC LABORATORIES, INC.

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226294

1089 East Collins Blvd., Richardson, Texas 75081 • (214) 238-5591 • FAX (214) 238-5592

BEAUMONT DALLAS HOUSTON

DATE RECEIVED : 17-MAY-1993

REPORT NUMBER : D93-5715-1
REPORT DATE : 27-MAY-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : CAFB-1518-B-NW/QA 3-2593
PROJECT : Carswell AFB 3-2593
DATE SAMPLED : 12-MAY-1993
ANALYSIS METHOD : EPA 8020
ANALYZED BY : PSS
ANALYZED ON : 20-MAY-1993
DILUTION FACTOR : 250

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	500 µg/Kg	< 500 µg/Kg
Toluene	500 µg/Kg	< 500 µg/Kg
Ethyl benzene	500 µg/Kg	9800 µg/Kg
Xylenes	500 µg/Kg	46000 µg/Kg
BTEX (total)		55800 µg/Kg #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/Kg	97.0 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. David R. Godwin PZ

David R. Godwin, Ph.D.
Chief Executive Officer

-2590

226205

COOLER RECEIPT FORM

Date Received 14 MAY 93 Project CARSWELL - FTW

Number of Coolers 1 District ~~FORT~~ WORTH

Date Checked in 14 MAY 93 By (sign) [signature]

1. Shipping bill number HAND CARRIED
2. Custody seals on cooler ON FRONT
3. Custody seals intact..... (Yes) No
4. Chain-of-Custody in plastic..... Yes (No) HAND CARRI
5. Chain-of-Custody filled out properly..... (Yes) No
6. SWD signed Chain-of-Custody properly..... (Yes) No
7. Ice and packing ICE - BUBBLE - WRAP
8. All bottles sealed..... (Yes) No
9. Any bottles broken..... Yes (No)
10. Labels in good condition and complete..... (Yes) No
11. Labels agree with COC..... (Yes) No
12. Correct containers used..... (Yes) No
13. Preserved properly..... (Yes) No
14. Sufficient sample..... (Yes) No
15. Bubbles absent from VOA..... Yes No N/A
16. Client called..... Yes (No)

Details: _____

17. Comments: _____

CONTRACT NO. DACA63-92-D-0046
(-0046)

MIPR# E8593052	SWD Lab#3-2593	Chest# HAND DELIVERED	Temp. 40°F

226206

CHAIN OF CUSTODY - SOIL SAMPLES
PAGE 1 OF 2

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CRESWELL AIR FORCE BASE	Date: 5/12/93 Time: P.M.
Site: BLDG # 1518	Boring No.: -N/A-
Proj. Engineer TODD SMITH	Phone No.: (214) [redacted] 264-0291

CONTAINERS

Jars (ea.)	Sample No.(s) & Depths	Total	C/Seal No.
1	CAFB-1518-B-NW/QA	1	

* [ ] = ½ LITER Jar ( ) = 120 ml Jars { } = Vials

PARAMETERS

	Parameter	Test Methods	*
	TRPH	418.1	
	BTEX	8020	
	LEAD	6010	

CUSTODY RECORD

Relinquished By:	Received By:	Date:	Time:
5/12/93		17MAY93	1055

LONE STAR OVERNIGHT
~~Bubbbb~~ #

MIPR# E85932056	SWD Lab #	Chest #	Temp. 40°F

226207

CHAIN OF CUSTODY PAGE 2 OF 2
SOIL/RINSTATE SAMPLE

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Tx.

PARAMETER	TEST METHOD	DETECTION LIMITS (TOTAL VALUES) (ug/L)	DETECTION LIMITS (TCLP VALUES) (ug/L)
Arsenic	7060	1.0	5
Barium	6010	10.0	10
Cadmium	6010	10.0	2
Chromium	6010	10.0	10
Lead	6010	20.0	20
Mercury	7471	0.2	0.2
Nickel	6010	15.0	20
Selenium	7740	1.0	2
Silver	6010	10.0	10
Zinc	6010	10.0	10

NOTE: If TCLP analysis is required, add test method 1311 to the other test methods.

226298

Well Boring Logs

for

MW-7 through MW-12

Hole No. MW-7 226209

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY, 7 7/8" ROCKBIT	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD	
3. DRILLING AGENCY USCE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number)	MW-7	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 3 / UNDISTURBED 0
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 10'	
7. THICKNESS OF OVERBURDEN	11'	16. DATE HOLE	STARTED 7 DEC 93 / COMPLETED 7 DEC 93
8. DEPTH DRILLED INTO ROCK	6'	17. ELEVATION TOP OF HOLE 567.91	
9. TOTAL DEPTH OF HOLE	17'	18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR BOB McVEY	

DEPTH a	SYMBOL b	CLASSIFICATION OF MATERIALS (Description) c	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
2	FILL	0.0 to 3.8' CLAY - medium/low plasticity, medium stiff/stiff, moist, very dark brown to brown, sandy/silty, fill?		0 PPM				
			FS-1	0 PPM	<30.0	6.5	5.4	
4								
6		3.8' to 6.5' CLAY - low plast, stiff, moist, brown to pale brown, few shells, very silty, calc.		0 PPM				
8		6.5' to 11.0' SAND/SILT - fine, few grains up to medium, moist to wet by 8.5', yellow brown and light gray, clayey, calc.	FS-2	0 PPM	30.5	5.8	6.2	
10 DEC 93				0 PPM				
7 DEC 93			FS-3	0 PPM	31.2	5.4	<5.0	
12		11' to 17' LIMESTONE - weather stained at top, mostly grey/dark grey by 15', hard (rock classification).						
14								
16		-TD 17.0'-						
18								
20								

SWL 350
SEP 80

PROJECT MONITOR WELL @ BSS | HOLE NO. MW-7

Hole No. MW-7

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS

1. PROJECT: MONITOR WELL INSTALL, CARSWELL AFB	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): BASE SERVICE STATION	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
3. DRILLING AGENCY: USCE	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): MW-7	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8, UNDISTURBED 0
5. NAME OF DRILLER: WILLIAMS	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: SEE REMARKS
7. THICKNESS OF OVERBURDEN: 11'	16. DATE HOLE: STARTED 7 DEC 93, COMPLETED 7 DEC 93
8. DEPTH DRILLED INTO ROCK: 6'	17. ELEVATION TOP OF HOLE: 567.91
9. TOTAL DEPTH OF HOLE: 17'	18. TOTAL CORE RECOVERY FOR BORING: %
	19. SIGNATURE OF INSPECTOR: BOB McVEY

MOISTURE CONTENT, % (a)	DEPTH FT. (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	2	FILL	0.0 to 3.8' CLAY - medium/low plasticity, medium stiff/stiff, moist, very dark brown to brown, sandy/silty, fill?			*Drilling 0 to 10' - 3" shelby water noted by 10', 10' to 11' - 10" auger, refusal, set 8" csng. to 11', 77/8" rockbit to 17' set well-see diagram
	4				FS-1	
	6		3.8' to 6.5' CLAY - low plast, stiff, moist, brown to pale brown, few shells, very silty, calc.		RINSATE	Samples RINSATE taken before 6' to 8' run - for BTEX 3-40ml vials & preserved w/HCL
	8		6.5' to 11.0' SAND/SILT - fine, few grains up to medium, moist to wet by 8.5', yellow brown and light gray, clayey, calc.		FS-2 QA QC	1/2 liter jars for BTEX & TRPH: FS-1: 2.0 to 3.0 FS-2: 6.5 to 8.0 FS-3: 9.0 to 10.0 BTEX only: QA & QC: 6.5 to 8.0
▼ 10 DEC 93						
▼ 7 DEC 93	10				FS-3	HNU Continuous reads from 0 to 11' of shelby pushes were all zero.
	12		11' to 17' LIMESTONE - weather stained at top, mostly grey/dark grey by 15', hard (rock classification).			*** Water Level - 18 hour check @ 8.6' 9 Dec. @ 8.7' 10 Dec. @ 8.7'.
	14					
	16		-TD 17.0'-			
	18					
	20					

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PROJECT: MONITOR WELL @ BSS | HOLE NO.: MW-7

Hole No. MW-8

226211

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT = SEE REMARKS	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and File number) .MW-8		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 1	
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER === SEE REMARKS	
		16. DATE HOLE STARTED 6 DEC 93; COMPLETED 6 DEC 93	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 556.73	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 27.0'		19. SIGNATURE OF INSPECTOR BOB MCVEY	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
			0.0' TO 13.5' CLAY 0.0' TO 5.0' - HIGH PLASTICITY, MEDIUM STIFF TO STIFF, MOIST, VERY DARK BROWN, SILTY, SLIGHTLY SANDY.			1.* - DRILLING 0.0' TO 14.0' - 3" SHELBY AT 2' INTERVALS WITH 8" AUGER CLEAN OUT EVERY TWO PUSHES. WATER NOTED BY 14.0' DURING AUGERING. 14.0' TO 26.0' - 10" AUGER. SET 8" CASING TO 26.0'. WITH 8" AUGER - CLEAN OUT TO 27.0'. SET WELL-SEE DIAGRAM.
	5		5.0' TO 10.0' - MEDIUM PLASTICITY, STIFF TO VERY STIFF, SLIGHTLY MOIST, DARK YELLOW BROWN, SANDY/SILTY, GRAVELLY, CALCAREOUS.		FS-1 C-1	2. SAMPLES TAKEN BEFORE 8.0' TO 10.0'. RINSATE-2-1 LITER AMBER GLASS PRESERVED WITH HCL AND ICED, FOR TRPH TEST. CARTON - 7.0' TO 8.0'. ½ LITER JARS - BTEX AND TRPH* FIELD FS-1: 6.0' TO 7.0' FS-2: 10.0' TO 12.0' FS-3: 26.0' TO 27.0' QA AND QC: 10.0' TO 12.0' TRPH ONLY.
	▼10 7 DEC 93		10.0' TO 13.5' - AS ABOVE, EXCEPT STIFF TO MEDIUM STIFF, VERY MOIST, VERY SANDY/SILTY.		FS-2 QA QC	3. HNU READINGS CONTINUOUS READINGS OF SHELBY SAMPLES: ALL READINGS WERE ZERO. FROM 0.0' TO 14.0', AND AT 19.0' = 0 AT 22.0' = 0 AT 27.0' = 0
	▽ 6 DEC 93 15		13.5' TO 27.0' SAND/SILT - FINE, WET, BROWN AND YELLOW BROWN, VERY CLAYEY, CALCAREOUS.			4. WATER LEVEL 18 HOUR CHECK AT 10.11'. DEVELOPED 6 DECEMBER, 1993. 8 DECEMBER, 1993 - AT 10.1'.
	20					

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PROJECT MONITOR WELL @ BSS | HOLE NO. MW-8

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226212

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 556.73 | Hole No. MW-8

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	22					
	24					
	26				FS-3	
			TD 27'			
	28					
	30					
	32					
	34					
	36					
	38					
	40					
	42					
	44					

ENG FORM 1836-A PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-8

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 08:00:12

Hole No. MW-8

226213

BORING LOG	DIVISION SWD	INSTALLATION FT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY W/8"&10" AUGER	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD	
3. DRILLING AGENCY USCE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) MW-8		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 1	
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 14'	
		16. DATE HOLE STARTED 6 DEC 93 COMPLETED 6 DEC 93	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 556.73	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A	
9. TOTAL DEPTH OF HOLE 27.0'		19. SIGNATURE OF INSPECTOR Robert McVey	

DEPTH (a)	SYMBOL (b)	CLASSIFICATION OF MATERIALS (Description) (c)	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
0		0.0' TO 13.5' CLAY 0.0' TO 5.0' - HIGH PLASTICITY, MEDIUM STIFF TO STIFF, MOIST, VERY DARK BROWN, SILTY, SLIGHTLY SANDY.		0 PPM				
2								
4				0 PPM				
6		5.0' TO 10.0' - MEDIUM PLASTICITY, STIFF TO VERY STIFF, SLIGHTLY MOIST, DARK YELLOW BROWN, SANDY/SILTY, GRAVELLY, CALCAREOUS.		0 PPM				
8			FS-1		<30.0	5.2	<5.0	
			C-1 / EB-1	0 PPM	<1.0			WATER CONTENT 12.1 % WET DENSITY 138.8 PCF DRY DENSITY 120.3 PCF ORGANIC MATTER 2.1 % POROSITY 27 %
10 ▽ 7 DEC 93				0 PPM				
12		10.0' TO 13.5' - AS ABOVE, EXCEPT STIFF TO MEDIUM STIFF, VERY MOIST, VERY SANDY/SILTY.	FS-2 OA, OC	0 PPM	<30.0	6.2	5.6	
14 ▽ 6 DEC 94		13.5' TO 27.0' SAND/SILT - FINE, WET, BROWN AND YELLOW BROWN, VERY CLAYEY, CALCAREOUS.		0 PPM				
16								
18				0 PPM				
20								

SWL 350
SEP 80

PROJECT MONITOR WELL @ BSS

HOLE NO. MW-8

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226214

BORING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 556.73 | Hole No. MW-8

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

DEPTH (a)	SYMBOL (b)	CLASSIFICATION OF MATERIALS (Description) (c)	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB
22				0 PPM			
24							
26			FS-3	0 PPM	33.9	5.6	11.4
		TD 27'					
28							
30							
32							
34							
36							
38							
40							
42							
44							

SWL 350-A
SEP 80

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-8

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Hole No. MW-9

226215

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 1 SHEETS
1. PROJECT: MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT: *SEE REMARKS	
2. LOCATION (Coordinates or Station): BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD	
3. DRILLING AGENCY: U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and File number): MW-9		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0	
5. NAME OF DRILLER: WILLIAMS		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: ***SEE REMARKS	
7. THICKNESS OF OVERBURDEN: 0'		16. DATE HOLE: STARTED 11/23/93; COMPLETED 11/23/93	
8. DEPTH DRILLED INTO ROCK: 0'		17. ELEVATION TOP OF HOLE: 560.30	
9. TOTAL DEPTH OF HOLE: 29'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: BOB MCVEY	

% MOISTURE CONTENT (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0		0.0' TO 7.0' SAND - FINE TO MEDIUM, SLIGHTLY MOIST, VERY DARK BROWN WITH DARK YELLOW BROWN SEAMS (CLEAN SAND ZONES), VERY SILTY AND CLAYEY, CALCAREOUS, SCATTERED GRAVELS TO 1.0".			1. * - DRILLING 0.0' TO 18.0' - 3" SHELBY AT 2' INTERVALS WITH 8" AUGER CLEAN OUT EVERY TWO PUSHES. WATER NOTED BY 18.0'. HOLE CAVING UP TO 16.0'. 18.0' TO 29.0' - 10" AUGER. SET CASING TO 30.0', AND 8" AUGER CLEAN OUT. SET WELL-SEE DIAGRAM.
	2					
	4					
	6				FS-1	2. SAMPLES - ½ LITER FS-1: 5.0' TO 6.0' FS-2: 14.0' TO 15.0' FS-3: 28.0' TO 29.0' PACKED IN ICE. BTEX AND TRPH PER SITE.
	8		7.0' TO 16.5' CLAY 7.0' TO 13.0' - HIGH PLASTICITY, VERY STIFF TO HARD, MOIST, VERY DARK BROWN TO DARK BROWN, SILTY AND SLIGHTLY SANDY, VERY SANDY SEAM - 8.0' TO 9.0'. 13.0' TO 16.5' - AS ABOVE, EXCEPT STIFF, AND SOME DARK RED BROWN.			3. HNU READINGS AT SURFACE = 0, (ZERO). CONTINUOUS READS OF EXTRUDED SHELBY'S: 0.0' TO 2.0' = 0 2.0' TO 4.0' = 0 4.0' TO 6.0' = 0 6.0' TO 8.0' = 0 8.0' TO 10.0' = 0 10.0' TO 12.0' = 0 12.0' TO 14.0' = 0 14.0' TO 16.0' = 4 AT 14.4' 16.0' TO 18.0' = 20 (PROBABLY DUE TO CONTAMINATED WATER) 18.0' TO 20.0' = UP TO 10 20.0' TO 22.0' = 0.2 AT 26.0' = 0 AT 29.0' = 0
	10					
	12					
	14				FS-2	
	16					
	18		16.5' TO 29.0' SAND - FINE, VERY MOIST, DARK YELLOW BROWN TO YELLOW BROWN AND LIGHT GRAY, VERY SILTY AND CLAYEY, SILT SEAMS, CHEMICAL ODOR AT TOP OF SECTION, AND DECREASING WITH DEPTH.			4. NOTES WATER AT 12.7', ONE HOUR AFTER DRILLING. 18 HOUR CHECK AT 12.7'. 29 NOVEMBER, 1993 - 11.8'. DEVELOPED 110 GALLONS UNTIL CLEAR ON 24 NOVEMBER, 1993. WELL SET AFTER ONE HOUR READING. 30 NOVEMBER, 1993 - 11.7'. 1 DECEMBER, 1993 - 11.7'.
	20					

▽ 24 NOV 93

▽ 23 NOV 93

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PROJECT: MONITOR WELL @ BSS

HOLE NO.: MW-9

226216

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE: 560.30

Hole No. MW-9

PROJECT: BASE SERVICE STATION

INSTALLATION: CARSWELL AFB

SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	22					
	24					
	26					
	28				FS-3	
			TD 29.0'			
	30					
	32					
	34					
	36					
	38					
	40					
	42					
	44					

ENG FORM 1836-A PREVIOUS EDITIONS ARE OBSOLETE.
MAR 71

PROJECT

HOLE NO.

Hole No. MW-9

226217

BORING LOG	DIVISION SWD	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS

1. PROJECT: MONITOR WELL INSTALL, CARSWELL AFB	10. SIZE AND TYPE OF BIT: 3" SHELBY, 8&10" AUGER
2. LOCATION (Coordinates or Station): BASE SERVICE STATION	11. DATUM FOR ELEVATION SHOWN (BM or MSL): NGVD
3. DRILLING AGENCY: USCE	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): MW-9	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6, UNDISTURBED 0
5. NAME OF DRILLER: WILLIAMS	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: ENCOUNTERED @ 18'
7. THICKNESS OF OVERBURDEN: -	16. DATE HOLE: STARTED 23 NOV 93, COMPLETED 23 NOV 93
8. DEPTH DRILLED INTO ROCK: -	17. ELEVATION TOP OF HOLE: 560.30
9. TOTAL DEPTH OF HOLE: 29.0'	18. TOTAL CORE RECOVERY FOR BORING: N/A
	19. SIGNATURE OF INSPECTOR: Robert McVey

DEPTH a	SYMBOL b	CLASSIFICATION OF MATERIALS (Description) c	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
2		0.0' TO 7.0' SAND - FINE TO MEDIUM, SLIGHTLY MOIST, VERY DARK BROWN WITH DARK YELLOW BROWN SEAMS (CLEAN SAND ZONES), VERY SILTY AND CLAYEY, CALCAREOUS, SCATTERED GRAVELS TO 1.0".		0 PPM				
4				0 PPM				
6			FS-1	0 PPM	<30.0	<4.7	<5.0	
8		7.0' TO 16.5' CLAY 7.0' TO 13.0' - HIGH PLASTICITY, VERY STIFF TO HARD, MOIST, VERY DARK BROWN TO DARK BROWN, SILTY AND SLIGHTLY SANDY, VERY SANDY SEAM - 8.0' TO 9.0'.		0 PPM				
10		13.0' TO 16.5' - AS ABOVE, EXCEPT STIFF, AND SOME DARK RED BROWN.		0 PPM				
12				0 PPM				
14			FS-2	0 PPM	<30.0	<4.7	<5.0	
16				4 PPM				
18 ▽ 23 NOV 94		16.5' TO 29.0' SAND - FINE, VERY MOIST, DARK YELLOW BROWN TO YELLOW BROWN AND LIGHT GRAY, VERY SILTY AND CLAYEY, SILT SEAMS, CHEMICAL ODOR AT TOP OF SECTION, AND DECREASING WITH DEPTH.		20 PPM				
20				UP TO 10 PPM				

▼ 24 NOV 94

SWL 350
SEP 80

PROJECT: MONITOR WELL @ BSS

HOLE NO.: MW-9

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226218

BORING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 560.30 | Hole No. MW-9

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	SAMPLE	PID	TPH PPM	BTEX PPB	MTBE PPB
22				0.2 PPM			
24							
26				0 PPM			
28			FS-3	0 PPM	<30.0	5.2	<5.0
		TD 29.0'					
30							
32							
34							
36							
38							
40							
42							
44							

SWL 350-A
SEP 80

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-9

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 06:58:49

Hole No. MW-10

226219

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY, W/ 8"&10" AUG	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION **		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and File number) .MW-10		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 1	
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 20'	
		16. DATE HOLE STARTED 9 DEC 93; COMPLETED 9 DEC 93	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 559.28	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A	
9. TOTAL DEPTH OF HOLE 32.0'		19. SIGNATURE OF INSPECTOR ROBERT McVEY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		0.0' TO 5.7' SAND - MOSTLY FINE, MOIST, DARK BROWN, SILTY TO VERY SILTY, CLAYEY, SLIGHTLY GRAVELLY, CALCAREOUS.		SHELBY TUBE	1.* - DRILLING NOTES 0.0' TO 20.0' - 3" SHELBY. WATER NOTED BY 20.0'. 10" AUGER TO 32.0', SET 8" CASING TO 32.0'. 8" AUGER CLEAN OUT. BAIL HOLE, SET WELL-SEE DIAGRAM. ** - HOLE OFFSET 56.5' NORTH, 4 DEGREES EAST, FROM 30" OAK TREE. WATER LEVEL - 18 HOUR CHECK AT 15.5'; 13 DECEMBER, 1993 - 14.85'. 2. SAMPLES -½ LITER BTEX AND TRPH: FS-1; 8.0' TO 9.0' FS-2; 16.0' TO 18.0' FS-3; 31.0' TO 32.0' TRPH ONLY: OA AND OC; 16.0' TO 18.0' RINSATE-2 1 LITER FOR TRPH - PRESERVED WITH HCL AND ICED, AND TAKEN BEFORE 14.0' TO 16.0' RUN. 3. HNU READINGS CONTINUOUS READS OF EXTRUDED SHELBY'S: 0.0' TO 14.0' - ALL ZERO 16.0' TO 18.0' - UP TO 350 18.0' TO 20.0' - UP TO 350 AT 27.0' - UP TO 7 AT 32.0' = ZERO 4. SHELBY SAMPLE SHELBY TUBE SEALED FROM RUN: 2.0' TO 4.0'.
	4					
	6		5.7' TO 12.0' CLAY/SILT - LOW TO MEDIUM PLASTICITY, HARD, SLIGHTLY MOIST TO DRY, BROWN AND RED YELLOW, VERY SANDY WITH SEAMS, CALCAREOUS.			
	8				FS-1	
	10					
	12		12.0' TO 18.5' CLAY - HIGH PLASTICITY, VERY STIFF, MOIST, DARK BROWN TO DARK YELLOW BROWN, VERY SANDY AND SILTY, SLIGHTLY GRAVELLY, CALCAREOUS, INCREASING SAND WITH DEPTH.			
	14					
13 DEC 93					RINSATE	
	16					
	18		18.5' TO 32.0' SAND - MOSTLY FINE, VERY MOIST TO WET, STRONG BROWN AND LIGHT GRAY, NUMEROUS THIN CLAY SEAMS, CHEMICAL ODOR.		FS-2 OA OC	
9 DEC 93	20					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT MONITOR WELL @ BSS | HOLE NO. MW-10

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:05:33

226220

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 559.28 | Hole No. MW-10

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	22					
	24					
	26					
	28					
	30					
	32		TD 32.0'		FS-3	
	34					
	36					
	38					
	40					
	42					
	44					

ENG FORM 1836-A PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-10

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:04:37

Hole No. MW-10

226221

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FT WORTH DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT: MONITOR WELL INSTALL, CARSWELL AFB
2. LOCATION (Coordinates or Station): BASE SERVICE STATION
3. DRILLING AGENCY: CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number): MW-10
5. NAME OF DRILLER: WILLIAMS
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: -
8. DEPTH DRILLED INTO ROCK: -
9. TOTAL DEPTH OF HOLE: 32.0'
10. SIZE AND TYPE OF BIT: 3" SHELBY W/8"&10" AUGER
11. DATUM FOR ELEVATION SHOWN (MSL or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: ENCOUNTERED @ 20'
16. DATE HOLE: STARTED 9 DEC 93; COMPLETED 9 DEC 93
17. ELEVATION TOP OF HOLE: 559.28
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: ROBERT McVEY

DEPTH (a)	SYMBOL (b)	CLASSIFICATION OF MATERIALS (Description) (c)	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
0		0.0' TO 5.7' SAND - MOSTLY FINE, MOIST, DARK BROWN, SILTY TO VERY SILTY, CLAYEY, SLIGHTLY GRAVELLY, CALCAREOUS.		0 PPM				
2			C-1	0 PPM				WATER CONTENT 14.2% WET DENSITY 110.2 PCF DRY DENSITY 96.5 PCF ORGANIC MATTER 1.8% POROSITY 42.1%
4								
6		5.7' TO 12.0' CLAY/SILT - LOW TO MEDIUM PLASTICITY, HARD, SLIGHTLY MOIST TO DRY, BROWN AND RED YELLOW, VERY SANDY WITH SEAMS, CALCAREOUS.		0 PPM				
8			FS-1	0 PPM	<30.0	22.4	<5.0	
10				0 PPM				
12		12.0' TO 18.5' CLAY - HIGH PLASTICITY, VERY STIFF, MOIST, DARK BROWN TO DARK YELLOW BROWN, VERY SANDY AND SILTY, SLIGHTLY GRAVELLY, CALCAREOUS, INCREASING SAND WITH DEPTH.		0 PPM				
13 DEC 93 ▼ 14			EB-1	0 PPM	<1.0			
16			FS-2	350 PPM	56	8022.7	39.2	
18		18.5' TO 32.0' SAND - MOSTLY FINE, VERY MOIST TO WET, STRONG BROWN AND LIGHT GRAY, NUMEROUS THIN CLAY SEAMS, CHEMICAL ODOR.		350 PPM				
9 DEC 93 ▽ 20								

SWL 350
SEP 80

PROJECT: MONITOR WELL @ BSS
HOLE NO.: MW-10

226222

BORING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 559.28 | Hole No. MW-10

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	SAMPLE	PID	TPH PPM	BTEX PPB	MTBE PPB
22							
24							
26				7 PPM			
28							
30							
32		TD 32.0'	FS-3	0 PPM	<30.0	590.6	91.1
34							
36							
38							
40							
42							
44							

SWL 350-A
SEP 80

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-10

Hole No. MW-11

226223

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY/8"&10" AUGER	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and File number) .MW-11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 0	
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 24'	
		16. DATE HOLE STARTED 29 NOV 93; COMPLETED 2 DEC 93	
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 558.88	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 38.0'		19. SIGNATURE OF INSPECTOR BOB MCVEY	

% MOISTURE CONTENT (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	2, 4, 6, 8, 10, 12, 14, 16, 18, 20		0.0' TO 38.0' SAND 0.0' TO 17.5' - FINE WITH SOME MEDIUM GRAINS, SLIGHTLY MOIST AT TOP TO DRY BY 6.0', SILTY TO VERY SILTY, FEW SCATTERED SHELL FRAGMENTS AFTER 10.0', BROWN TO LIGHT BROWN, WITH SOME DARK YELLOW BROWN, AND A VERY DARK BROWN SEAM FROM 2.6' TO 4.5' (VERY CLAYEY), CALCAREOUS.			1.* - DRILLING NOTES 0.0' TO 28.0' - 3" SHELBY. NOTE: 22.0' TO 24.0' CAME UP EMPTY; RE-PUSHED TO 24.5' FOR RECOVERY. 8" AUGER CLEAN OUT AFTER EVERY TWO PUSHES. WET SAND NOTED AT 24.0' DURING AUGER CLEAN OUT. 28.0' TO 37.0' - 10" AUGER. 8" AUGER CLEAN OUT 38.0', AFTER 8" CASING SET TO 37.0'. SET WELL-SEE DIAGRAM. DEVELOP WELL.
					FS-1	
			17.5' TO 25.0' - AS SAND ABOVE, EXCEPT SLIGHTLY MOIST, WITH CLAY SEAMS AT 21.4' TO 21.7', AND 24.7' TO 25.1'.			2. SAMPLE NOTES 2½ LITER FOR BTEX AND TRPH, AND PACKED IN ICE FOR S.W.D. QA AND QC - BTEX ONLY. FS-1: 7.0' TO 8.0' FS-2: 20.0' TO 22.0' QA/QC: 20.0' TO 22.0' FS-3: 37.0' TO 38.0' RINSATE-3, 40 ML. TAKEN BEFORE 16.0' TO 18.0' RUN. 3. HNU READINGS TESTED CONTINUOUSLY ON SHELBY MATERIAL AND AS NOTED: SURFACE = ZERO; ALL SHELBY READS FROM 0.0' TO 28.0' WERE ZERO; AS WERE READS AT 32.0', AND 38.0'. 4. WATER LEVEL WATER AT 33.0' AFTER DRILLING INSIDE CASING. 18 HOUR CHECK INSIDE CASING AT 15.5-? DEVELOP HOLE 4 DECEMBER, 1993. WATER AT 26.2' ON 6 DECEMBER, 1993, AND 7 DECEMBER, 1993.
					RINSATE	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT MONITOR WELL @ BSS | HOLE NO. MW-11

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226224

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 558.88 | Hole No. MW-11

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	22				FS-2 QA QC	
29 NOV 93	24					
6 DEC 93	26		25.0' TO 38.0' - FINE, WET, DARK GRAY AND DARK YELLOW BROWN, SILTY TO VERY SILTY, SILT SEAMS, H2S ODOR FROM 25.0' TO 32.0', NUMEROUS THIN CLAY SEAMS SCATTERED, GRAVELLY AFTER 37.0', CLAY SEAM 32.0' TO 32.4', COARSE TO FINE SEAM WITH TREE WOOD AND GRAVELS AND SHELLS FROM 31.0' TO 32.0'.			
	28					
	30					
	32					
	34					
	36				FS-3	
	38		TD 38.0'			
	40					
	42					
	44					

ENG FORM 1836-A PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-11

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:22:04

Hole No. MW-11

226225

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FT WORTH DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY/8"&10" AUGER	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (GS or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and File number) MW-11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 24'	
		16. DATE HOLE STARTED 29 NOV 93	COMPLETED 2 DEC 93
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 558.88	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 38.0'		19. SIGNATURE OF INSPECTOR ROBERT McVEY	

DEPTH a	SYMBOL b	CLASSIFICATION OF MATERIALS (Description) c	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
2		0.0' TO 38.0' SAND 0.0' TO 17.5' - FINE WITH SOME MEDIUM GRAINS. SLIGHTLY MOIST AT TOP TO DRY BY 6.0'. SILTY TO VERY SILTY. FEW SCATTERED SHELL FRAGMENTS AFTER 10.0'. BROWN TO LIGHT BROWN. WITH SOME DARK YELLOW BROWN. AND A VERY DARK BROWN SEAM FROM 2.6' TO 4.5' (VERY CLAYEY). CALCAREOUS.		0 PPM				
4				0 PPM				
6				0 PPM				
8			FS-1	0 PPM	52.7	10.0	<5.0	
10				0 PPM				
12				0 PPM				
14				0 PPM				
16			CB	0 PPM	N/A	<1.0	<1.0	
18		17.5' TO 25.0' - AS SAND ABOVE. EXCEPT SLIGHTLY MOIST. WITH CLAY SEAMS AT 21.4' TO 21.7'. AND 24.7' TO 25.1'.		0 PPM				
20				0 PPM				

SWL 350
SEP 80

PROJECT MONITOR WELL @ BSS

HOLE NO. MW-11

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:24:04

226226

BORING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 558.88 | Hole No. MW-11

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	SAMPLE	PID	TPH PPM	BTEX PPB	MTBE PPB
22			FS-2 0A. OC	0 PPM	48.6	6.1	<5.0
29 NOV 93							
24				0 PPM			
26		25.0' TO 38.0' - FINE, WET, DARK GRAY AND DARK YELLOW BROWN, SILTY TO VERY SILTY, SILT SEAMS, H2S ODOR FROM 25.0' TO 32.0', NUMEROUS THIN CLAY SEAMS SCATTERED, GRAVELLY AFTER 37.0', CLAY SEAM 32.0' TO 32.4', COARSE TO FINE SEAM WITH TREE WOOD AND GRAVELS AND SHELLS FROM 31.0' TO 32.0'.		0 PPM			
6 DEC 93							
28				0 PPM			
30							
32				0 PPM			
34							
36			FS-3		51.7	5.7	<5.0
38		TD 38.0'		0 PPM			
40							
42							
44							

SWL 350-A
SEP 80

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-11

f:/ed/drawing/carswell/bss/bsslogs May. 13, 1994 07:24:56

Hole No. MW-12

226227

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY W/8"&10" AUGER	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U.S.C.E.		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) .MW-12		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6	UNDISTURBED 0
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 10.6'	
7. THICKNESS OF OVERBURDEN -		16. DATE HOLE STARTED 13 DEC 93	COMPLETED 13 DEC 93
8. DEPTH DRILLED INTO ROCK -		17. ELEVATION TOP OF HOLE 560.20	
9. TOTAL DEPTH OF HOLE 28.0'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR BOB MCVEY	

% MOISTURE CONTENT (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0		0.0' TO 28.0' SAND 0.0' TO 6.0' - FINE, MOIST, DARK BROWN TO BROWN, VERY SILTY, CALCAREOUS, CLAYEY.			1. * - DRILLING NOTES 0.0' TO 12.0' - 3" SHELBY. WATER NOTED BY 12.0'. WATER TAPED AT 10.6'. 12.0' TO 28.0' - 10" AUGER. SET 8" CASING TO 28.0'. 8" AUGER - CLEAN OUT, AND BAIL HOLE. SET WELL-SEE DIAGRAM. 2. SAMPLES ½ LITER BTEX AND TRPH AT EACH SITE: FS-1: 7.0' TO 8.0' FS-2: 8.0' TO 9.0' FS-3: 26.0' TO 27.0' 3. HNU READINGS CONTINUOUS READS OF EXTRUDED SHELBY'S FROM 0.0' TO 12.0' = ZERO. AT 23.0' = ZERO. AT 28.0' = ZERO.
	2					
	4					
	6		6.0' TO 9.0' - FINE, SLIGHTLY MOIST, RED BROWN, SILTY AND CLAYEY, SHELLS, CALCAREOUS.		FS-1	
	8				FS-2	
	10		9.0' TO 23.0' - MOSTLY FINE, WET, RED BROWN TO RED YELLOW, VERY SILTY AND CLAYEY, THIN CLAY SEAMS, CALCAREOUS.			
			13 DEC 93			
	12					
	14					
	16					
	18					
	20					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT MONITOR WELL @ BSS | HOLE NO. MW-12

226228

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 560.20 | Hole No. MW-12

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	22					
	24		23.0' TO 28.0' - FINE, WET, YELLOW BROWN AND LIGHT GRAY, VERY SILTY AND CLAYEY, CALCAREOUS.			
	26				FS-3	
	28		TD 28.0'			
	30					
	32					
	34					
	36					
	38					
	40					
	42					
	44					

ENG FORM 1836-A PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-12

Hole No. MW-12

226229

BORING LOG	DIVISION SOUTHWESTERN	INSTALLATION FORT WORTH	SHEET 1 OF 2 SHEETS
1. PROJECT MONITOR WELL INSTALL, CARSWELL AFB		10. SIZE AND TYPE OF BIT 3" SHELBY W/8"&10" AUGER	
2. LOCATION (Coordinates or Station) BASE SERVICE STATION		11. DATUM FOR ELEVATION SHOWN (BM or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and this number) MW-12		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER WILLIAMS		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ENCOUNTERED @ 10.6'	
		16. DATE HOLE STARTED 13 DEC 93	COMPLETED 13 DEC 93
7. THICKNESS OF OVERBURDEN -		17. ELEVATION TOP OF HOLE 560.20	
8. DEPTH DRILLED INTO ROCK -		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 28.0'		19. SIGNATURE OF INSPECTOR ROBERT McVEY	

DEPTH a	SYMBOL b	CLASSIFICATION OF MATERIALS (Description) c	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB	OTHER
2		0.0' TO 28.0' SAND 0.0' TO 6.0' - FINE, MOIST, DARK BROWN TO BROWN, VERY SILTY, CALCAREOUS, CLAYEY.		0 PPM				
4				0 PPM				
6				0 PPM				
8		6.0' TO 9.0' - FINE, SLIGHTLY MOIST, RED BROWN, SILTY AND CLAYEY, SHELLS, CALCAREOUS.	FS-1	0 PPM	<30.0	<4.7	<5.0	
			FS-2		<30.0	<4.7	<5.0	
10		9.0' TO 23.0' - MOSTLY FINE, WET, RED BROWN TO RED YELLOW, VERY SILTY AND CLAYEY, THIN CLAY SEAMS, CALCAREOUS.		0 PPM				
13 DEC 93								
12				0 PPM				
14								
16								
18								
20								

226230

BORING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 560.20 | Hole No. MW-12

PROJECT: BASE SERVICE STATION | INSTALLATION: CARSWELL AFB | SHEET 2 OF 2 SHEETS

DEPTH (a)	SYMBOL (b)	CLASSIFICATION OF MATERIALS (Description) (c)	SAMPLE*	PID	TPH PPM	BTEX PPB	MTBE PPB
22							
				0 PPM			
24		23.0' TO 28.0' - FINE, WET, YELLOW BROWN AND LIGHT GRAY, VERY SILTY AND CLAYEY, CALCAREOUS.					
26			FS-3		<30.0	<4.7	<5.0
28		TD 28.0'		0 PPM			
30							
32							
34							
36							
38							
40							
42							
44							

SWL 350-A
SEP 80

PROJECT: MONITOR WELL @ BSS | HOLE NO. MW-12

Signed Laboratory Reports

for

Soil Samples

from

Well Borings

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226232

oject Name : _Carswell

Field Sample Number : _MW-07-FS-1 (2'-3') Matrix : _Soil____
SWD Sample Number : _3-9616

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-2
File Name : _9312-246.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226233

oject Name : _Carswell

Field Sample Number : _MW-07-FS-1 (2'-3')
SWD Sample Number : _3-9616___

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Matrix : _Soil_____

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-2
File Name : _9312-246.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	6.5	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	5.4	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	21.4	55	39*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226234

oject Name : _Carswell

Field Sample Number : _MW-07___
SWD Sample Number : _3-9615___

Matrix : _Aqueous__

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/15/93
Date Sample Analyzed : _12/15/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-1
File Name : _9312-246.A

COMPOUND	SAMPLE RESULTS UNITS (ug/L)	PQL UNITS (ug/L)
Benzene	<1	1
Toluene	<1	1
Ethylbenzene	<1	1
Xylenes (Total)	<1	1
Methyl Tert Butyl Ether	<1	1

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	42.9	55	78	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226235

oject Name : _Carswell

Field Sample Number : _MW-07-FS-2 (6.5'-8')
SWD Sample Number : _3-9617

Matrix : _Soil_____

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-3
File Name : _9312-246.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	30.5	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226236

Project Name : _Carswell

Field Sample Number : _MW-07-FS-2 (6.5'-8')
SWD Sample Number : _3-9617___

Matrix : _Soil_____

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-3
File Name : _9312-246.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.8	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	_19.9	55	36*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226237

'roject Name : _Carswell

Field Sample Number : _MW-07-FS-3 (9'-10')
SWD Sample Number : _3-9618

Matrix : _Soil____

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-4
File Name : _9312-246.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	31.2	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226238

oject Name : _Carswell

Field Sample Number : _MW-07-FS-3 (9'-10')
SWD Sample Number : _3-9618___

Matrix : _Soil_____

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-4
File Name : _9312-246.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.4	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	25.7	55	47*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226239

Project Name : _Carswell

Field Sample Number : _MW-D7-QC
SWD Sample Number : _3-9619___

Matrix : _Soil____

Date Sample Collected : _12/07/93
Date Sample Received : _12/08/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5D3D___
Analytical Method : _802D___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-246-5
File Name : _9312-246.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.4	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	6.2	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	23.4	55	43*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

2262-10

DATE RECEIVED : 8-DEC-1993

REPORT NUMBER : D93-13945-1
REPORT DATE : 21-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-07-QA 3-9620
PROJECT : Carswell (3-9620)
DATE SAMPLED : 7-DEC-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : PSS
ANALYZED ON : 13-DEC-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 32-121393

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	2.0 µg/Kg	< 2.0 µg/Kg	
Toluene	2.0 µg/Kg	< 2.0 µg/Kg	
Ethyl benzene	2.0 µg/Kg	< 2.0 µg/Kg	
Xylenes	2.0 µg/Kg	< 2.0 µg/Kg	
BTEX (total)		< 2.0 µg/Kg	#

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/Kg	109 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

226241

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

DATE RECEIVED : 8-DEC-1993

REPORT NUMBER : D93-13945-1
REPORT DATE : 21-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-07-QA 3-9620
PROJECT : Carswell (3-9620)
DATE SAMPLED : 7-DEC-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : PSS
ANALYZED ON : 13-DEC-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 32-121393

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/Kg	< 10.0 µg/Kg

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/Kg	109 %

Martin Jeffus dm
Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226242

roject Name : _Carswell

Field Sample Number : _MW-08-FS-1 6'-7'
SWD Sample Number : _3-9577

Matrix : _Soil____

Date Sample Collected : _11/06/93
Date Sample Received : _11/07/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-1
File Name : _9312-225.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226243

oject Name : _Carswell

Field Sample Number : _MW-08-FS-1 6'-7'
SWD Sample Number : _3-9577___

Matrix : _Soil____

Date Sample Collected : _12/06/93
Date Sample Received : _12/07/93

Date Sample Prepared : _12/08/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-1
File Name : _9312-225.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.2	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl tert butyl ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	19.7	55	36*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226244

Project Name : _Carswell

Field Sample Number : _MW-08 Rinsate
SWD Sample Number : _3-9580___

Matrix : _Aqueous__

Date Sample Collected : _11/06/93
Date Sample Received : _11/07/93

Date Sample Prepared : _12/23/93*
Date Sample Analyzed : _12/27/93
Preparation Method : _9070___
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-4
File Name : _9312-225.B

Analyte	Results Units:(mg/L)	PQL Units:(mg/L)
TPH	<1.0	1.0

PQL - Practical Quantitation Limit
* - Sample Extracted Outside EPA Holding Time. See Case Narrative.

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226245

oject Name : _Carswell

Field Sample Number : _MW-08-FS-2 10'-12' Matrix : _Soil____
SWD Sample Number : _3-9578

Date Sample Collected : _11/06/93
Date Sample Received : _11/07/93

Contract Laboratory Sample Number : _9312-225-2
File Name : _9312-225.B

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226246

Project Name : _Carswell

Field Sample Number : _MW-08-FS-2 10'-12'
SWD Sample Number : _3-9578___

Matrix : _Soil_____

Date Sample Collected : _12/06/93
Date Sample Received : _12/07/93

Date Sample Prepared : _12/08/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-2
File Name : _9312-225.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	6.2	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl tert butyl ether	5.6	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	18.7	55	34*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226247

Project Name : _Carswell

Field Sample Number : _MW-08-FS-3 26'-27'
SWD Sample Number : _3-9579

Matrix : _Soil_____

Date Sample Collected : _11/06/93
Date Sample Received : _11/07/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-3
File Name : _9312-225.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	33.9	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226243

ject Name : _Carswell

Field Sample Number : _MW-08-FS-3 26'-27'
SWD Sample Number : _3-9579___

Matrix : _Soil_____

Date Sample Collected : _12/06/93
Date Sample Received : _12/07/93

Date Sample Prepared : _12/08/93
Date Sample Analyzed : _12/11/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-3
File Name : _9312-225.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.6	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl tert butyl ether	11.4	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	29.2	55	53	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226249

oject Name : _Carswell

Field Sample Number : _MW-08-QC
SWD Sample Number : _3-9581

Matrix : _Soil_____

Date Sample Collected : _11/06/93
Date Sample Received : _11/07/93

Date Sample Prepared : _12/09/93
Date Sample Analyzed : _12/14/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-225-5
File Name : _9312-225.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226250

DATE RECEIVED : 6-DEC-1993

REPORT NUMBER : D93-13832-1
REPORT DATE : 15-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-08-QA 3-9582
PROJECT : Carswell (3-9582)
DATE SAMPLED : 6-DEC-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 7-DEC-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 13-DEC-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_030

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	< 10 mg/Kg

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226251

DATE RECEIVED : 6-DEC-1993

REPORT NUMBER : D93-13832-1
REPORT DATE : 15-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-08-QA 3-9582
PROJECT : Carswell (3-9582)
DATE SAMPLED : 6-DEC-1993

MISCELLANEOUS ANALYSES		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Solids /1	0.01 %	83.4 %
Analyzed using EPA 160.3 on 10-DEC-1993 by JAM QC Batch No : 89368A		

Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226252

oject Name : _Carswell

Field Sample Number : _FS-1 5'-6'
SWD Sample Number : _3-9296

Matrix : _Soil_____

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Date Sample Prepared : _12/07/93
Date Sample Analyzed : _12/09/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _WH_____

Contract Laboratory Sample Number : _9311-763-1
File Name : _9311-763.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226253

oject Name : _Carswell

Field Sample Number : _FS-1 5'-6'
SWD Sample Number : _3-9296___

Matrix : _Soil____

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Date Sample Prepared : _12/01/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9311-763-1
File Name : _9311-763.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	22.6	55	41*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226254

roject Name : _Carswell

Field Sample Number : _FS-2 14'-15'
SWD Sample Number : _3-9297

Matrix : _Soil_____

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Date Sample Prepared : _12/07/93
Date Sample Analyzed : _12/09/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _WH_____

Contract Laboratory Sample Number : _9311-763-2
File Name : _9311-763.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226255

)ject Name : _Carswell

Field Sample Number : _FS-2 14'- 15'
SWD Sample Number : _3-9297___

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Matrix : _Soil_____

Date Sample Prepared : _12/01/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9311-763-2
File Name : _9311-763.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	30.2	55	55	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226256

'roject Name : _Carswell

Field Sample Number : _FS-3 28'-29'
SWD Sample Number : _3-9298

Matrix : _Soil____

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Date Sample Prepared : _12/07/93
Date Sample Analyzed : _12/09/93
Preparation Method : _9071___
Analytical Method : _418.1__
Analyst : _WH_____

Contract Laboratory Sample Number : _9311-763-3
File Name : _9311-763.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226257

oject Name : _Carswell

Field Sample Number : _FS-3 28'- 29'
SWD Sample Number : _3-9298___

Matrix : _Soil____

Date Sample Collected : _11/23/93
Date Sample Received : _11/30/93

Date Sample Prepared : _12/01/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9311-763-3
File Name : _9311-763.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.2	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	29.5	55	54	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226258

oject Name : _Carswell

Field Sample Number : _MW-10-FS-1 ((8'-9') Matrix : _Soil_____
SWD Sample Number : _3-9754

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/14/93
Date Sample Analyzed : _12/16/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-2
File Name : _9312-379.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226259

oject Name : _Carswell

Field Sample Number : _MW-10-FS-1 (8'-9')
SWD Sample Number : _3-9754___

Matrix : _Soil_____

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/13/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-2
File Name : _9312-379.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	7.4	4.8
Toluene	9.1	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	5.9	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	70.4	55	128	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226260

oject Name : _Carswell

Field Sample Number : _MW-10
SWD Sample Number : _3-9753___

Matrix : _Aqueous__

Date Sample Collected : _12/09/93
Date Sample Received : _11/11/93

Date Sample Prepared : _12/16/93
Date Sample Analyzed : _12/17/93
Preparation Method : _9070____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-1
File Name : _9312-379.B

Analyte	Results Units:(mg/L)	PQL Units:(mg/L)
TPH	<1.0	1.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226261

ject Name : _Carswell

rield Sample Number : _MW-10-FS-2 (16'-18') Matrix : _Soil_____
SWD Sample Number : _3-9755

ate Sample Collected : _12/09/93
Date Sample Received : _12/11/93

ontract Laboratory Sample Number : _9312-379-3
ile Name : _9312-379.B

Date Sample Prepared : _12/14/93
Date Sample Analyzed : _12/16/93
Preparation Method : _9071___
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	32.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226262

roject Name : _Carswell

Field Sample Number : _MW-10-FS-2 (16'-18')
SWD Sample Number : _3-9755___

Matrix : _Soil_____

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/13/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _10_____

Contract Laboratory Sample Number : _9312-379-3
File Name : _9312-379.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	93.6	4.8
Toluene	779	4.9
Ethylbenzene	1,900	4.7
Xylenes (Total)	5,250.1	5.1
Methyl Tert Butyl Ether	39.2	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	64.9	55	118	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226263

)ject Name : _Carswell

Field Sample Number : _MW-10-FS-2 (31'-32')
SWD Sample Number : _3-9756

Matrix : _Soil_____

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/14/93
Date Sample Analyzed : _12/16/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-4
File Name : _9312-379.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226264

oject Name : _Carswell

Field Sample Number : _MW-10-FS-3 (31'-32')
SWD Sample Number : _3-9756___

Matrix : _Soil_____

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/13/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-4
File Name : _9312-379.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	43.4	4.8
Toluene	37.2	4.9
Ethylbenzene	111	4.7
Xylenes (Total)	399	5.1
Methyl Tert Butyl Ether	91.1	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	66.8	55	121	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226265

roject Name : _Carswell

Field Sample Number : _MW-10-QC
SWD Sample Number : _3-9757

Matrix : _Soil_____

Date Sample Collected : _12/09/93
Date Sample Received : _12/11/93

Date Sample Prepared : _12/14/93
Date Sample Analyzed : _12/16/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-379-5
File Name : _9312-379.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	39.1	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226266

DATE RECEIVED : 10-DEC-1993

REPORT NUMBER : D93-14098-1
REPORT DATE : 21-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-10-QA 3-9758
PROJECT : Carswell (3-9758)
DATE SAMPLED : 9-DEC-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 13-DEC-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 14-DEC-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_030

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	56 mg/Kg

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081.
Tel. 214-238-5591
Fax. 214-238-5592

226267

DATE RECEIVED : 10-DEC-1993

REPORT NUMBER : D93-14098-1
REPORT DATE : 21-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-10-QA 3-9758
PROJECT : Carswell (3-9758)
DATE SAMPLED : 9-DEC-1993

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Solids	/1	0.01 %	86.8 %
Analyzed using EPA 160.3 on 15-DEC-1993 by JAM QC Batch No : 89380J			

Martin Jeffus dm

Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226263

oject Name : _Carswell

Field Sample Number : _MW-11-FS-1 7'-8'
SWD Sample Number : _3-9424

Matrix : _Soil____

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Date Sample Prepared : _12/03/93
Date Sample Analyzed : _12/03/93
Preparation Method : _9071___
Analytical Method : _418.1__
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-1
File Name : _9312-015.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	52.7	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226269

oject Name : _Carswell

Field Sample Number : _MW-11-FS-1 7'-8'
SWD Sample Number : _3-9424___

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Matrix : _Soil_____

Date Sample Prepared : _12/02/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-1
File Name : _9312-015.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	4.8	4.8
Toluene	5.2	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	26.2	55	48*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226270

Project Name : _Carswell

Field Sample Number : _MW-11-FS-1 16'-18'
SWD Sample Number : _3-9426-7

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Matrix : _Aqueous__

Date Sample Prepared : _12/02/93
Date Sample Analyzed : _12/02/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-4
File Name : _9312-015.A

COMPOUND	SAMPLE RESULTS UNITS (ug/L)	PQL UNITS (ug/L)
Benzene	<1	1
Toluene	<1	1
Ethylbenzene	<1	1
Xylenes (Total)	<1	1
Methyl Tert Butyl Ether	<1	1

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	_50.2	55	91	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226271

Project Name : _Carswell

Field Sample Number : _MW-11-FS-2 20'-22' Matrix : _Soil____
SWD Sample Number : _3-9425

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Contract Laboratory Sample Number : _9312-015-2
File Name : _9312-015.B

Date Sample Prepared : _12/03/93
Date Sample Analyzed : _12/03/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _WH_____
Dilution Factor : _1_____

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	48.6	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226272

oject Name : _Carswell

Field Sample Number : _MW-11-FS-2 20'-22'
SWD Sample Number : _3-9425___

Matrix : _Soil_____

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Date Sample Prepared : _12/02/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-2
File Name : _9312-015.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	_43.4	55	79	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226273

oject Name : _Carswell

Field Sample Number : _MW-11-FS-3 37'-38'
SWD Sample Number : _3-9426

Matrix : _Soil____

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Date Sample Prepared : _12/03/93
Date Sample Analyzed : _12/03/93
Preparation Method : _9071___
Analytical Method : _418.1__
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-3
File Name : _9312-015.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	51.7	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226274

Project Name : _Carswell

Field Sample Number : _MW-11-FS-3 37'-38'
SWD Sample Number : _3-9426___

Matrix : _Soil_____

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Date Sample Prepared : _12/02/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-3
File Name : _9312-015.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	5.7	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	26.7	55	49*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226275

ject Name : _Carswell

Field Sample Number : _MW-11-QC
SWD Sample Number : _3-9428___

Matrix : _Soil_____

Date Sample Collected : _11/29/93
Date Sample Received : _12/01/93

Date Sample Prepared : _12/02/93
Date Sample Analyzed : _12/03/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-015-5
File Name : _9312-015.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	6.1	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	20.2	55	37*	50-150

PQL - Practical Quantitation Limit
* - Surrogate Recovery Outside QC Limits

LABORATORY MANAGER

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226276

DATE RECEIVED : 1-DEC-1993

REPORT NUMBER : D93-13658-1
REPORT DATE : 9-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-11-QA 3-9429
PROJECT : Carswell (3-9429)
DATE SAMPLED : 29-NOV-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : PSS
ANALYZED ON : 7-DEC-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 32-120793

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/Kg	< 2.0 µg/Kg
Toluene	2.0 µg/Kg	< 2.0 µg/Kg
Ethyl benzene	2.0 µg/Kg	< 2.0 µg/Kg
Xylenes	2.0 µg/Kg	< 2.0 µg/Kg
BTEX (total)		< 2.0 µg/Kg #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/Kg	113 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226277

DATE RECEIVED : 1-DEC-1993

REPORT NUMBER : D93-13658-1
REPORT DATE : 9-DEC-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Soil
ID MARKS : MW-11-QA 3-9429
PROJECT : Carswell (3-9429)
DATE SAMPLED : 29-NOV-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : PSS
ANALYZED ON : 7-DEC-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 32-120793

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/Kg	< 10.0 µg/Kg

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/Kg	113 %

Martin Jeffus dm

Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226278

roject Name : _Carswell

Field Sample Number : _MW-12 FL-1 (7'-8')
SWD Sample Number : _3-9800

Matrix : _Soil_____

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Date Sample Prepared : _12/17/93
Date Sample Analyzed : _12/21/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-1
File Name : _9312-477.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
. Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226279

roject Name : _Carswell

Field Sample Number : _MW-12 FL-1 (7'-8')
SWD Sample Number : _3-9800___

Matrix : _Soil_____

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Date Sample Prepared : _12/16/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-1
File Name : _9312-477.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<6.5	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	70.5	55	128	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226280

oject Name : _Carswell

Field Sample Number : _MW-12 FS-2 (8'-9')
SWD Sample Number : _3-9801

Matrix : _Soil____

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Date Sample Prepared : _12/17/93
Date Sample Analyzed : _12/21/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-2
File Name : _9312-477.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226281

Project Name : _Carswell

Field Sample Number : _MW-12 FL-2 (8'-9')
SWD Sample Number : _3-9801___

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Matrix : _Soil_____

Date Sample Prepared : _12/16/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030____
Analytical Method : _8020____
Analyst : _WH_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-2
File Name : _9312-477.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	71.4	55	130	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226282

'roject Name : _Carswell

Field Sample Number : _MW-12 FS-3 (26'-27') Matrix : _Soil____
SWD Sample Number : _3-9802

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Date Sample Prepared : _12/17/93
Date Sample Analyzed : _12/21/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-3
File Name : _9312-477.B

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	<30.0	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226283

oject Name : _Carswell

Field Sample Number : _MW-12 FL-3 (26'-27')
SWD Sample Number : _3-9801___

Matrix : _Soil____

Date Sample Collected : _12/13/93
Date Sample Received : _12/15/93

Date Sample Prepared : _12/16/93
Date Sample Analyzed : _12/21/93
Preparation Method : _5030___
Analytical Method : _8020___
Analyst : _WH____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9312-477-3
File Name : _9312-477.A

COMPOUND	SAMPLE RESULTS UNITS (ug/Kg)	PQL UNITS(ug/Kg)
Benzene	<4.8	4.8
Toluene	<4.9	4.9
Ethylbenzene	<4.7	4.7
Xylenes (Total)	<5.1	5.1
Methyl Tert Butyl Ether	<5.0	5.0

UNITS: ug/L

SURROGATE STANDARD	RESULT	EXP	% REC	QC LIMITS % RECOVERY
Bromofluorobenzene	_67.5	55	123	50-150

PQL - Practical Quantitation Limit

LABORATORY MANAGER

226284

Chain of Custody Forms

for

Soil Samples

from

Well Borings

3-9296 + 3-9295

COOLER RECEIPT FORM 226285

Date Received 24NOV93 Project CARSWELL

Number of Coolers 1 District FT. WORTH

Date Checked in 24NOV93 By (sign) Shirley A. Hall

1. Shipping bill number HAND DELIVERED
2. Custody seals on cooler —
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....(Yes) No
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERT
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No) ①
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....Yes (No)

Details:

17. Comments: ① 1 VIAL OF SAMPLE # FS-1 (3-9296) HAS CRACKED LID.

MIPR# E87930087	SWD LAB# 3-9295 3-9296 3-9297	CHEST# C - 14	TEMP. 4°

226286

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 23 Nov 93 Time: 1030
Site: Base Service Station	Boring No. MW-9
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

[2] Jars per Sample	Sample No. & Depths 3-9296	3-9297	3-9295		Total Jars	C/Seal No.
	FS-1	FS-2	FS-3		6	231193C14
	5'-6'	14'-15'	28-29			

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
V	BTEX/MTBE	8020	[1]
V	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		24 Nov 93	0800
	Randy Smith	24Nov93	0800

S-9424
T-12
9424

226287

COOLER RECEIPT FORM

Date Received 30 Nov 93 Project CARDWELL

Number of Coolers 1 District FT. WORTH

Date Checked in 30Nov93 By (sign) Randy Smith

1. Shipping bill number HAND-CARRIED
2. Custody seals on cooler Ø
3. Custody seals intact.....(Yes) No
4. Chain-of-Custody in plastic.....(Yes) No
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERT
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....Yes (No)

Details:

17. Comments:

MIPR# E87930087	SWD LAB#	CHEST# C-48	TEMP. 4°

226288

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 29 NOV 93 Time: ~~0~~ 1414
Site: Base Service Station	Boring No. MW-11
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths 3-9424	3-9425	3-9426	Total Jars	C/Seal No.
	FS-1	FS-2	FS-3	6	291193C48
	7' to 8'	20' to 22'	37' to 38'		

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
J	BTEX/MTBE	8020	[1]
J	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		30 Nov.	0800
	Randy Smith	30 NOV 93	0830

MIPR# E87930087	SWD LAB# [illegible]	CHEST# C-48	TEMP. 4°

226283

CHAIN OF CUSTODY
RINSATE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 29 Nov 93 Time: 1024

Site: Base Service Station Boring & Sample No. MW-11, ~FS-2

Technical Mgr.: Deborah Fitzgerald Phone No. 817-334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
		3	C-48	~~CS~~ 291193C48

* LEGEND: [] = 1L Plastic () = 1L Amber glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
✓	BTEX/MTBE	8020	{3}
	~~TRPH~~	~~418.1~~	~~(2)~~

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		30 Nov 93	0800
	Randy Smith	30 Nov 93	0830

MIPR# E87930087	SWD LAB# [illegible]	CHEST# C-48	TEMP. 4°

226200

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 29 Nov 93 Time: 1231
Site: Base Service Station	Boring No. MW-11 QC
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QC				1	291193C48
	T.B.A.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
✓	BTEX/MTBE	8020	[1]
	~~TPH~~	~~418.1~~	~~[1]~~

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		30 Nov 93	0800
	Rhonda Smith	30 Nov 93	0830

MIPR# E87930087	SWD LAB# [illegible]	CHEST# C-48	TEMP. 4°

226291

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 29 NOV 93 Time: 1231
Site: Base Service Station	Boring No. MW-11 QA
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QA				1	291193C48
	T.B.A.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
✓	BTEX/MTBE	8020	[1]
	~~TPH~~	~~418.1~~	~~[1]~~

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		30 NOV	0800
	Linda Smith	30 NOV 93	0830

COOLER RECEIPT FORM 226292

Date Received 06DEC93 Project CARDWELL - BASE SVC STN

Number of Coolers 1 District FT. WORTH

Date Checked in 06DEC93 By (sign) Randy Smith

1. Shipping bill number HAND-CARRIED
2. Custody seals on cooler No
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....Yes (No) HAND CARR
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERTS
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....Yes (No)

Details: _____

17. Comments: _____

MIPR# E87930087	SWD LAB#	CHEST# C-14	TEMP. 4°

226293

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 6-12-93 Time: 1030
Site: Base Service Station	Boring No. MW-8
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	3-9577	3-9578	3-9579			
	FS-1	FS-2	FS-3		6	61293C14
	6'to7'	10'-12'	26'-27'			

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
J	BTEX/MTBE	8020	[1]
J	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McKay			
	Randy Smith	06DEC93	1215

MIPR# E87930087	SWD LAB# 3-9580	CHEST# C-14	TEMP. 4°

226294

CHAIN OF CUSTODY
RINSATE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 6-12-93 Time: 0928

Site: Base Service Station Boring & Sample No. MW-8-

Technical Mgr.: Deborah Fitzgerald Phone No. 817-334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
(2)			C-14	61293C14

* LEGEND: [] = 1L Plastic () = 1L Amber glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	~~8020~~	~~(3)~~
V	TRPH preserved w/ HCL	418.1	(2)

CUSTODY RECORD

Relinquished by	Received by	Date	Time
MCVer			
	Randy Smith	06DEC93	1215

MIPR# E87930087	SWD LAB# 3-5581	CHEST# C-14	TEMP. 4

226295

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 6·12·93 Time: 0945
Site: Base Service Station	Boring No. MW-8, QC
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

1 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QC				1	61293c14
	T.B.A.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	~~8020~~	~~[1]~~
✓	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey			
	Randy Smith	06 DEC 93	1215

MIPR# E87930087	SWD LAB# 3-4582	CHEST# C-14	TEMP. 4°

226296

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 6-12-93 Time: 0945
Site: Base Service Station	Boring No. MW-8-QA
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

~~X~~ Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QA				1	61293C14
	T.B.A.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	~~8020~~	~~[1]~~
✓	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey			
	Rudy Smith	06DEC93	1215

COOLER RECEIPT FORM 226297

Date Received 07 DEC 93 Project CARSWELL

Number of Coolers 1 District FT. WORTH

Date Checked in 07 DEC 93 By (sign) Randy Smith

1. Shipping bill number HAND-CARRIED
2. Custody seals on cooler No
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....Yes (No)
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERT
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....Yes (No)

Details: _____

17. Comments: _____

MIPR# E87930087	SWD LAB#3-4115	CHEST# C-83	TEMP. 4°

226298

CHAIN OF CUSTODY
RINSATE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 7-12-93 Time: 1035
Site: Base Service Station	Sample No. MW-7
Technical Mgr.: Deborah Fitzgerald	Phone No. 817-334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
		23	C-83	71293C83

* LEGEND: [] = 1L Plastic () = 1L Amber glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
✓	BTEX/MTBE ~~Plastic~~ preserved HCl ≥2	8020	{3}

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey			
	Randy Smith	07DEC93	1400

MIPR# E87930087	SWD LAB#	CHEST# C-83	TEMP. 4°

226299

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 7-12-93 Time: 1045
Site: Base Service Station	Boring No. MW-2
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	FS-1	FS-2	FS-3		6	71293C83
	2' to 3'	6.5 to 8'	9' to 10'			

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
√	BTEX/MTBE	8020	[1]
√	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey			
	Randy Smith	07 DEC 93	1400

MIPR# E87930087	SWD LAB# 3-4619	CHEST# C-83	TEMP. 4°

CHAIN OF CUSTODY
SOIL SAMPLES

228390

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 7-12-93 Time: 1038
Site: Base Service Station	Boring No. MW-7 - QC
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QC				1	71293C83
	T.B.A.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

✓	Parameter	Test Method	*
✓	BTEX/MTBE	8020	[1]
	~~TRPH~~	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
	Randy Smith	07DEC93	1400

MIPR# E87930087	SWD LAB# 3-9620	CHEST# C-83	TEMP. 4°

CHAIN OF CUSTODY
SOIL SAMPLES

226391

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 7-12-93 Time: 1038
Site: Base Service Station	Boring No. MW-7 QA
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QA				1	71293C83
	TBA.					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
√	BTEX/MTBE	8020	[1]
	[redacted]	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey			
	Randy Smith	07 DEC 93	1400

COOLER RECEIPT FORM 226392

Date Received 09 DEC 93 Project CARSWELL - SVC. STN.

Number of Coolers 1 District FT. WORTH

Date Checked in 10 DEC 93 By (sign) Randy Smith

1. Shipping bill number HAND-CARRIED
2. Custody seals on cooler No
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....Yes (No)
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERTS
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....Yes (No)

Details: _____

17. Comments: _____

MIPR# E87930087	SWD LAB# 7753	CHEST# C-93	TEMP. 4°

226393

CHAIN OF CUSTODY
RINSATE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 9-12-93 Time: 1035

Site: Base Service Station Boring & Sample No. MW-10

Technical Mgr.: Deborah Fitzgerald Phone No. 817-334-3221

CONTAINERS

Glass	Plastic	Vial	C-93 Chest No.	Custody Seal
(2)			~~C-93~~	9/293C93

* LEGEND: [] = 1L Plastic () = 1L Amber glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	8020	{3}
√	TRPH preserved w/ HCL < 2	418.1	(2)

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVey		9-12-93	
	Randy Smith	09 DEC 93	1630

MIPR# E87930087	SWD LAB#	CHEST# C-93	TEMP. 4°

226304

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 9-12-93 Time: 1210
Site: Base Service Station	Boring No. MW-10
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths 3-9754	3-9755	3-9756	Total Jars	C/Seal No.
	FS-1	FS-2	FS-3	6	9/293C93
	8' to 9'	16' to 18'	31' to 32'		

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
✓	BTEX/MTBE	8020	[1]
✓	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McKay		9-12-93	
	Randy Smith	09 DEC 93	1630

MIPR# E87930087	SWD LAB# [illegible]	CHEST# C-93	TEMP. 4°

CHAIN OF CUSTODY
SOIL SAMPLES

226305

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 9-12-93 Time: 1050
Site: Base Service Station	Boring No. MW-10 QC
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QC				1	91293C93
	—					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	8020	[1]
✓	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		9-12-93	
	Randy Smith	09 DEC 93	1630

MIPR# E87930087	SWD LAB# 3-9758	CHEST# C-93	TEMP 22°C

CHAIN OF CUSTODY
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 9-12-93 Time: 1050
Site: Base Service Station	Boring No. MW-10 QA
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

2 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	QA				1	9/293c93
	—					

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
	~~BTEX/MTBE~~	8020	[1]
✓	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Mary		9-12-93	
	Randy Smith	09 DEC 93	1630

226397

COOLER RECEIPT FORM

Date Received 14DEC93 Project CARSWELL - BASE SVC STN

Number of Coolers 1 District FT. WORTH

Date Checked in 14DEC93 By (sign) Randy Smith

1. Shipping bill number HAND CARRIED
2. Custody seals on cooler Ø
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....Yes (No)
5. Chain-of-Custody filled out properly.....(Yes) No
6. SWD signed Chain-of-Custody properly.....(Yes) No
7. Ice and packing ICE AND INSERT
8. All bottles sealed.....(Yes) No
9. Any bottles broken.....Yes (No)
10. Labels in good condition and complete.....(Yes) No
11. Labels agree with COC.....(Yes) No
12. Correct containers used.....(Yes) No
13. Preserved properly.....(Yes) No
14. Sufficient sample.....(Yes) No
15. Bubbles absent from VOA.....Yes No N/A
16. Client called.....(Yes) No

Details: SOMEBODY CALLED & TALKED TO MATT FAN/ISM

17. Comments:

MIPR# E87930087	SWD LAB#	CHEST# C-83	TEMP. 4°

CHAIN OF CUSTODY
SOIL SAMPLES

226308

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 13 Dec 93 Time: 1100
Site: Base Service Station	Boring No. MW-12
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

(2) Jars per Sample	Sample No. & Depths 3-9800	3-9801	3-9802		Total Jars	C/Seal No.
	FS-1	FS-2	FS-3		6	131293C83
	3'-8'	8'-9'	26-27			

* LEGEND: [] = 1/2L Jar

PARAMETERS

	Parameter	Test Method	*
√	BTEX/MTBE	8020	[1]
√	TRPH	418.1	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
McVay		14 DEC 93	
	Randy Smith	14DEC93	0800

QA/QC Report

for

Soil Samples

from

Well Borings

226310

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

SUBMITTAL OF SWDED-GL REPORT 15728-5

PROJECT: CARSWELL AFB - FTW Feature: BASE SERVICE STATION	Contract No.
TEST REQUEST NO.: E87930087 Dated: 09 DECEMBER 1992 Received: 14 DECEMBER 1992	From: CHIEF, GEOTECHNICAL BRANCH

MATERIAL: Four travel blanks, eighteen soil samples, four quality control samples, and four quality assurance samples.

Date Received: 24,30 November and 06,07,09,& 14 December 1993

Remarks:

Report sent to: FORT WORTH DISTRICT	Copy furnished:

Date: JAN 12 1994	Name and title: STEPHEN L. BROOKS Acting Director SWD Laboratory	Signature for

226311

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Enviromental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

CASE NARRATIVE

Four travel blanks, eighteen soil samples, four quality control samples and four quality assurance samples arrived at Southwestern Division Laboratory on 24, 30 November and 06, 07, 09 and 14 December 1993 from Carswell AFB. The samples arrived in good condition and with complete chain of custodies except that sample 3-9296 arrived with a cracked lid. The analyses for the field and quality control samples were contracted out to a Corps of Engineers' validated laboratory, Environmental Testing and Consulting, Inc. The analyses for the quality assurance samples were contracted out to a Corps of Engineers' validated laboratory, NDRC Laboratories, Inc.

The data package from NDRC Laboratories, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods within proper holding times. All matrix spike, surrogate and laboratory control recoveries were within control limits. All method blanks were free of contamination.

The data package from Environmental Testing and Consulting, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods and within proper holding times. All duplicates, matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions.

- Surrogate recoveries for BTEX for numerous samples were outside of control limits.
- For samples 9577-9581 and 9615-9620, MSD recoveries and MS/MSD RPD values for TPH as gasoline range organics were outside of control limits. Acceptable MS recoveries were recorded.
- For samples 9753-9758, MS/MSD RPD values for benzene and toluene were outside of control limits.
- For samples 9753-9758, the MS recovery for TPH as gasoline range organics was outside of control limits. An acceptable MSD recovery was recorded.
- For samples 9753-9758 and 9800-9802, the MS/MSD recoveries for MTBE were outside of control limits. Acceptable LCS recoveries validated the data.

All method blanks were free of contamination. Corrections for several typographical errors can be found on the Quality Control Checklist.

Following is a synopsis of the quality assurance samples and their related QC and field samples:

226312

Customer Sample No.: MW-11 QC, MW-11 QA
SWD Lab Sample No.: 3-9428, 3-9429

Parameter	Field	QC	QA	Units	Comment
BTEX:					
benzene	NA	< 4.8	< 2.0	µg/Kg	Agree
toluene	NA	6.1	< 2.0	µg/Kg	Agree
ethylbenzene	NA	< 4.7	< 2.0	µg/Kg	Agree
xylenes	NA	< 5.1	< 2.0	µg/Kg	Agree
MTBE	NA	< 5.0	< 10.0	µg/Kg	Agree

Following is a synopsis of the quality assurance samples and their related QC and field samples:

226313

Customer Sample No.: MW-08 QC, MW-08 QA
SWD Lab Sample No.: 3-9581, 3-9582

Parameter	Field	QC	QA	Units	Comment
TPH	NA	< 30.0	< 10.0	mg/Kg	Agree

Following is a synopsis of the quality assurance samples and their related QC and field samples:

226314

Customer Sample No.: MW-07 QC, MW-07 QA
SWD Lab Sample No.: 3-9619, 3-9620

Parameter	Field	QC	QA	Units	Comment
BTEX:					
benzene	NA	< 4.8	< 2.0	µg/Kg	Agree
toluene	NA	5.4	< 2.0	µg/Kg	Agree
ethylbenzene	NA	< 4.7	< 2.0	µg/Kg	Agree
xylenes	NA	< 5.1	< 2.0	µg/Kg	Agree
MTBE	NA	6.2	< 10.0	µg/Kg	Agree

Following is a synopsis of the quality assurance samples and their related QC and field samples:

226315

Customer Sample No.: MW-10 QC, MW-10 QA
SWD Lab Sample No.: 3-9757, 3-9758

Parameter	Field	QC	QA	Units	Comment
TPH	NA	39.1	56	mg/Kg	Agree

PROJECT: Carswell AFB Data check time: 5 hr

226316

SAMPLES: 9296-9298, 9424-9429, 9577-9582, 9615-9620, 9753-9758, 9800-9802

REPORT DATE: 10 January 1994

QUALITY CONTROL CHECKLIST

Chain of Custody Check

1. Do sample ID numbers agree with the C.O.C? [Y] [~~N~~]
2. Do site and location agree with the C.O.C? [~~Y~~] [N]
3. Do sampling dates agree with the C.O.C? [Y] [~~N~~]
4. Do method numbers agree with the C.O.C? [~~Y~~] [N]
5. Are all samples and analyses accounted for? [~~Y~~] [N]

Data Check

1. Holding Times
   a) BTEX/MTBE [~~In~~] [Out]
   b) TRPH [~~In~~] [Out]

2. Do detection limits and dilution factors agree? [~~Y~~] [N]

3. Are units correct? [~~Y~~] [N]

QC Check

1. MS/MSD [In] [~~Out~~]

2. RPD for MS/MSD [In] [~~Out~~]

3. LCS and/or Blank Spike [~~In~~] [Out]

4. Blanks [Below ~~DL~~] [Above DL]

5. Acceptable Surrogates [Y] [~~N~~]

6. RPD for duplicates [~~In~~] [Out]

7. Tuning and calibration check [~~Y~~] [N]

Comments

For sample MW-11-FS-1 16'-18' field ID should be MW-11-FS-2 16'-18' and SWD number should be 3-9427.
For sample 3-9756, field ID should be MW-10-FS-3 (31'-32') for TPH.
For sample 3-9800, field ID should be MW-12-FS-1 (7'-8').
Sampling dates for samples 9577-9581 should be December not November.
Date received for sample 3-9753 should be December not November.
Holding time for sample 3-9580 not exceeded for TPH.
Surrogate out for BTEX for samples 9296, 9424, 9426, 9428, 9577, 9578, 9616-9619 and for method blanks (12/2-3) and for MSD (12/3).

QUALITY CONTROL CHECKLIST

226317

MS/MSD RPD for TPH for samples 9424-9429 should be 2%, not 25%.
For samples 9577-9581 and 9615-9620, MSD and MS/MSD RPD out for TPH in gasoline range organics.
For samples 9753-9758, MS/MSD RPD out for benzene and toluene, MS out for TPH in gasoline range organics, and MS/MSD out for MTBE.
For samples 9800-9802, MS/MSD out for MTBE.

Signed Laboratory Report

for

Physical Soil Parameters

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

226319

SUBMITTAL OF SWDED-GL REPORT 15728-6

PROJECT: CARSWELL AFB - FTW Feature: BASE SERVICE STATION	Contract No.
TEST REQUEST NO.: E87930087 Dated: 09 DECEMBER 1992 Received: 14 DECEMBER 1992	From: CHIEF, GEOTECHNICAL BRANCH FORT WORTH DISTRICT

MATERIAL: Two undisturbed soil samples for physical analyses

Date Received: 21 December 1993

Remarks:

DIRECTOR'S FILE COPY

Report sent to: FORT WORTH DISTRICT	Copy furnished:

Date: MAR 16 1994	Name and title: RICHARD F. ADAMSON Acting Director SWD Laboratory	Signature Richard F. Adamson

226320

RESULTS OF PHYSICAL ANALYSES OF UNDISTURBED SOIL SAMPLES

REPORT NO.: CESWD-ED-GL 15728
PROJECT: CARSWELL AFB - LPST I.D. NO. 104524, BLDG. 1518

TESTS	RESULTS	
SWD LAB NO. FIELD NO.	93/4752 MW-10	93/4753 MW-08
Water Content (ASTM D2216), % :	14.2	12.1
Wet Density (ASTM D 2937), pcf:	110.2	134.8
Dry Density (ASTM D 2937), pcf:	96.5	120.3
Specific Gravity of Solids (ASTM D 854):	2.67	2.64
Organic Matter (ASTM D 2974), % :	1.8	2.1
Porosity (calculated), % :	42.1	27.0

TAB

APPENDIX B

226322

State of Texas Well Reports

for

MW-7 through MW-12

Send original copy by certified mail to: **Texas Water Commission, P.O. Box 13087, Austin, Texas 78711**

Please use black ink.

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas
WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, Texas 78711

226323

1) OWNER AIR FORCE BASE CONSOLIDATION AGENCY (Name) ADDRESS (CARSWELL AFB) (Street or RFD) FT. WORTH (City) TX. (State) (Zip)

2) LOCATION OF WELL: County TARRANT . MW-7 BASE SERVICE STA. miles in (NE, SW, etc.) direction from (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ **LEGAL DESCRIPTION:**

Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section or survey lines N. 402544.9901 E. 2024301.7444

☑ **SEE ATTACHED MAP**

3) **TYPE OF WORK (Check):**
☑ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) **PROPOSED USE (Check):**
☐ Domestic ☐ Industrial ☑ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) **DRILLING METHOD (Check):** ☐ Driven
☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☐ Other AUGER

6) **WELL LOG:**
Date Drilling: Started 7 DEC 1993 Completed 7 DEC 1993

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	17

7) **BOREHOLE COMPLETION:**
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☑ Gravel Packed ☐ Other SAND PACKED
If Gravel Packed give interval . . . from 4 ft. to 17 ft.

From (ft.)	To (ft.)	Description and color of formation material
0	6.5'	CLAY, BROWN
6.5'	11.0'	SAND/SILT, LT. GRAY
11.0'	17.0'	LIMESTONE, GRAY

8) **CASING, BLANK PIPE, AND WELL SCREEN DATA:**

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casting Screen
4	N	PVC, CSG	0.05	6.13	
4	N	PVC, SCREEN	6.13	16.13	.01

(Use reverse side if necessary)

9) **CEMENTING DATA** [Rule 287.44(1)]
Cemented from 0.5 ft. to 2.0 ft. No. of Sacks Used .5
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

10) **SURFACE COMPLETION**
☑ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

11) **WATER LEVEL:**
Static level 8.7' ft. below land surface Date 9 DEC. 93
Artesian flow _____ gpm. Date _____

12) **PACKERS:** Type Depth

13) **TYPE PUMP:**
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

14) **WELL TESTS:**
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

15) **WATER QUALITY:**
Did you knowingly penetrate any strata which contained undesirable constituents?
☐ Yes ☑ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? ☐ Yes ☐ No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

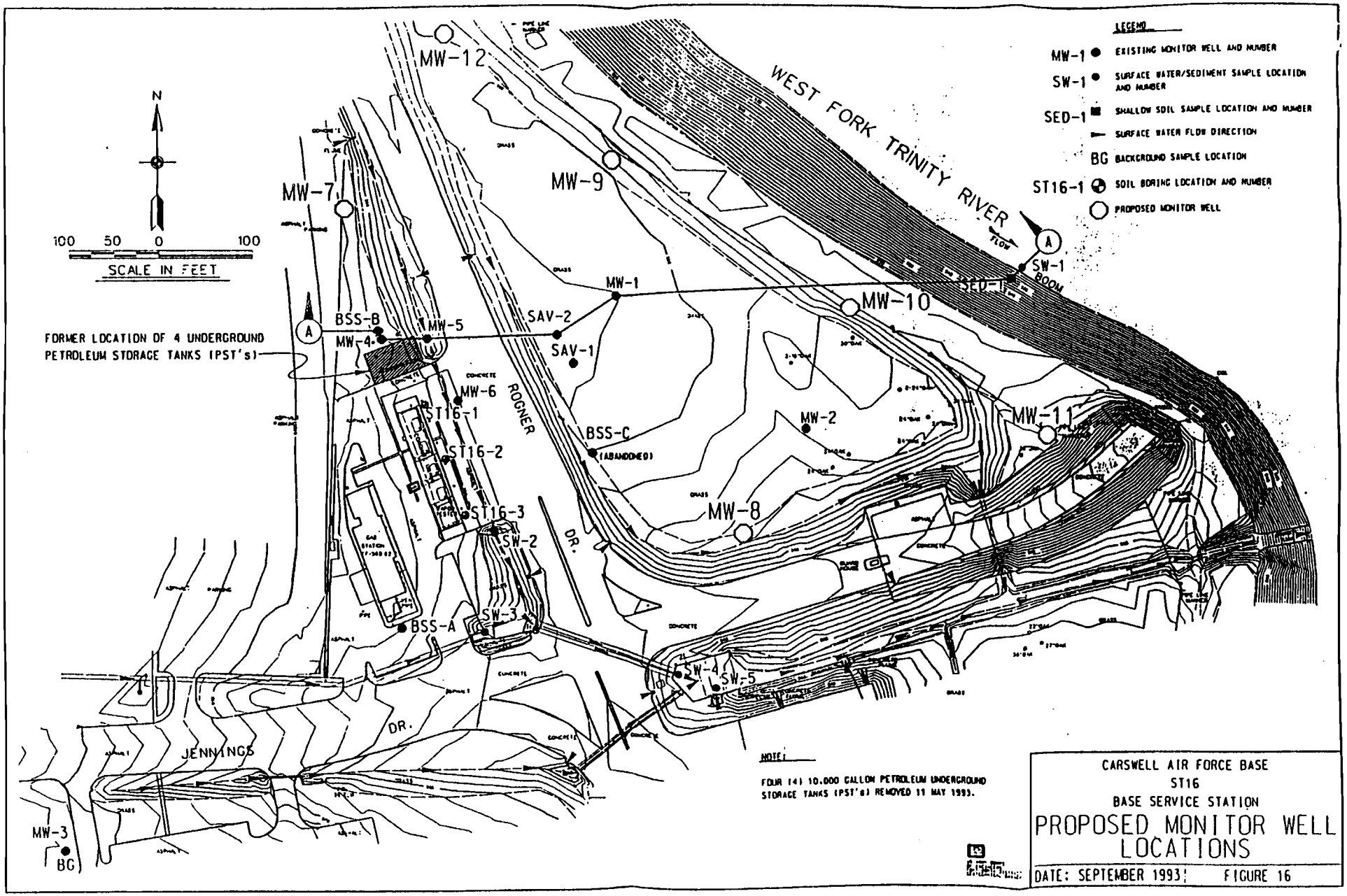
COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) WELL DRILLER'S LICENSE NO. N/A

ADDRESS P.O. Box 17300 (Street or RFD) FT WORTH (City) TX (State) 76102 (Zip)

(Signed) Robert Behm (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
BOOM
MW-12
MW-9
MW-7
MW-10
MW-11
MW-8
MW-2
MW-1
MW-3
MW-4
MW-5
MW-6
SAV-1
SAV-2
SED-1
SW-1
SW-2
SW-3
SW-4
SW-5
BSS-A
BSS-B
BSS-C
(ABANDONED)
ST16-1
ST16-2
ST16-3
ROGNER
DR.
JENNINGS
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993 FIGURE 16

226324

Send original copy by certified mail to: **Texas Water Commission, P.O. Box 13087, Austin, Texas 78711** *Please use black ink.*

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, Texas 78711

22825

OWNER AIRFORCE BASE CONSOLIDATION AGENCY (CARSWELL AFB) ADDRESS FT. WORTH, TX, [redacted]
(Name) (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL:
County TARRANT, MW # 8 BASE SERV. STA. miles in _____ direction from _____
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ **LEGAL DESCRIPTION:**

Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section or survey lines N 402159.1392 ; E. 2024734.6082

☑ SEE ATTACHED MAP

3) **TYPE OF WORK (Check):**
☑ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) **PROPOSED USE (Check):**
☐ Domestic ☐ Industrial ☑ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) **DRILLING METHOD (Check):** ☐ Driven
☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☑ Other AUGER

6) **WELL LOG:**
Date Drilling: Started 6 DEC 1993 Completed 6 DEC 1993

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	27

7) **BOREHOLE COMPLETION:**
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☐ Gravel Packed ☑ Other SAND PACKED
If Gravel Packed give interval . . . from 4 ft. to 27 ft.

From (ft.) To (ft.) Description and color of formation material

0.0 TO 13.5' CLAY DK. BROWN
13.5' TO 27.0 SAND/SILT; LT. BROWN

8) **CASING, BLANK PIPE, AND WELL SCREEN DATA:**

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casting Screen
4	N	PVC Csg	0	6'	
4	N	PVC SCREEN	6	26	.01

(Use reverse side if necessary)

9) **CEMENTING DATA** [Rule 287.44(1)]
Cemented from 0 ft. to 2 ft. No. of Sacks Used .5
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

10) **SURFACE COMPLETION**
☑ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

11) **WATER LEVEL:**
Static level 10.1 ft. below land surface Date _____
Artesian flow _____ gpm. Date _____

12) **PACKERS:** Type Depth

13) **TYPE PUMP:**
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

14) **WELL TESTS:**
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

15) **WATER QUALITY:**
Did you knowingly penetrate any strata which contained undesirable constituents?
☐ Yes ☑ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? ☐ Yes ☐ No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) WELL DRILLER'S LICENSE NO. N/A

ADDRESS P.O. BOX 17300 (Street or RFD) FT. WORTH (City) TX (State) 76102 (Zip)

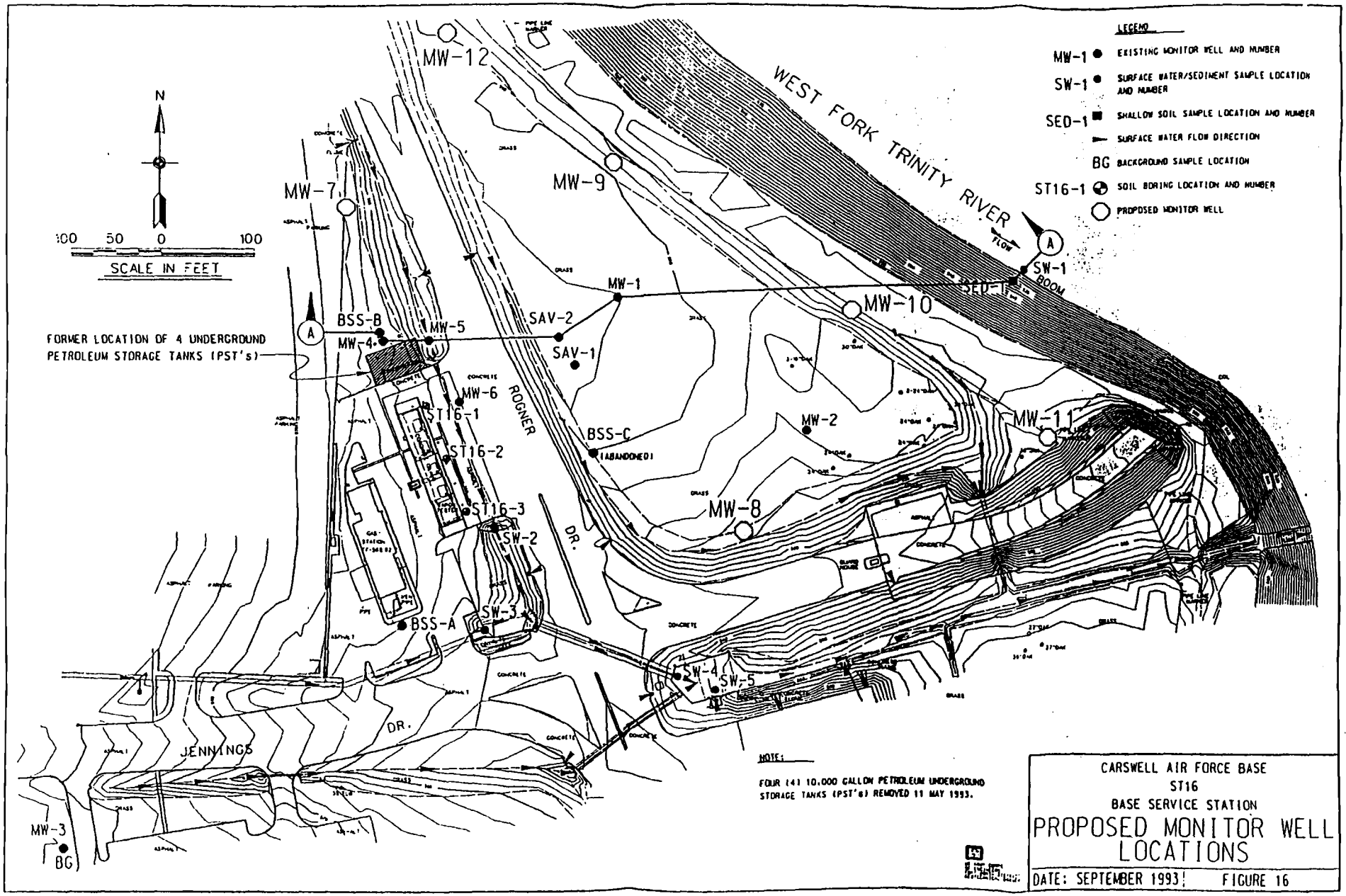
(Signed) Robert Bulow (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____

WWD-012 (Rev. 05-18-90)

TEXAS WATER COMMISSION COPY


N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
MW-12
MW-7
MW-9
WEST FORK TRINITY RIVER
FLOW
MW-1
SED-1
SW-1
BOOM
MW-10
BSS-B
MW-4
MW-5
SAV-2
SAV-1
MW-6
ST16-1
ST16-2
ST16-3
ROGNER
BSS-C
(ABANDONED)
MW-2
MW-11
MW-8
SW-2
DR.
BSS-A
SW-3
SW-4
SW-5
JENNINGS
MW-3
BG
LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST'S) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

226329

Send original copy by certified mail to: **Texas Water Commission, P.O. Box 13087, Austin, Texas 78711** — *Please use black ink.*

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, Texas 78711
226327

1) OWNER AIRFORCE BASE CONSOLIDATION AGENCY (CARSWELL AFB) (Name) ADDRESS FT. WORTH, TX (Street or RFD) (City) (State) (Zip)

2) **LOCATION OF WELL:** County TARRANT MW#9 BASE SERV. STA miles in _____ (NE, SW, etc.) direction from _____ (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ **LEGAL DESCRIPTION:**

Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section or survey lines N. 402577.4135 ; E. 2024576.1113

☒ **SEE ATTACHED MAP**

3) **TYPE OF WORK (Check):**
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) **PROPOSED USE (Check):**
☐ Domestic ☐ Industrial ☒ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) **DRILLING METHOD (Check):** ☐ Driven
☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☐ Other AUGER

6) **WELL LOG:**
Date Drilling: Started 23 NOV 1993 Completed 23 NOV 1993

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	29'

7) **BOREHOLE COMPLETION:**
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☐ Gravel Packed ☒ Other SAND PACKED
If Gravel Packed give interval . . . from 6 ft. to 29 ft.

From (ft.)	To (ft.)	Description and color of formation material
0.0	7.0	SAND, BROWN
7.0	16.5	CLAY, DK. BROWN
16.5	29.0	SAND, LT. GRAY

8) **CASING, BLANK PIPE, AND WELL SCREEN DATA:**

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casting Screen
4	N	PVC	0	8.1	Csg
4	N	PVC SCREEN	8.1	28.1	.01

(Use reverse side if necessary)

9) **CEMENTING DATA** [Rule 287.44(1)]
Cemented from 6 ft. to 4 ft. No. of Sacks Used .5
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

13) **TYPE PUMP:**
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder ☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) **SURFACE COMPLETION**
☒ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

14) **WELL TESTS:**
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) **WATER LEVEL:**
Static level 127 ft. below land surface Date _____
Artesian flow _____ gpm. Date _____

15) **WATER QUALITY:**
Did you knowingly penetrate any strata which contained undesirable constituents?
☒ Yes ☐ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata 16'
Was a chemical analysis made? ☒ Yes ☐ No

12) **PACKERS:** Type Depth

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) WELL DRILLER'S LICENSE NO. N/A

ADDRESS P.O. BOX 17300 (Street or RFD) FT. WORTH (City) TX (State) 76102 (Zip)

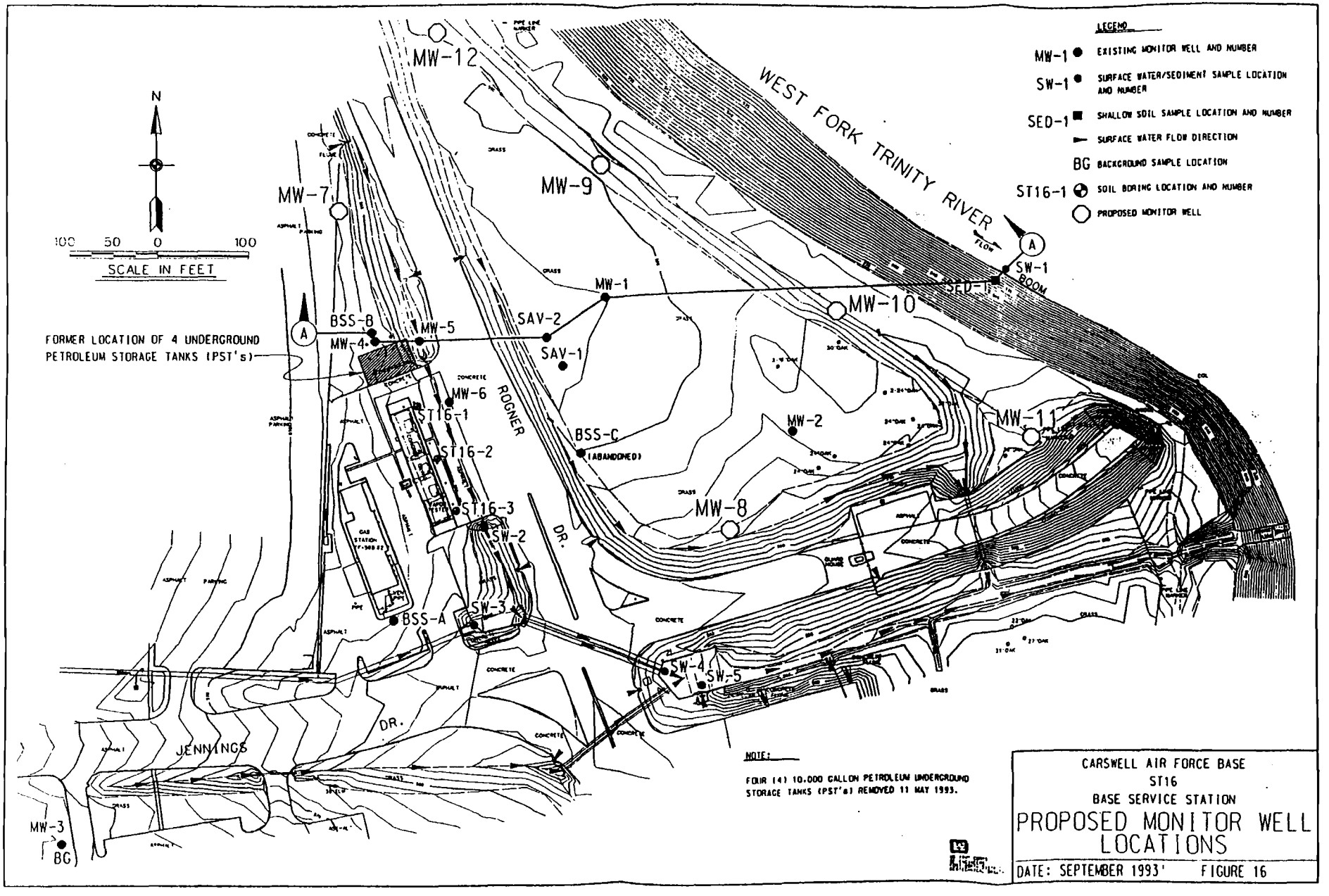
(Signed) Robert Behm (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____

WWD-012 (Rev. 05-18-90)

TEXAS WATER COMMISSION COPY


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
ROGNER
JENNINGS
DR.
MW-12
MW-9
MW-7
MW-1
MW-10
MW-11
MW-2
MW-8
MW-6
MW-5
MW-4
MW-3
BG
BSS-B
BSS-A
BSS-C
(ABANDONED)
SAV-1
SAV-2
ST16-1
ST16-2
ST16-3
SW-1
SW-2
SW-3
SW-4
SW-5
SED-1
A
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993' FIGURE 16

226328

State of Texas

226329

REPORT OF
UNDESIRABLE WATER OR CONSTITUENTS

To be completed by Well Driller. (Type or print.)

1. Well Driller: GREG WILLIAMS

   Company Name: U.S. ARMY CORPS OF ENGINEERS

   Address: 819 TAYLOR (Street or RFD) FT. WORTH (City) TX. (State)

2. Landowner or Person Having Well Drilled: AIRFORCE BASE CONSOLIDATION AGENCY

   Address: (CARSWELL AFB) (Street or RFD) FT. WORTH (City) TX (State)

3. Location of Well: County TARRANT ☑ See attached map MW-9

   League _____ Abstract No. _____

   NW¼, NE¼, SW¼, SE¼, of Section _____ Block _____

   Survey Y = 402577.4135 ; X = 2024576.1113

   _____ miles in _____ (NE, SW, etc.) direction.

   from _____ (Town)

4. Reason why Report was submitted:

   ☐ Naturally-occurring, poor-quality groundwater encountered;

   ☑ Hydrocarbon contamination encountered (includes gasoline, diesel, etc.);

   ☐ Hazardous material/hazardous waste contamination encountered;

   ☐ Other; describe _____

5. Date Well Drilled: 23 NOV. 93 Type Well: MONITOR

6. Has a Water Well Report form relating to this well been forwarded to the Texas Water Commission?

   ☑ Yes ☐ No Date _____

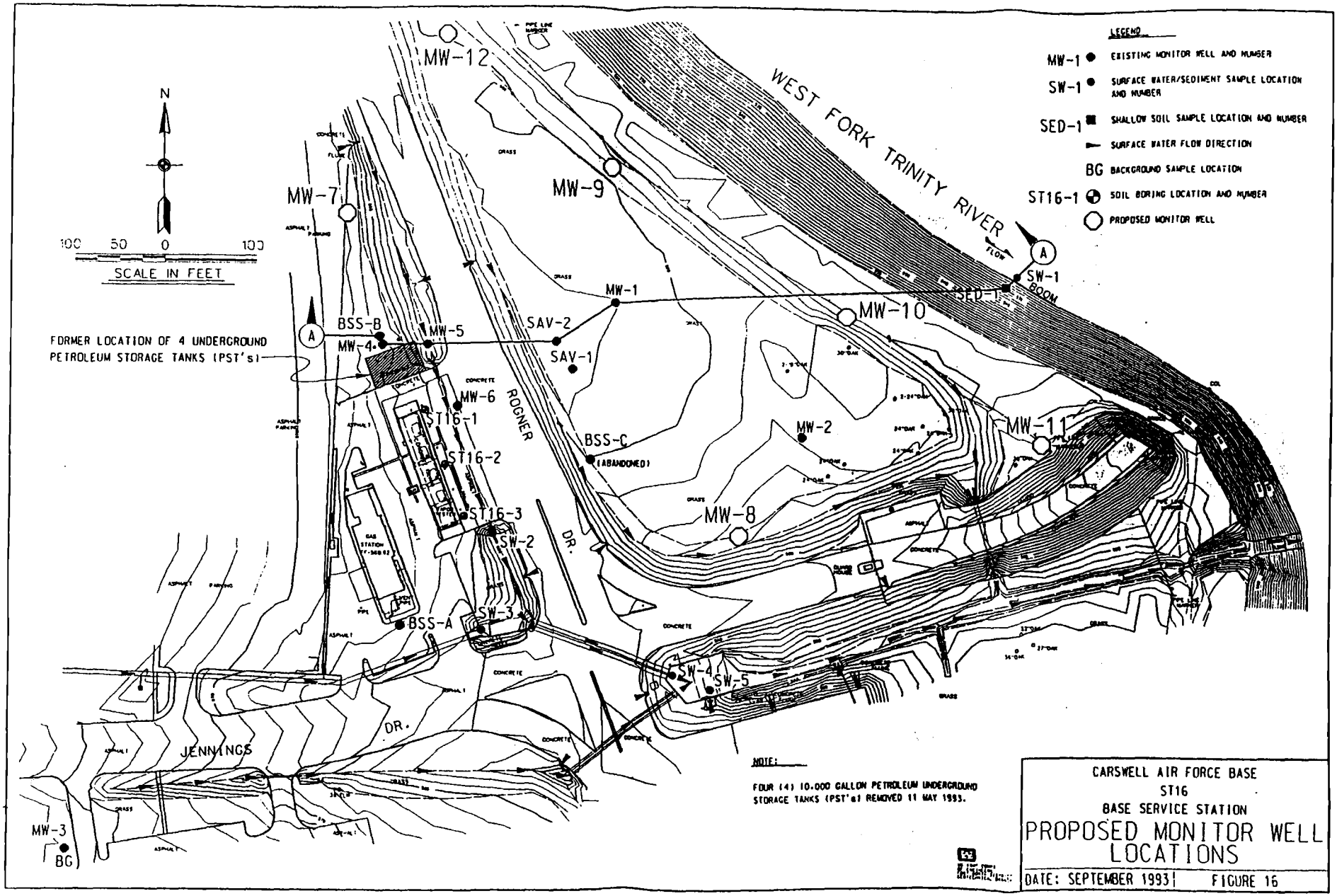
7. I do hereby certify that in drilling, deepening, or otherwise altering the above described well, undesirable water or constituents has been encountered and the landowner or person having the well drilled has been informed by certified mail that such well must be completed or plugged in such a manner as to avoid injury or pollution.

   Date 1 Feb 94

   Reg. No. _____ (Signed) for Robert Beckman (Well Driller)

Send *White Copy* by Certified Mail to: TEXAS WATER COMMISSION, P.O. Box 13087, Austin, Texas 78711
Send *Yellow Copy* by Certified Mail to: LANDOWNER or PERSON HAVING WELL DRILLED
Pink Copy to be retained by: WELL DRILLER

WWD-015 (Rev. 07-20-90)


N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
WEST FORK TRINITY RIVER
FLOW
BOOM
MW-12
MW-9
MW-7
MW-1
MW-10
SW-1
SED-1
BSS-B
MW-4
MW-5
SAV-2
SAV-1
MW-6
ST16-1
ST16-2
ST16-3
ROGNER
DR.
BSS-C
(ABANDONED)
MW-2
MW-11
MW-8
SW-2
SW-3
BSS-A
SW-4
SW-5
JENNINGS
MW-3
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

226330

Send original copy by certified mail to: **Texas Water Commission, P.O. Box 13087, Austin, TX 78711-3087** — *Please use black ink.*

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas
WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, TX 78711-3087
512-371-6299

1) **OWNER** AIR FORCE BASE CONSOLIDATION AGENCY (CARSWELL AFB) ADDRESS _____ 226331
(Name) (Street or RFD) (City) (State) (Zip)

2) **LOCATION OF WELL:** County TARRANT . MW # 10 BASE SERVICE STA. miles in _____ (NE, SW, etc.) direction from _____ (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ **LEGAL DESCRIPTION:**

Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section or survey lines N. 402409.9415 ; E. 2024787.2038

☒ **SEE ATTACHED MAP**

3) **TYPE OF WORK (Check):**
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) **PROPOSED USE (Check):**
☐ Domestic ☐ Industrial ☒ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) **DRILLING METHOD (Check):** ☐ Driven
☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☒ Other AUGER

6) **WELL LOG:**
Date Drilling: Started 9 DEC. 1993 Completed 9 DEC. 1993

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	36.4

7) **BOREHOLE COMPLETION:**
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☐ Gravel Packed ☒ Other SAND PACKED
If Gravel Packed give interval . . . from 0 ft. to 36.4 ft.

From (ft.)	To (ft.)	Description and color of formation material
0.0	5.7	SAND, DK BROWN
5.7	12.0	CLAY/SILT, BROWN
12.6	18.5	CLAY; DK. BROWN
18.5	32'	SAND, LT. GRAY

(Use reverse side if necessary)

8) **CASING, BLANK PIPE, AND WELL SCREEN DATA:**

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casting Screen
4	N	PVC	0	12	Sch
4	N	PVC SCREEN	12	32	.01

9) **CEMENTING DATA** [Rule 287.44(1)]
Cemented from 0 ft. to 8 ft. No. of Sacks Used 1
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

10) **SURFACE COMPLETION**
☒ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

11) **WATER LEVEL:**
Static level 14.8 ft. below land surface Date _____
Artesian flow _____ gpm. Date _____

12) **PACKERS:** Type Depth

13) **TYPE PUMP:**
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

14) **WELL TESTS:**
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

15) **WATER QUALITY:**
Did you knowingly penetrate any strata which contained undesirable constituents?
☒ Yes ☐ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata 19
Was a chemical analysis made? ☐ Yes ☐ No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) WELL DRILLER'S LICENSE NO. N/A

ADDRESS P.O. BOX 17300 (Street or RFD) FT. WORTH (City) TX (State) 76102 (Zip)

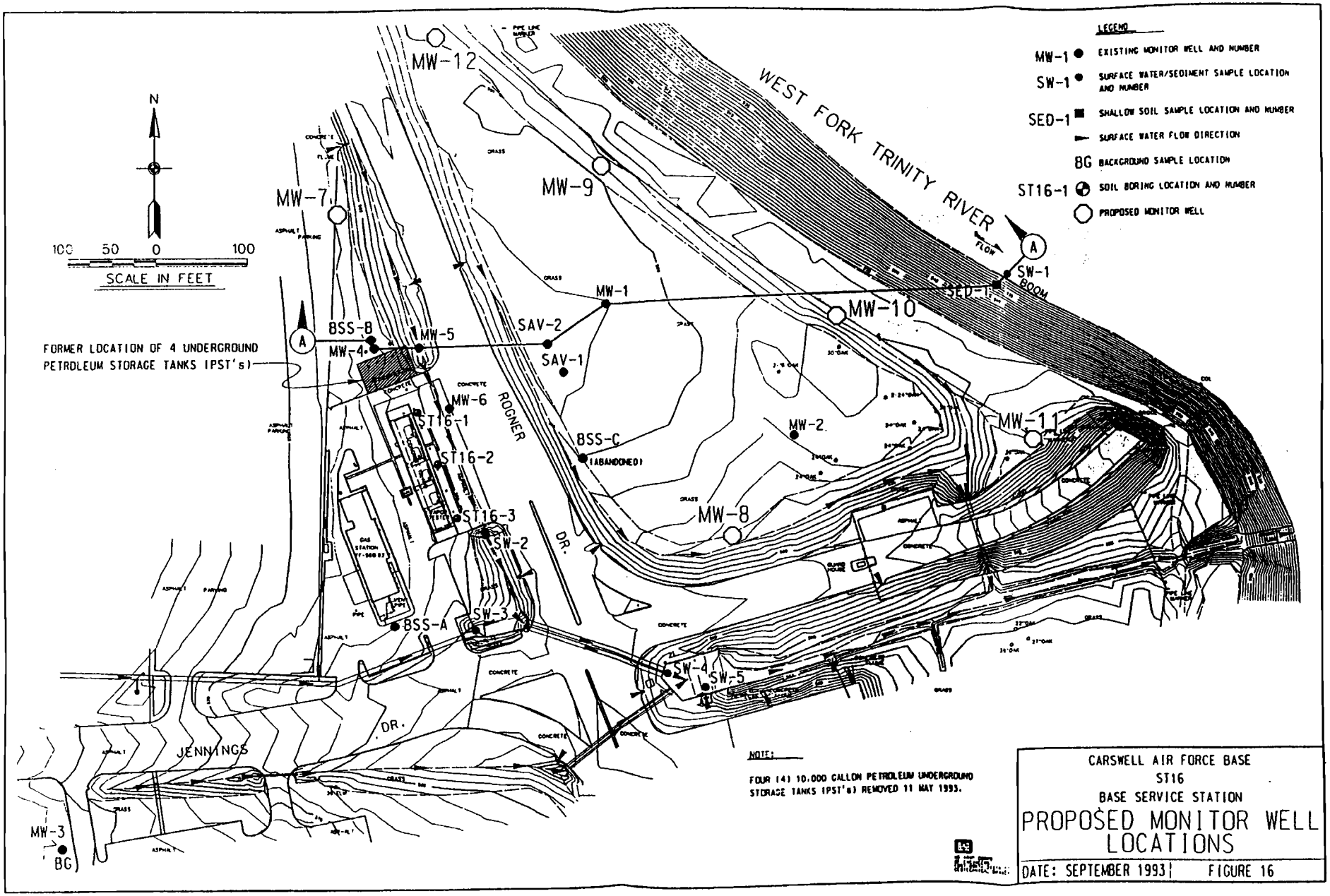
(Signed) Robert Bolin (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____

TWC-0199 (Rev. 05-18-90)

TEXAS WATER COMMISSION COPY


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
BOOM
MW-12
MW-9
MW-7
MW-1
MW-10
SW-1
SED-1
BSS-B
MW-4
MW-5
SAV-2
SAV-1
MW-6
ST16-1
ST16-2
ST16-3
ROGNER
BSS-C
(ABANDONED)
MW-2
MW-11
MW-8
SW-2
SW-3
BSS-A
SW-4
SW-5
DR.
JENNINGS
MW-3
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

226332

State of Texas

226333

REPORT OF
UNDESIRABLE WATER OR CONSTITUENTS

To be completed by Well Driller. (Type or print.)

1. Well Driller: GREG WILLIAMS

   Company Name: U.S. ARMY CORPS OF ENGINEERS

   Address: 819 TAYLOR (Street or RFD) FT. WORTH (City) TX (State)

2. Landowner or Person Having Well Drilled: AIR FORCE BASE CONSOLIDATION AGENCY

   Address: (CARSWELL AFB) (Street or RFD) FT. WORTH, TX. (City) (State)

3. Location of Well: County TARRANT ☐ See attached map MW-10

   League _____ Abstract No. _____

   NW¼, NE¼, SW¼, SE¼, of Section _____ Block _____

   Survey Y=402409.9415 X=2024787.2038

   _____ miles in _____ (NE, SW, etc.) direction.

   from _____ (Town)

4. Reason why Report was submitted:

   ☐ Naturally-occurring, poor-quality groundwater encountered;

   ☑ Hydrocarbon contamination encountered (includes gasoline, diesel, etc.);

   ☐ Hazardous material/hazardous waste contamination encountered;

   ☐ Other; describe _____

5. Date Well Drilled: 9 DEC 93 Type Well: MONITOR

6. Has a Water Well Report form relating to this well been forwarded to the Texas Water Commission?

   ☑ Yes ☐ No Date _____

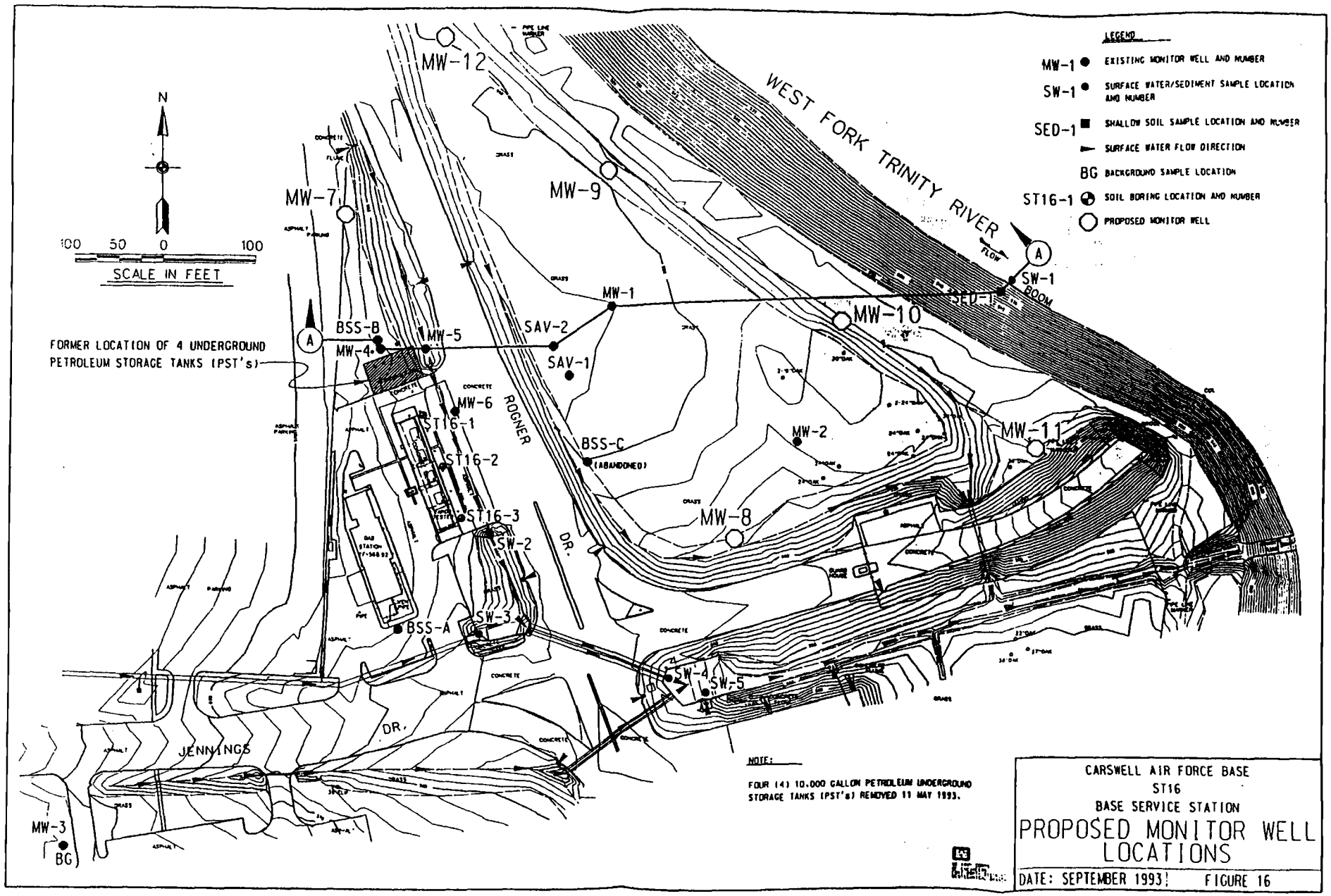
7. I do hereby certify that in drilling, deepening, or otherwise altering the above described well, undesirable water or constituents has been encountered and the landowner or person having the well drilled has been informed by certified mail that such well must be completed or plugged in such a manner as to avoid injury or pollution.

   Date 1 FEB 94

   ~~Reg. No.~~ _____ (Signed) for Robert Bilan (Well Driller)

Send *White Copy* by Certified Mail to: TEXAS WATER COMMISSION, P.O. Box 13087, Austin, Texas 78711
Send *Yellow Copy* by Certified Mail to: LANDOWNER or PERSON HAVING WELL DRILLED
Pink Copy to be retained by: WELL DRILLER

WWD-015 (Rev. 07-20-90)


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
BOOM
ROGNER
DR.
JENNINGS
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
BSS-A
BSS-B
BSS-C
(ABANDONED)
SAV-1
SAV-2
SED-1
SW-1
SW-2
SW-3
SW-4
SW-5
ST16-1
ST16-2
ST16-3
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

226334

Send original copy by certified mail to: Texas Water Commission, P.O. Box 13087, Austin, TX 78711-3087

Please use black ink.

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas
WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, TX 78711-3087
512-371-6299

1) OWNER AIRFORCE BASE CONSOLIDATION AGENCY (CARSWELL AFB) ADDRESS FT WORTH TX 76102
(Name) (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL: County TARRANT MW # 11 BASE SERV. STA. 226335 miles in (NE, SW, etc.) direction from (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ LEGAL DESCRIPTION:
Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____
Distance and direction from two intersecting section or survey lines N. 402277.9749 ; E. 2025036.4795

☑ SEE ATTACHED MAP

3) TYPE OF WORK (Check):
☑ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☐ Domestic ☐ Industrial ☑ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) DRILLING METHOD (Check):
☐ Driven ☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☐ Other AUGER

6) WELL LOG:
Date Drilling: Started 29 NOV 1993 Completed 3 DEC 1993

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	38

7) BOREHOLE COMPLETION:
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☐ Gravel Packed ☑ Other SAND
If Gravel Packed give interval . . . from 11' ft. to 32.6 ft.

From (ft.)	To (ft.)	Description and color of formation material
0.0	38'	SAND, LT. BR.

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casing Screen
4	N	PVC	0	12.2	
4	N	PVC SCREEN	12.2	32.2	.01

(Use reverse side if necessary)

9) CEMENTING DATA [Rule 287.44(1)]
Cemented from 0 ft. to 9 ft. No. of Sacks Used 1
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

13) TYPE PUMP:
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) SURFACE COMPLETION
☑ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

14) WELL TESTS:
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) WATER LEVEL:
Static level 26.2 ft. below land surface Date 6 DEC 93
Artesian flow _____ gpm. Date _____

15) WATER QUALITY:
Did you knowingly penetrate any strata which contained undesirable constituents?
☐ Yes ☑ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? ☐ Yes ☐ No

12) PACKERS: Type Depth

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) WELL DRILLER'S LICENSE NO. N/A

ADDRESS P.O. Box 17300 (Street or RFD) FT. WORTH (City) TX. (State) 76102 (Zip)

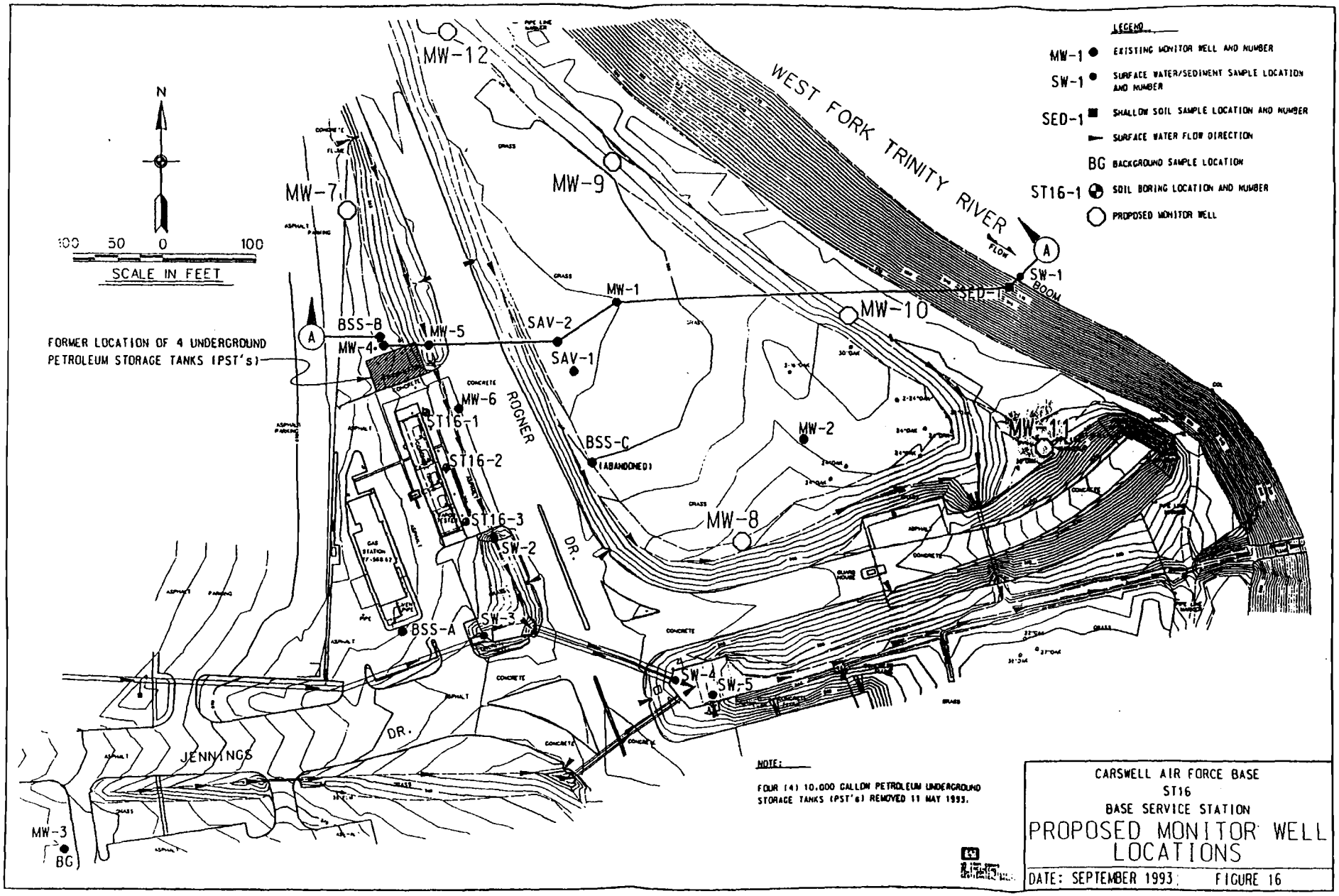
(Signed) Robert Behn (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____

TWC-0199 (Rev. 05-18-90)

TEXAS WATER COMMISSION COPY


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
BOOM
MW-12
MW-9
MW-7
MW-1
SED-1
SW-1
MW-10
BSS-B
MW-4
MW-5
SAV-2
SAV-1
MW-6
ST16-1
ROGNER
ST16-2
ST16-3
BSS-C
(ABANDONED)
MW-2
MW-11
MW-8
SW-2
DR.
SW-3
BSS-A
SW-4
SW-5
JENNINGS
DR.
MW-3
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

Send original copy by certified mail to: **Texas Water Commission, P.O. Box 13087, Austin, TX 78711-3087** *Please use black ink.*

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side*

State of Texas WELL REPORT

Texas Water Well Drillers Board
P.O. Box 13087
Austin, TX 78711-3087
512-371-6299

1) **OWNER** BASE AIR FORCE CONSOLIDATION AGENCY (CARSWELL AFB) (Name) **ADDRESS** FT. WORTH (Street or RFD) (City) TX (State) 226337 (Zip)

2) **LOCATION OF WELL:** County TARRANT . MW #12 BASE SERV. STA. miles in (NE, SW, etc.) direction from (Town)

Driller **must** complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ **LEGAL DESCRIPTION:**

Section No. _____ Block No. _____ Township _____ Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section or survey lines N. 402726.4936 ; E. 2024390.2792

☑ **SEE ATTACHED MAP**

3) **TYPE OF WORK (Check):**
☑ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) **PROPOSED USE (Check):**
☐ Domestic ☐ Industrial ☑ Monitor ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Injection ☐ De-Watering

5) **DRILLING METHOD (Check):** ☐ Driven
☐ Mud Rotary ☐ Air Hammer ☐ Jetted ☐ Bored ☐ Air Rotary ☐ Cable Tool ☑ Other AUGER

6) **WELL LOG:**
Date Drilling: Started 13 DEC 19 93 Completed 13 DEC 19 93

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
10	Surface	28'

7) **BOREHOLE COMPLETION:**
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☐ Gravel Packed ☑ Other SAND
If Gravel Packed give interval . . . from 5.5 ft. to 28' ft.

From (ft.)	To (ft.)	Description and color of formation material
0.0	28.0	SAND, Rd. BROWN

8) **CASING, BLANK PIPE, AND WELL SCREEN DATA:**

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From	Setting (ft.) To	Gage Casing Screen
4	N	PVC	0	7.7	
4	N	PVC SCREEN	7.7	27.7	.01

(Use reverse side if necessary)

9) **CEMENTING DATA** [Rule 287.44(1)]
Cemented from 0 ft. to 3.5 ft. No. of Sacks Used _____
_____ ft. to _____ ft. No. of Sacks Used _____
Method used _____
Cemented by _____

13) **TYPE PUMP:**
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) **SURFACE COMPLETION**
☑ Specified Surface Slab Installed [Rule 287.44(2)(A)]
☐ Specified Steel Sleeve Installed [Rule 287.44(3)(A)]
☐ Pitless Adapter Used [Rule 287.44(3)(B)]
☐ Approved Alternative Procedure Used [Rule 287.71]

14) **WELL TESTS:**
Type Test: ☐ Pump ☐ Bailer ☐ Jetted ☐ Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) **WATER LEVEL:**
Static level 10.6 ft. below land surface Date 13 DEC 93
Artesian flow _____ gpm. Date _____

15) **WATER QUALITY:**
Did you knowingly penetrate any strata which contained undesirable constituents?
☐ Yes ☑ No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? ☐ Yes ☐ No

12) **PACKERS:** Type Depth

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME U.S. ARMY CORPS OF ENGINEERS (Type or print) **WELL DRILLER'S LICENSE NO.** N/A

ADDRESS P.O. BOX 17300 (Street or RFD) FT WORTH (City) TX (State) 76102 (Zip)

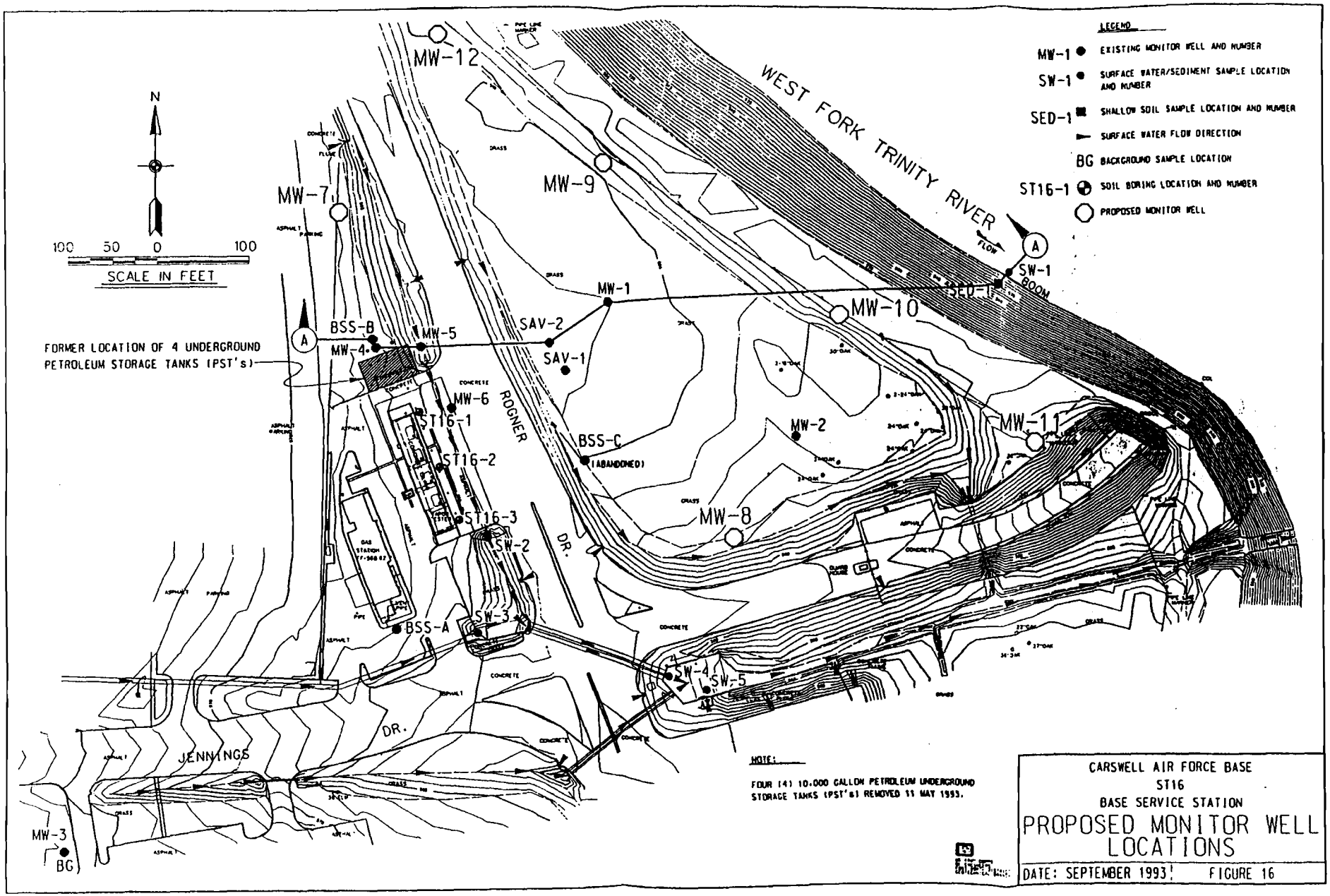
(Signed) Robert Behn (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. _____ Located on map _____

TWC-0199 (Rev. 05-18-90)

TEXAS WATER COMMISSION COPY


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
MW-12
MW-9
MW-7
MW-1
MW-10
SW-1
@OOM
SED-1
BSS-B
MW-5
MW-4
SAV-2
SAV-1
MW-6
ST16-1
ST16-2
ST16-3
ROGNER
BSS-C
(ABANDONED)
MW-2
MW-11
MW-8
SW-2
SW-3
BSS-A
SW-4
SW-5
DR.
JENNINGS
MW-3
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

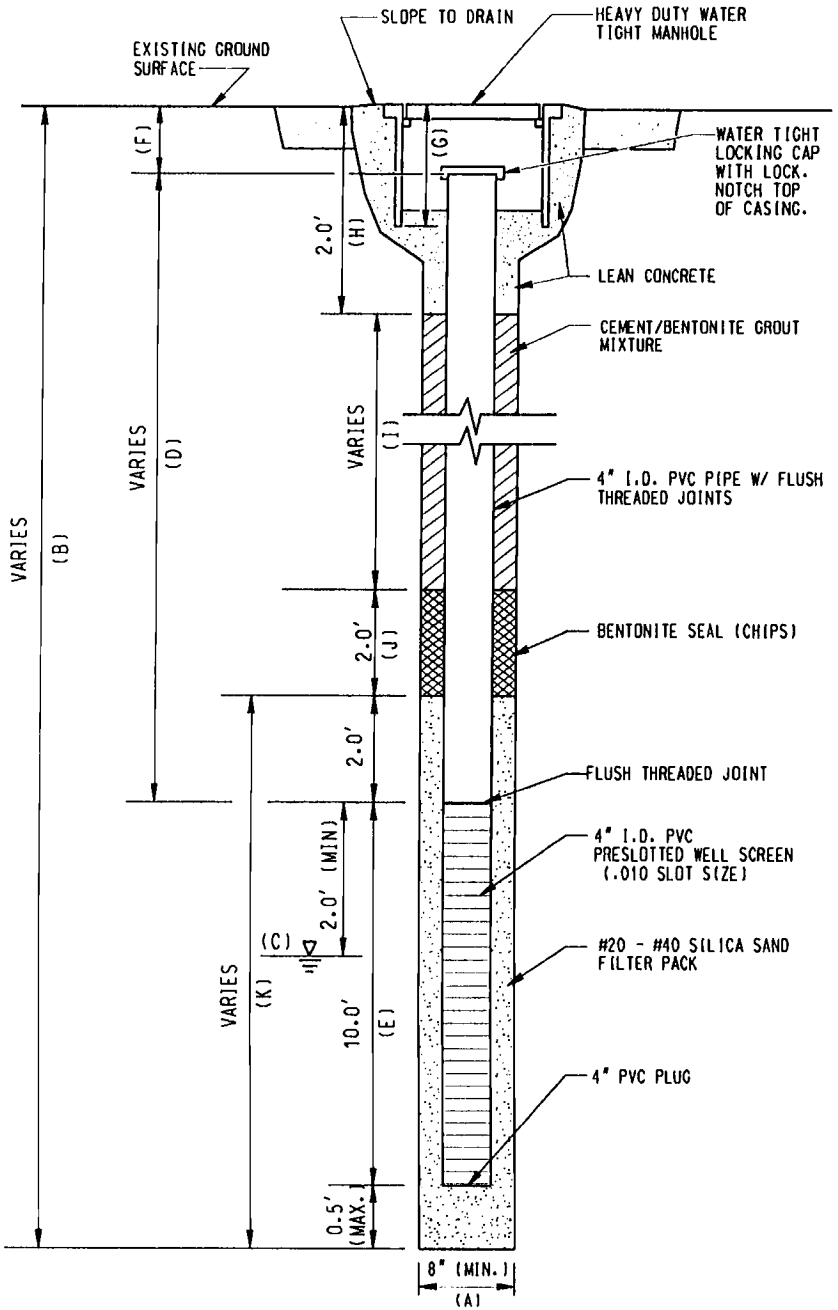
226338

226339

Well Construction Details

for

MW-7 through MW-12



WELL NUMBER: MW-7			
PROJECT: BASE SERVICE STATION			
DATE INSTALLED: 7 DEC 93		SETTING	
INSTALLED BY: CORPS OF ENGINEERS		From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	17
C	Depth to groundwater (ft) ▽	0	10
D	Blank pipe (ft)	+0.05	6.13
E	Well Screen (ft)	6.13	16.13
F	Depth to Top of Well (ft)	+0.05	
G	Protective casing (ft)	+0.2	1.36
H	Lean concrete (ft)	+0.5	2.0
I	Grout mix (ft)		
J	Bentonite seal (ft)	2	4
K	Filter pack (ft)	4	17

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2024301.7444
Y Coordinate (Northing)	402544.9901
Ground Elevation	567.91
Well Casing Notch Elevation	567.88

US Army Corps of Engineers Fort Worth District

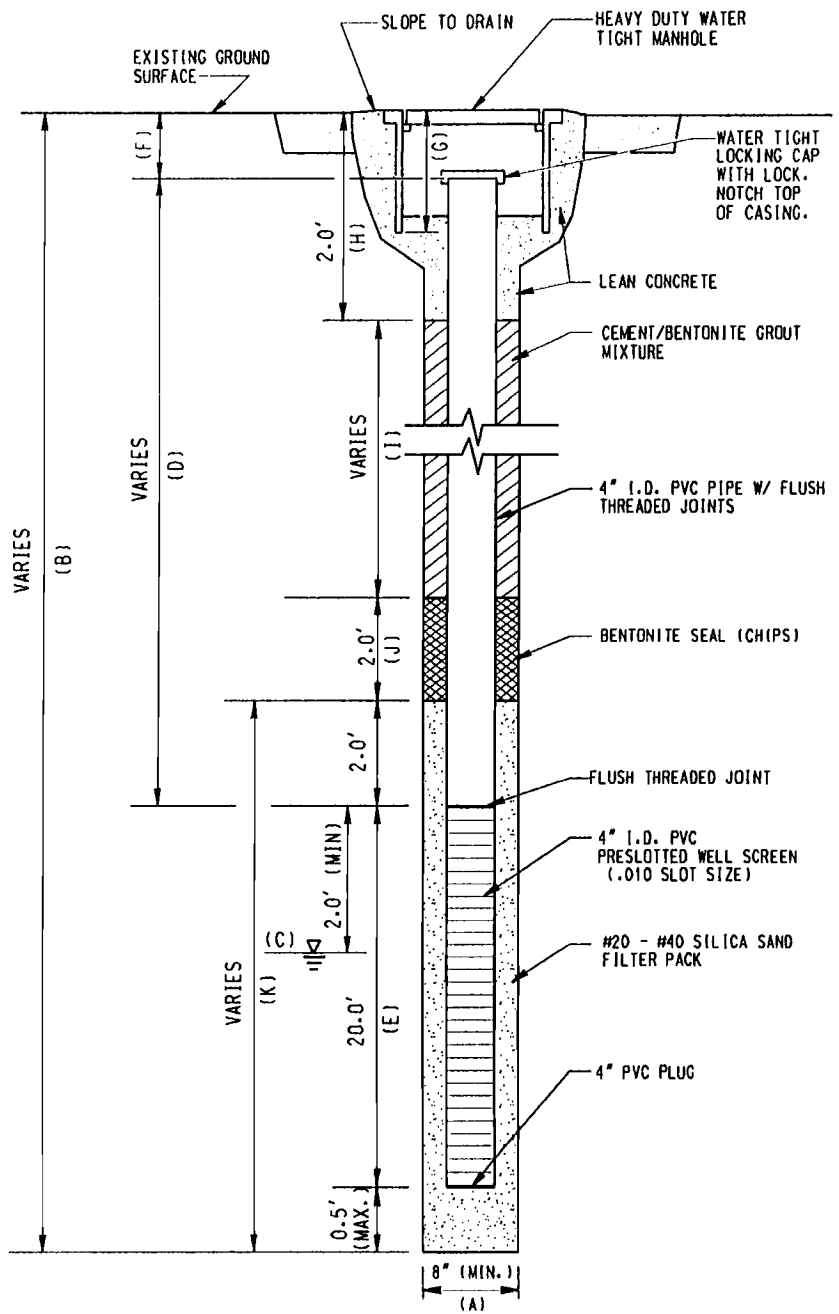
CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

JUNE 1994

22633-0

f:/ed/drawing/carswell/bss/1518wel Apr. 13, 1994 11:40:48



WELL NUMBER:	MW-8		
PROJECT:	BASE SERVICE STATION		
DATE INSTALLED:	6 DEC 93	SETTING	
INSTALLED BY:	CORPS OF ENGINEERS	From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	27
C	Depth to groundwater (ft) ▽	0	14
D	Blank pipe (ft)	+0.27	6
E	Well Screen (ft)	6	26
F	Depth to Top of Well (ft)	+0.27	
G	Protective casing (ft)	+0.4	1.16
H	Lean concrete (ft)	0.4	2.0
I	Grout mix (ft)		
J	Bentonite seal (ft)	2	4
K	Filter pack (ft)	4	27

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2024734.6082
Y Coordinate (Northing)	402159.1392
Ground Elevation	556.73
Well Casing Notch Elevation	556.91

US Army Corps of Engineers Fort Worth District

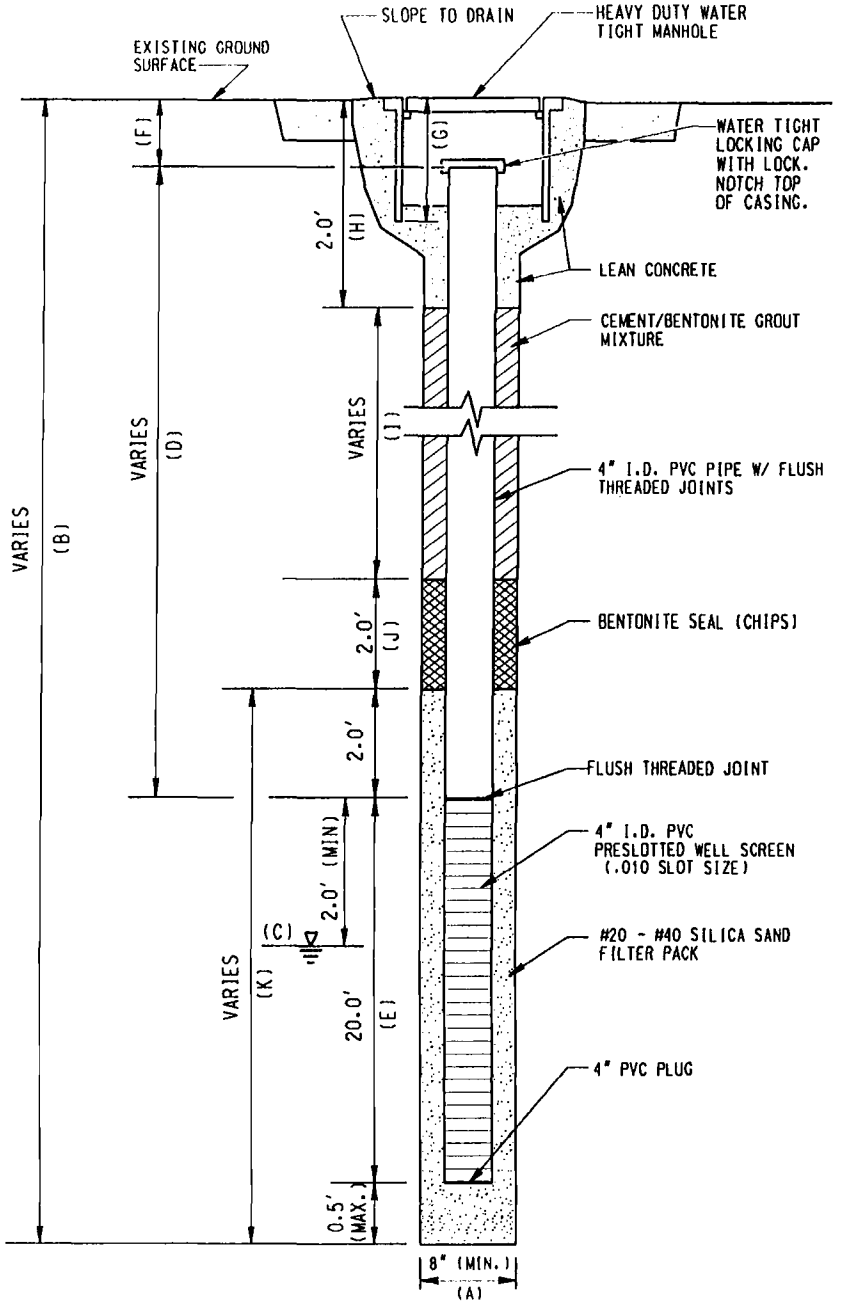
CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

226341

JUNE 1994

f:/ed/drawing/carswell/bss/1518wel Apr. 11, 1994 13:56:42



WELL NUMBER:	MW-9		
PROJECT:	BASE SERVICE STATION		
DATE INSTALLED:	23 NOV 93	SETTING	
INSTALLED BY:	CORPS OF ENGINEERS	From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	29
C	Depth to groundwater (ft) ▽	0	18
D	Blank pipe (ft)	+0.32	8.06
E	Well Screen (ft)	8.06	28.06
F	Depth to Top of Well (ft)	+0.32	
G	Protective casing (ft)	+0.48	1.08
H	Lean concrete (ft)	+0.4	1.5
I	Grout mix (ft)	1.5	4.0
J	Bentonite seal (ft)	4	6
K	Filter pack (ft)	6	29.0

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2024576.1113
Y Coordinate (Northing)	402577.4135
Ground Elevation	560.44
Well Casing Notch Elevation	560.30

US Army Corps of Engineers Fort Worth District

CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

226342

JUNE 1994

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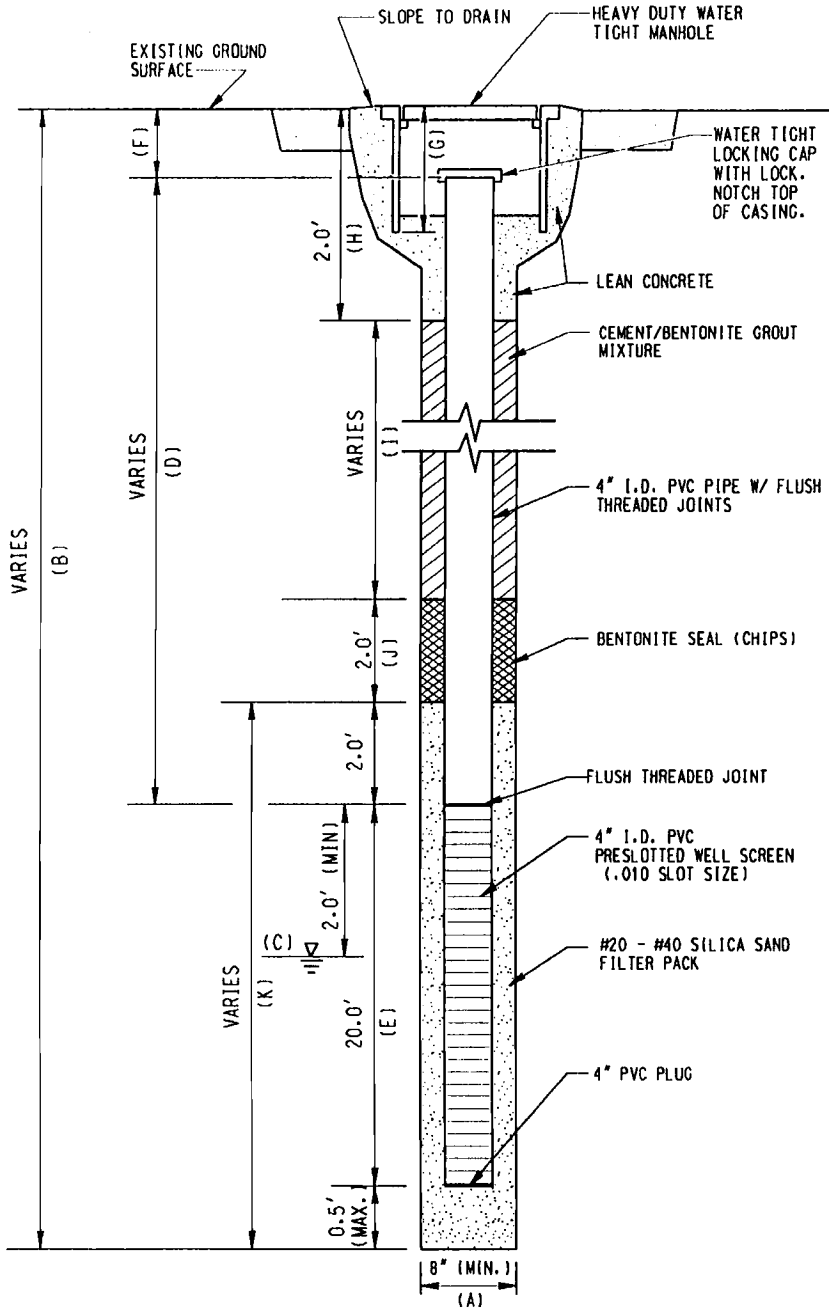

WELL NUMBER:	MW-10		
PROJECT:	BASE SERVICE STATION		
DATE INSTALLED:	9 DEC 93	SETTING	
INSTALLED BY:	CORPS OF ENGINEERS	From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	32
C	Depth to groundwater (ft) ▽	0	20
D	Blank pipe (ft)	+0.15	12
E	Well Screen (ft)	12	32
F	Depth to Top of Well (ft)	+0.16	
G	Protective casing (ft)	+0.57	0.99
H	Lean concrete (ft)	0.5	4
I	Grout mix (ft)	4	8
J	Bentonite seal (ft)	8	10
K	Filter pack (ft)	10	32

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2024787.2038
Y Coordinate (Northing)	402409.9415
Ground Elevation	559.28
Well Casing Notch Elevation	559.53

US Army Corps of Engineers Fort Worth District

CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

226343

JUNE 1994

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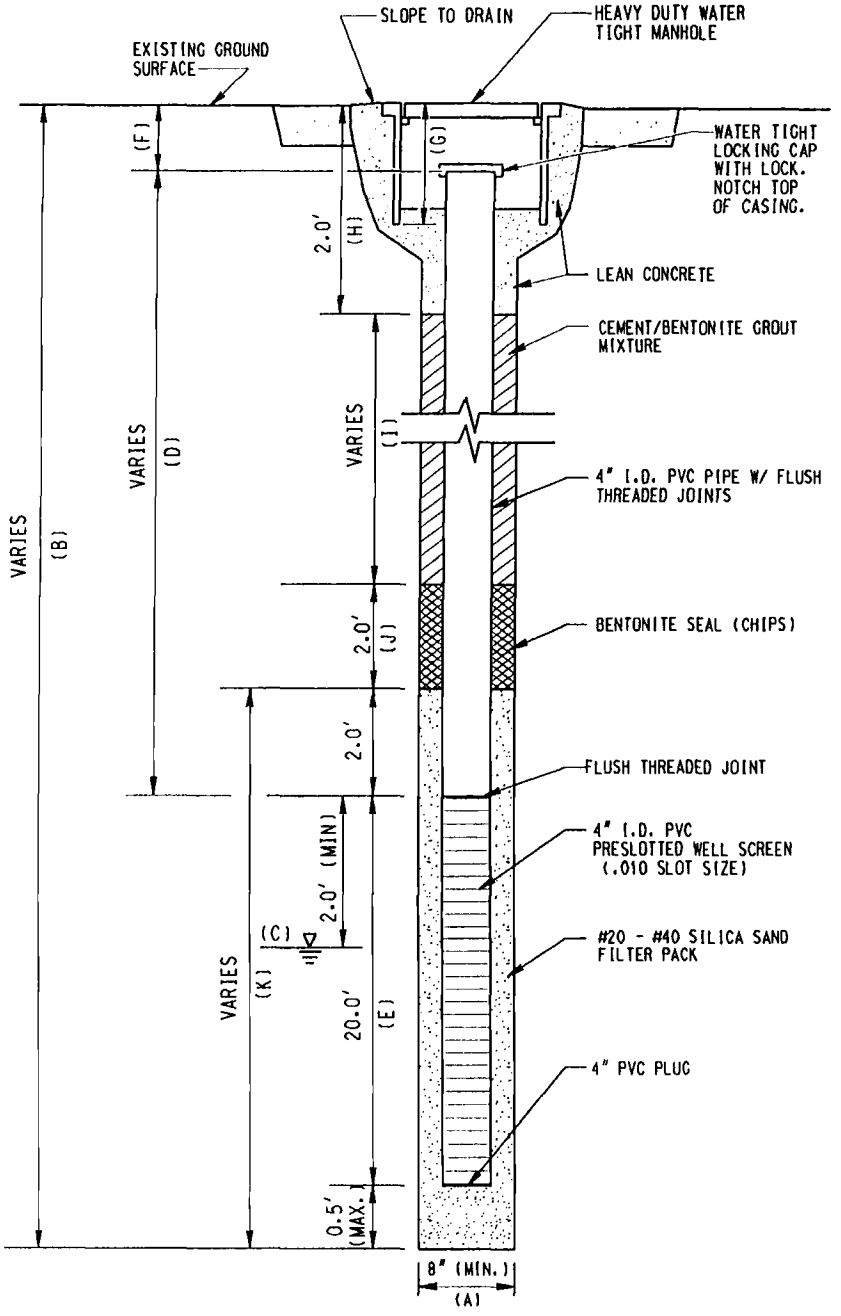

WELL NUMBER:	MW-11		
PROJECT:	BASE SERVICE STATION		
DATE INSTALLED:	29 NOV 9	SETTING	
INSTALLED BY:	CORPS OF ENGINEERS	From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	38
C	Depth to groundwater (ft) ▽	0	24
D	Blank pipe (ft)	+0.18	12.2
E	Well Screen (ft)	12.2	32.2
F	Depth to Top of Well (ft)	+0.18	
G	Protective casing (ft)	+0.38	1.18
H	Lean concrete (ft)	+0.2	5
I	Grout mix (ft)	5	9
J	Bentonite seal (ft)	9	11
K	Filter pack (ft)	11	36.6

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2025036.4795
Y Coordinate (Northing)	402277.9749
Ground Elevation	558.88
Well Casing Notch Elevation	558.90

US Army Corps of Engineers Fort Worth District

CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

226344

JUNE 1994

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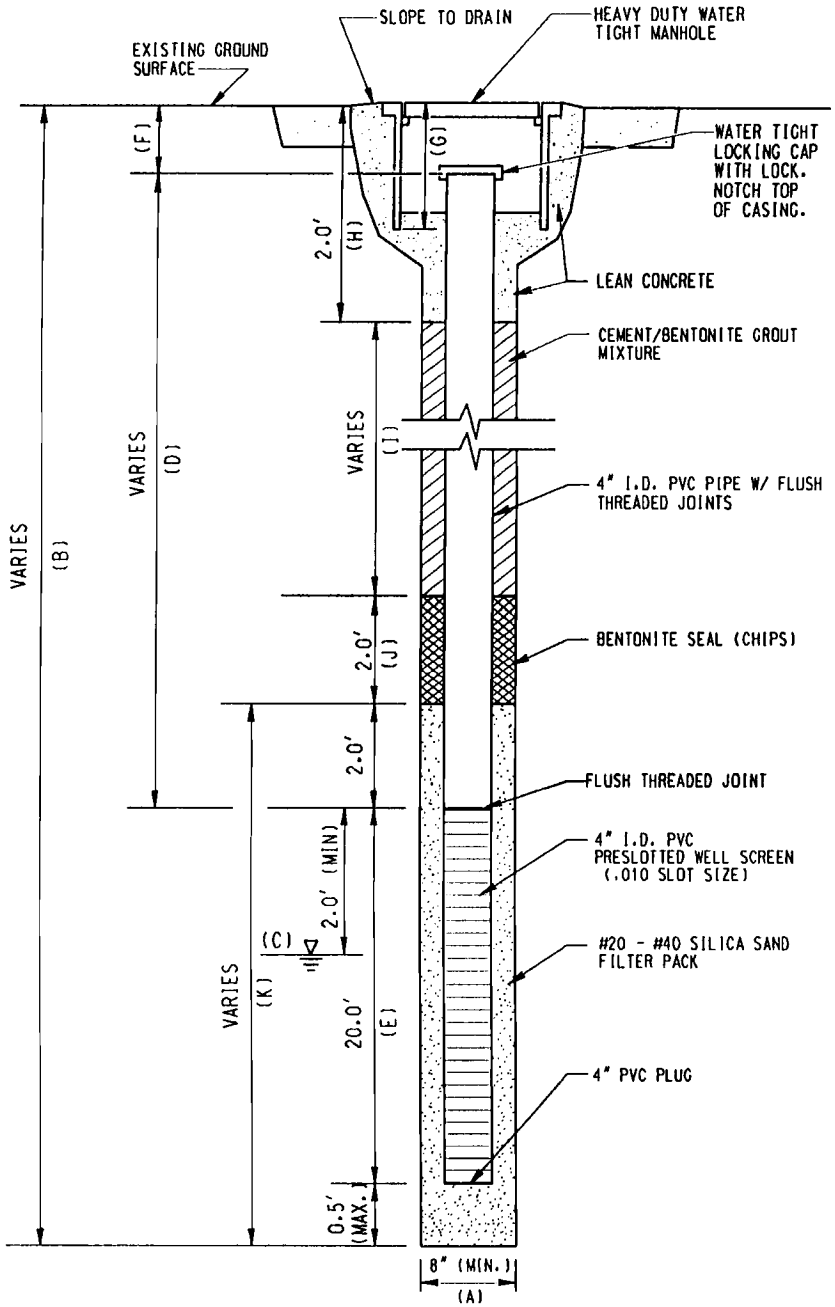

WELL NUMBER:	MW-12		
PROJECT:	BASE SERVICE STATION		
DATE INSTALLED:	13 DEC 9	SETTING	
INSTALLED BY:	CORPS OF ENGINEERS	From*	To
A	Diameter of boring (in)	———	10
B	Depth of boring (ft)	0	28
C	Depth to groundwater (ft) ▽	0	10.6
D	Blank pipe (ft)	+0.2	7.07
E	Well Screen (ft)	7.07	27.07
F	Depth to Top of Well (ft)	+0.2	
G	Protective casing (ft)	+0.38	1.18
H	Lean concrete (ft)	+0.5	1.5
I	Grout mix (ft)	1.5	3.5
J	Bentonite seal (ft)	3.5	5.5
K	Filter pack (ft)	5.5	28.0

* Measured from ground surface (0 feet)

SURVEY FEATURE	MEASUREMENT
X Coordinate (Easting)	2024390.2792
Y Coordinate (Northing)	402726.4936
Ground Elevation	560.20
Well Casing Notch Elevation	560.38

US Army Corps of Engineers Fort Worth District

CARSWELL AIR FORCE BASE
SITE ASSESMENT
BASE SERVICE STATION
BUILDING 1518
LPST ID NO. 104524

WELL CONSTRUCTION DETAIL

22623.5

JUNE 1994

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226346

NOTE:

1. HORIZONTAL AND VERTICAL CONTROL FURNISHED BY THE CORPS OF ENGINEERS, FORT WORTH DISTRICT, FORT WORTH, TEXAS.

A. HORIZONTAL
1. "CAR-5" - R.R.SPIKE WITH PUNCH HOLE
Y=403,429.717
X=2,021,380.341
2. "TP-3" - 100d NAIL
Y=406,564.098
X=2,023,818.018

B. VERTICAL
1. TBM-K-910
U.S.C.&G.S. MONUMENT K-910
ELEV.-614.71

2. ALL SURFACE UTILITIES WERE LOCATED BY AN ACTUAL SURVEY AS SHOWN.

3. ALL UNDERGROUND UTILITIES ARE FROM PLANS FURNISHED BY CARSWELL A.F.B. ENGINEERS, CARSWELL AIR FORCE BASE, FORT WORTH, TEXAS.

A. WATER, TAB - C-1
SHEET 1 OF 1
LAST UPDATE: OCTOBER 30, 1991
B. STORM DRAIN, TAB - C-3
SHEET 1 OF 1
LAST UPDATE: OCTOBER 30, 1991
C. ELECTRICAL, TAB - C-4
SHEET 1 OF 1
LAST UPDATE: OCTOBER 30, 1991
D. SANITARY SEWER, TAB - C-2
SHEET 1 OF 1
LAST UPDATE: OCTOBER 30, 1991
E. NATURAL GAS, TAB - C-6
SHEET 1 OF 1
LAST UPDATE: OCTOBER 30, 1991

MW-12 X-2024390.28 Y- 402726.49
MW-7 X-2024301.74 Y- 402544.99
MW-5 X-2024384.37 Y- 402380.86
BSS-B X-2024331.56 Y- 402390.19
MW-4 X-2024335.22 Y- 402380.68
MW-6 X-2024418.34 Y- 402311.95
ST16-1 X-2024382.27 Y- 402307.72
ST16-2 X-2024405.13 Y- 402248.69
ST16-3 X-2024426.72 Y- 402190.24
BSS-A X-2024357.67 Y- 402068.71
MW-3 X-2023990.22 Y- 401823.77
MW-9 X-2024576.11 Y- 402577.41
MW-1 X-2024591.26 Y- 402429.15
SAV-2 X-2024525.75 Y- 402383.47
SAV-1 X-2024543.93 Y- 402352.06
BSS-C X-2024565.39 Y- 402254.10
MW-10 X-2024787.20 Y- 402409.94
MW-2 X-2024800.28 Y- 402278.44
MW-8 X-2024734.61 Y- 402159.14
MW-11 X-2025036.48 Y- 402277.97

WEST FORK TRINITY RIVER
ROGNER DR.
JENNINGS DR.
CHAIN LINK FENCE
ASPHALT PARKING
GRASS
CONCRETE
GAS STATION FF-568.62
GUARD HOUSE FF-562.03
PLANTER
PIPE LINE MARKER
BRIDGE
N 401850
E 2024850

100 50 0 100 200
SCALE IN FEET

LEGEND

MW-11 ● MONITOR WELL LOCATION AND NUMBER (EXISTING)

Carter & Burgess
CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING AND THE ENVIRONMENT
CARTER & BURGESS, INC.

US ARMY CORPS OF ENGINEERS FORT WORTH DISTRICT GEOTECHNICAL BRANCH

CARSWELL AIR FORCE BASE
BASE SERVICE STATION
BUILDING 1518

SURVEY DATA FOR MONITOR WELL LOCATIONS

DATE: JUNE 1994

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226347

State of Texas Well Plugging Report

for BSS-C

Please use black ink. File WHITE COPY with: Texas Water Commission P.O. Box 13087 Austin, Texas 78711 Phone (512) 371-6299	State of Texas **PLUGGING REPORT** (This form must be completed and filed with the TWC within 30 days following the date the well is plugged as required by current statutory law.)	226348 Texas Water Well Drillers Board P.O. Box 13087 Austin, Texas 78711 Phone (512) 371-6299

A. Well Identification and Location Data

1) Owner AIR FORCE CONVERSION AGENCY (Name) Address FORMER CARSWELL AFB (Street or RFD) FT. WORTH (City) TX. (State) 76127 (Zip)

2) Owner's Well Number BSS-C (BASE SERVICE STATION)

3) Location of Well: County TARRANT 6 miles in W/ (N.E., S.W., etc.) direction from DOWNTOWN FT. WORTH, TX. (Town)

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ Legal description:

Section No. _____ Block No. _____ Township _____

Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section lines or survey lines: _____

☒ See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller ATEC ASSOC. INC. License Number UNKNOWN/ City UNKNOWN/

5) Drilled 14 FEB 1988; 6) Diameter of hole 6.6 inches; 7) Total depth of well 13 feet.

C. Current Plugging Data

8) Date well plugged 1 DEC, 1993.

9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.

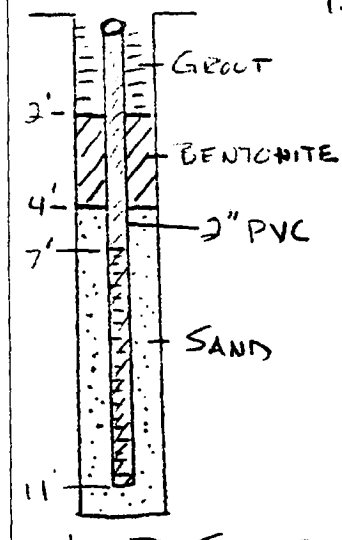
10) Name of Driller or other person actually performing the plugging operations GREG WILLIAMS

if a water well driller plugged the well, give the driller's license no. _____.

11) Casing and cementing data relative to the plugging operations:

Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
2	0.0	11.0

Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
0.0	11.0	7 GAL.



1. CASING BROKE OFF 3" BELOW Gd. SURF.
2. BACKFILLED 2" PVC W/ CEMENT BENTONITE GROUT
3. BACKFILLED ANNULUS W/ GROUT TO SURFACE

NOT TO SCALE

SEE ATTACHED WELL CONSTRUCTION SKETCH

D. Validation of Information Included in Form

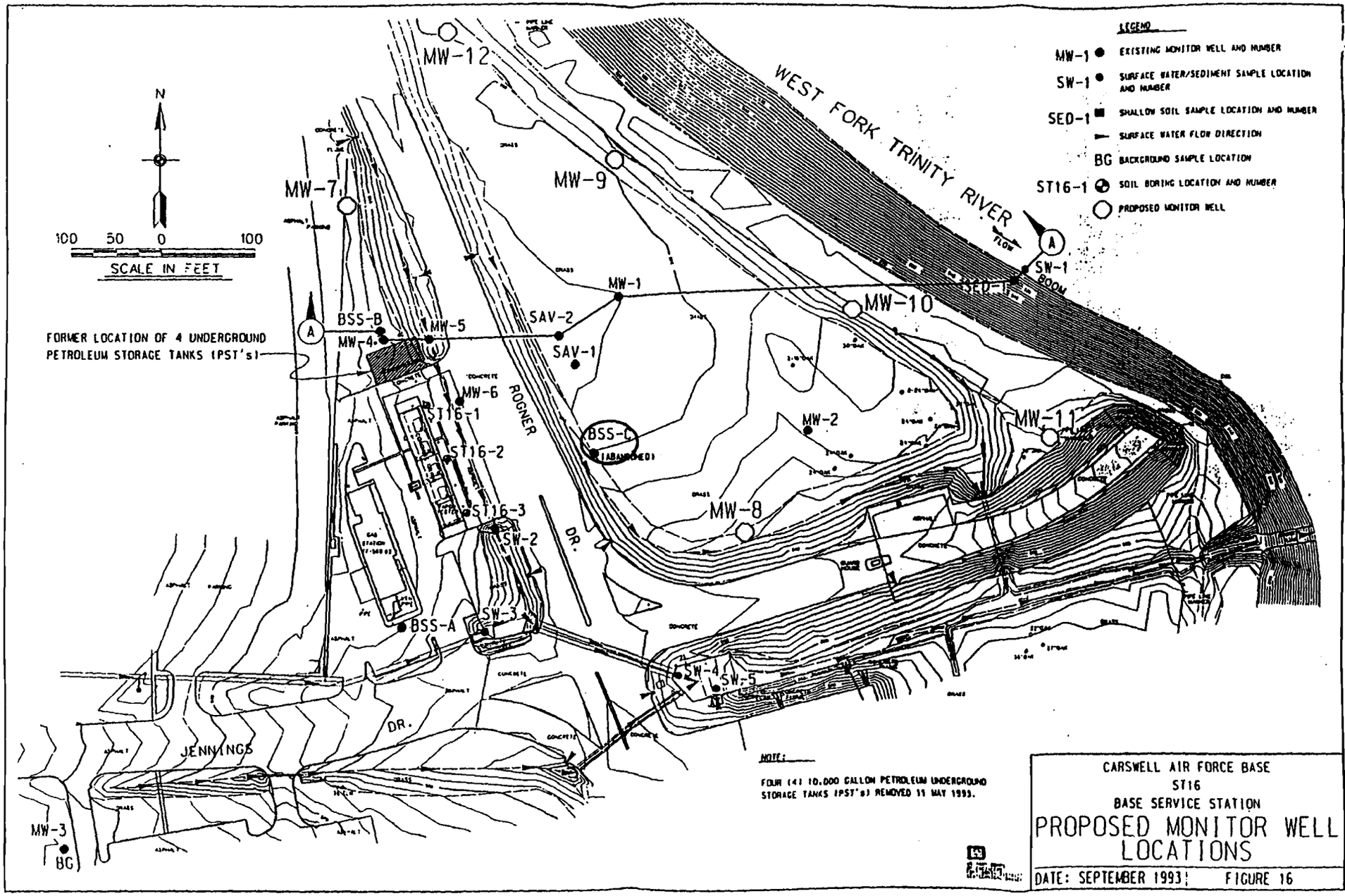
I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name U.S. ARMY CORPS OF ENGINEERS (Type or Print)

Address 819 TAYLOR (Street or RFD) FT. WORTH (City) TX. (State) 76102 (Zip)

(Signed) _____ (Person performing plugging operations) (Signed) _____ (Owner of Well)

For TWC use only
Well No. _____


LEGEND
MW-1 EXISTING MONITOR WELL AND NUMBER
SW-1 SURFACE WATER/SEDIMENT SAMPLE LOCATION AND NUMBER
SED-1 SHALLOW SOIL SAMPLE LOCATION AND NUMBER
SURFACE WATER FLOW DIRECTION
BG BACKGROUND SAMPLE LOCATION
ST16-1 SOIL BORING LOCATION AND NUMBER
PROPOSED MONITOR WELL
N
100 50 0 100
SCALE IN FEET
FORMER LOCATION OF 4 UNDERGROUND PETROLEUM STORAGE TANKS (PST's)
WEST FORK TRINITY RIVER
FLOW
ROGNER
DR.
JENNINGS
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
SAV-1
SAV-2
SW-1
SW-2
SW-3
SW-4
SW-5
SED-1
BSS-A
BSS-B
BSS-C
(ABANDONED)
ST16-1
ST16-2
ST16-3
800M
BG
NOTE:
FOUR (4) 10,000 GALLON PETROLEUM UNDERGROUND STORAGE TANKS (PST's) REMOVED 11 MAY 1993.
CARSWELL AIR FORCE BASE
ST16
BASE SERVICE STATION
PROPOSED MONITOR WELL LOCATIONS
DATE: SEPTEMBER 1993
FIGURE 16

22634

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 12 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site BSS		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 4	
4. HOLE NO.: BSSC		11. ELEVATION GROUND WATER: 548.72 ft MSL (3/4/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/14/88	
6. COORDINATES OF HOLE: X: 2024565.7 Y: 402254.07		13. ELEVATION TOP OF HOLE: 560.00 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		BSSC-1	S/CLLR	SILTY CLAY: DARK GRAY, SOME FINE GRAINED SAND, MINOR PEBBLES.
2		BSSC-2	S/CLLR	SAME AS ABOVE
4		BSSC-3	S/SLSM	CLAYEY SILT: LIGHT BROWN/GRAY, FINE GRAINED SAND, FEW LIMESTONE FRAGMENTS.
9		BSSC-4	S/CLLR	GRAVELLY CLAY: ABUNDANT LIMESTONE FRAGMENTS, WET.
10			S/GRCL	GRAVEL AND CLAY: INCREASING GRAVEL. WATER AT 10 FEET.
12			R/LMSN	LIMESTONE: LIGHT GRAY, INDURATED. REFUSAL AND END OF BORING AT 12 FEET.

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Base Service Station (BSS)

COORDINATES 402,254.07567 2,024,365.70484

DATE COMPLETED 2/15/88

SUPERVISED BY Guy J. Childs

DRILLER ATEC Associates, Inc.

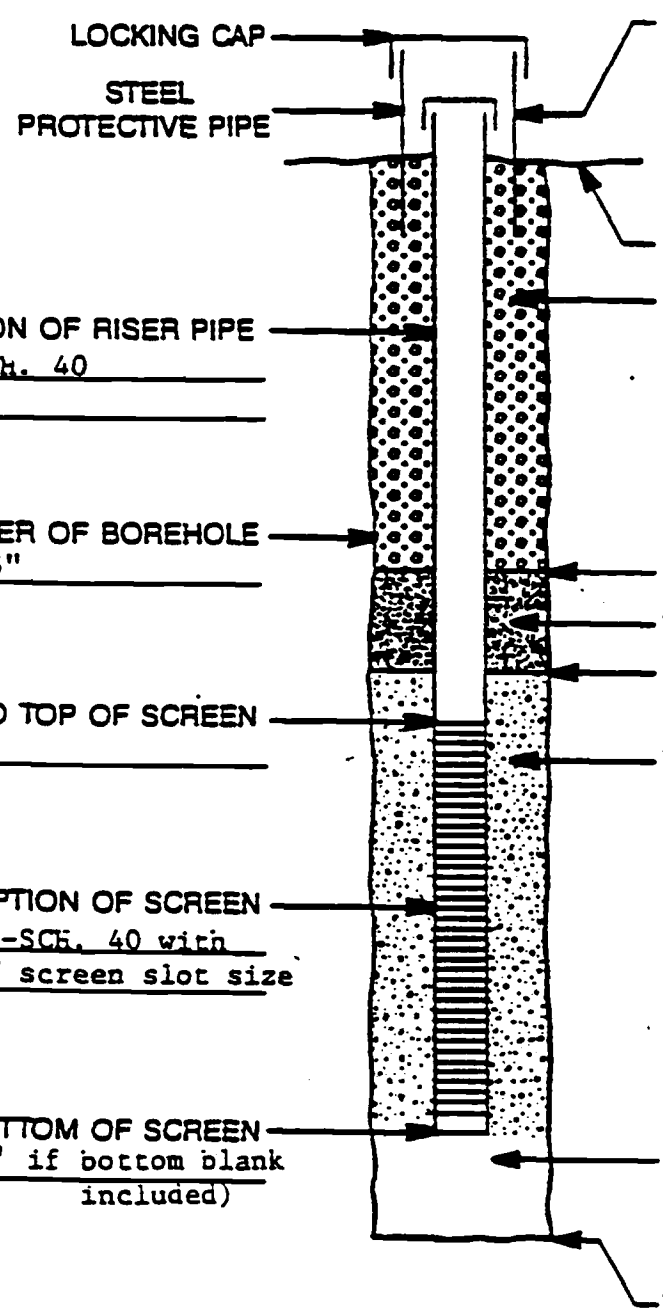
DRILLING METHOD Hollow-Stem Auger

WELL NO. BSS-C

226351

AQUIFER Upper Zone

DEPTH TO WATER 10.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 559.57'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL -0.43'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 2'

TYPE OF SEAL Bentonite 1/4" pellers

DEPTH TO TOP OF SAND PACK 4'

DEPTH TO TOP OF SCREEN 7'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 11.0' (12.0' if bottom blank included)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 12'

D87 - 1240A

226352

Surveyor's Report

226353

January 13, 1994

Mr. L.W. Grigsby, R.P.L.S.
Corps. Of Engineers
17300 CESWF-CT-R
Fort Worth, Texas 76102-0300

RE: Carswell Air Force Base Service Station
Monitoring Well Locations
A.R.S. Project No.: 300-94-003

Dear Mr. Grigsby:

Below are the coordinates of the 8 monitoring well locations that were requested. Please call if you have any comments or questions.

Well No.	Northing	Easting	Elevation	Desc
MW-7	402544.9901	2024301.7444	567.88	"V" IN PVC
			567.91	GROUND
MW-8	402159.1392	2024734.6082	556.91	"V" IN PVC
			556.73	GROUND
MW-9	402577.4135	2024576.1113	560.30	"V" IN PVC
			560.44	GROUND
MW-10	402409.9415	2024787.2038	559.53	"V" IN PVC
			559.28	GROUND
MW-11	402277.9749	2025036.4795	558.90	"V" IN PVC
			558.88	GROUND
MW-12	402726.4936	2024390.2792	560.38	"V" IN PVC
			560.20	GROUND
SAV-1	402352.0591	2024543.9276	561.51	"V" IN PVC
			561.62	GROUND
SAV-2	402383.4666	2024525.7474	561.25	"V" IN PVC
			561.66	GROUND

Thank you,

Brian Wright, R.P.L.S.
Project Surveyor

SURVEYED LOCATIONS OF BORINGS
AND HOLE DATA

226354

Project: CARSWELL A.F. BASE
Vicinity: FT. WORTH, TX.
Datum, Horizontal: 1927 Vertical: 1929 MSL
Traverse:
Texas State Plane Coordinates: Zone: NORTH CENTRAL

Hole Number	X	Y	Elev M.S.L.	Depth			Remarks
				Water	Rock	Hole	
MW # 1	2024591.26	402,429.15	561.06				
MW # 2	2024,800.28	402,278.44	558.30				
MW # 3	2023,990.22	401,823.77	576.96				
MW # 4	2024,335.22	402,380.68	567.19				
MW # 5	2024,384.37	402,380.86	561.32				
MW # 6	2024,418.34	402,311.95	563.53				
MW # BSS-A	2024,357.67	402,068.71	567.03				
MW # BSS-B	2024,331.56	402,390.19	566.84				
MW # ST16-1	2024,382.27	402,307.72	565.38				
MW # ST16-2	2024,405.13	402,248.69	565.39				
MW # ST16-3	2024,426.72	402,190.24	565.33				
MW # SAV-1	2024,543.98	402,352.32	561.26				
MW # SAV-2	2024,525.90	402,383.71	561.22				
MW BSS-C	2024,565.39	402,254.10	559.88				REPORTED ABANDONED
MW #	2024,296.23	402,211.38	568.36				UNNAMED

NOTE: Coordinates to nearest foot
Elevations to nearest tenth foot
Specify chain or stadis traverse

PAGE NO.	NO. OF PAGES	DATE	SUBMITTED BY (Name and Title)
1	1	6/25/93	Paul Dugoly

Well Sampling Daily Worksheets

and

Field Data Forms

226356

WELL SAMPLING DAILY WORKSHEET

Project: CARSWELL AFB	Site: Service Station				
Monitor Well #	MW12	MW9	MW10	MW 11	
Date Purged	1/3/94	1/3/94	1/3/94	1/3/93	
Casing Dia/Type	4"/PVC	4" PVC	4" PVC	4" PVC	
Depth Reference Pt.	N.S	N.S	N.S.	W.S.	
Total Depth	27.45	27.91	32.90	32.20	
Depth to Water	9.62	10.74	15.05	26.45	
Water in Feet	17.83	17.17	17.85	5.75	
Gallons to Purge	35.36	34.05	35.40	11.40	
Purging Started	08:20	0900	1040	1120	
Purging Stopped	0835	0930	1100	1130	
Avg. Flow Rate	1.13 g.p.m.	1.13 g.p.m.	1 g.p.m	.6 g.p.m	
Total Amt. Purged	17 gal	34 gal	20 gal	6 gal	
Actual Purge Time	15 min	30 min	20 min	10 min	
Purging System Used	Hand Bail	Hand Bail	Hand Bail	Hand Bail	
Technician Initials	D.G. J.H	D.G J.H.	D.G. J.H	D.G. J.H	
Date Sampled	1/3/94	1/3/94	1/3/94	1/3/94	
New Depth to Water	9.58	10.62	14.93	26.70	
Sampling Started	1445	1510	1530	1615	
Sampling Stopped	1455	1520	1540	1625	
Sampling Method Used	Disp Bail	Disp Bail	Disp Bail	Disp Bail	
Type Samples Taken	2/2/3	2/2/3	3/2/3	2/2/3	/ /
Time/Field Meas.	1440	1505	1525	1610	
pH (4)	8.04 8.04 8.03 8.03	7.97 7.97 7.96 7.96	7.56 7.56 7.56 7.55	7.31 7.31 7.31 7.31	
Conductivity (4)	1108 1108 1107 1106	1200 1200 1199 1199	1202 1202 1201 1201	938 938 938 937	
Temperature	62.5	59.7	58.6	58.1	
Turbidity	Clear	Slightly Turbid	Turbid	Slightly Turbid	
Ice Chest #(s)	C-78	C78	C 66	C103	
Custody Seal #(s)	10394 C-78	10394C78	10394C66	10394C103	
V/O Chest #(s)	C-103	C103	C-103	C103	
Custody Seal #	10394C103	10394C103	10394C103	10394C103	
Bus Bill Number	12069816333 →		120698	1644	
Date/Time Shipped	1.3.94 / 1730	1.3.94/1730	1.3.94 / 1730	1.3.94/1730	/
Vented/Locked/Key#	Y / Y / 1600	Y / Y / 1600	Y / Y / 1600	Y / Y / 1600	/ /
Signature	J. Hand D. Garnett	J. Hand D. Garnett	J. Hand D. Garnett	J. Hand D. Garnett	

Page ___ of ___

226357

GROUNDWATER SAMPLE FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1/3/93

SITE: Base Service Station TYPE OF SAMPLE: WATER

WELL NO: MW12 LOCATION: North WEST OF Service Station (across the st

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural ground

DEPTH TO WATER AT TIME OF PURGING: 9.62 TIME\DATE: 0820\1.3.93

RATE OF RECHARGE: 6 hr recharge

DEPTH TO WATER AT TIME OF SAMPLING: 9.58 TIME\DATE: 1445\1.3.93

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 8.04 8.04 TIME: 1440 TYPE: Hydac

PH: 8.03 8.03

CONDUCTIVITY, umhos/cm TIME: 1440 TYPE: Hydac

1108 1108 TEMPERATURE: 62.5

1107 1106 TURBIDITY: Clear

CHEST# C78 C/SEAL# 10394C78 BUS BILL# 1206981633

VOC CHEST# C103 C/SEAL# 10394103 BUS BILL# 1206981644

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

PURGE DAY: Cold, Sunny 38° - Well was locked - Gasoline odor - Brown Muddy WATER

SAMPLE DAY: Cold Sunny Afternoon - samples were clear - Gasoline Odor

SAMPLE COLLECTOR: J. Hall & D Garrett

226358

GROUNDWATER SAMPLE FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1-3-94

SITE: Base Service Station TYPE OF SAMPLE: WATER

WELL NO: MW-9 LOCATION: West of Service Station Across the

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural Ground

DEPTH TO WATER AT TIME OF PURGING: 10.74 TIME\DATE: 0900\1.3.94

RATE OF RECHARGE: Total Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 10.62 TIME\DATE: 1510\1.3.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.97 7.97 TIME: 1505 TYPE: Hydac

PH: 7.96 7.96

CONDUCTIVITY, umhos/cm TIME: 1505 TYPE: Hydac

1200 1200 TEMPERATURE: 59.7

1199 1199 TURBIDITY: Slightly

CHEST# C78 C/SEAL# 10394C78 BUS BILL# 120698163 3

VOC CHEST# C103 C/SEAL# 10394C103 BUS BILL# 120699 1644

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

PURGE DAY: Sunny - Cold 38° - Brown purge water

Well was locked. Gasoline Odor

SAMPLE DAY: Sunny afternoon

Gasoline Odor = Slightly turbid

SAMPLE COLLECTOR: J. Hand - D. Garnett

226359

GROUNDWATER SAMPLE FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1-4-94

SITE: Base Service Station TYPE OF SAMPLE: WATER

WELL NO: MW10 LOCATION: North of Service Station (Acro Street

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural ground

DEPTH TO WATER AT TIME OF PURGING: 1505 TIME\DATE: 1040\1.4.93

RATE OF RECHARGE: Total Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 14.93 TIME\DATE: 1530\1.4.9

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.56 7.54 TIME: 1525 TYPE: Hydac

PH: 7.56 7.55

CONDUCTIVITY, umhos/cm TIME: 1525 TYPE: Hydac

1202 1202 TEMPERATURE: 58.6

1201 1201 TURBIDITY: Yes (Brown)

CHEST# C66 C/SEAL# 10394C66 BUS BILL# 120 69816 44

VOC CHEST# C103 C/SEAL# 10394C103 BUS BILL# 126981644

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

PURGE DAY: Sunny - Cold 40° - Well was locked. Gasoline Odor

SAMPLE DAY: Sunny AFTERNOON - QA & QC Taken Gasoline Odor - Sample water was brown

SAMPLE COLLECTOR: J. Hand & D. Barnett

226360

GROUNDWATER SAMPLE FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1/3/94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW11 LOCATION: East of S.S. across street

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural ground

DEPTH TO WATER AT TIME OF PURGING: 26.45 TIME\DATE: 1120\1.3.94

RATE OF RECHARGE: Total Recharge

DEPTH TO WATER AT TIME OF SAMPLING: 26.70 TIME\DATE: 1615\1.3.94

WATER TABLE: _____ MEASURING DEVICE: SamplePro

PH: 7.31 7.31 TIME: 1610 TYPE: Hydac

PH: 7.31 7.31

CONDUCTIVITY, umhos/cm TIME: 1610 TYPE: Hydac

938 938

938 937 TEMPERATURE: 58.1

TURBIDITY: Slightly

CHEST# C103 C/SEAL# 10394C103 BUS BILL# 1206981644

VOC CHEST# C103 C/SEAL# 10394C103 BUS BILL# 1206981644

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

PURGE DAY: Cold Sunny - 42° Well casing is cut off at an angle - Well was locked - Brown purge water.

SAMPLE DAY: Sunny Afternoon

Gasoline Odor - Slightly turbid

SAMPLE COLLECTOR: J. Hall & D. Garrett

226361

WELL SAMPLING DAILY WORKSHEET

Project: Caswell AFB	Site: Base Service Station				
Monitor Well #	MW2	MW1	Sav2	Sav1	
Date Purged	1/4/94	1/4/94	1/4/94	1/4/94	
Casing Dia/Type	4"/PVC	4"/PVC	4" PVC	4" PVC	
Depth Reference Pt.	W.S.	N.S.	N.S.	N.S.	
Total Depth	45.00	42.12	22.30	22.50	
Depth to Water	13.36	13.37	12.97	13.43	
Water in Feet	31.64	28.75	9.33	9.07	
Gallons to Purge	62.74	57.01	18.50	17.98	
Purging Started	0830	1020	1055	1100	
Purging Stopped	0950	1130	1105	1115	
Avg. Flow Rate	.78 g.p.m	.81 g.p.m.	1.85 g.p.m	1.2 g.p.m.	
Total Amt. Purged	62.74	57 gal	18.50 gal	18 gal	
Actual Purge Time	80 min	70 min	10 min	15 min	
Purging System Used	Well Wiz	Well Wiz	Hand Bail	Hand Bail	
Technician Initials	J.H. D.G.	J.H. D.G.	J.H. D.G.	J.H. D.G.	
Date Sampled	1-4-94	1-4-94	1-5-94	1-5-94	
New Depth to Water	13.36	13.30	12.82	13.28	
Sampling Started	1600	1620	1430	1450	
Sampling Stopped	1610	1630	1440	1455	
Sampling Method Used	Disp Bailer	D. Bailer	D. Bailer	D. Bailer	
Type Samples Taken	2/1/3	3/1/3	3/1/3	2/1/3	/ /
Time/Field Meas.	1555	1615	1425	1445	
pH (4)	8.00 8.00	7.91 7.91	7.66 7.66	7.66 7.66	
	8.00 8.00	7.90 7.90	7.66 7.66	7.65 7.65	
Conductivity (4)	10.05 10.04	1195 1194	1091 1091	945 944	
	10.04 10.04	1194 1193	1090 1085	944 944	
Temperature	62.9	60.0	67.8	67.1	
Turbidity	Clear	Yes	Yes	Yes	
Ice Chest #(s)	C-93	C 55	C47	C47	
Custody Seal #(s)	10494C93	10494C55	10594C47		
V/O Chest #(s)	C 55	C 55	C47	C47	
Custody Seal #	10494C55	10494C55	10504C47		
Bus Bill Number	120698	1699	→	→	
Date/Time Shipped	10494/1730	10494/1730	1.5.94/	1.5.94/	/
Vented/Locked/Key#	Y/N/-	Y/N/-	Y/N/-	Y/N/	/ /
Signature	J. Hard D. Garnett	J. Hard D. Garnett	J. Hard D. Garnett	J. Hard D. Garnett	

QC-B C-93 3 1 3 1650

QA-B C55 3 1 3 1635

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226362

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1/4/94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW2 LOCATION: across the street from Static

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Well casing 6" below natural ground

DEPTH TO WATER FROM TOP OF CASING: 13.36 TIME: 0830/1.4.9

RATE OF RECHARGE: Total Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 13.36 TIME: 1600/1.4.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 8.00 8.00 TIME: 1555 TYPE: Hydac

PH: 8.00 8.00

CONDUCTIVITY, umhos/cm TIME: 1555 TYPE: Hydac

1005 1004 TEMPERATURE: 62.9

1004 1004 TURBIDITY: Clear

CHEST# C93 C/SEAL# 10494C93 BUS BILL# 120698 1699

CHEST# C55 C/SEAL# 10494C55 BUS BILL# 120698 1699

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day: Cool 45° - Black water came out of well first using the well wizard. Gasoline Odor No Bolts or locked.

Sample Day: Sunny - Cool - Windy - 53°

SAMPLE COLLECTOR: J. Davis D. Barnett

226363

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1/4/94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW 1 LOCATION: Across the Street from Station

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Well Casing 1" above Ground Level

DEPTH TO WATER FROM TOP OF CASING: 13.37 TIME: 1020\1.4.94

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 13.30 TIME: 1620\1.4.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.91 7.91 TIME: 1615 TYPE: Hydac

PH: 7.90 7.90

CONDUCTIVITY, umhos/cm TIME: 1615 TYPE: Hydac

1195 1194 TEMPERATURE: 60.0

1194 1193 TURBIDITY: yes

CHEST# CSS C/SEAL# 1094CSS BUS BILL# 120698169 9

CHEST# CSS C/SEAL# 1094CSS BUS BILL# 120698169 9

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day - Sunny - cold - 49° - No Odor

No Bolts or locked

Sample Day - Sunny, Windy cool 55°

SAMPLE COLLECTOR: J. David D Barnett

226364

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.4.94

SITE: Base Service Station #16 TYPE OF SAMPLE: WATER

WELL NO: SAV 2 LOCATION: across From Base Service St.

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. 31" Protective Casing

DEPTH TO WATER FROM TOP OF CASING: 12.97 TIME: 1.4.94 \ 105

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 12.82 TIME: 1.5.94 \ 14

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.66 7.66 TIME: 1425 TYPE: Hydac

PH: 7.66 7.66

CONDUCTIVITY, umhos/cm TIME: 1425 TYPE: Hydac

1091 1091 TEMPERATURE: 67.8

1090 1088 TURBIDITY: yes

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 1206981699

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 1206981699

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day: Sunny - Cold - 50° - All purge water was brown. Gasoline Odor

Sample Day: Sunny - Windy - 65°
Water was slightly turbid at first then became clear brown and the last was uneven color. Gasoline odor

SAMPLE COLLECTOR: J. Hand & D. Garnett

226365

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.4.94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: SAV1 LOCATION: across the street from Service Station

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. 39" Protective Casing

DEPTH TO WATER FROM TOP OF CASING: 13.43 TIME: 1100 \ 1.4.94

RATE OF RECHARGE: 24hr recovery

DEPTH TO WATER AT TIME OF SAMPLING: 13.28 TIME: 1450 \ 1.5.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.66 7.66 TIME: 1445 TYPE: Hydac

PH: 7.65 7.65

CONDUCTIVITY, umhos/cm TIME: 1445 TYPE: Hydac

945 944 TEMPERATURE: 67.1

944 944 TURBIDITY: Lys

CHEST# C-47 C/SEAL# 10594C47 BUS BILL# 120698169 9

CHEST# C 47 C/SEAL# 10594C47 BUS BILL# 120698169 9

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day: Sunny 80° - bold All purge water was brown. Gasoline Odor.

Sample Day - Sunny 65°

Water was clear at first bail, then ever bailer got darker till it was all brown.

SAMPLE COLLECTOR: J. Hand & D. Garnett

WELL SAMPLING DAILY WORKSHEET 226366

Project: Carswell AFB	Site: BSS - ST 16				
Monitor Well #	MW8	MW7	MW3	BSS-A	
Date Purged	1/5/93	1/5/93	1/5/93	1/5/93	
Casing Dia/Type	4" PVC	4" PVC	4" PVC	2"	
Depth Reference Pt.	N.S	N.S	S.S.	N.S	
Total Depth	27.00	16.50	19.03	10.60	
Depth to Water	9.80	8.36	11.25	5.40	
Water in Feet	17.20	8.14	7.78	5.20	
Gallons to Purge	34 gal	16.14 gal	15.42 gal	2.71 gal	
Purging Started	0840	1030	1300	1330	
Purging Stopped	0910	1040	1310	1335	
Avg. Flow Rate	1.13 g.p.m	1.4 g.p.m.	1 g.p.m	.54 g.p.m	
Total Amt. Purged	34 gal	14 gal	10 gal dry	2.7 dry	
Actual Purge Time	30 min	10 min	10 min	5 min	
Purging System Used	Hand Bail	H. Bail	H. Bail	H. Bail	
Technician Initials	J.H. D.G.	J.H. D.G.	J.H. D.G.	J.H. D.G.	
Date Sampled	1.5.94	1.5.94	1.5.94	1.5.94	
New Depth to Water	2.73	8.36	11.26	5.43	
Sampling Started	1530	1545	1615	1645	
Sampling Stopped	1535	1600	1630	17:00	
Sampling Method Used	Disp. Bailer	Disp Bail	Disp Bail	Disp Bail	
Type Samples Taken	2/2/3	2/1/3	3/1/3	2/1/3	/ /
Time/Field Meas.	1525	15:40	16:10	16:40	
pH (4)	7.53 7.52 7.52 7.52	7.49 7.49 7.48 7.48	8.04 8.04 8.03 8.01	8.00 7.99 7.97 7.97	
Conductivity (4)	793 793 793 793	1228 1222 1282 1220	860 859 860 859	915 916 916 915	
Temperature	63.9	67.0	68.0	64.0	
Turbidity	VEO	Sl Tur	Sl Tur	Turbid	
Ice Chest #(s)	C49	C49	C20A	C20A	
Custody Seal #(s)	10594C49	10594C49	10594C20A	→	
V/O Chest #(s)	C47	C47	C47	C47	
Custody Seal #	10594C47	10594C47	10594C20A	→	
Bus Bill Number	120698	1721	→	→	
Date/Time Shipped	1.5.94/1730	1.5.94/1730	1.5.94/1730	1.5.94/1730	/
Vented/Locked/Key#	Y/Y/1600	Y/Y/1600	Y/N/-	Y/N/-	/ /
Signature	J. Hand	D. Garnett	→	→	

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226367

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.5.94

SITE: Base Service Station TYPE OF SAMPLE: WATER

WELL NO: MW8 LOCATION: East - Across Street from Ser Sta

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural ground

DEPTH TO WATER FROM TOP OF CASING: 9.80 TIME: 0840 \ 1.5 C

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 9.73 TIME: 1530 \ 1.5

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.53 7.52 TIME: 1525 TYPE: Hydac

PH: 7.52 7.52

CONDUCTIVITY, umhos/cm TIME: 1525 TYPE: Hydac

793 793 TEMPERATURE: 63.9

793 793 TURBIDITY: Yes

CHEST# C49 C/SEAL# 10594C49 BUS BILL# 120698172 1

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 120698172 1

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day - 39°. Cold Windy

No Odor - ALL brown purge WATER

2' Concrete Dg around casing

Casing at NATURAL ground

Sample day. No Odor - Turbid water

SAMPLE COLLECTOR: J. Hand & D. Garnett

226368

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.5.94

SITE: BASE SERVICE STATION TYPE OF SAMPLE: WATER

WELL NO: MW1 LOCATION: N. of Service Station

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Natural Ground

DEPTH TO WATER FROM TOP OF CASING: 8.36 TIME: 1030\1.5.94

RATE OF RECHARGE: Total Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 8.36 TIME: 1545\1.5.9

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.49 7.49 TIME: 1540 TYPE: Hydac

PH: 7.48 7.48

CONDUCTIVITY, umhos/cm TIME: 1540 TYPE: Hydac

1228 1222 TEMPERATURE: 67.0

1222 1220 TURBIDITY: Slight

CHEST# C49 C/SEAL# 10594C49 BUS BILL# 120698172 1

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 120698172 1

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day - 42° Sunny, Windy, Cold

2' concrete square around casing

open purged water

Sample Day - cold, sunny, windy

Slightly turbid water samples

SAMPLE COLLECTOR: J. Hand & D. Garnett

226369

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.5.94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW3 LOCATION: Across the Street (South)

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. 5" above N.G.

DEPTH TO WATER FROM TOP OF CASING: 11.25 TIME: 1300\1.5.94

RATE OF RECHARGE: Total Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 11.26 TIME: 1615\1.5.9

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 8.04 8.04 TIME: 1610 TYPE: Hydac

PH: 8.03 8.01

CONDUCTIVITY, umhos/cm TIME: 1610 TYPE: Hydac

860 859 TEMPERATURE: 68.0

860 859 TURBIDITY: Slightly

CHEST# C20A C/SEAL# 10594C20A BUS BILL# 1206981721

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 1206981721

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day- Sunny Cool 50° Windy
No Smell - Brown Purge Water

Sampl Day- Cool -
Slightly Turbid Sample Water

SAMPLE COLLECTOR: J. Hand & D. Garnett

226370

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1-5-94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: BSS-1A LOCATION: South of Service Station

CSG DIAM 2" CSG TYPE: PVC

RISER ELEV. 5" above Natural ground - 3' Round concrete mon. mark on South side

DEPTH TO WATER FROM TOP OF CASING: 5.40 TIME: 1330\1.5.94

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 5.43 TIME: 1645\1.5.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 8.00 7.99 TIME: 1640 TYPE: Hydac

PH: 7.97 7.97

CONDUCTIVITY, umhos/cm TIME: 1640 TYPE: Hydac

915 916 TEMPERATURE: 64.0

916 915 TURBIDITY: Yes

CHEST# C20A C/SEAL# 10594C20A BUS BILL# 120698172 1

CHEST# C47 C/SEAL# 10594C47 BUS BILL# 120698172 1

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day - Sunny - Cool 50° Windy

No smell - Well cas

Protective casing was full of water.

Seal on casing not very tight.

Sample Day - Sunny - Cool - Windy

SAMPLE COLLECTOR: J Hamlin & D. Garnett

226371

WELL SAMPLING DAILY WORKSHEET

Project: Carswell AFB	Site: Base Service Station				
Monitor Well #	MW6	MW5	MW4	BSS-B	
Date Purged	1-6-94	1-6-94	1-6-94	1-6-94	
Casing Dia/Type	4" PVC	4" PVC	4" PVC	2" PVC	
Depth Reference Pt.	N.S	E.S.	N.S	N.S.	
Total Depth	9.93	8.05	15.18	13.08	
Depth to Water	2.52	5.02	6.65	9.81	
Water in Feet	7.41	3.03	8.53	3.27	
Gallons to Purge	14.69	6.01	16.91	1.70 gal	
Purging Started	0835	0900	0925	0920	
Purging Stopped	0845	0905	0935	0925	
Avg. Flow Rate	1.3 g.p.m	.8 g.p.m	1 g.p.m.	.2 g.p.m	
Total Amt. Purged	13 gal	4 gal	10 gal	1 gal	
Actual Purge Time	10 min	5 min	10 min	5 min	
Purging System Used	H. Bail	H. Bail	H Bail	H. Bail	
Technician Initials	J.H. D.G	J.H. D.G	J.H. D.G	J.H. D.G	
Date Sampled	1.6.94	1.6.94	1.6.94	1.6.94	
New Depth to Water	2.50	5.52	6.66	9.82	
Sampling Started	1335	1350	1505	1435	
Sampling Stopped	1345	1410	1520	1455	
Sampling Method Used	Disp Bail	Disp Bail	Disp Bail	Disp Bail	
Type Samples Taken	21113	21113	21113	31113	1 1
Time/Field Meas.	1330	1350	1500	1430	
pH (4)	9.13 9.12 9.12 9.13	8.21 8.21 8.19 8.18	7.44 7.44 7.44 7.44	7.66 7.67 7.62 7.63	
Conductivity (4)	892 892 893 894	819 820 820 820	1036 1037 1036 1037	1048 1049 1048 1049	
Temperature	59.9°	54.7°	62.4°	59.8°	
Turbidity	CLEAR	SL. TUR	TURBID	BLACK H2O TURBID	
Ice Chest #(s)	C93	C93	C20	C20	
Custody Seal #(s)	10694C93	10694C93	10694C78	10694C78	
V/O Chest #(s)	C20	C20	C20	C20	
Custody Seal #	10694C78	10694C78	10694C78	10694C78	
Bus Bill Number	120698175 4	→	→	→	
Date/Time Shipped	1.6.94	1.6.94	1.6.94	1.6.94	1
Vented/Locked/Key#	Y/N/	Y/Y/1.66	Y/N/	Y/Y/1.66	1 1
Signature	J. Hall & D. Barnett				

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STRONG GAS

226372

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1-6-94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW6 LOCATION: IN Street, N.E of B. Station

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. 5" Below N.G.

DEPTH TO WATER FROM TOP OF CASING: 2.52 TIME: 0835\ 1.6.94

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 2.50 TIME: 1335\ 1.6.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 9.13 9.12 TIME: 1330 TYPE: Hydac

PH: 9.12 9.13

CONDUCTIVITY, umhos/cm TIME: 1330 TYPE: Hydac

892 892 TEMPERATURE: 59.9°

893 894 TURBIDITY: Clear

CHEST# C93 C/SEAL# 10694C93 BUS BILL# 120698 1754

CHEST# C20 C/SEAL# 10694C20 BUS BILL# 120698 1754

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day: Cool - 60° - Not locked - No Odor

Brown Purge Water

Sample Day - Cool - Clear Samples

SAMPLE COLLECTOR: J. Hall & D. Barnett

226373

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1.6.94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW5 LOCATION: Drainage Ditch N.E. Static

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. 30" W.C. 44" P.C.

DEPTH TO WATER FROM TOP OF CASING: 5.02 TIME: 0900 \ 1.6.94

RATE OF RECHARGE: TOTAL Recovery

DEPTH TO WATER AT TIME OF SAMPLING: 5.52 TIME: 1350 \ 1.6.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 8.21 8.21 TIME: 1350 TYPE: Hydac

PH: 8.19 8.19

CONDUCTIVITY, umhos/cm TIME: 1350 TYPE: Hydac

819 820 TEMPERATURE: 54.7

820 820 TURBIDITY: Slightly

CHEST# C 93 C/SEAL# 10694C93 BUS BILL# 120 6981754

CHEST# C 20 C/SEAL# 10694020 BUS BILL# 120 6981754

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge Day - 1.0' - Cool - No Odor
Brown Purge Water

Sample Day - Cool
Slightly turbid Water

SAMPLE COLLECTOR: J. Davis & D. Garnett

226374

WATER SAMPLES FIELD DATA FORM

PROJECT: Carswell AFB DATE: 1-6-94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: MW4 LOCATION: North of Station

CSG DIAM 4" CSG TYPE: PVC

RISER ELEV. Ground Level

DEPTH TO WATER FROM TOP OF CASING: 6.65 TIME: 0925/1.6.94

RATE OF RECHARGE: TOTAL RECOVERY

DEPTH TO WATER AT TIME OF SAMPLING: 6.66 TIME: 1505/1.6.94

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.44 7.44 TIME: 1500 TYPE: Hydac

PH: 7.44 7.44

CONDUCTIVITY, umhos/cm TIME: 1500 TYPE: Hydac

1034 1037 TEMPERATURE: 62.4°

1034 1037 TURBIDITY: yes

CHEST# C 20 C/SEAL# 10694C20 BUS BILL# 120698175 4

CHEST# C 20 C/SEAL# 10694C20 BUS BILL# 120698175 4

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge- High reading when first opened well on LEL- After letting it set, cleared out. Dirty water then black. Strong Odor

Sample Day- Cool- Windy

Odor = Solvid

No Gasoline on Paste

SAMPLE COLLECTOR: J. Hall & D. Barnett

226375

WATER SAMPLES FIELD DATA FORM

PROJECT: Caldwell AFB DATE: 1-.94

SITE: Base Service Station TYPE OF SAMPLE: Water

WELL NO: BSS-B LOCATION: North of Service Station

CSG DIAM 2" CSG TYPE: PVC

RISER ELEV. 32" W.C. 35 P.C.

DEPTH TO WATER FROM TOP OF CASING: 9.81 TIME: 0920 \ 1. .94

RATE OF RECHARGE: TOTAL Recharge

DEPTH TO WATER AT TIME OF SAMPLING: 9.82 TIME: 1435 \ 1. 9-

WATER TABLE: _____ MEASURING DEVICE: Sample Pro

PH: 7.66 7.67 TIME: 1430 TYPE: Hydac

PH: 7.62 7.63

CONDUCTIVITY, umhos/cm TIME: 1430 TYPE: Hydac

1048 1049 TEMPERATURE: 59.8°

1048 1049 TURBIDITY: Very Black

CHEST# C20 C/SEAL# 10694C20 BUS BILL# 120698175 4

CHEST# C20 C/SEAL# 10694C20 BUS BILL# 120698175 4

NOTES CONCERNING CONDITION OF WELL, ODOR, COLOR, AND PROBLEMS

Purge - Slight Odor - Solid black water from well. - Well locked

Sample Day - Cool - All Samples Were very black and thick. Bad Odor

No Gasoline on Paste.

SAMPLE COLLECTOR: J. Hand & D. Garnett

Signed Laboratory Reports

for

Groundwater Sampling

from

Wells

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NDRC Laboratories

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226377

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-1
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-1 4-0001
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-141

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/L	< 10.0 µg/L
Bromomethane	10.0 µg/L	< 10.0 µg/L
Vinyl chloride	10.0 µg/L	< 10.0 µg/L
Chloroethane	10.0 µg/L	< 10.0 µg/L
Methylene chloride	5.0 µg/L	7.3 µg/L
Acetone	100 µg/L	< 100 µg/L
Carbon disulfide	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethene	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethene	5.0 µg/L	< 5.0 µg/L
Chloroform	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethane	5.0 µg/L	< 5.0 µg/L
2-Butanone	50.0 µg/L	< 50.0 µg/L
1,1,1-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Carbon tetrachloride	5.0 µg/L	< 5.0 µg/L
Vinyl acetate	50.0 µg/L	< 50.0 µg/L

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Fax. 214-258-5592

226378

REPORT NUMBER : D94-29-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	88.4 %
Toluene-d8 (SS)	50.0 µg/L	100 %
Bromofluorobenzene (SS)	50.0 µg/L	100 %

Martin Jeffus
General Manager

Inchcape Testing Services
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226379

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-1
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-1 4-0001
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	10 µg/L

Martin Jeffus
Martin Jeffus
General Manager

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226380

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-1
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-1 4-0001
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-141

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	88.4 %
4-Bromofluorobenzene (SS)	50.0 µg/L	100 %
Toluene-d8 (SS)	50.0 µg/L	100 %

Martin Jeffus dm

Martin Jeffus
General Manager

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Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

220231

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-9 4-0002
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	16.0 µg/L
Toluene	1.0 µg/L	3.8 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	3.4 µg/L
BTEX (total)		23.2 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	98.1 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus dm

Martin Jeffus
General Manager

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Tel. 214-258-5591
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226382

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-9 4-0002
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	98.1 %

Martin Jeffus dm

Martin Jeffus
General Manager

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

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DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-9 4-0002
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-72

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	1.8 mg/L

Martin Jeffus dm
Martin Jeffus
General Manager

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Tel. 214-258-5591
Fax. 214-258-5592

226384

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-9 4-0002
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.004 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 5-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6856

Martin Jeffus
General Manager

Inchcape Testing Services
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DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-9 4-0002
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	898 mg/L
Analyzed using EPA 160.1 on 5-JAN-1994 by JWC QC Batch No : 59461A			

Martin Jeffus dm

Martin Jeffus
General Manager

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Fax. 214-238-5592

226386

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 100
QC BATCH NO : VOA1-141

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	1000	µg/L	<	1000	µg/L
Bromomethane	1000	µg/L	<	1000	µg/L
Vinyl chloride	1000	µg/L	<	1000	µg/L
Chloroethane	1000	µg/L	<	1000	µg/L
Methylene chloride	500	µg/L	<	500	µg/L
Acetone	10000	µg/L	<	10000	µg/L
Carbon disulfide	500	µg/L	<	500	µg/L
1,1-Dichloroethene	500	µg/L	<	500	µg/L
1,1-Dichloroethane	500	µg/L	<	500	µg/L
1,2-Dichloroethene	500	µg/L	<	500	µg/L
Chloroform	500	µg/L	<	500	µg/L
1,2-Dichloroethane	500	µg/L	<	500	µg/L
2-Butanone	5000	µg/L	<	5000	µg/L
1,1,1-Trichloroethane	500	µg/L	<	500	µg/L
Carbon tetrachloride	500	µg/L	<	500	µg/L
Vinyl acetate	5000	µg/L	<	5000	µg/L

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226387

REPORT NUMBER : D94-29-3
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	500	µg/L	<	500	µg/L
1,2-Dichloropropane	500	µg/L	<	500	µg/L
cis-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Trichloroethene	500	µg/L	<	500	µg/L
Chlorodibromomethane	500	µg/L	<	500	µg/L
1,1,2-Trichloroethane	500	µg/L	<	500	µg/L
Benzene	500	µg/L		5260	µg/L
trans-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Bromoform	500	µg/L	<	500	µg/L
2-Chloroethylvinyl ether	1000	µg/L	<	1000	µg/L
4-Methyl-2-pentanone	5000	µg/L	<	5000	µg/L
2-Hexanone	5000	µg/L	<	5000	µg/L
Tetrachloroethene	500	µg/L	<	500	µg/L
Toluene	500	µg/L	>	20000	µg/L
1,1,2,2-Tetrachloroethane	500	µg/L	<	500	µg/L
Chlorobenzene	500	µg/L	<	500	µg/L
Ethylbenzene	500	µg/L		4850	µg/L
Styrene	500	µg/L	<	500	µg/L
Xylenes	500	µg/L		13900	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	85.6	%
Toluene-d8 (SS)	50.0	µg/L	100	%
Bromofluorobenzene (SS)	50.0	µg/L	101	%

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

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Richardson, TX 75081
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Fax. 214-238-5592

226388

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /2
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 200
QC BATCH NO : VOA1-141

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Toluene	1000 µg/L	21600 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	91.3 %
Toluene-d8 (SS)	50.0 µg/L	97.6 %
Bromofluorobenzene (SS)	50.0 µg/L	101 %

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226383

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 100
QC BATCH NO : VOA1-141

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	500 µg/L	6090 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	85.6 %
4-Bromofluorobenzene (SS)	50.0 µg/L	100 %
Toluene-d8 (SS)	50.0 µg/L	101 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226390

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Ethyl-methylbenzene	13.30	VOA	4000	µg/L
Trimethylbenzene	13.81	VOA	3200	µg/L
Indan	14.51	VOA	1800	µg/L

Martin Jeffus

Martin Jeffus
General Manager

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Richardson, TX 75081
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226391

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 5-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	300 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	704 µg/L

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Richardson, TX 75081
Tel. 214-238-5591
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226392

REPORT NUMBER : D94-29-3
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 µg/L	90.3 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226393

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-72

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	9.8 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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Fax. 214-238-5592

226394

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	0.019 mg/L
Dilution Factor : 1 Prepared using EPA 3015 on 5-JAN-1994 by CEL Analyzed using EPA 7421 on 6-JAN-1994 by AH QC Batch No : 6856			

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226395

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-10 4-0003
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	847 mg/L
Analyzed using EPA 160.1 on 5-JAN-1994 by JWC QC Batch No : 59461A			

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226396

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 100
QC BATCH NO : VOA1-141

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	1000 µg/L	< 1000 µg/L
Bromomethane	1000 µg/L	< 1000 µg/L
Vinyl chloride	1000 µg/L	< 1000 µg/L
Chloroethane	1000 µg/L	< 1000 µg/L
Methylene chloride	500 µg/L	< 500 µg/L
Acetone	10000 µg/L	< 10000 µg/L
Carbon disulfide	500 µg/L	< 500 µg/L
1,1-Dichloroethene	500 µg/L	< 500 µg/L
1,1-Dichloroethane	500 µg/L	< 500 µg/L
1,2-Dichloroethene	500 µg/L	< 500 µg/L
Chloroform	500 µg/L	< 500 µg/L
1,2-Dichloroethane	500 µg/L	< 500 µg/L
2-Butanone	5000 µg/L	< 5000 µg/L
1,1,1-Trichloroethane	500 µg/L	< 500 µg/L
Carbon tetrachloride	500 µg/L	< 500 µg/L
Vinyl acetate	5000 µg/L	< 5000 µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226397

REPORT NUMBER : D94-29-6
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	500	µg/L	<	500	µg/L
1,2-Dichloropropane	500	µg/L	<	500	µg/L
cis-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Trichloroethene	500	µg/L	<	500	µg/L
Chlorodibromomethane	500	µg/L	<	500	µg/L
1,1,2-Trichloroethane	500	µg/L	<	500	µg/L
Benzene	500	µg/L		5480	µg/L
trans-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Bromoform	500	µg/L	<	500	µg/L
2-Chloroethylvinyl ether	1000	µg/L	<	1000	µg/L
4-Methyl-2-pentanone	5000	µg/L	<	5000	µg/L
2-Hexanone	5000	µg/L	<	5000	µg/L
Tetrachloroethene	500	µg/L	<	500	µg/L
Toluene	500	µg/L	>	20000	µg/L
1,1,2,2-Tetrachloroethane	500	µg/L	<	500	µg/L
Chlorobenzene	500	µg/L	<	500	µg/L
Ethylbenzene	500	µg/L		4790	µg/L
Styrene	500	µg/L	<	500	µg/L
Xylenes	500	µg/L		14000	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	84.2	%
Toluene-d8 (SS)	50.0	µg/L	96.8	%
Bromofluorobenzene (SS)	50.0	µg/L	99.3	%

Martin Jeffs
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax 214-238-5592

226398

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /2
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 200
QC BATCH NO : VOA1-141

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Toluene	1000 µg/L	21800 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	84.2 %
Toluene-d8 (SS)	50.0 µg/L	101 %
Bromofluorobenzene (SS)	50.0 µg/L	93.2 %

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226399

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 100
QC BATCH NO : VOA1-141

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	500 µg/L	6790 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	84.2 %
4-Bromofluorobenzene (SS)	50.0 µg/L	96.8 %
Toluene-d8 (SS)	50.0 µg/L	99.3 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226100

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 5-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Ethyl-methylbenzene	13.30	VOA	4000	µg/L
Trimethylbenzene	13.81	VOA	3300	µg/L
Indan	14.51	VOA	1900	µg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226401

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 5-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	18	µg/L	<	18	µg/L
Acenaphthylene	10	µg/L		66	µg/L
Anthracene	6.6	µg/L	<	6.6	µg/L
Benzo(a)anthracene	0.13	µg/L	<	0.13	µg/L
Benzo(b)fluoranthene	0.18	µg/L	<	0.18	µg/L
Benzo(k)fluoranthene	0.17	µg/L	<	0.17	µg/L
Benzo(g,h,i)perylene	0.76	µg/L	<	0.76	µg/L
Benzo(a)pyrene	0.23	µg/L	<	0.23	µg/L
Chrysene	1.5	µg/L	<	1.5	µg/L
Dibenzo(a,h)anthracene	0.30	µg/L	<	0.30	µg/L
Fluoranthene	2.1	µg/L	<	2.1	µg/L
Fluorene	2.1	µg/L	<	2.1	µg/L
Indeno(1,2,3-cd)pyrene	0.43	ug/L	<	0.43	ug/L
Naphthalene	10	µg/L		144	µg/L

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226492

REPORT NUMBER : D94-29-6
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 µg/L	95.7 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226493

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-72

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	9.4 mg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226404

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.028 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 5-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6856

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226405

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-6
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-A 4-0006
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	843 mg/L
Analyzed using EPA 160.1 on 5-JAN-1994 by JWC QC Batch No : 59461A			

Martin Jeffus

Martin Jeffus
General Manager

ENVIRONMENTAL TESTING & CONSULTING, INC.
Memphis, TN
INORGANIC ANALYSIS DATA SHEET

226406

Project Name :Carswell AFB

Field Sample Number :QA-A
SWD Sample Number :4-0007

Matrix :AQUEOUS

Date Sample Collected :01/03/94
Date Sample Received :01/05/94

Contract Laboratory Sample Number :9401-080-01

Analyte	Result	Units	DL	Date Analyzed	Method	Analyst
Total Dissolved Solids	1035	mg/L	2	01/06/94	160.1	TG

DL - Detection Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING & CONSULTING, INC.
Memphis, TN
INORGANIC ANALYSIS DATA SHEET

226407

ı ject Name :Carswell AFB

Field Sample Number :QA-A
SWD Sample Number :4-0007

Matrix :AQUEOUS

Date Sample Collected :01/03/94
Date Sample Received :01/05/94

Contract Laboratory Sample Number :9401-080-01

Analyte	Result Units :(mg/L)	DL	Date Analyzed	Method	Analyst	Dilutio Factor
Lead	0.037	0.001	01/18/94	7421	MK	5

DL - Detection Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226498

ect Name : _Carswell AFB - Base Service Station

Field Sample Number : _QA-A
SWD Sample Number : _4-0007___

Matrix : _Aqueous__

Date Sample Collected : _01/03/94
Date Sample Received : _01/05/91

Date Sample Prepared : _01/05/94
Date Sample Analyzed : _01/06/94
Preparation Method : _9070____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _10_____

Contract Laboratory Sample Number : _9401-080-1
File Name : _9401-080.B

Analyte	Results Units:(mg/L)	PQL Units:(mg/L)
TPH	20.7	1.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226403

ct Name : _Carswell AFB - Base Service Station

Field Sample Number : _QA-A_____
SWD Sample Number : _4-0007___

Matrix : _Aqueous__

Date Sample Collected : _01/03/94
Date Sample Received : _01/05/94

Date Sample Prepared : _01/13/94
Date Sample Analyzed : _01/13/94
Preparation Method : _8240-Low
Analytical Method : _8240____
Analyst : _CB/LS___
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9401-080-1
File name : _9401-080.A

COMPOUND	RESULTS UNITS:(ug/L)	PQL
Acetone	<100	100
Acrolein	<50	50
Acrylonitrile	<50	50
Benzene	4,480	5
Bromodichloromethane	<5	5
Bromoform	<5	5
Bromomethane	<5	5
Carbon Disulfide	<50	50
Carbon Tetrachloride	<5	5
Chlorobenzene	<5	5
Chlorodibromomethane	<5	5
roethane	<5	5
oroethyl vinyl ether	<50	50
Chloroform	<5	5
Chloromethane	<5	5
Dibromomethane	<5	5
1,4-Dichloro-2-butene	<5	5
Dichlorodifluoromethane	<5	5
1,1-Dichloroethane	<5	5
1,2-Dichlorobenzene	<5	5
1,3-Dichlorobenzene	<5	5
1,4-Dichlorobenzene	<5	5
Methyl tert-butyl ether	6,540	10

COMPOUND	RESULTS UNITS:(ug/L)	PQL
1,2-Dichloroethane	<5	5
1,1-Dichloroethene	<5	5
trans-1,2-Dichloroethene	<5	5
1,2-Dichloropropane	<5	5
cis-1,3-Dichloropropene	<5	5
trans-1,3-Dichloropropene	<5	5
Ethylbenzene	4,100	5
Ethyl Methacrylate	<50	50
2-Hexanone(MBK)	<50	50
Iodomethane	<5	5
4-Methyl-2-pentanone (MIBK)	<50	50
Methylene Chloride	<20	20
2-Butanone(MEK)	<50	50
Styrene	<5	5
1,1,2,2-Tetrachloroethane	<5	5
Tetrachloroethene	<5	5
Toluene	21,400	5
1,1,1-Trichloroethane	<5	5
1,1,2-Trichloroethane	<5	5
Trichloroethene	<5	5
Trichlorofluoromethane	<5	5
1,2,3-Trichloropropane	<5	5
Vinyl Acetate	<50	50
Vinyl Chloride	<5	5
Xylenes (total)	13,100	5

Units: ug/L

SURROGATE STANDARDS	RESULT	EXP	%REC	QC LIMITS % RECOVERY
1,2-Dichloroethane-d4	52.5	50.0	105	76-114
Toluene-d8	50.0	50.0	100	88-110
4-Bromofluorobenzene	51.9	50.0	104	86-115

PQL - Practical Quantitation Limit

LABORATORY MANAGER

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.
4-0007
226410

Lab Name: ENVIRONMENTAL TESTING & CONSULTING Contract: _____

Lot No.: _____ Site: CARSWELL Location: QA - A Group: _____

Matrix: (soil/water) H2O Lab Sample ID: 9401-080-1

Sample wt/vol: _____ (g/mL) 10mL Lab File ID: V2011301

Level: (low/med) LOW Date Received: 1/5/94

% Moisture: not dec. _____ Date Analyzed: 1/13/94

GC Column: RESTEK 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 10 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 78-78-4	2-Methylbutane	2.78	194	91
2. 109-66-0	Pentane	3.13	148	80
3. 646-04-8	cis-2-Pentene	3.37	80.8	91
4. 107-83-5	2-Methylpentane	4.53	108	64
5. 625-27-4	2-Methyl-2-pentene	7.01	60.8	80
6. 1120-62-3	3-Methylcyclopentene	9.24	50	90
7. 110-82-7	Cyclohexane	9.71	54.4	56
8. 620-14-4	1-Ethyl-3-methylbenzene	19.91	35.1	95
9. 526-73-8	1,2,3-Trimethylbenzene	20.67	27.9	94
10. 611-15-4	1-Ethenyl-2-methylbenzene	21.96	12.3	76
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
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20.				
21.				
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23.				
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26.				
27.				
28.				
29.				
30.				

PAH Analysis Data Sheet

Lab Sample ID: 4-0007 1:100
Lab Code: 4-0007 1:100 Case: COE

Matrix: WATER
Reporting Units: uG/L

Client: Army Corps of Engineer
SDG: 4-0007
Date Received: 01-05-94
Date Analyzed: 01-19-94
Date Extracted: 01-10-94

Sample Size: 1 L
Final Extract Volume: 1.0 mL

Dilution Factor: 100

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	890 J	1800.00	180.000
208-96-8	Acenaphthylene	U	2300.00	230.000
83-32-9	Acenaphthene	U	1800.00	180.000
86-73-7	Fluorene	U	210.00	21.000
85-01-8	Phenanthrene	U	640.00	64.000
120-12-7	Anthracene	U	660.00	66.000
206-44-0	Fluoranthene	U	210.00	21.000
129-00-0	Pyrene	U	270.00	27.000
56-55-3	Benzo(a)anthracene	U	13.00	1.300
218-01-9	Chyrsene	U	150.00	1.500
205-99-2	Benzo(b)fluoranthene	U	18.00	1.800
207-08-9	Benzo(k)fluoranthene	U	17.00	1.700
50-32-8	Benzo(a)pyrene	U	23.00	2.300
53-70-3	Dibenzo(ah)anthracene	U	30.00	3.000
191-24-2	Benzo(ghi)perylene	U	76.00	7.600
193-39-5	Indeno(123-cd)pyrene	U	43.00	4.300

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
J - Estimated Value, above MDL but below PQL

Surrogate recovery report for sample: 4-0007 1:100

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Limits Max.
p-Terphenyl	84	94	70%	135%

10005
226412

PAH Analysis Data Sheet

Lab Sample ID: 4-0007
Lab Code: 4-0007 Case: COE

Matrix: WATER
Reporting Units: uG/L

Client: Army Corps of Engineer
SDG: 4-0007
Date Received: 01-05-94
Date Analyzed: 01-18-94
Date Extracted: 01-10-94

Sample Size: 1 L
Final Extract Volume: 1.0 mL

Dilution Factor: 1

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	*	18.00	1.800
208-96-8	Acenaphthylene	U	23.00	2.300
83-32-9	Acenaphthene	U	18.00	1.800
86-73-7	Fluorene	U	2.10	0.210
85-01-8	Phenanthrene	U	6.40	0.640
120-12-7	Anthracene	U	6.60	0.660
206-44-0	Fluoranthene	U	2.10	0.210
129-00-0	Pyrene	U	2.70	0.270
56-55-3	Benzo(a)anthracene	U	0.13	0.013
218-01-9	Chyrsene	U	1.50	0.150
205-99-2	Benzo(b)fluoranthene	U	0.18	0.018
207-08-9	Benzo(k)fluoranthene	U	0.17	0.017
50-32-8	Benzo(a)pyrene	U	0.23	0.023
53-70-3	Dibenzo(ah)anthracene	U	0.30	0.030
191-24-2	Benzo(ghi)perylene	U	0.76	0.076
193-39-5	Indeno(123-cd)pyrene	U	0.43	0.043

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
* - See 1:100 Dilution

Surrogate recovery report for sample: 4-0007

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Max.
p-Terphenyl	118	121	70%	135%

Form 1

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226413

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-11 4-0004
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	1.0 µg/L	< 1.0 µg/L	
Toluene	1.0 µg/L	< 1.0 µg/L	
Ethyl benzene	1.0 µg/L	< 1.0 µg/L	
Xylenes	1.0 µg/L	< 1.0 µg/L	
BTEX (total)		< 1.0 µg/L	#

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	106 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
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226414

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-11 4-0004
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	106 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
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Richardson, TX 75081
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Fax. 214-238-5592

226415

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-11 4-0004
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-72

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffries
General Manager

Inchcape Testing Services
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226416

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-11 4-0004
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.004 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 5-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6856

Martin Jeffs
Martin Jeffs
General Manager

Inchcape Testing Services
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226417

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-11 4-0004
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	671 mg/L
Analyzed using EPA 160.1 on 5-JAN-1994 by JWC QC Batch No : 59461A			

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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225413

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-5
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-12 4-0005
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	104 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus

Martin Jeffus
General Manager

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226419

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-5
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-12 4-0005
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-010594

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	104 %

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
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226420

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-5
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-12 4-0005
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 5-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-72

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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226421

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-5
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-12 4-0005
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 5-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6856

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226422

DATE RECEIVED : 4-JAN-1994

REPORT NUMBER : D94-29-5
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-12 4-0005
: Base Service Station
PROJECT : Carswell AFB (4-0001-0006)
DATE SAMPLED : 3-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	789 mg/L
Analyzed using EPA 160.1 on 5-JAN-1994 by JWC QC Batch No : 59461A			

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
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226423

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-1
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-2 4-0009
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-141

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/L	<	10.0	µg/L
Bromomethane	10.0	µg/L	<	10.0	µg/L
Vinyl chloride	10.0	µg/L	<	10.0	µg/L
Chloroethane	10.0	µg/L	<	10.0	µg/L
Methylene chloride	5.0	µg/L		7.3	µg/L
Acetone	100	µg/L	<	100	µg/L
Carbon disulfide	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	<	5.0	µg/L
Chloroform	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	<	5.0	µg/L
2-Butanone	50.0	µg/L	<	50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Carbon tetrachloride	5.0	µg/L	<	5.0	µg/L
Vinyl acetate	50.0	µg/L	<	50.0	µg/L

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226424

REPORT NUMBER : D94-66-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	94.0 %
Toluene-d8 (SS)	50.0 µg/L	98.7 %
Bromofluorobenzene (SS)	50.0 µg/L	99.0 %

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
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226425

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-1
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-2 4-0009
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	10 µg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
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226426

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 25
QC BATCH NO : VOA1-141

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	250	µg/L	<	250	µg/L
Bromomethane	250	µg/L	<	250	µg/L
Vinyl chloride	250	µg/L	<	250	µg/L
Chloroethane	250	µg/L	<	250	µg/L
Methylene chloride	125	µg/L	<	125	µg/L
Acetone	2500	µg/L	<	2500	µg/L
Carbon disulfide	125	µg/L	<	125	µg/L
1,1-Dichloroethene	125	µg/L	<	125	µg/L
1,1-Dichloroethane	125	µg/L	<	125	µg/L
1,2-Dichloroethene	125	µg/L	<	125	µg/L
Chloroform	125	µg/L	<	125	µg/L
1,2-Dichloroethane	125	µg/L	<	125	µg/L
2-Butanone	1250	µg/L	<	1250	µg/L
1,1,1-Trichloroethane	125	µg/L	<	125	µg/L
Carbon tetrachloride	125	µg/L	<	125	µg/L
Vinyl acetate	1250	µg/L	<	1250	µg/L

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226427

REPORT NUMBER : D94-66-2
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	125	µg/L	<	125	µg/L
1,2-Dichloropropane	125	µg/L	<	125	µg/L
cis-1,3-Dichloropropene	125	µg/L	<	125	µg/L
Trichloroethene	125	µg/L	<	125	µg/L
Chlorodibromomethane	125	µg/L	<	125	µg/L
1,1,2-Trichloroethane	125	µg/L	<	125	µg/L
Benzene	125	µg/L		1010	µg/L
trans-1,3-Dichloropropene	125	µg/L	<	125	µg/L
Bromoform	125	µg/L	<	125	µg/L
2-Chloroethylvinyl ether	250	µg/L	<	250	µg/L
4-Methyl-2-pentanone	1250	µg/L	<	1250	µg/L
2-Hexanone	1250	µg/L	<	1250	µg/L
Tetrachloroethene	125	µg/L	<	125	µg/L
Toluene	125	µg/L		2650	µg/L
1,1,2,2-Tetrachloroethane	125	µg/L	<	125	µg/L
Chlorobenzene	125	µg/L	<	125	µg/L
Ethylbenzene	125	µg/L		4610	µg/L
Styrene	125	µg/L	<	125	µg/L
Xylenes	125	µg/L		9610	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	92.0	%
Toluene-d8 (SS)	50.0	µg/L	102	%
Bromofluorobenzene (SS)	50.0	µg/L	103	%

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226428

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methylbutane	2.22	VOA	2000	µg/L
Pentane	2.51	VOA	1300	µg/L
Unknown alkane	3.77	VOA	1900	µg/L
Methylcyclopentane	5.76	VOA	1200	µg/L
Propylbenzene	13.19	VOA	630	µg/L
Ethyl-methylbenzene	13.31	VOA	3100	µg/L
Methylethylbenzene	13.62	VOA	800	µg/L
Trimethylbenzene	13.82	VOA	3100	µg/L
Trimethylbenzene	14.29	VOA	800	µg/L
Naphthalene	16.70	VOA	700	µg/L
Indan	14.52	VOA	1700	µg/L

Martin Jeffus
Martin Jeffus
General Manager

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226429

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 6-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	18	µg/L	<	18	µg/L
Acenaphthylene	10	µg/L		355	µg/L
Anthracene	6.6	µg/L	<	6.6	µg/L
Benzo(a)anthracene	0.13	µg/L	<	0.13	µg/L
Benzo(b)fluoranthene	0.18	µg/L	<	0.18	µg/L
Benzo(k)fluoranthene	0.17	µg/L	<	0.17	µg/L
Benzo(g,h,i)perylene	0.76	µg/L	<	0.76	µg/L
Benzo(a)pyrene	0.23	µg/L	<	0.23	µg/L
Chrysene	1.5	µg/L	<	1.5	µg/L
Dibenzo(a,h)anthracene	0.30	µg/L	<	0.30	µg/L
Fluoranthene	2.1	µg/L	<	2.1	µg/L
Fluorene	2.1	µg/L	<	2.1	µg/L
Indeno(1,2,3-cd)pyrene	0.43	ug/L	<	0.43	ug/L
Naphthalene	10	µg/L		700	µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226430

REPORT NUMBER : D94-66-2
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 µg/L	109 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226431

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 25
QC BATCH NO : VOA1-141

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	125 µg/L	270 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	92.0 %
4-Bromofluorobenzene (SS)	50.0 µg/L	102 %
Toluene-d8 (SS)	50.0 µg/L	103 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226432

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	8.0 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226433

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-2
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-1 4-0010
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.016 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 6-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6866

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226434

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 25
QC BATCH NO : VOA1-141

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	250	µg/L	<	250	µg/L
Bromomethane	250	µg/L	<	250	µg/L
Vinyl chloride	250	µg/L	<	250	µg/L
Chloroethane	250	µg/L	<	250	µg/L
Methylene chloride	125	µg/L	<	125	µg/L
Acetone	2500	µg/L	<	2500	µg/L
Carbon disulfide	125	µg/L	<	125	µg/L
1,1-Dichloroethene	125	µg/L	<	125	µg/L
1,1-Dichloroethane	125	µg/L	<	125	µg/L
1,2-Dichloroethene	125	µg/L	<	125	µg/L
Chloroform	125	µg/L	<	125	µg/L
1,2-Dichloroethane	125	µg/L	<	125	µg/L
2-Butanone	1250	µg/L	<	1250	µg/L
1,1,1-Trichloroethane	125	µg/L	<	125	µg/L
Carbon tetrachloride	125	µg/L	<	125	µg/L
Vinyl acetate	1250	µg/L	<	1250	µg/L

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Fax. 214-258-5592

226435

REPORT NUMBER : D94-66-4
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	125	µg/L	<	125	µg/L
1,2-Dichloropropane	125	µg/L	<	125	µg/L
cis-1,3-Dichloropropene	125	µg/L	<	125	µg/L
Trichloroethene	125	µg/L	<	125	µg/L
Chlorodibromomethane	125	µg/L	<	125	µg/L
1,1,2-Trichloroethane	125	µg/L	<	125	µg/L
Benzene	125	µg/L		1020	µg/L
trans-1,3-Dichloropropene	125	µg/L	<	125	µg/L
Bromoform	125	µg/L	<	125	µg/L
2-Chloroethylvinyl ether	250	µg/L	<	250	µg/L
4-Methyl-2-pentanone	1250	µg/L	<	1250	µg/L
2-Hexanone	1250	µg/L	<	1250	µg/L
Tetrachloroethene	125	µg/L	<	125	µg/L
Toluene	125	µg/L		2500	µg/L
1,1,2,2-Tetrachloroethane	125	µg/L	<	125	µg/L
Chlorobenzene	125	µg/L	<	125	µg/L
Ethylbenzene	125	µg/L		4450	µg/L
Styrene	125	µg/L	<	125	µg/L
Xylenes	125	µg/L		9210	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	91.3	%
Toluene-d8 (SS)	50.0	µg/L	98.8	%
Bromofluorobenzene (SS)	50.0	µg/L	100	%

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226436

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-141

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methylbutane	2.22	VOA	2100	µg/L
Propylbenzene	13.19	VOA	610	µg/L
Ethyl-methylbenzene	13.31	VOA	3000	µg/L
Methylethylbenzene	13.62	VOA	770	µg/L
Trimethylbenzene	13.82	VOA	3000	µg/L
Trimethylbenzene	14.29	VOA	790	µg/L
Indan	14.52	VOA	1700	µg/L
Naphthalene	16.70	VOA	690	µg/L
Pentane	2.51	VOA	1400	µg/L
Unknown alkane	3.78	VOA	2000	µg/L
Methylcyclopentane	5.76	VOA	1100	µg/L

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226437

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 6-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	360 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	713 µg/L

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Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226438

REPORT NUMBER : D94-66-4
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Phenanthrene	6.4	µg/L	< 6.4	µg/L
Pyrene	2.7	µg/L	< 2.7	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1-Fluoronapthalene (SS)	100	µg/L	105	%

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226439

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 25
QC BATCH NO : VOA1-141

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	125 µg/L	277 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	91.3 %
4-Bromofluorobenzene (SS)	50.0 µg/L	98.8 %
Toluene-d8 (SS)	50.0 µg/L	100 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226440

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	9.0 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226441

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-4
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : QC-B 4-0012
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	0.016 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 6-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6866

Martin Jeffus dm

Martin Jeffus
General Manager

ENVIRONMENTAL TESTING & CONSULTING, INC.
Memphis, TN
INORGANIC ANALYSIS DATA SHEET

226442

ect Name :Carswell AFB-Base Service

Field Sample Number :QA-B
WD Sample Number :4-0013

Matrix :AQUEOUS

Date Sample Collected :01/04/94
ate Sample Received :01/06/94

Contract Laboratory Sample Number :9401-105-01

alyte	Result Units :(mg/L)	DL	Date Analyzed	Method	Analyst	Dilution Factor
Lead	0.015	0.001	01/18/94	7421	MK	1

L - Detection Limit

ABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226443

ct Name : _Carswell AFB - Base Service Station

Field Sample Number : _QA-B
SWD Sample Number : _4-0013___

Matrix : _Aqueous__

te Sample Collected : _01/04/94
Date Sample Received : _01/06/94

ntract Laboratory Sample Number : _9401-105-1
rile Name : _9401-105.B

Date Sample Prepared : _01/11/94
Date Sample Analyzed : _01/12/94
Preparation Method : _9070____
Analytical Method : _418.1___
Analyst : _AJ_____
Dilution Factor : _10_____

Analyte	Results Units:(mg/L)	PQL Units:(mg/L)
TPH	17.1	1.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226444

t Name : _Carswell AFB - Base Service Station

ield Sample Number : _QA-B____
WD Sample Number : _4-0013___

te Sample Collected : _01/04/94
ate Sample Received : _01/06/94

Matrix : _Aqueous__

Date Sample Prepared : _01/13/94
Date Sample Analyzed : _01/13/94
Preparation Method : _8240-Low
Analytical Method : _8240____
Analyst : _CB/LS___
Dilution Factor : _50_____

ntract Laboratory Sample Number : _9401-105.A
.le name : _9401-105-1

COMPOUND	RESULTS UNITS:(ug/L)	PQL
etone	<5000	5000
crolein	<2500	2500
rylonitrile	<2500	2500
nzene	1,320	250
omodichloromethane	<250	250
romoform	<250	250
omomethane	<250	250
rbon Disulfide	<2500	2500
arbon Tetrachloride	<250	250
hlorobenzene	<250	250
lorodibromomethane	<250	250
ethane	<250	250
roethyl vinyl ether	<2500	2500
loroform	<250	250
loromethane	<250	250
romomethane	<250	250
1,4-Dichloro-2-butene	<250	250
chlorodifluoromethane	<250	250
1-Dichloroethane	<250	250
2-Dichlorobenzene	<250	250
3-Dichlorobenzene	<250	250
1,4-Dichlorobenzene	<250	250
thyl tert-butyl ether	<500	500

COMPOUND	RESULTS UNITS:(ug/L)	PQL
1,2-Dichloroethane	<250	250
1,1-Dichloroethene	<250	250
trans-1,2-Dichloroethene	<250	250
1,2-Dichloropropane	<250	250
cis-1,3-Dichloropropene	<250	250
trans-1,3-Dichloropropene	<250	250
Ethylbenzene	5,500	250
Ethyl Methacrylate	<2500	2500
2-Hexanone(MBK)	<2500	2500
Iodomethane	<250	250
4-Methyl-2-pentanone (MIBK)	<2500	2500
Methylene Chloride	<1000	1000
2-Butanone(MEK)	<2500	2500
Styrene	<250	250
1,1,2,2-Tetrachloroethane	<250	250
Tetrachloroethene	<250	250
Toluene	3,010	250
1,1,1-Trichloroethane	<250	250
1,1,2-Trichloroethane	<250	250
Trichloroethene	<250	250
Trichlorofluoromethane	<250	250
1,2,3-Trichloropropane	<250	250
Vinyl Acetate	<2500	2500
Vinyl Chloride	<250	250
Xylenes (total)	11,700	250

Units: ug/L

SURROGATE STANDARDS	RESULT	EXP	%REC	QC LIMITS % RECOVERY
1,2-Dichloroethane-d4	53.0	50.0	106	76-114
Toluene-d8	49.7	50.0	99	88-110
4-Bromofluorobenzene	52.8	50.0	106	86-115

PQL - Practical Quantitation Limit

LABORATORY MANAGER

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.
4-0013

Lab Name: ENVIRONMENTAL TESTING & CONSULTING Contract: 226445

P. No.: Site: CARSWELL Location: QA - B Group:

Matrix: (soil/water) H2O Lab Sample ID: 9401-105-1

Sample wt/vol: (g/mL) 10mL Lab File ID: V2011301

Level: (low/med) LOW Date Received: 1/6/94

% Moisture: not dec. Date Analyzed: 1/13/94

GC Column: RESTEK 502.2 ID: 0.53 (mm) Dilution Factor: 50.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 10 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 78-78-4	2-Methylbutane	2.74	1340	64
2. 109-66-0	Pentane	3.07	990	64
3. 98-82-8	(1-Methylethyl)-benzene	19.03	340	91
4. 103-65-1	Propylbenzene	19.71	735	86
5. 622-96-8	1-Ethyl-4-methylbenzene	19.89	3840	95
6. 611-14-3	1-Ethyl-2-methylbenzene	20.40	979	94
7. 95-63-6	1,2,4-Ttrimethylbenzene	20.63	3810	93
8. 496-11-7	2,3,-Dihydro-1H-indene	21.95	1590	87
9. 934-80-5	4-Ethyl-1,2dimethylbenzene	22.51	210	94
10. 91-20-3	Naphthalene	25.29	385	91
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

PAH Analysis Data Sheet

Lab Sample ID: 4-0013
Lab Code: 4-0013 Case: COE

Matrix: WATER
Reporting Units: uG/L

Client: Army Corps of Engineer
SDG: 4-0013
Date Received: 01-06-94
Date Analyzed: 01-18-94
Date Extracted: 01-10-94

Sample Size: 1 L
Final Extract Volume: 1.0 mL

Dilution Factor: 1

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	*	18.00	1.800
208-96-8	Acenaphthylene	U	23.00	2.300
83-32-9	Acenaphthene	U	18.00	1.800
86-73-7	Fluorene	U	2.10	0.210
85-01-8	Phenanthrene	U	6.40	0.640
120-12-7	Anthracene	U	6.60	0.660
206-44-0	Fluoranthene	U	2.10	0.210
129-00-0	Pyrene	U	2.70	0.270
56-55-3	Benzo(a)anthracene	U	0.13	0.013
218-01-9	Chyrsene	U	1.50	0.150
205-99-2	Benzo(b)fluoranthene	U	0.18	0.018
207-08-9	Benzo(k)fluoranthene	U	0.17	0.017
50-32-8	Benzo(a)pyrene	U	0.23	0.023
53-70-3	Dibenzo(ah)anthracene	U	0.30	0.030
191-24-2	Benzo(ghi)perylene	U	0.76	0.076
193-39-5	Indeno(123-cd)pyrene	U	0.43	0.043

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
* - See 1:100 Dilution

Surrogate recovery report for sample: 4-0013

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Max.
p-Terphenyl	101	109	70%	135%

100010
226447

PAH Analysis Data Sheet

Lab Sample ID: 4-0013 1:100 –
Lab Code: 4-0013 1:100 Case: COE

Matrix: WATER
Reporting Units: uG/L

Client: Corps of Engineer
SDG: 4-0013
Date Received: 01-06-94
Date Analyzed: 01-19-94
Date Extracted: 01-10-94

Sample Size: 1 L
Final Extract Volume: 1.0 mL

Dilution Factor: 100

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	710 J	1800.00	180.000
208-96-8	Acenaphthylene	U	2300.00	230.000
83-32-9	Acenaphthene	U	1800.00	180.000
86-73-7	Fluorene	U	210.00	21.000
85-01-8	Phenanthrene	U	640.00	64.000
120-12-7	Anthracene	U	660.00	66.000
206-44-0	Fluoranthene	U	210.00	21.000
129-00-0	Pyrene	U	270.00	27.000
56-55-3	Benzo(a)anthracene	U	13.00	1.300
218-01-9	Chyrsene	U	150.00	15.000
205-99-2	Benzo(b)fluoranthene	U	18.00	1.800
207-08-9	Benzo(k)fluoranthene	U	17.00	1.700
50-32-8	Benzo(a)pyrene	U	23.00	2.300
53-70-3	Dibenzo(ah)anthracene	U	30.00	3.000
191-24-2	Benzo(ghi)perylene	U	76.00	7.600
193-39-5	Indeno(123-cd)pyrene	U	43.00	4.300

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
J - Estimated Value, above MDL but below PQL

Surrogate recovery report for sample: 4-0013 1:100

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Max.
p-Terphenyl	87	95	70%	135%

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226448

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-2 4-0011
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 30-011094

BTEX ANALYSIS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Benzene	10	µg/L	31	µg/L	
Toluene	10	µg/L	< 10	µg/L	
Ethyl benzene	10	µg/L	700	µg/L	
Xylenes	10	µg/L	1500	µg/L	
BTEX (total)			2230	µg/L	#

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
Bromofluorobenzene	50.0	µg/L	109	%

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus dm

Martin Jeffus
General Manager

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226443

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-2 4-0011
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 30-011094

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	100 µg/L	1400 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	109 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226450

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-2 4-0011
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 6-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	2.5 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226451

DATE RECEIVED : 5-JAN-1994

REPORT NUMBER : D94-66-3
REPORT DATE : 14-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-2 4-0011
: Base Service Station
PROJECT : Carswell AFB (4-0009-0012)
DATE SAMPLED : 4-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.004 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 6-JAN-1994 by CEL
Analyzed using EPA 7421 on 6-JAN-1994 by AH
QC Batch No : 6866

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226452

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-1
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-3 4-0017
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-142

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/L	<	10.0	µg/L
Bromomethane	10.0	µg/L	<	10.0	µg/L
Vinyl chloride	10.0	µg/L	<	10.0	µg/L
Chloroethane	10.0	µg/L	<	10.0	µg/L
Methylene chloride	5.0	µg/L		7.6	µg/L
Acetone	100	µg/L	<	100	µg/L
Carbon disulfide	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	<	5.0	µg/L
Chloroform	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	<	5.0	µg/L
2-Butanone	50.0	µg/L	<	50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Carbon tetrachloride	5.0	µg/L	<	5.0	µg/L
Vinyl acetate	50.0	µg/L	<	50.0	µg/L

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226453

REPORT NUMBER : D94-112-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Bromodichloromethane	5.0	µg/L	< 5.0	µg/L
1,2-Dichloropropane	5.0	µg/L	< 5.0	µg/L
cis-1,3-Dichloropropene	5.0	µg/L	< 5.0	µg/L
Trichloroethene	5.0	µg/L	< 5.0	µg/L
Chlorodibromomethane	5.0	µg/L	< 5.0	µg/L
1,1,2-Trichloroethane	5.0	µg/L	< 5.0	µg/L
Benzene	5.0	µg/L	< 5.0	µg/L
trans-1,3-Dichloropropene	5.0	µg/L	< 5.0	µg/L
Bromoform	5.0	µg/L	< 5.0	µg/L
2-Chloroethylvinyl ether	10.0	µg/L	< 10.0	µg/L
4-Methyl-2-pentanone	50.0	µg/L	< 50.0	µg/L
2-Hexanone	50.0	µg/L	< 50.0	µg/L
Tetrachloroethene	5.0	µg/L	< 5.0	µg/L
Toluene	5.0	µg/L	< 5.0	µg/L
1,1,2,2-Tetrachloroethane	5.0	µg/L	< 5.0	µg/L
Chlorobenzene	5.0	µg/L	< 5.0	µg/L
Ethylbenzene	5.0	µg/L	< 5.0	µg/L
Styrene	5.0	µg/L	< 5.0	µg/L
Xylenes	5.0	µg/L	< 5.0	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	92.8	%
Toluene-d8 (SS)	50.0	µg/L	104	%
Bromofluorobenzene (SS)	50.0	µg/L	94.0	%

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226454

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-1
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-3 4-0017
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-142

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	10 µg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax 214-238-5592

226455

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-1 4-0018
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 34-011294

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Benzene	10	µg/L	1200	µg/L
Toluene	10	µg/L	230	µg/L
Ethyl benzene	10	µg/L	290	µg/L
Xylenes	10	µg/L	790	µg/L
BTEX (total)			2510	µg/L #

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
Bromofluorobenzene	50.0	µg/L	88.0	%

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
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226456

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-1 4-0018
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 34-011294

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	100 µg/L	700 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	88.0 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax 214-258-5592

22645?

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-1 4-0018
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	5.2 mg/L

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
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Fax. 214-258-5592

226458

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-1 4-0018
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS

TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	0.005 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 7-JAN-1994 by CEL
Analyzed using EPA 7421 on 7-JAN-1994 by AH
QC Batch No : 6871

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

229153

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 10
QC BATCH NO : VOA1-142

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	100	µg/L	<	100	µg/L
Bromomethane	100	µg/L	<	100	µg/L
Vinyl chloride	100	µg/L	<	100	µg/L
Chloroethane	100	µg/L	<	100	µg/L
Methylene chloride	50	µg/L	<	50	µg/L
Acetone	1000	µg/L	<	1000	µg/L
Carbon disulfide	50	µg/L	<	50	µg/L
1,1-Dichloroethene	50	µg/L	<	50	µg/L
1,1-Dichloroethane	50	µg/L	<	50	µg/L
1,2-Dichloroethene	50	µg/L	<	50	µg/L
Chloroform	50	µg/L	<	50	µg/L
1,2-Dichloroethane	50	µg/L	<	50	µg/L
2-Butanone	500	µg/L	<	500	µg/L
1,1,1-Trichloroethane	50	µg/L	<	50	µg/L
Carbon tetrachloride	50	µg/L	<	50	µg/L
Vinyl acetate	500	µg/L	<	500	µg/L

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1089 E. Collins Blvd.
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226460

REPORT NUMBER : D94-112-3
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	50 µg/L	< 50 µg/L
1,2-Dichloropropane	50 µg/L	< 50 µg/L
cis-1,3-Dichloropropene	50 µg/L	< 50 µg/L
Trichloroethene	50 µg/L	< 50 µg/L
Chlorodibromomethane	50 µg/L	< 50 µg/L
1,1,2-Trichloroethane	50 µg/L	< 50 µg/L
Benzene	50 µg/L	> 2000 µg/L
trans-1,3-Dichloropropene	50 µg/L	< 50 µg/L
Bromoform	50 µg/L	< 50 µg/L
2-Chloroethylvinyl ether	100 µg/L	< 100 µg/L
4-Methyl-2-pentanone	500 µg/L	< 500 µg/L
2-Hexanone	500 µg/L	< 500 µg/L
Tetrachloroethene	50 µg/L	< 50 µg/L
Toluene	50 µg/L	1700 µg/L
1,1,2,2-Tetrachloroethane	50 µg/L	< 50 µg/L
Chlorobenzene	50 µg/L	< 50 µg/L
Ethylbenzene	50 µg/L	1710 µg/L
Styrene	50 µg/L	< 50 µg/L
Xylenes	50 µg/L	3790 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	96.0 %
Toluene-d8 (SS)	50.0 µg/L	105 %
Bromofluorobenzene (SS)	50.0 µg/L	97.2 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226461

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /2
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 50
QC BATCH NO : VOA1-142

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	250 µg/L	4340 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	101 %
Toluene-d8 (SS)	50.0 µg/L	104 %
Bromofluorobenzene (SS)	50.0 µg/L	98.8 %

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

228462

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-142

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methylbutane	2.20	VOA	740	µg/L
Unknown alkane	2.50	VOA	550	µg/L
Unknown alkane	3.74	VOA	1100	µg/L
Methylcyclopentane	5.73	VOA	490	µg/L
Propylbenzene	13.15	VOA	860	µg/L
Ethyl-methylbenzene	13.28	VOA	1600	µg/L
Trimethylbenzene	13.78	VOA	2500	µg/L
Trimethylbenzene	14.25	VOA	400	µg/L
Propenylbenzene	14.48	VOA	1300	µg/L
Ethyl-dimethylbenzene	14.99	VOA	540	µg/L
Methyl-propenylbenzene	15.13	VOA	400	µg/L
Tetramethylbenzene	15.49	VOA	380	µg/L
Dihydro-methyl-1H-indene	15.97	VOA	470	µg/L

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226463

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : FFL
PREPARED ON : 8-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	18	µg/L	<	18	µg/L
Acenaphthylene	10	µg/L		454	µg/L
Anthracene	6.6	µg/L	<	6.6	µg/L
Benzo(a)anthracene	0.13	µg/L	<	0.13	µg/L
Benzo(b)fluoranthene	0.18	µg/L	<	0.18	µg/L
Benzo(k)fluoranthene	0.17	µg/L	<	0.17	µg/L
Benzo(g,h,i)perylene	0.76	µg/L	<	0.76	µg/L
Benzo(a)pyrene	0.23	µg/L	<	0.23	µg/L
Chrysene	1.5	µg/L	<	1.5	µg/L
Dibenzo(a,h)anthracene	0.30	µg/L	<	0.30	µg/L
Fluoranthene	2.1	µg/L	<	2.1	µg/L
Fluorene	2.1	µg/L	<	2.1	µg/L
Indeno(1,2,3-cd)pyrene	0.43	ug/L	<	0.43	ug/L
Naphthalene	10	µg/L		591	µg/L

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226464

REPORT NUMBER : D94-112-3
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Phenanthrene	6.4	µg/L	< 6.4	µg/L
Pyrene	2.7	µg/L	< 2.7	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1-Fluoronapthalene (SS)	100	µg/L	113	%

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226465

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 10
QC BATCH NO : VOA1-142

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	50 µg/L	1830 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	96.0 %
4-Bromofluorobenzene (SS)	50.0 µg/L	105 %
Toluene-d8 (SS)	50.0 µg/L	97.2 %

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226466

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	9.0 mg/L

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226467

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : SAV-2 4-0019
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	0.041 mg/L
Dilution Factor : 1 Prepared using EPA 3015 on 7-JAN-1994 by CEL Analyzed using EPA 7421 on 7-JAN-1994 by AH QC Batch No : 6871			

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226468

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-7 4-0020
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	101 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226469

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-7 4-0020
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	101 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226470

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-7 4-0020
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226471

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-7 4-0020
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 7-JAN-1994 by CEL
Analyzed using EPA 7421 on 7-JAN-1994 by AH
QC Batch No : 6871

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226472

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-7 4-0020
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	855 mg/L
Analyzed using EPA 160.1 on 7-JAN-1994 by JWC QC Batch No : 59462A			

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226473

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-8 4-0021
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	100 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffries
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226474

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-8 4-0021
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	220 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	100 %

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226475

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-8 4-0021
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226476

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-8 4-0021
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	0.009 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 7-JAN-1994 by CEL .
Analyzed using EPA 7421 on 7-JAN-1994 by AH
QC Batch No : 6871

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226477

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-8 4-0021
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Dissolved Solids	/1	1.0 mg/L	546 mg/L
Analyzed using EPA 160.1 on 7-JAN-1994 by JWC QC Batch No : 59462A			

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226478

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-142

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/L	<	10.0	µg/L
Bromomethane	10.0	µg/L	<	10.0	µg/L
Vinyl chloride	10.0	µg/L	<	10.0	µg/L
Chloroethane	10.0	µg/L	<	10.0	µg/L
Methylene chloride	5.0	µg/L	<	5.0	µg/L
Acetone	100	µg/L	<	100	µg/L
Carbon disulfide	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	<	5.0	µg/L
Chloroform	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	<	5.0	µg/L
2-Butanone	50.0	µg/L	<	50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Carbon tetrachloride	5.0	µg/L	<	5.0	µg/L
Vinyl acetate	50.0	µg/L	<	50.0	µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226479

REPORT NUMBER : D94-112-6
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Bromodichloromethane	5.0	µg/L	< 5.0	µg/L
1,2-Dichloropropane	5.0	µg/L	< 5.0	µg/L
cis-1,3-Dichloropropene	5.0	µg/L	< 5.0	µg/L
Trichloroethene	5.0	µg/L	< 5.0	µg/L
Chlorodibromomethane	5.0	µg/L	< 5.0	µg/L
1,1,2-Trichloroethane	5.0	µg/L	< 5.0	µg/L
Benzene	5.0	µg/L	< 5.0	µg/L
trans-1,3-Dichloropropene	5.0	µg/L	< 5.0	µg/L
Bromoform	5.0	µg/L	< 5.0	µg/L
2-Chloroethylvinyl ether	10.0	µg/L	< 10.0	µg/L
4-Methyl-2-pentanone	50.0	µg/L	< 50.0	µg/L
2-Hexanone	50.0	µg/L	< 50.0	µg/L
Tetrachloroethene	5.0	µg/L	< 5.0	µg/L
Toluene	5.0	µg/L	< 5.0	µg/L
1,1,2,2-Tetrachloroethane	5.0	µg/L	< 5.0	µg/L
Chlorobenzene	5.0	µg/L	< 5.0	µg/L
Ethylbenzene	5.0	µg/L	< 5.0	µg/L
Styrene	5.0	µg/L	< 5.0	µg/L
Xylenes	5.0	µg/L	< 5.0	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	95.1	%
Toluene-d8 (SS)	50.0	µg/L	106	%
Bromofluorobenzene (SS)	50.0	µg/L	97.5	%

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226430

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-142

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	10 µg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226481

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : FFL
PREPARED ON : 8-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	18	µg/L	<	18	µg/L
Acenaphthylene	10	µg/L	<	10	µg/L
Anthracene	6.6	µg/L	<	6.6	µg/L
Benzo(a)anthracene	0.13	µg/L	<	0.13	µg/L
Benzo(b)fluoranthene	0.18	µg/L	<	0.18	µg/L
Benzo(k)fluoranthene	0.17	µg/L	<	0.17	µg/L
Benzo(g,h,i)perylene	0.76	µg/L	<	0.76	µg/L
Benzo(a)pyrene	0.23	µg/L	<	0.23	µg/L
Chrysene	1.5	µg/L	<	1.5	µg/L
Dibenzo(a,h)anthracene	0.30	µg/L	<	0.30	µg/L
Fluoranthene	2.1	µg/L	<	2.1	µg/L
Fluorene	2.1	µg/L	<	2.1	µg/L
Indeno(1,2,3-cd)pyrene	0.43	ug/L	<	0.43	ug/L
Naphthalene	10	µg/L	<	10	µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226482

REPORT NUMBER : D94-112-6
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 µg/L	83.0 %

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson. TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226483

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-142

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	95.1 %
4-Bromofluorobenzene (SS)	50.0 µg/L	106 %
Toluene-d8 (SS)	50.0 µg/L	97.5 %

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226484

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226485

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-6
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-3 4-0022
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.005 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 7-JAN-1994 by CEL
Analyzed using EPA 7421 on 7-JAN-1994 by AH
QC Batch No : 6871

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226486

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-7
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-A 4-0023
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	101 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226187

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-7
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-A 4-0023
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	101 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226488

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-7
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-A 4-0023
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 7-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-73

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226489

DATE RECEIVED : 6-JAN-1994

REPORT NUMBER : D94-112-7
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-A 4-0023
: Base Service Station
PROJECT : Carswell AFB (4-0017-23)
DATE SAMPLED : 5-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.013 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 7-JAN-1994 by CEL
Analyzed using EPA 7421 on 7-JAN-1994 by AH
QC Batch No : 6871

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226490

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-1
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-4 4-0032
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : VOA1-143

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/L	<	10.0	µg/L
Bromomethane	10.0	µg/L	<	10.0	µg/L
Vinyl chloride	10.0	µg/L	<	10.0	µg/L
Chloroethane	10.0	µg/L	<	10.0	µg/L
Methylene chloride	5.0	µg/L		6.4	µg/L
Acetone	100	µg/L	<	100	µg/L
Carbon disulfide	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	<	5.0	µg/L
Chloroform	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	<	5.0	µg/L
2-Butanone	50.0	µg/L	<	50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Carbon tetrachloride	5.0	µg/L	<	5.0	µg/L
Vinyl acetate	50.0	µg/L	<	50.0	µg/L

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226491

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-1
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : TB-4 4-0032
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 10-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-143

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	10 µg/L

Martin Jeffus dsm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226492

REPORT NUMBER : D94-145-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	86.3 %
Toluene-d8 (SS)	50.0 µg/L	102 %
Bromofluorobenzene (SS)	50.0 µg/L	99.2 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226493

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-4 4-0033
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 50
METHOD FACTOR : 1
QC BATCH NO : 34-011294

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Benzene	50	µg/L	910	µg/L
Toluene	50	µg/L	6800	µg/L
Ethyl benzene	50	µg/L	1100	µg/L
Xylenes	50	µg/L	2500	µg/L
BTEX (total)			11300	µg/L #

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
Bromofluorobenzene	50.0	µg/L	100	%

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226494

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-4 4-0033
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 30-011194A

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	100 µg/L	< 100 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	91.0 %

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226495

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-4 4-0033
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-74

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	8.5 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226496

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-2
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-4 4-0033
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.003 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 10-JAN-1994 by CEL
Analyzed using EPA 7421 on 10-JAN-1994 by JBM
QC Batch No : 6885

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226497

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-5 4-0034
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 30-011194A

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	10 µg/L	1600 µg/L
Toluene	10 µg/L	450 µg/L
Ethyl benzene	10 µg/L	970 µg/L
Xylenes	10 µg/L	1500 µg/L
BTEX (total)		4520 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	87.0 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffries
Martin Jeffries
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226498

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-5 4-0034
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 10
METHOD FACTOR : 1
QC BATCH NO : 30-011194A

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	100 µg/L	700 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	87.0 %

Martin Jeffries
Martin Jeffries
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226499

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-5 4-0034
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-74

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	2.5 mg/L

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226590

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-3
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-5 4-0034
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 10-JAN-1994 by CEL
Analyzed using EPA 7421 on 10-JAN-1994 by JBM
QC Batch No : 6885

Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226591

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-6 4-0035
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194A

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	8.2 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		8.2 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	101 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

2265 2

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-6 4-0035
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : CNA
ANALYZED ON : 11-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-011194A

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	290 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	101 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226503

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-6 4-0035
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 1
QC BATCH NO : L23-74

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226504

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-4
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : MW-6 4-0035
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 10-JAN-1994 by CEL.
Analyzed using EPA 7421 on 10-JAN-1994 by JBM
QC Batch No : 6885

Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226595

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 10
QC BATCH NO : VOA1-143

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	100	µg/L	<	100	µg/L
Bromomethane	100	µg/L	<	100	µg/L
Vinyl chloride	100	µg/L	<	100	µg/L
Chloroethane	100	µg/L	<	100	µg/L
Methylene chloride	50	µg/L	<	50	µg/L
Acetone	1000	µg/L	<	1000	µg/L
Carbon disulfide	50	µg/L	<	50	µg/L
1,1-Dichloroethene	50	µg/L	<	50	µg/L
1,1-Dichloroethane	50	µg/L	<	50	µg/L
1,2-Dichloroethene	50	µg/L	<	50	µg/L
Chloroform	50	µg/L	<	50	µg/L
1,2-Dichloroethane	50	µg/L	<	50	µg/L
2-Butanone	500	µg/L	<	500	µg/L
1,1,1-Trichloroethane	50	µg/L	<	50	µg/L
Carbon tetrachloride	50	µg/L	<	50	µg/L
Vinyl acetate	500	µg/L	<	500	µg/L

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226506

REPORT NUMBER : D94-145-5
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	50	µg/L	<	50	µg/L
1,2-Dichloropropane	50	µg/L	<	50	µg/L
cis-1,3-Dichloropropene	50	µg/L	<	50	µg/L
Trichloroethene	50	µg/L	<	50	µg/L
Chlorodibromomethane	50	µg/L	<	50	µg/L
1,1,2-Trichloroethane	50	µg/L	<	50	µg/L
Benzene	50	µg/L	>	2000	µg/L
trans-1,3-Dichloropropene	50	µg/L	<	50	µg/L
Bromoform	50	µg/L	<	50	µg/L
2-Chloroethylvinyl ether	100	µg/L	<	100	µg/L
4-Methyl-2-pentanone	500	µg/L	<	500	µg/L
2-Hexanone	500	µg/L	<	500	µg/L
Tetrachloroethene	50	µg/L	<	50	µg/L
Toluene	50	µg/L	>	2000	µg/L
1,1,2,2-Tetrachloroethane	50	µg/L	<	50	µg/L
Chlorobenzene	50	µg/L	<	50	µg/L
Ethylbenzene	50	µg/L	>	2000	µg/L
Styrene	50	µg/L	<	50	µg/L
Xylenes	50	µg/L	>	2000	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	83.3	%
Toluene-d8 (SS)	50.0	µg/L	103	%
Bromofluorobenzene (SS)	50.0	µg/L	99.3	%

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226597

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYZED BY : BSR
ANALYZED ON : 10-JAN-1994
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-143

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methylbutane	2.20	VOA	2400	µg/L
Ethyl-methylbenzene	13.27	VOA	2100	µg/L
Trimethylbenzene	13.78	VOA	2600	µg/L
Hexane	4.62	VOA	18000	µg/L
Cyclopentane	3.76	VOA	1300	µg/L
Methylpentane	4.13	VOA	500	µg/L
Isopropylbenzene	13.61	VOA	140	µg/L
Indan	14.49	VOA	180	µg/L
Pentene	2.49	VOA	2000	µg/L
Unknown alkene	2.85	VOA	2100	µg/L

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226598

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8240 /2
ANALYZED BY : BSR
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 100
QC BATCH NO : VOA1-143

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	1000	µg/L	<	1000	µg/L
Bromomethane	1000	µg/L	<	1000	µg/L
Vinyl chloride	1000	µg/L	<	1000	µg/L
Chloroethane	1000	µg/L	<	1000	µg/L
Methylene chloride	500	µg/L	<	500	µg/L
Acetone	10000	µg/L	<	10000	µg/L
Carbon disulfide	500	µg/L	<	500	µg/L
1,1-Dichloroethene	500	µg/L	<	500	µg/L
1,1-Dichloroethane	500	µg/L	<	500	µg/L
1,2-Dichloroethene	500	µg/L	<	500	µg/L
Chloroform	500	µg/L	<	500	µg/L
1,2-Dichloroethane	500	µg/L	<	500	µg/L
2-Butanone	5000	µg/L	<	5000	µg/L
1,1,1-Trichloroethane	500	µg/L	<	500	µg/L
Carbon tetrachloride	500	µg/L	<	500	µg/L
Vinyl acetate	5000	µg/L	<	5000	µg/L

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226599

REPORT NUMBER : D94-145-5
ANALYSIS METHOD : EPA 8240 /2

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	500	µg/L	<	500	µg/L
1,2-Dichloropropane	500	µg/L	<	500	µg/L
cis-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Trichloroethene	500	µg/L	<	500	µg/L
Chlorodibromomethane	500	µg/L	<	500	µg/L
1,1,2-Trichloroethane	500	µg/L	<	500	µg/L
Benzene	500	µg/L		10800	µg/L
trans-1,3-Dichloropropene	500	µg/L	<	500	µg/L
Bromoform	500	µg/L	<	500	µg/L
2-Chloroethylvinyl ether	1000	µg/L	<	1000	µg/L
4-Methyl-2-pentanone	5000	µg/L	<	5000	µg/L
2-Hexanone	5000	µg/L	<	5000	µg/L
Tetrachloroethene	500	µg/L	<	500	µg/L
Toluene	500	µg/L		25200	µg/L
1,1,2,2-Tetrachloroethane	500	µg/L	<	500	µg/L
Chlorobenzene	500	µg/L	<	500	µg/L
Ethylbenzene	500	µg/L		2290	µg/L
Styrene	500	µg/L	<	500	µg/L
Xylenes	500	µg/L		7590	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	106	%
Toluene-d8 (SS)	50.0	µg/L	103	%
Bromofluorobenzene (SS)	50.0	µg/L	104	%

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226510

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 10
QC BATCH NO : VOA1-143

VOLATILES ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl tertiary butyl ether	50 µg/L	617 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	83.3 %
4-Bromofluorobenzene (SS)	50.0 µg/L	103 %
Toluene-d8 (SS)	50.0 µg/L	99.3 %

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226511

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
PREPARATION METHOD : EPA 3520
PREPARED BY : FFL
PREPARED ON : 8-JAN-1994
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 12-JAN-1994
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_005

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	109 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	207 µg/L

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226512

REPORT NUMBER : D94-145-5
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 µg/L	71.6 %

Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226513

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 10-JAN-1994
DILUTION FACTOR : 10
QC BATCH NO : L23-74

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	5 mg/L	20 mg/L

Martin Jeffus
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226513

DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : D94-145-5
REPORT DATE : 19-JAN-1994

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Mai Tran

SAMPLE MATRIX : Liquid
ID MARKS : BSS-B 4-0036
: Base Service Station
PROJECT : Carswell AFB (4-0032-0036)
DATE SAMPLED : 6-JAN-1994

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 10-JAN-1994 by CEL
Analyzed using EPA 7421 on 10-JAN-1994 by JBM .
QC Batch No : 6885

Martin Jeffus

Martin Jeffus
General Manager

226514

Chain of Custody Forms

for

Water Samples

from

Wells

4-0001 THRU 307

COOLER RECEIPT FORM

226515

Date Received 04 JAN 94 Project CARSWELL - BASE SERVICE STATION

Number of Coolers 4 District FT WORTH

Date Checked in 04-JAN 94 By (sign) Rhonda Smith

1. Shipping bill number 6N 120 698 163 3 ; 164 4
2. Custody seals on cooler 1 FRONT AND 1 BACK EACH
3. Custody seals intact.....(YES) NO
4. Chain-of-Custody in plastic.....(YES) NO
5. Chain-of-Custody filled out properly.....YES (NO) (1)
6. SWD signed Chain-of-Custody properly.....YES NO
7. Ice and Packing _____
8. All bottles sealed.....YES NO
9. Any bottles broken.....YES NO
10. Labels in good condition and complete.....YES NO
11. Labels agree with COC.....YES NO
12. Correct containers used.....YES NO
13. Preserved properly.....YES NO
14. Sufficient sample.....YES NO
15. Bubbles absent from VOA.....YES NO
16. Temperature of coolers at receipt 2.4°C
17. Client called.....YES NO

Details: _____

18. Comments: COC INDICATES ALL SX'S TO BE TESTED FOR VO, BUT LABELS AND LETTER DATED 3JAN94 INDICATE MTBE ON ALL SX'S & BTEX/MTBE ON SOME. COC'S FOR SX'S TO TEST BTEX/MTBE HAVE 2 VIALS EA, BUT SWD REC'D 3 VIALS EA. COC'S FOR ALL SX'S INDICATE 1L AMBER GLASS PER TRPH SX, BUT SWD REC'D 2 EACH 1/SX

MIPR# E87940092	CHEST# C103	C/SEAL# 1394C103

226516

CHAIN OF CUSTODY
TRAVEL BLANKS

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 1/3/94 Time: 1315

Site: Base Service Station Sample No. TB-1

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

Analysis Requested: VOLATILE ORGANICS EPA Method 8240

Water Source: DISTILLED WATER

Signature of Sampler: J. Hard

SAMPLES CONTAINED IN THIS COOLER

No. of Vials	Sample Number	SWD Lab Number
3	TB-1	4-0001
3	MW9	4-0002
3	MW10	4-0003
3	MW11	4-0004
3	MW12	4-0005
3	QA-A	4-0007
3	QC-A	4-006
21	Total No. of Vials Shipped	

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J Hard		1/3/94	1730
	Randy Smith	04 JAN 94	1045

MIPR# 87940092	SWD LAB# 4-0002	CHEST# C78	TEMP.

226517

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1-3-94 Time: 15:10
Site: Base Service Station	Well No. MW9
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	2	3	C78	01039478

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		1-3-94	17:30
	[signature]	04 JAN 94	1015

MIPR# 87940092	SWD LAB# 4-0003	CHEST# C 66	TEMP.

226518

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/3/94 Time: 1530
Site: Base Service Station	Well No. MW 10
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	2	3	C66	1C394C66

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J Ward		1/3/94	1730
	Randy Smith	04JAN94	1645

MIPR# 87940092	SWD LAB# 40004	CHEST# C 103	TEMP.

226519

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/3/94 Time: 1615
Site: Base Service Station	Well No. MW11
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	2	3	C103	10394C103

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Davis		1/3/93	1730
	Kenda Smith	04/JAN/94	1025

MIPR# 87940092	SWD LAB# 4-0005	CHEST# C78	TEMP.

226520

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1-3-94 Time: 14:45
Site: Base Service Station	Well No. MW 12
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	2	3	C78	01039478

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		1-3-94	17:30
	[signature]	04 Jan 94	1015

MIPR# 87940092	SWD LAB# 4-0006	CHEST# C 20	TEMP.

226521

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/3/94 Time: 1600
Site: Base Service Station	Well No. QC-A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	2	3	C 20	103 94 C 20

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hand		1/3/94	1730
	Linda Smith	04 Jan 94	1015

MIPR# 87940092	SWD LAB# 4-0007	CHEST# C66 & C20	TEMP.

226522

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/3/94 Time: 1545
Site: Base Service Station	Well No. QA-A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	2	3	C66 & C20	0394C66

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[illegible]		1/3/94	1730
	[illegible] Smith	04 JAN 94	1015

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COOLER RECEIPT FORM

226523

Date Received 05 JAN 94 Project CARSWELL - BASE SERVICE STATION

Number of Coolers 2 District FT. WORTH

Date Checked in 05JAN94 By (sign) Randy Smith

1. Shipping bill number GH 120 698 169 9
2. Custody seals on cooler No
3. Custody seals intact.....Yes No N/A
4. Chain-of-Custody in plastic.....Yes No
5. Chain-of-Custody filled out properly.....Yes No
6. SWD signed Chain-of-Custody properly.....Yes No
7. Ice and packing ICE AND INSERTS
8. All bottles sealed.....Yes No
9. Any bottles broken.....Yes No
10. Labels in good condition and complete.....Yes No
11. Labels agree with COC.....Yes No (1)
12. Correct containers used.....Yes No
13. Preserved properly.....Yes No
14. Sufficient sample.....Yes No
15. Bubbles absent from VOA.....Yes No (2)
16. Temperature of cooler(s) at receipt 2.3°C
17. Client called.....Yes No

Details:

18. Comments: (1) 3 VIALS LABELED FOR BTEX/MTBE AND COC INDICATES ONLY 2 TO BE SENT. TRAVEL BLANKS COC INDICATES METHOD 8240 (VO) FOR ALL 5X'S. BTEX/MTBE CORRECTLY IDENTIFIED ON LABEL AND GROUNDWATER COC FOR 5X MW-2 1/SU (2) 1 VIAL W/BUBBLE 1/SU

MIPR# E87940092	CHEST# C55	C/SEAL# 10494 55

226524

CHAIN OF CUSTODY
TRAVEL BLANKS

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 1/04/94 Time: 1530

Site: Base Service Station Sample No. TB-2

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

Analysis Requested: VOLATILE ORGANICS EPA Method 8240

Water Source: DISTILLED WATER

Signature of Sampler: J. Hard

SAMPLES CONTAINED IN THIS COOLER

No. of Vials	Sample Number	SWD Lab Number
3	TB-2	4-0009
3	MW-1	4-0010
3	MW-2	4-0011
3	QA-B	4-0013
3	QC-B	4-0012
15	Total	
15	Total No. of Vials Shipped	

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hard		1/04/94	1730
	Randy Smith	05 JAN 94	0950

MIPR# 87940092	SWD LAB#	CHEST# C55	TEMP.

226525

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/4/94 Time: 1620
Site: Base Service Station	Well No. MW1
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1	3	C55	10494C55

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
	Randy Smith	05 JAN 94	0950

MIPR# 87940092	SWD LAB#	CHEST# C93	TEMP.

226526

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/4/94 Time: 1600
Site: Base Service Station	Well No. MW2
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C93	10494 C93

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hrud		1/4/94	1720
	Randy Smith	05JAN94	0950

MIPR# 87940092	SWD LAB#	CHEST# C93	TEMP.

226527

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/4/94 Time: 1650
Site: Base Service Station	Well No. CC-B
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3		3	C93	10494C93

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE -	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH -	418.1	(1)
✓	PAH -	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb) -	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
		1/4/94	1730
	Randy Smith	05JAN94	0950

MIPR# 87940092	SWD LAB#	CHEST# C55	TEMP.

226528

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1/04/94 Time: 1635
Site: Base Service Station	Well No. CA-B
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C55	[illegible]5

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		1/4/94	[illegible]
	Randy Smith	05JAN95	0950

d 2017
to
4-2023

226529

COOLER RECEIPT FORM

Date Received 06 JAN 94 Project CARSWELL - BASE SERVICE STATION

Number of Coolers 3 District FT. WORTH

Date Checked in 06 JAN 94 By (sign) Randy Smith

1. Shipping bill number GH 120 698 172 1
2. Custody seals on cooler 1 FRONT AND 1 BACK
3. Checked for radioactivity.....Yes (No) (1)
4. Custody seals intact.....(Yes) No
5. Chain-of-Custody in plastic.....(Yes) No
6. Temperature of cooler at receipt less than 4°C....(Yes) No
   If NO, Actual temperature(s) of cooler(s)_____
   Call POC. Details_____
7. Ice and Packing ICE AND INSERTS
8. Chain-of-Custody filled out properly.....(Yes) No
9. SWD signed Chain-of-Custody properly.....(Yes) No
10. All bottles sealed.....(Yes) No
11. Any bottles broken.....Yes (No)
12. Labels in good condition and complete.....(Yes) No
13. Labels agree with COC.....Yes (No) (2)
14. Correct containers used.....(Yes) No
15. Preserved properly.....(Yes) No
16. Sufficient sample.....(Yes) No
17. Bubbles absent from VOA.....(Yes) No
18. Client called.....(Yes) No

    Details: DONNIE G. ADD'D SX'S SENT LAST NIGHT 1/5 H

19. MIPR # _____

20. Comments: (1) DON'T HAVE MISTER! (2) COC INDICATES 2 VIALS FOR BTEX/MTBE SX'S - REC'D 3 EA. COC INDICATES ALL SX'S TESTED 8240, BUT LABELS & GROUNDWATER COC'S INDICATE BTEX/MTBE 8020 FOR SOME.

MIPR# E87940092	CHEST# C47	C/SEAL# 10594 C47

226530

CHAIN OF CUSTODY
TRAVEL BLANKS

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 1.5.94 Time: 0800

Site: Base Service Station Sample No. TB-3

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

Analysis Requested: VOLATILE ORGANICS EPA Method 8240

Water Source: Distilled

Signature of Sampler: D. Barnett

SAMPLES CONTAINED IN THIS COOLER

No. of Vials	Sample Number	SWD Lab Number
3	TB-3	4-0017
3	SAV1	4-0018
3	SAV2	4-0019
3	MW7	4-0020
3	MW8	4-0021
3	MW3	4-0022
3	BSS-A	4-0023
	Total No. of Vials Shipped	

CUSTODY RECORD

Relinquished by	Received by	Date	Time
D. Barnett		1-5-94	17:45
	Randy Smith	06 JAN 94	1000

MIPR# 87940092	SWD LAB# 4-0018	CHEST# C47	TEMP.

226531

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.5.94 Time: 1445
Site: Base Service Station	Well No. SA1
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C47	10594 CA7

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Haw		1.5.94	17.45
	Randy Smith	06 JAN 94	1000

MIPR# 87940092	SWD LAB# 4-0019	CHEST# C47	TEMP.

226532

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.5.94 Time: 1425
Site: Base Service Station	Well No. SAV 2
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1	2	C47	10594C47

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
		1.5.94	17:45
	Randy Smith	06JAN94	1000

MIPR# 87940092	SWD LAB# 4-0020	CHEST# C49	TEMP.

226533

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.5 94 Time: 1545
Site: Base Service Station	Well No. MW7
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	2	3	C49	10594C49

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Brand		1.5 94	1745
	Randy Smith	06 JAN 94	1000

MIPR# 87940092	SWD LAB# 4-0021	CHEST# C49	TEMP.

226534

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.5.94 Time: 1530
Site: Base Service Station	Well No. MW8
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	2	3	C49	10594C49

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
✓	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		1.5.94	1745
	[signature]	1/5/94	1900

MIPR# 87940092	SWD LAB# 4-0022	CHEST# C20A	TEMP.

226535

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1-5-94 Time: 1745
Site: Base Service Station	Well No. MW3
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1	3	C20A	1594C20A

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
✓	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dowd		1-5-94	1745
	Randy Smith	06 JAN 94	1000

MIPR# 87940092	SWD LAB# 4-0023	CHEST# C20A	TEMP.

226536

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.5.94 Time: 1645
Site: Base Service Station	Well No. BSS-A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C20A	10594C20A

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(1)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hand		1.5.94	1745
	Randy Smith	06JAN94	1000

032
+ 034
036

226537

COOLER RECEIPT FORM

Date Received 07JAN94 Project CARSWELL - BASE SVC STA

Number of Coolers 2 District FT WORTH

Date Checked in 07JAN94 By (sign) Randy Smith

1. Shipping bill number GH 120 698 175 4
2. Custody seals on cooler 1 ON FRONT AND 1 ON BACK
3. Checked for radioactivity.....Yes (No) (1)
4. Custody seals intact.....(Yes) No
5. Chain-of-Custody in plastic.....(Yes) No
6. Temperature of cooler at receipt less than 4°C...(Yes) No
   If NO, Actual temperature(s) of cooler(s) _____
   Call POC. Details _____
7. Ice and Packing ICE AND INSERTS
8. Chain-of-Custody filled out properly.....Yes (No) (2)
9. SWD signed Chain-of-Custody properly.....(Yes) No
10. All bottles sealed.....(Yes) No
11. Any bottles broken.....Yes (No)
12. Labels in good condition and complete.....(Yes) No
13. Labels agree with COC.....Yes (No) (2)
14. Correct containers used.....(Yes) No
15. Preserved properly.....(Yes) No
16. Sufficient sample.....(Yes) No
17. Bubbles absent from VOA.....Yes (No) (3)
18. Client called.....(Yes) No

    Details: DONNIE G. ADD'D SX'S TO BE SENT LAST NIGHT //SH

19. MIPR # _____

20. Comments: (1) DON'T HAVE METER (2) TRAVEL BLANKS COC STILL LISTS BTEX/MTBE SX'S FOR VO (8240). ALL OTHER DISCREPENCIES FIXED (3) 1 VIAL W/BUBBLE //SH

MIPR# E87940092	CHEST# C 20	C/SEAL# 10694 C20

226538

CHAIN OF CUSTODY
TRAVEL BLANKS

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 1.6.94 Time: 1300

Site: Base Service Station Sample No. TB4

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

Analysis Requested: VOLATILE ORGANICS EPA Method 8240

Water Source: DISTILLED WATER

Signature of Sampler: J. Howell

SAMPLES CONTAINED IN THIS COOLER

No. of Vials	Sample Number	SWD Lab Number
3	TB4	4-0032
3	mw4	4-0033
3	mw5	4-0034
3	mw6	4-0035
3	BSS-B	4-0036
15	Total No. of Vials Shipped	

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Howell		1.6.94	1700
	Randy Smith	07 JAN 94	1115

MIPR# 87940092	SWD LAB# 40033	CHEST# C20	TEMP.

226539

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.6.94 Time: 1505
Site: Base Service Station	Well No. MW4
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C20	1694C20

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{3}
✓	TRPH	418.1	(2)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Howard		1.6.94	1700
	Randy Smith	01/07/95	1115

MIPR# 87940092	SWD LAB# 4-0034	CHEST# C93	TEMP.

2265.10

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1.6.94 Time: 1350
Site: Base Service Station	Well No. MW5
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C93	10694C93

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{2}
✓	TRPH	418.1	(2)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hall		1.6.94	1700
	Randy Smith	07 JAN 94	1115

MIPR# 87940092	SWD LAB# 40035	CHEST# C93	TEMP.

226541

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1·6·94 Time: 1335
Site: Base Service Station	Well No. MW6
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
2	1	3	C93	10694 C 93

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
	VOC/MTBE	8240	{3}
✓	BTEX/MTBE	8020	{3}
✓	TRPH	418.1	(2)
	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Hand		1·6·94	17
	Randy Smith	01/AN/94	1115

MIPR# 87940092	SWD LAB# 40036	CHEST# C20	TEMP.

226542

CHAIN OF CUSTODY
GROUNDWATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 1·6·94 Time: 1435
Site: Base Service Station	Well No. BSS·B
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1	3	C20	10694 C20

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial
<> = 125ml amber glass

PARAMETERS

	Parameter	Test Method	*
✓	VOC/MTBE	8240	{3}
	BTEX/MTBE	8020	{3}
✓	TRPH	418.1	(2)
✓	PAH	8310	(1)
	Total Dissolved Solids (TDS)	160.1	[1]
✓	Lead (Pb)	7421	[1]
	General Scan (BTEX)	8000	<1>

CUSTODY RECORD

Relinquished by	Received by	Date	Time
		1·6·94	1700
	Rudy Smith	07JAN94	1115

226543

QA/QC Report

for

Water Samples

from

Wells

226541

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

SUBMITTAL OF CESWD-ED-GL REPORT 15952

PROJECT: CARSWELL AFB Feature: BASE SERVICE STATION	Contract No.:
TEST REQUEST NO.: E87940092 DATED: 02 NOV 1993 RECEIVED: 12 NOV 1993	From: Chief, Geotech Branch Fort Worth District

MATERIAL: Sixteen water samples, four travel blanks, two quality control samples and two quality assurance samples.

Date Received: 04, 05, 06, 07 January 1994

Remarks:
VOLUME 1 OF 3

Report Sent To: FORT WORTH DISTRICT	Copy Furnished:

Date: FEB 08 1994	Name and Title: For STEPHEN L. BROOKS Acting Director SWD Laboratory	Signature:

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

226545

CASE NARRATIVE

Sixteen water samples, four travel blanks, two quality control samples and two quality assurance samples arrived at Southwestern Division Laboratory on 04-07 January 1994 from Carswell AFB - Base Service Station. The samples arrived in good condition but the chain of custodies did not agree with the labels concerning tests requested and number of samples sent per test. The analyses for the field samples were contracted out to a Corps of Engineers' validated laboratory, NDRC Laboratories, Inc. The analyses for the quality assurance samples, excluding the analyses for PAH, were contracted out to a Corps of Engineers' validated laboratory, Environmental Testing and Consulting, Inc. The analyses for PAH for the quality assurance samples were contracted out to a Corps of Engineers' validated laboratory, Southwest Research Institute.

The data package from NDRC Laboratories, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods within proper holding times. All matrix spike, surrogate and laboratory control recoveries were within control limits. All method blanks were free of contamination.

The data package from Environmental Testing and Consulting, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods and within proper holding times. All duplicates, matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions.

- The MSD recovery and the MS/MSD RPD value for lead for both samples were outside of control limits. Acceptable MS and LCS were recorded.
- The continuing calibration for most volatile organic analytes for both samples were outside of control limits.
- The MS/MSD recoveries for TRPH for sample 4-0013 were outside of control limits due to high analyte concentration. The LCS/LCSD recoveries were acceptable.

All method blanks were free of contamination.

The data package from Southwest Research Institute was received complete with all required internal quality control information. All analyses were performed using specified methods and within proper holding times. All matrix spike and surrogate recoveries were within control limits. All method blanks were free of contamination.

Following is a synopsis of the quality assurance samples and their related QC and field samples:

Customer Sample No.: MW-10, QC-A, QA-A
SWD Lab Sample No.: 4-0003, 4-0006, 4-0007

Parameter	Field	QC	QA	Units	Comment
Lead	19	28	37	µg/L	Agree
TDS	847	843	1035	mg/L	Agree
TRPH	9.8	9.4	20.7	mg/L	Agree
VOA/MTBE					
Benzene	5260	5480	4480	µg/L	Agree
Toluene	21600	21800	21400	µg/L	Agree
Ethyl benzene	4850	4790	4100	µg/L	Agree
Xylene	13900	14000	13100	µg/L	Agree
MTBE	6090	6790	6540	µg/L	Agree
TICs	3 TICs	3 TICs	10 TICs		
PAH:					
Acenaphthylene	300	66	< 23	µg/L	Disag*
Naphthalene	704	144	890	µg/L	Disag*

* Data was rechecked and found acceptable.

Following is a synopsis of the quality assurance samples and their related QC and field samples:

226547

Customer Sample No.: MW-1, QC-B, QA-B
SWD Lab Sample No.: 4-0010, 4-0012, 4-0013

Parameter	Field	QC	QA	Units	Comment
Lead	16	16	15	µg/L	Agree
TRPH	8.0	9.0	17.1	mg/L	Agree
VOA/MTBE					
Benzene	1010	1020	1320	µg/L	Agree
Toluene	2650	2500	3010	µg/L	Agree
Ethyl benzene	4610	4450	5500	µg/L	Agree
Xylene	9610	9210	11700	µg/L	Agree
MTBE	270	277	<500	µg/L	Agree
TICs	11 TICs	11 TICs	10 TICs		
PAH:					
Acenaphthylene	355	360	< 23	µg/L	Disag*
Naphthalene	700	713	710	µg/L	Agree

* Data was rechecked and found acceptable.

PROJECT: Carswell AFB Data check time: 6 hr

226548

SAMPLES: 0001-0007, 0009-0013, 0017-0023, 0032-0036

REPORT DATE: 31 January 1994

QUALITY CONTROL CHECKLIST

Chain of Custody Check

1. Do sample ID numbers agree with the C.O.C? [Y] [N]
2. Do site and location agree with the C.O.C? [Y] [N]
3. Do sampling dates agree with the C.O.C? [Y] [N]
4. Do method numbers agree with the C.O.C? [Y] [N]
5. Are all samples and analyses accounted for? [Y] [N]

Data Check

1. Holding Times
   a) BTEX/MTBE [In] [Out]
   b) TRPH [In] [Out]
   c) TDS [In] [Out]
   d) Lead [In] [Out]
   e) Volatiles [In] [Out]
   f) PAH [In] [Out]

2. Do detection limits and dilution factors agree? [Y] [N]

3. Are units correct? [Y] [N]

QC Check

1. MS/MSD [In] [Out]

2. RPD for MS/MSD [In] [Out]

3. LCS and/or Blank Spike [In] [Out]

4. Blanks [Below DL] [Above DL]

5. Acceptable Surrogates [Y] [N]

6. RPD for duplicates [In] [Out]

7. Tuning and calibration check [Y] [N]

Comments

For QA samples, MS and MS/MSD RPD out for Pb and continuing calibration out for most VOA analytes.
For QA sample 4-0013, MS/MSD out for TRPH due to high analyte concentration. LCS/LCSD are good.
Methylene chloride (7.3 µg/L) detected in trip blanks (4-0001 and 4-0032).

TAB

APPENDIX C

Soil Sampling and Surface Water Sampling

Field Data Sheets

226551

SOIL/SEDIMENT SAMPLING

FIELD DATA SHEET

Location Base Service Date 20 Sept 93

Site West Bank of W. Fork Trinity River Sample No. SED-1A

Weather Conditions Sunny, dry, cool

Stream Conditions Low, still

Depth of stream N/A

Sampling Depth [redacted] 1.0' Start/End Times 0900 - 0910

Sample Containers Collected:		QA/QC Samples Collected:
VOC	2	N/A
TRPH & Pb	1	
PAH	1	

Rinsate Sample to be analyzed for N/A

Cooler No. C-115

Remarks/Comments River about 8' below SED-1 sampling pt. Location immediately above water surface of river, approx 10' S of SED-1 location. Clayey sand, V. moist, gray to black w/ depth, strong gasoline odor. Contamination appears to extend 2' above water surface. No sheen on water. No other areas found w/ odor along river. 3 days after rain (9/25)

Sampler's Signature Deborah C Fitzgerald

226552

SURFACE WATER SAMPLING

FIELD DATA SHEET

Location Carswell B.S.S. Date 10-22-93

Site South end of Culvert Sample No. SW-2A

Weather Conditions Clear, Sunny, Cool - 60°

Stream Conditions strong, hydrocarbon odor, water ~~clear~~ murky, tan in color, very slow flow

Depth of stream 1 ft.

Sampling Depth Surface Start/End Times 0930 - 0940

Sample Containers Collected:

VOC	3
TRPH	2
PAH	1
Pb	1

QA/QC Samples Collected:

VOC	✓
TRPH	✓
PAH	✓
Pb	✓

Rinsate Sample to be analyzed for N/A

Cooler No. C-73

Remarks/Comments strong hydrocarbon odor

Sampler's Signature B Post, J. Drysdale

226553

SOIL/SEDIMENT SAMPLING

FIELD DATA SHEET

Location South end CAFB BSS (adjacent to), Rogner Date 10-22

Site Sed-2A Sample No. _____

Weather Conditions Near 65°

Stream Conditions Murky, cloudy, low flow

Depth of stream 1"-3"

Sampling Depth 1'-2' Start/End Times 10:00

Sample Containers Collected:		QA/QC Samples Collected:	
VOC	✓		N/A
TRPH & Pb	✓		✓
PAH	✓		—

Rinsate Sample to be analyzed for N/A

Cooler No. C-15

Remarks/Comments Soil was predominantly black & odorous with ~~stone~~ & mixed sand and gravel & organic material (i.e plant debris).

Sampler's Signature J. D

226554

SURFACE WATER SAMPLING

FIELD DATA SHEET

Location CAFB B.S.S. Date 10-22-93

Site East end of Culvert on upstream side of Concrete Dam structure Sample No. SW-3A

Weather Conditions clear, sunny, 60°

Stream Conditions Cloudy

Depth of stream 2 ft.

Sampling Depth Surface Start/End Times 1100 - 1110

Sample Containers Collected:

VOC	
TRPH	
PAH	
Pb	

QA/QC Samples Collected: NO

VOC	
TRPH	
PAH	
Pb	

Rinsate Sample to be analyzed for N/A

Cooler No.

Remarks/Comments

water sample clear, no odor, slight tan color

Sampler's Signature B. Post

226555

SURFACE WATER SAMPLING

FIELD DATA SHEET

Location C. A.F.B., B.S.S. Date 10-22-93

Site East end of Culvert on downstream side of concrete Dam Structure Sample No. SW-4A

Weather Conditions clear, sunny, 60°

Stream Conditions less cloudy than upstream side

Depth of stream 1-2 ft

Sampling Depth Surface Start/End Times 11:15 - 11

Sample Containers Collected:

VOC	
TRPH	
PAH	
Pb	

QA/QC Samples Collected: No

VOC	
TRPH	
PAH	
Pb	

Rinsate Sample to be analyzed for N/A

Cooler No.

Remarks/Comments water clear, slight color, no odor

Sampler's Signature B. Post, Jim Drysdale

226556

SOIL/SEDIMENT SAMPLING

FIELD DATA SHEET

Location C. A. F. B. B. S. S. Date 10-22-93

Site East end of culvert, left overbank Sample No. SED-4A

Weather Conditions clear, sunny 60°

Stream Conditions less cloudy than upstream side

Depth of stream 1-2 ft

Sampling Depth 1-2 ft Start/End Times 11:15 - 1130

Sample Containers Collected: QA/QC Samples Collected: no

VOC	3	N/A
TRPH & Pb	2	
PAH	1	

Rinsate Sample to be analyzed for N/A

Cooler No.

Remarks/Comments

Soil is gray colored clay, hydrocarbon odor

Sampler's Signature B. Post, Jim Drysdale

226557

SURFACE WATER SAMPLING

FIELD DATA SHEET

Location C.A.F.B, ~~B.S.~~ Bank Date 10-22-93

Site Drain Culvert along Knights Lake East of bank Parking Lot Sample No. SW-5A

Weather Conditions _____

_____

Stream Conditions clear, no odor, slight flow to drain

Sample collected on south side of drain

Depth of stream 4"

Sampling Depth surface Start/End Times 1145 - 1210

Sample Containers Collected: QA/QC Samples Collected: NO

VOC	✓	VOC	
TRPH	✓	TRPH	
PAH	✓	PAH	
Pb	✓	Pb	

Rinsate Sample to be analyzed for N/A

Cooler No. C-97

Remarks/Comments _____

Sampler's Signature Beverly Post

226558

SOIL/SEDIMENT SAMPLING

FIELD DATA SHEET

Location Bank on A St. Date 10-22

Site West side of driveway along A St - Seep area Sample No. Sed-5A

Weather Conditions ~~[illegible]~~ Clear

Stream Conditions Clear w/ orange bacterial growth & oily sheen on surface

Depth of stream 1"-3"

Sampling Depth 1"-1½" Start/End Times 11:45

Sample Containers Collected:		QA/QC Samples Collected:
VOC	✓	N/A
TRPH & Pb	✓	
PAH	✓	

Rinsate Sample to be analyzed for N/A

Cooler No. C-97

Remarks/Comments Tannish brown & gray gravelly clay w/ silt & organic debris. No odor was detectable. Had a tough time getting to this depth because of gravel.

Sampler's Signature Jim Drysdale

226559

Signed Laboratory Reports

for

West Fork Trinity River

Shallow Soil Sample

226560

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

SUBMITTAL OF SWDED-GL REPORT 15728-3

PROJECT: CARSWELL AFB - FTW Feature: BASE SERVICE STATION	Contract No.
TEST REQUEST NO.: E87930087 Dated: 09 DECEMBER 1992 Received: 14 DECEMBER 1992	From: CHIEF, GEOTECHNICAL BRANCH

MATERIAL: One soil sample.

Date Received: 28 September 1993

Remarks:

Report sent to: FORT WORTH DISTRICT	Copy furnished:

Date: NOV 03 1993	Name and title: STEPHEN L. BROOKS Acting Director SWD Laboratory	Signature Steph Brooks

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226561

DATE RECEIVED : 28-SEP-1993

REPORT NUMBER : D93-11033-1
REPORT DATE : 13-OCT-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-1A 3-5919
: Base Service Station
PROJECT : Carswell AFB (3-5919)
DATE SAMPLED : 28-SEP-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 6-OCT-1993
DILUTION FACTOR : 10000
QC BATCH NO : VOA3-083

VOLATILE ORGANICS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Chloromethane	100000	µg/Kg	< 100000	µg/Kg
Bromomethane	100000	µg/Kg	< 100000	µg/Kg
Vinyl chloride	100000	µg/Kg	< 100000	µg/Kg
Chloroethane	100000	µg/Kg	< 100000	µg/Kg
Methylene chloride	50000	µg/Kg	< 50000	µg/Kg
Acetone	1000000	µg/Kg	< 1000000	µg/Kg
Carbon disulfide	50000	µg/Kg	< 50000	µg/Kg
1,1-Dichloroethene	50000	µg/Kg	< 50000	µg/Kg
1,1-Dichloroethane	50000	µg/Kg	< 50000	µg/Kg
1,2-Dichloroethene	50000	µg/Kg	< 50000	µg/Kg
Chloroform	50000	µg/Kg	< 50000	µg/Kg
1,2-Dichloroethane	50000	µg/Kg	< 50000	µg/Kg
2-Butanone	500000	µg/Kg	< 500000	µg/Kg
1,1,1-Trichloroethane	50000	µg/Kg	< 50000	µg/Kg
Carbon tetrachloride	50000	µg/Kg	< 50000	µg/Kg
Vinyl acetate	500000	µg/Kg	< 500000	µg/Kg

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

225562

REPORT NUMBER : D93-11033-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	50000	µg/Kg	<	50000	µg/Kg
1,2-Dichloropropane	50000	µg/Kg	<	50000	µg/Kg
cis-1,3-Dichloropropene	50000	µg/Kg	<	50000	µg/Kg
Trichloroethene	50000	µg/Kg	<	50000	µg/Kg
Chlorodibromomethane	50000	µg/Kg	<	50000	µg/Kg
1,1,2-Trichloroethane	50000	µg/Kg	<	50000	µg/Kg
Benzene	50000	µg/Kg	<	50000	µg/Kg
trans-1,3-Dichloropropene	50000	µg/Kg	<	50000	µg/Kg
Bromoform	50000	µg/Kg	<	50000	µg/Kg
2-Chloroethylvinyl ether	100000	µg/Kg	<	100000	µg/Kg
4-Methyl-2-pentanone	500000	µg/Kg	<	500000	µg/Kg
2-Hexanone	500000	µg/Kg	<	500000	µg/Kg
Tetrachloroethene	50000	µg/Kg	<	50000	µg/Kg
Toluene	50000	µg/Kg		287000	µg/Kg
1,1,2,2-Tetrachloroethane	50000	µg/Kg	<	50000	µg/Kg
Chlorobenzene	50000	µg/Kg	<	50000	µg/Kg
Ethylbenzene	50000	µg/Kg		118000	µg/Kg
Styrene	50000	µg/Kg	<	50000	µg/Kg
Xylenes	50000	µg/Kg		742000	µg/Kg

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/Kg	99.8	%
Toluene-d8 (SS)	50.0	µg/Kg	95.7	%
Bromofluorobenzene (SS)	50.0	µg/Kg	96.3	%

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226564

DATE RECEIVED : 28-SEP-1993

REPORT NUMBER : D93-11033-1
REPORT DATE : 13-OCT-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-1A 3-5919
: Base Service Station
PROJECT : Carswell AFB (3-5919)
DATE SAMPLED : 28-SEP-1993
PREPARATION METHOD : EPA 3550
PREPARED BY : FFL
PREPARED ON : 1-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : MGD
ANALYZED ON : 6-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 670
QC BATCH NO : 8310_3550_003

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Acenaphthene	1210	µg/Kg	< 1210	µg/Kg
Acenaphthylene	1540	µg/Kg	< 1540	µg/Kg
Anthracene	442	µg/Kg	< 442	µg/Kg
Benzo(a)anthracene	8.7	µg/Kg	< 8.7	µg/Kg
Benzo(b)fluoranthene	12.1	µg/Kg	< 12.1	µg/Kg
Benzo(k)fluoranthene	11.4	µg/Kg	< 11.4	µg/Kg
Benzo(g,h,i)perylene	50.9	µg/Kg	< 50.9	µg/Kg
Benzo(a)pyrene	15.4	µg/Kg	< 15.4	µg/Kg
Chrysene	101	µg/Kg	< 101	µg/Kg
Dibenz(a,h)anthracene	20.1	µg/Kg	< 20.1	µg/Kg
Fluoranthene	141	µg/Kg	< 141	µg/Kg
Fluorene	141	µg/Kg	< 141	µg/Kg
Indeno(1,2,3-cd)pyrene	28.8	µg/Kg	< 28.8	µg/Kg
Naphthalene	1210	µg/Kg	36000	µg/Kg

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

229565

REPORT NUMBER : D93-11033-1
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Phenanthrene	429	µg/Kg	<	429	µg/Kg
Pyrene	181	µg/Kg	<	181	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226587

DATE RECEIVED : 28-SEP-1993

REPORT NUMBER : D93-11033-1
REPORT DATE : 13-OCT-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-1A 3-5919
: Base Service Station
PROJECT : Carswell AFB (3-5919)
DATE SAMPLED : 28-SEP-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : FFL
PREPARED ON : 29-SEP-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 30-SEP-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_023

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	130 mg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226568

DATE RECEIVED : 28-SEP-1993

REPORT NUMBER : D93-11033-1
REPORT DATE : 13-OCT-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-1A 3-5919
: Base Service Station
PROJECT : Carswell AFB (3-5919)
DATE SAMPLED : 28-SEP-1993

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	1.0 mg/Kg	6.9 mg/Kg

Dilution Factor : 5
Prepared using EPA 3051 on 29-SEP-1993 by JK
Analyzed using EPA 7421 on 7-OCT-1993 by JBM
QC Batch No : 5499

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226530

DATE RECEIVED : 28-SEP-1993

REPORT NUMBER : D93-11033-1
REPORT DATE : 13-OCT-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-1A 3-5919
: Base Service Station
PROJECT : Carswell AFB (3-5919)
DATE SAMPLED : 28-SEP-1993

MISCELLANEOUS ANALYSES			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Total Solids	/1	0.01 %	85.6 %
Analyzed using EPA 160.3 on 30-SEP-1993 by CLM QC Batch No : 77115C			

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

226570

Chain of Custody Form

for

West Fork Trinity River

Shallow Soil Sample

MIPR# E87930087	SWD LAB# 3-5919	CHEST# C115	TEMP.

226571

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 9/28/93 Time: 0900
Site: Base Service Station	Sample No. SED-1A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-1A				4	92893C115
	~~1.0~~ 1.0'					

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method per Pebble	*
✓	VOC	~~8020~~ 8240	{2}
✓	TRPH and Pb	418.1 & 7421	[1]
✓	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Deborah Fitzgerald		9-28-93	1000
	JR Nelson	9-28-93	1400

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

226572

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

QA/QC Report

for

West Fork Trinity River

Shallow Soil Sample

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

226574

CASE NARRATIVE

One soil sample arrived at Southwestern Division Laboratory on 28 September 1993 from Carswell Air Force Base. The sample arrived in good condition and with a complete chain of custody. On 28 September 1993, the Technical Manager, Ms. Deborah Fitzgerald, was contacted to discuss the VOC method. As a result of the discussions, the VOC method was changed from Method 8020 to Method 8240. The sample was contracted out to a Corps of Engineers' validated laboratory, NDRC Laboratories, Inc.

The data package from NDRC Laboratories, Inc. was received complete with all required internal quality control information. For the PAH analysis, the sample was run on 6 October 1993, but the internal quality control reports were from 17 September 1993. All analyses were performed using specified methods within proper holding times. All matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions. The MS/MSD recoveries for lead were outside control limits due to matrix interference. Both the RPD for the duplicate and the MS/MSD recoveries were outside control limits for lead. The MS/MSD recoveries for acenphtene and acenaphene, both PAH compounds, were out of control limits. The MSD recovery for flourene, a PAH compound, was out of control limits. The laboratory control sample for the PAH analysis was out of control limits for acenaphthylene, acenaphthene, and anthracene. SWD Laboratory has discussed remedying the problem of laboratory control standards failures with NDRC in order to avoid future problems. All method blanks appeared free of contamination.

PROJECT: Carswell AFB

Data check time: 1 hr

226575

SAMPLES: 3-5919

REPORT DATE: 22 Oct. 93

QUALITY CONTROL CHECKLIST

Chain of Custody Check

1. Do sample ID numbers agree with the C.O.C? [Y]
2. Do site and location agree with the C.O.C? [Y]
3. Do sampling dates agree with the C.O.C? [Y]
4. Do method numbers agree with the C.O.C? [Y]
5. Are all samples and analyses accounted for? [Y]

Data Check

1. Holding Times
   a) Volatile Organics 14 days [In]
   b) Petroleum Hydrocarbons 28 days [In]
   c) Lead 6 months [In]
   d) Hydrocarbons [In] *

2. Do detection limits and dilution factors agree? [Y]

3. Are units correct? [Y]

QC Check

1. MS/MSD [Out]

2. RPD for MS/MSD [Out]

3. LCS and/or Blank Spike [Out]

4. Blanks [Below DL]

5. Acceptable Surrogates [Y] [N] N/A

6. RPD for duplicates [Out]

7. Tuning and calibration check [Y] [N] N/A

Comments

* Date sampled is 28 Sept. Date analyzed is 17 Sept.-- NDRC used a batch from the previously sent samples.
MS%: Lead at 65.3%, Acenaphthylene at 72.8%, Acenaphene at 52.9%.
RPD for Duplicates: Lead at 16.7%.
RPD for MS/MSD: Lead at 26.7%.
MSD%: Acenphthylene at 67.8%, Acenaphthene at 50.8%, Flourene at 79.2%.
LCS%: Acenaphthylene at 70.8%, Acenaphthene at 47.1%, Anthracene at 87.0%.

PAH - run on Oct 6, 1993 QC package from Sept 17.

FH

Signed Laboratory Reports

for

Surface Water and Shallow Soil Samples

226577

SOUTHWESTERN DIVISION LABORATORY, CORPS OF ENGINEERS
4815 Cass Street
Dallas, Texas 75235

SUBMITTAL OF SWDED-GL REPORT 15728-4

PROJECT: CARSWELL AFB - FTW Feature: BASE SERVICE STATION	Contract No.
TEST REQUEST NO.: E87930087 Dated: 09 DECEMBER 1992 Received: 14 DECEMBER 1992	From: CHIEF, GEOTECHNICAL BRANCH

MATERIAL: Three soil samples, four water samples, one travel blank, one rinsate blank, one soil quality control sample, one soil quality assurance sample, one water quality control sample, and one water quality assurance sample.

Date Received: 25 October 1993

Remarks:

Report sent to: FORT WORTH DISTRICT	Copy furnished:

Date: NOV 29 1993	Name and title: STEPHEN L. BROOKS Acting Director SWD Laboratory	Signature Stephen Brooks

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226578

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-1
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : TB-1A 3-6706
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/L	<	10.0	µg/L
Bromomethane	10.0	µg/L	<	10.0	µg/L
Vinyl chloride	10.0	µg/L	<	10.0	µg/L
Chloroethane	10.0	µg/L	<	10.0	µg/L
Methylene chloride	5.0	µg/L	<	5.0	µg/L
Acetone	100	µg/L	<	100	µg/L
Carbon disulfide	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	<	5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	<	5.0	µg/L
Chloroform	5.0	µg/L	<	5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	<	5.0	µg/L
2-Butanone	50.0	µg/L	<	50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Carbon tetrachloride	5.0	µg/L	<	5.0	µg/L
Vinyl acetate	50.0	µg/L	<	50.0	µg/L

Inchcape Testing Services
NDRC Laboratories

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226579

REPORT NUMBER : D93-12122-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	95.4 %
Toluene-d8 (SS)	50.0 µg/L	104 %
Bromofluorobenzene (SS)	50.0 µg/L	98.6 %

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

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226580

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-1
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : TB-1A 3-6706
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 28-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/L

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Martin Jeffus
General Manager

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226581

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-5
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : EB-2A 3-6710
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	< 10 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	< 10 µg/L

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226582

REPORT NUMBER : D93-12122-5
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	90.3 %

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Martin Jeffus
General Manager

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226583

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-5
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : EB-2A 3-6710
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : DTR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-102693

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L
BTEX (total)		< 1.0 µg/L #

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene	50.0 µg/L	102 %

Based upon Good Laboratory Practice, the result is rounded to the appropriate number of significant figures.

NDRC Laboratories, Inc. Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
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226584

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-5
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : EB-2A 3-6710
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8020 /1
ANALYZED BY : DTR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 1
QC BATCH NO : 30-102693

METHYL TERTIARY BUTYL ETHER		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Methyl Tertiary Butyl Ether	10.0 µg/L	< 10.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
4-Bromofluorobenzene (SS)	50.0 µg/L	102 %

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Martin Jeffus
General Manager

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226585

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-5
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : EB-2A 3-6710
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

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Martin Jeffus
General Manager

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226586

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-5
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : EB-2A 3-6710
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

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Martin Jeffus
General Manager

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226587

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-6
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2A 3-6711
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/L	< 10.0 µg/L
Bromomethane	10.0 µg/L	< 10.0 µg/L
Vinyl chloride	10.0 µg/L	< 10.0 µg/L
Chloroethane	10.0 µg/L	< 10.0 µg/L
Methylene chloride	5.0 µg/L	< 5.0 µg/L
Acetone	100 µg/L	< 100 µg/L
Carbon disulfide	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethene	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethene	5.0 µg/L	< 5.0 µg/L
Chloroform	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethane	5.0 µg/L	< 5.0 µg/L
2-Butanone	50.0 µg/L	< 50.0 µg/L
1,1,1-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Carbon tetrachloride	5.0 µg/L	< 5.0 µg/L
Vinyl acetate	50.0 µg/L	< 50.0 µg/L

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226583

REPORT NUMBER : D93-12122-6
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	112 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	10.7 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	103 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	94.8 %
Toluene-d8 (SS)	50.0 µg/L	105 %
Bromofluorobenzene (SS)	50.0 µg/L	99.9 %

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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226583

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-6
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2A 3-6711
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methylbutane	2.22	VOA	350	µg/L
Pentane	2.51	VOA	100	µg/L
Methyl-t-butyl ether	4.18	VOA	420	µg/L
Methylcyclopentane	5.75	VOA	130	µg/L
Unknown alkane	7.50	VOA	66	µg/L
Pentene	3.78	VOA	240	µg/L
Methylethylbenzene	13.32	VOA	120	µg/L
Ethyl-methylbenzene	13.62	VOA	74	µg/L
Diisopropyl ether	5.10	VOA	180	µg/L
Cyclopropylbenzene	14.51	VOA	80	µg/L
Trimethylbenzene	14.28	VOA	65	µg/L

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Martin Jeffus
General Manager

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226590

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-6
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2A 3-6711
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	< 10 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	< 10 µg/L

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226591

REPORT NUMBER : D93-12122-6
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	83.9 %

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Martin Jeffus
General Manager

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226532

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-6
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2A 3-6711
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

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Martin Jeffus
General Manager

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Fax. 214-238-5592

226593

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-6
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2A 3-6711
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

NDRC Laboratories, Inc. Martin Jeffus

Martin Jeffus
General Manager

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226594

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-7
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2AQC 3-6712
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/L	< 10.0 µg/L
Bromomethane	10.0 µg/L	< 10.0 µg/L
Vinyl chloride	10.0 µg/L	< 10.0 µg/L
Chloroethane	10.0 µg/L	< 10.0 µg/L
Methylene chloride	5.0 µg/L	< 5.0 µg/L
Acetone	100 µg/L	< 100 µg/L
Carbon disulfide	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethene	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethene	5.0 µg/L	< 5.0 µg/L
Chloroform	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethane	5.0 µg/L	< 5.0 µg/L
2-Butanone	50.0 µg/L	< 50.0 µg/L
1,1,1-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Carbon tetrachloride	5.0 µg/L	< 5.0 µg/L
Vinyl acetate	50.0 µg/L	< 50.0 µg/L

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226595

REPORT NUMBER : D93-12122-7
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	5.0	µg/L	<	5.0	µg/L
1,2-Dichloropropane	5.0	µg/L	<	5.0	µg/L
cis-1,3-Dichloropropene	5.0	µg/L	<	5.0	µg/L
Trichloroethene	5.0	µg/L	<	5.0	µg/L
Chlorodibromomethane	5.0	µg/L	<	5.0	µg/L
1,1,2-Trichloroethane	5.0	µg/L	<	5.0	µg/L
Benzene	5.0	µg/L	<	5.0	µg/L
trans-1,3-Dichloropropene	5.0	µg/L	<	5.0	µg/L
Bromoform	5.0	µg/L	<	5.0	µg/L
2-Chloroethylvinyl ether	10.0	µg/L	<	10.0	µg/L
4-Methyl-2-pentanone	50.0	µg/L	<	50.0	µg/L
2-Hexanone	50.0	µg/L	<	50.0	µg/L
Tetrachloroethene	5.0	µg/L	<	5.0	µg/L
Toluene	5.0	µg/L		95.8	µg/L
1,1,2,2-Tetrachloroethane	5.0	µg/L	<	5.0	µg/L
Chlorobenzene	5.0	µg/L	<	5.0	µg/L
Ethylbenzene	5.0	µg/L		7.0	µg/L
Styrene	5.0	µg/L	<	5.0	µg/L
Xylenes	5.0	µg/L		88.3	µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/L	96.5	%
Toluene-d8 (SS)	50.0	µg/L	106	%
Bromofluorobenzene (SS)	50.0	µg/L	100	%

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

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Richardson, TX 75081
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226596

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-7
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2AQC 3-6712
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Methyl-t-butyl ether	4.17	VOA	400	µg/L
Diisopropyl ether	5.12	VOA	140	µg/L
Methylcyclopentane	5.75	VOA	92	µg/L
Unknown alkane	7.50	VOA	50	µg/L
Methylethylbenzene	13.31	VOA	100	µg/L
Trimethylbenzene	14.28	VOA	58	µg/L
Cyclopropylbenzene	14.51	VOA	69	µg/L
Pentene	3.78	VOA	170	µg/L
Ethyl-methylbenzene	13.62	VOA	65	µg/L
Methylbutane	2.22	VOA	240	µg/L
Pentane	2.51	VOA	65	µg/L

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226597

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-7
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2AQC 3-6712
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	10 µg/L	< 10 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	10 µg/L	< 10 µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226598

REPORT NUMBER : D93-12122-7
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	85.7 %

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226599

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-7
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2AQC 3-6712
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

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Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

22603

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-7
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-2AQC 3-6712
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.003 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226691

Project Name : _Carswell

Field Sample Number : _SW-2A/QA_
SWD Sample Number : _3-6713___

Matrix : _Aqueous__

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Date Sample Prepared : _11/04-05/93
Date Sample Analyzed : _11/04-05/93
Preparation Method : _8240-Low
Analytical Method : _8240____
Analyst : _CB/LS___
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9310-727-3
File name : _9310-727.B

COMPOUND	RESULTS UNITS:(ug/L)	PQL
Acetone	<100	100
Acrolein	<50	50
Acrylonitrile	<50	50
Benzene	73	5
Bromodichloromethane	<5	5
Bromoform	<5	5
Bromomethane	<5	5
Carbon Disulfide	<50	50
Carbon Tetrachloride	<5	5
Chlorobenzene	<5	5
Chlorodibromomethane	<5	5
Chloroethane	<5	5
2-Chloroethyl vinyl ether	<50	50
Chloroform	<5	5
Chloromethane	<5	5
Dibromomethane	<5	5
1,4-Dichloro-2-butene	<5	5
Dichlorodifluoromethane	<5	5
1,1-Dichloroethane	<5	5

COMPOUND	RESULTS UNITS:(ug/L)	PQL
1,2-Dichloroethane	<5	5
1,1-Dichloroethene	<5	5
trans-1,2-Dichloroethene	<5	5
1,2-Dichloropropane	<5	5
cis-1,3-Dichloropropene	<5	5
trans-1,3-Dichloropropene	<5	5
Ethylbenzene	6	5
Ethyl Methacrylate	<50	50
2-Hexanone(MBK)	<50	50
Iodomethane	<5	5
4-Methyl-2-pentanone (MIBK)	<50	50
Methylene Chloride	<20	20
2-Butanone(MEK)	<50	50
Styrene	<5	5
1,1,2,2-Tetrachloroethane	<5	5
Tetrachloroethene	<5	5
Toluene	82	5
1,1,1-Trichloroethane	<5	5
1,1,2-Trichloroethane	<5	5
Trichloroethene	<5	5
Trichlorofluoromethane	<5	5
1,2,3-Trichloropropane	<5	5
Vinyl Acetate	<50	50
Vinyl Chloride	<5	5
Xylenes (total)	103	5

Units: ug/L

SURROGATE STANDARDS	RESULT	EXP	%REC	QC LIMITS % RECOVERY
1,2-Dichloroethane-d4	52.2	50.0	104	76-114
Toluene-d8	47.3	50.0	95	88-110
4-Bromofluorobenzene	49.2	50.0	98	86-115

PQL - Practical Quantitation Limit

ORATORY MANAGER

1E

SAMPLE NO.

3-6713

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

226602

Lab Name: ENVIRONMENTAL TESTING & CONSULTING Contract: _____

ect No.: _____ Site: CARSWELL Location: SW-2A/QA Group: _____

Matrix: (soil/water) H2O Lab Sample ID: 9310-727-3

Sample wt/vol: _____ (g/mL) 10mL Lab File ID: V2110501

Level: (low/med) LOW Date Received: 10/28/93

% Moisture: not dec. _____ Date Analyzed: 11/5/93

GC Column: RESTEK 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 10 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 109-66-0	Pentane	3.07	49.2	50
2. 1630-94-0	1,1-Dimethylcyclopropane	3.58	35.9	90
3. 79-29-8	2,3-Dimethylbutane	4.48	41.7	86
4. 108-20-3	Diisopropyl ether	6.28	84	50
5. 96-37-7	Methylcyclopentane	7.58	58.5	86
6. 611-14-3	1-Ethyl-2-methylbenzene	19.95	52.5	95
7. 108-67-8	1,3,5-Trimethylbenzene	20.02	53.6	72
8. 611-14-3	1-Ethyl-2-methylbenzene	20.45	73.1	95
9. 620-14-4	1-Ethyl-3-methylbenzene	21.48	76.3	94
10. 36617-02-4	(2-Bromocyclopropyl)benzene	22.01	48.8	32
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226693

Project Name : _Carswell

Field Sample Number : _SW-2A/QA
SWD Sample Number : _3-6713

Matrix : _Aqueous__

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Date Sample Prepared : _11/01/93
Date Sample Analyzed : _11/01/93
Preparation Method : _9070___
Analytical Method : _418.1__
Analyst : _AJ_____

Contract Laboratory Sample Number : _9310-727-3
File Name : _9310-727.D

Analyte	Results Units:(mg/L)	PQL Units:(mg/L)
TPH	<1.0	1.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

S O U T H W E S T R E S E A R C H I N S T I T U T E

PAH Analysis Data Sheet

Lab Sample ID: 3-6713
Client Sample ID: 3-6713

Matrix: WATER
Reporting Units: uG/L

Sample Size: 1 L
Final Extract Volume: 1.0 mL

Client: ARMY CORPS OF ENGINEERS
Project No.: 01-5765-003
Date Received: 10/30/93
Date Analyzed: 11/08/93
Date Extracted: 11/03/93

Dilution Factor: 1

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	U	18.00	1.800
208-96-8	Acenaphthylene	U	23.00	2.300
83-32-9	Acenaphthene	U	18.00	1.800
86-73-7	Fluorene	U	2.10	0.210
85-01-8	Phenanthrene	U	6.40	0.640
120-12-7	Anthracene	U	6.60	0.660
206-44-0	Fluoranthene	U	2.10	0.210
129-00-0	Pyrene	U	2.70	0.270
56-55-3	Benzo(a)anthracene	U	0.13	0.013
218-01-9	Chyrsene	U	1.50	0.150
205-99-2	Benzo(b)fluoranthene	U	0.18	0.018
207-08-9	Benzo(k)fluoranthene	U	0.17	0.017
50-32-8	Benzo(a)pyrene	U	0.23	0.023
53-70-3	Dibenzo(ah)anthracene	U	0.30	0.030
191-24-2	Benzo(ghi)perylene	U	0.76	0.076
193-39-5	Indeno(123-cd)pyrene	U	0.43	0.043

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310

Surrogate recovery report for sample: 3-6713

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Limits Max.
p-Terphenyl	101	100	70%	135%

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Inorganic Analysis Data Sheet

22805

Project Name : _Carswell

Field Sample Number : _SW-2A/QA
SWD Sample Number : _3-6713

Matrix : _Aqueous__

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Contract Laboratory Sample Number : _9310-727-3
File Name : _9310-727.E

Element	Results Units:(mg/L)	DL	Date Analyzed	Method	Analyst	Dilution Factor
Lead	<0.001	0.001	11/11/93	7421	JF	1

DL - Detection Limit

Laboratory Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226696

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-3
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2A 3-6703
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA3-104

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/Kg	< 10.0 µg/Kg
Bromomethane	10.0 µg/Kg	< 10.0 µg/Kg
Vinyl chloride	10.0 µg/Kg	< 10.0 µg/Kg
Chloroethane	10.0 µg/Kg	< 10.0 µg/Kg
Methylene chloride	5.0 µg/Kg	< 5.0 µg/Kg
Acetone	100 µg/Kg	< 100 µg/Kg
Carbon disulfide	5.0 µg/Kg	< 5.0 µg/Kg
1,1-Dichloroethene	5.0 µg/Kg	< 5.0 µg/Kg
1,1-Dichloroethane	5.0 µg/Kg	< 5.0 µg/Kg
1,2-Dichloroethene	5.0 µg/Kg	< 5.0 µg/Kg
Chloroform	5.0 µg/Kg	< 5.0 µg/Kg
1,2-Dichloroethane	5.0 µg/Kg	< 5.0 µg/Kg
2-Butanone	50 µg/Kg	< 50 µg/Kg
1,1,1-Trichloroethane	5.0 µg/Kg	< 5.0 µg/Kg
Carbon tetrachloride	5.0 µg/Kg	< 5.0 µg/Kg
Vinyl acetate	50.0 µg/Kg	< 50.0 µg/Kg

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1089 E. Collins Blvd.
Richardson, TX 75081
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Fax. 214-238-5592

226697

REPORT NUMBER : D93-12127-3
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloropropane	5.0	µg/Kg	<	5.0	µg/Kg
cis-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Trichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chlorodibromomethane	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Benzene	5.0	µg/Kg	<	5.0	µg/Kg
trans-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Bromoform	5.0	µg/Kg	<	5.0	µg/Kg
2-Chloroethylvinyl ether	10.0	µg/Kg	<	10.0	µg/Kg
4-Methyl-2-pentanone	50.0	µg/Kg	<	50.0	µg/Kg
2-Hexanone	50.0	µg/Kg	<	50.0	µg/Kg
Tetrachloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Toluene	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Chlorobenzene	5.0	µg/Kg	<	5.0	µg/Kg
Ethylbenzene	5.0	µg/Kg	<	5.0	µg/Kg
Styrene	5.0	µg/Kg	<	5.0	µg/Kg
Xylenes	5.0	µg/Kg	<	5.0	µg/Kg

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/Kg	117	%
Toluene-d8 (SS)	50.0	µg/Kg	102	%
Bromofluorobenzene (SS)	50.0	µg/Kg	105	%

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226613

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-3
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2A 3-6703
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA3-104

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Trimethylpentane	9.42	VOA	47	µg/Kg
Unknown alkane	13.61	VOA	25	µg/Kg
Unknown alkane	13.94	VOA	63	µg/Kg
Unknown alkane	14.08	VOA	24	µg/Kg
Unknown alkane	14.22	VOA	66	µg/Kg
Unknown alkane	14.51	VOA	100	µg/Kg
Unknown alkane	14.75	VOA	39	µg/Kg
Unknown alkane	15.00	VOA	21	µg/Kg
Octahydro-methano-1H-indene	15.39	VOA	37	µg/Kg
Unknown alkane	15.80	VOA	82	µg/Kg
Unknown hydrocarbon	16.35	VOA	85	µg/Kg
Unknown alkanes (naphtha)	16.00	VOA	1200	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax 214-238-5592

22866J

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-3
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2A 3-6703
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3550
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 670
QC BATCH NO : 8310_3550_004

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	1210	µg/Kg	<	1210	µg/Kg
Acenaphthylene	1540	µg/Kg	<	1540	µg/Kg
Anthracene	442	µg/Kg		629	µg/Kg
Benzo(a)anthracene	8.7	µg/Kg		2040	µg/Kg
Benzo(b)fluoranthene	12.1	µg/Kg		1450	µg/Kg
Benzo(k)fluoranthene	11.4	µg/Kg	<	11.4	µg/Kg
Benzo(g,h,i)perylene	50.9	µg/Kg		1540	µg/Kg
Benzo(a)pyrene	15.4	µg/Kg		1580	µg/Kg
Chrysene	101	µg/Kg		2040	µg/Kg
Dibenz(a,h)anthracene	20.1	µg/Kg	<	20.1	µg/Kg
Fluoranthene	141	µg/Kg		6240	µg/Kg
Fluorene	141	µg/Kg	<	141	µg/Kg
Indeno(1,2,3-cd)pyrene	28.8	µg/Kg		665	µg/Kg
Naphthalene	1210	µg/Kg		3910	µg/Kg

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226610

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-4
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2AQC 3-6704
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA3-104

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/Kg	<	10.0	µg/Kg
Bromomethane	10.0	µg/Kg	<	10.0	µg/Kg
Vinyl chloride	10.0	µg/Kg	<	10.0	µg/Kg
Chloroethane	10.0	µg/Kg	<	10.0	µg/Kg
Methylene chloride	5.0	µg/Kg	<	5.0	µg/Kg
Acetone	100	µg/Kg	<	100	µg/Kg
Carbon disulfide	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chloroform	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
2-Butanone	50	µg/Kg	<	50	µg/Kg
1,1,1-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Carbon tetrachloride	5.0	µg/Kg	<	5.0	µg/Kg
Vinyl acetate	50.0	µg/Kg	<	50.0	µg/Kg

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226611

REPORT NUMBER : D93-12127-3
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Phenanthrene	429	µg/Kg	1780	µg/Kg
Pyrene	181	µg/Kg	3670	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226612

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-3
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2A 3-6703
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 30-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_027

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	110 mg/Kg

NDRC Laboratories, Inc. Martin Jeffs

Martin Jeffs
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226613

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-3
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2A 3-6703
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	10 mg/Kg	52 mg/Kg

Dilution Factor : 50
Prepared using EPA 3051 on 26-OCT-1993 by JK
Analyzed using EPA 7421 on 5-NOV-1993 by MES
QC Batch No : 6017

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226614

REPORT NUMBER : D93-12127-4
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloropropane	5.0	µg/Kg	<	5.0	µg/Kg
cis-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Trichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chlorodibromomethane	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Benzene	5.0	µg/Kg	<	5.0	µg/Kg
trans-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Bromoform	5.0	µg/Kg	<	5.0	µg/Kg
2-Chloroethylvinyl ether	10.0	µg/Kg	<	10.0	µg/Kg
4-Methyl-2-pentanone	50.0	µg/Kg	<	50.0	µg/Kg
2-Hexanone	50.0	µg/Kg	<	50.0	µg/Kg
Tetrachloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Toluene	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Chlorobenzene	5.0	µg/Kg	<	5.0	µg/Kg
Ethylbenzene	5.0	µg/Kg	<	5.0	µg/Kg
Styrene	5.0	µg/Kg	<	5.0	µg/Kg
Xylenes	5.0	µg/Kg	<	5.0	µg/Kg

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/Kg	117	%
Toluene-d8 (SS)	50.0	µg/Kg	101	%
Bromofluorobenzene (SS)	50.0	µg/Kg	93.7	%

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226615

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-4
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2AQC 3-6704
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA3-104

TENTATIVELY IDENTIFIED COMPOUNDS				
COMPOUND	RETENTION TIME	FRACTION	RESULT	
Unknown alkanes (naphtha)	15.20	VOA	100	µg/Kg
Dimethylhexane	7.64	VOA	120	µg/Kg
Propyl acetate	8.83	VOA	30	µg/Kg
Trimethylpentane	9.24	VOA	66	µg/Kg
Trimethylpentane	9.38	VOA	140	µg/Kg
Unknown alkane	14.19	VOA	17	µg/Kg
Unknown alkane	14.48	VOA	27	µg/Kg
Unknown aromatic	14.76	VOA	14	µg/Kg
Octahydromethano-1H-indene	15.35	VOA	87	µg/Kg
Unknown hydrocarbon	16.33	VOA	21	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226616

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-4
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2AQC 3-6704
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3550
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 670
QC BATCH NO : 8310_3550_004

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	1210	µg/Kg	<	1210	µg/Kg
Acenaphthylene	1540	µg/Kg	<	1540	µg/Kg
Anthracene	442	µg/Kg	<	442	µg/Kg
Benzo(a)anthracene	8.7	µg/Kg		769	µg/Kg
Benzo(b)fluoranthene	12.1	µg/Kg	<	12.1	µg/Kg
Benzo(k)fluoranthene	11.4	µg/Kg	<	11.4	µg/Kg
Benzo(g,h,i)perylene	50.9	µg/Kg		653	µg/Kg
Benzo(a)pyrene	15.4	µg/Kg		602	µg/Kg
Chrysene	101	µg/Kg		789	µg/Kg
Dibenz(a,h)anthracene	20.1	µg/Kg	<	20.1	µg/Kg
Fluoranthene	141	µg/Kg		2090	µg/Kg
Fluorene	141	µg/Kg	<	141	µg/Kg
Indeno(1,2,3-cd)pyrene	28.8	µg/Kg		240	µg/Kg
Naphthalene	1210	µg/Kg		1360	µg/Kg

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226617

REPORT NUMBER : D93-12127-4
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Phenanthrene	429	µg/Kg	530	µg/Kg
Pyrene	181	µg/Kg	1400	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226619

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-4
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2AQC 3-6704
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 30-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_026

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	210 mg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226619

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-4
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-2AQC 3-6704
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	10 mg/Kg	55 mg/Kg

Dilution Factor : 50
Prepared using EPA 3051 on 26-OCT-1993 by JK
Analyzed using EPA 7421 on 5-NOV-1993 by MES
QC Batch No : 6017

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Volatile Compounds
Organics Analysis Data Sheet

226620

ect Name : _Carswell

ield Sample Number : _SED-2AQA
SWD Sample Number : _3-6705

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Matrix : _Soil_____

Date Sample Prepared : _11/05/93
Date Sample Analyzed : _11/05/93
Preparation Method : _8240-Low
Analytical Method : _8240___
Analyst : _CB/LS___
Percent Solid : _52%____
Dilution Factor : _1_____

Contract Laboratory Sample Number : _9310-727-2
File Name : _9310-727.B

COMPOUND	RESULTS[1] UNITS:(ug/Kg)	PQL
cetone	<100	100
crolein	<50	50
Acrylonitrile	<50	50
enzene	<5	5
romodichloromethane	<5	5
Bromoform	<5	5
Bromomethane	<5	5
arbon Disulfide	<50	50
arbon Tetrachloride	<5	5
Chlorobenzene	<5	5
Chlorodibromomethane	<5	5
hloroethane	<5	5
oroethyl vinyl ether	<50	50
oform	<5	5
hloromethane	<5	5
ibromomethane	<5	5
,4-Dichloro-2-butene	<5	5
Dichlorodifluoromethane	<5	5
,1-Dichloroethane	<5	5

COMPOUND	RESULTS[1] UNITS:(ug/Kg)	PQL
1,2-Dichloroethane	<5	5
1,1-Dichloroethene	<5	5
trans-1,2-Dichloroethene	<5	5
1,2-Dichloropropane	<5	5
cis-1,3-Dichloropropene	<5	5
trans-1,3-Dichloropropene	<5	5
Ethylbenzene	<5	5
Ethyl Methacrylate	<50	50
2-Hexanone(MBK)	<50	50
Iodomethane	<5	5
4-Methyl-2-pentanone (MIBK)	<50	50
Methylene Chloride	<20	20
2-Butanone(MEK)	<50	50
Styrene	<5	5
1,1,2,2-Tetrachloroethane	<5	5
Tetrachloroethene	<5	5
Toluene	<5	5
1,1,1-Trichloroethane	<5	5
1,1,2-Trichloroethane	<5	5
Trichloroethene	<5	5
Trichlorofluoromethane	<5	5
1,2,3-Trichloropropane	<5	5
Vinyl Acetate	<50	50
Vinyl Chloride	<5	5
Xylenes (total)	<5	5

Units: ug/L

SURROGATE STANDARDS	RESULT	EXP	%REC	QC LIMITS % RECOVERY
1,2-Dichloroethane-d4	48.0	50.0	96	70-121
Toluene-d8	44.6	50.0	89	81-117
4-Bromofluorobenzene	43.6	50.0	87	74-121

PQL - Practical Quantitation Limit
1 - Results Reported As Dry Weight

TORY MANAGER

1E

SAMPLE NO.

3-6705

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

226621

Lab Name: ENVIRONMENTAL TESTING & CONSULTING Contract:

ıct No.: Site: CARSWELL Location: SED-2AQA Group:

Matrix: (soil/water) SOIL Lab Sample ID: 9310-727-2

Sample wt/vol: 10g (g/mL) 10mL Lab File ID: V2110501

Level: (low/med) LOW Date Received: 10/28/93

% Moisture: not dec. 48.5 Date Analyzed: 11/5/93

GC Column: RESTEK 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 15 Concentration Units: (ug/L or ug/Kg) ug/Kg

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 1070-87-7	2,2,4,4-Tetramethylpentane	10.07	176	59
2. 592-13-2	2,5-Dimethlyhexane	12.01	20.8	59
3. 565-75-3	2,3,4-Trimethylpentane	12.91	72.6	90
4. 560-21-4	2,3,3-Trimethylpentane	13.19	178	90
5. 3522-94-9	2,2,5-Trimethylhexane	13.84	24.2	72
6. 4248-77-5	Dimethanesulfonate 1,9-nonanedio	21.92	9.1	45
7. 53907-79-2	8-Thiabicyclo[5.1.0]octane	22.22	7.1	42
8. 6004-38-2	Octahydro-4,7-methano-1H-indede	23.01	81.3	87
9. 33649-79-5	2-Chlorobicyclo[2.2.2]octane	23.64	9.8	37
10. 1453-24-3	1-Ethylcyclohexene	24.29	6.9	47
11.				
12.				
13.				
14.				
15.				
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25.				
26.				
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28.				
29.				
30.				

226622

SOUTHWEST RESEARCH INSTITUTE

PAH Analysis Data Sheet

Lab Sample ID: 3-6705
Client Sample ID: 3-6705

Matrix: SOIL
Reporting Units: uG/kG

Sample Size: 30 G
Final Extract Volume: 10 mL
% Dry Weight: 73 %

Client: ARMY CORPS OF ENGINEERS
Project No.: 01-5765-003
Date Received: 10/30/93
Date Analyzed: 11/09/93
Date Extracted: 11/04/93

Dilution Factor: 1

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	U	16521	1.800
208-96-8	Acenaphthylene	*	21110	2.300
83-32-9	Acenaphthene	U	16521	1.800
86-73-7	Fluorene	U	1927	0.210
85-01-8	Phenanthrene	*	5874	0.640
[illegible]-12-7	Anthracene	*	6058	0.660
44-0	Fluoranthene	*	1927	0.210
[illegible]-00-0	Pyrene	U	2478	0.270
56-55-3	Benzo(a)anthracene	410	119	0.013
218-01-9	Chyrsene	1147	1377	0.150
205-99-2	Benzo(b)fluoranthene	354	165	0.018
207-08-9	Benzo(k)fluoranthene	U	156	0.017
50-32-8	Benzo(a)pyrene	*	211	0.023
53-70-3	Dibenzo(ah)anthracene	128 J	275	0.030
191-24-2	Benzo(ghi)perylene	505 J	698	0.076
193-39-5	Indeno(123-cd)pyrene	390	395	0.043

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
J - Estimated value
* SEE 1:10 DILUTION

Surrogate recovery report for sample: 3-6705

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Limits Max.
p-Terphenyl	220	118	70%	135%

226623

SOUTHWEST RESEARCH INSTITUTE

PAH Analysis Data Sheet

Lab Sample ID: 3-6705 1:10
Client Sample ID: 3-6705

Matrix: SOIL
Reporting Units: uG/kG

Sample Size: 30 G
Final Extract Volume: 10 mL
% Dry Weight: 73 %

Client: ARMY CORPS OF ENGINEERS
Project No.: 01-5765-003
Date Received: 10/30/93
Date Analyzed: 11/09/93
Date Extracted: 11/04/93

Dilution Factor: 10

CAS No.	Compound	Result	PQL	MDL
91-20-3	Naphthalene	U	165205	1.800
208-96-8	Acenaphthylene	670 J	211096	2.300
83-32-9	Acenaphthene	U	165205	1.800
86-73-7	Fluorene	U	19274	0.210
85-01-8	Phenanthrene	1030 J	58740	0.640
?-12-7	Anthracene	400 J	60575	0.660
-44-0	Fluoranthene	2450	19274	0.210
29-00-0	Pyrene	U	24781	0.270
56-55-3	Benzo(a)anthracene	*	1193	0.013
218-01-9	Chyrsene	*	13767	0.150
205-99-2	Benzo(b)fluoranthene	*	1652	0.018
207-08-9	Benzo(k)fluoranthene	U	1560	0.017
50-32-8	Benzo(a)pyrene	460	2111	0.023
53-70-3	Dibenzo(ah)anthracene	*	2753	0.030
191-24-2	Benzo(ghi)perylene	*	6975	0.076
193-39-5	Indeno(123-cd)pyrene	*	3947	0.043

U = undetected; not found above given detection limit
PQL - Practical Quantitation Limit per Method 8310
MDL - Method Detection Limit per Method 8310
J - Estimated value
* SEE 1:10 DILUTION

Surrogate recovery report for sample: 3-6705 1:10

Surrogate	Percent Recovery UV	Percent Recovery FLUOR.	Limits Min.	Limits Max.
p-Terphenyl	273	115	70%	135%

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Total Petroleum Hydrocarbons
Organics Analysis Data Sheet

226624

ct Name : _Carswell

Field Sample Number : _SED-2AQA
SWD Sample Number : _3-6705

Matrix : _Soil____

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Date Sample Prepared : _11/04/93
Date Sample Analyzed : _11/04/93
Preparation Method : _9071____
Analytical Method : _418.1___
Analyst : _AJ_____

Contract Laboratory Sample Number : _9310-727-2
File Name : _9310-727.D

Analyte	Results Units:(mg/Kg)	PQL Units:(mg/Kg)
TPH	231	30.0

PQL - Practical Quantitation Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING AND CONSULTING, INC.
Memphis, TN
Inorganic Analysis Data Sheet

226625

Project Name : _Carswell

Preparation Method : _3050___

Field Sample Number : _SED-2AQA
SWD Sample Number : _3-6705

Matrix : _Soil____

Date Sample Collected : _10/22/93
Date Sample Received : _10/28/93

Contract Laboratory Sample Number : _9310-727-2
File Name : _9310-727.E

Element	Results[1] Units:(mg/Kg)	DL	Date Analyzed	Method	Analyst	Dilution Factor
Lead	55.3	0.050	11/18/93	7421	JF	50

DL - Detection Limit
1 - Results based on Dry Weight

oratory Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226626

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-4
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-3A 3-6709
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/L	< 10.0 µg/L
Bromomethane	10.0 µg/L	< 10.0 µg/L
Vinyl chloride	10.0 µg/L	< 10.0 µg/L
Chloroethane	10.0 µg/L	< 10.0 µg/L
Methylene chloride	5.0 µg/L	< 5.0 µg/L
Acetone	100 µg/L	< 100 µg/L
Carbon disulfide	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethene	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethene	5.0 µg/L	< 5.0 µg/L
Chloroform	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethane	5.0 µg/L	< 5.0 µg/L
2-Butanone	50.0 µg/L	< 50.0 µg/L
1,1,1-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Carbon tetrachloride	5.0 µg/L	< 5.0 µg/L
Vinyl acetate	50.0 µg/L	< 50.0 µg/L

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226627

REPORT NUMBER : D93-12122-4
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	95.2 %
Toluene-d8 (SS)	50.0 µg/L	104 %
Bromofluorobenzene (SS)	50.0 µg/L	98.5 %

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Martin Jeffus
General Manager

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226628

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-4
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-3A 3-6709
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/L

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Martin Jeffus
General Manager

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226629

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-4
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-3A 3-6709
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 20
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	36 µg/L	< 36 µg/L
Acenaphthylene	20 µg/L	< 20 µg/L
Anthracene	13.2 µg/L	< 13.2 µg/L
Benzo(a)anthracene	0.26 µg/L	< 0.26 µg/L
Benzo(b)fluoranthene	0.36 µg/L	< 0.36 µg/L
Benzo(k)fluoranthene	0.34 µg/L	< 0.34 µg/L
Benzo(g,h,i)perylene	1.52 µg/L	< 1.52 µg/L
Benzo(a)pyrene	0.46 µg/L	< 0.46 µg/L
Chrysene	3.0 µg/L	< 3.0 µg/L
Dibenzo(a,h)anthracene	0.60 µg/L	< 0.60 µg/L
Fluoranthene	4.2 µg/L	< 4.2 µg/L
Fluorene	4.2 µg/L	< 4.2 µg/L
Indeno(1,2,3-cd)pyrene	0.86 ug/L	< 0.86 ug/L
Naphthalene	20 µg/L	< 20 µg/L

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226630

REPORT NUMBER : D93-12122-4
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	12.8 µg/L	< 12.8 µg/L
Pyrene	5.4 µg/L	< 5.4 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	83.2 %

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Martin Jeffus
General Manager

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226631

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-4
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-3A 3-6709
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

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Martin Jeffus
General Manager

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Richardson, TX 75081
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226632

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-4
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-3A 3-6709
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

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Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226633

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-2
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-4A 3-6702
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA3-104

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/Kg	<	10.0	µg/Kg
Bromomethane	10.0	µg/Kg	<	10.0	µg/Kg
Vinyl chloride	10.0	µg/Kg	<	10.0	µg/Kg
Chloroethane	10.0	µg/Kg	<	10.0	µg/Kg
Methylene chloride	5.0	µg/Kg	<	5.0	µg/Kg
Acetone	100	µg/Kg	<	100	µg/Kg
Carbon disulfide	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chloroform	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
2-Butanone	50	µg/Kg	<	50	µg/Kg
1,1,1-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Carbon tetrachloride	5.0	µg/Kg	<	5.0	µg/Kg
Vinyl acetate	50.0	µg/Kg	<	50.0	µg/Kg

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Richardson, TX 75081
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Fax. 214-238-5592

226634

REPORT NUMBER : D93-12127-2
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloropropane	5.0	µg/Kg	<	5.0	µg/Kg
cis-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Trichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chlorodibromomethane	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Benzene	5.0	µg/Kg	<	5.0	µg/Kg
trans-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Bromoform	5.0	µg/Kg	<	5.0	µg/Kg
2-Chloroethylvinyl ether	10.0	µg/Kg	<	10.0	µg/Kg
4-Methyl-2-pentanone	50.0	µg/Kg	<	50.0	µg/Kg
2-Hexanone	50.0	µg/Kg	<	50.0	µg/Kg
Tetrachloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Toluene	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Chlorobenzene	5.0	µg/Kg	<	5.0	µg/Kg
Ethylbenzene	5.0	µg/Kg	<	5.0	µg/Kg
Styrene	5.0	µg/Kg	<	5.0	µg/Kg
Xylenes	5.0	µg/Kg	<	5.0	µg/Kg

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/Kg	114	%
Toluene-d8 (SS)	50.0	µg/Kg	103	%
Bromofluorobenzene (SS)	50.0	µg/Kg	90.0	%

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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Richardson, TX 75081
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226635

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-3
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-4A 3-6708
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Chloromethane	10.0	µg/L	< 10.0	µg/L
Bromomethane	10.0	µg/L	< 10.0	µg/L
Vinyl chloride	10.0	µg/L	< 10.0	µg/L
Chloroethane	10.0	µg/L	< 10.0	µg/L
Methylene chloride	5.0	µg/L	< 5.0	µg/L
Acetone	100	µg/L	< 100	µg/L
Carbon disulfide	5.0	µg/L	< 5.0	µg/L
1,1-Dichloroethene	5.0	µg/L	< 5.0	µg/L
1,1-Dichloroethane	5.0	µg/L	< 5.0	µg/L
1,2-Dichloroethene	5.0	µg/L	< 5.0	µg/L
Chloroform	5.0	µg/L	< 5.0	µg/L
1,2-Dichloroethane	5.0	µg/L	< 5.0	µg/L
2-Butanone	50.0	µg/L	< 50.0	µg/L
1,1,1-Trichloroethane	5.0	µg/L	< 5.0	µg/L
Carbon tetrachloride	5.0	µg/L	< 5.0	µg/L
Vinyl acetate	50.0	µg/L	< 50.0	µg/L

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226636

REPORT NUMBER : D93-12122-3
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	97.0 %
Toluene-d8 (SS)	50.0 µg/L	103 %
Bromofluorobenzene (SS)	50.0 µg/L	99.8 %

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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226637

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-3
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-4A 3-6708
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/L

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Martin Jeffus
General Manager

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226638

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-3
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-4A 3-6708
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Acenaphthene	18	µg/L	<	18	µg/L
Acenaphthylene	10	µg/L	<	10	µg/L
Anthracene	6.6	µg/L	<	6.6	µg/L
Benzo(a)anthracene	0.13	µg/L	<	0.13	µg/L
Benzo(b)fluoranthene	0.18	µg/L	<	0.18	µg/L
Benzo(k)fluoranthene	0.17	µg/L	<	0.17	µg/L
Benzo(g,h,i)perylene	0.76	µg/L	<	0.76	µg/L
Benzo(a)pyrene	0.23	µg/L	<	0.23	µg/L
Chrysene	1.5	µg/L	<	1.5	µg/L
Dibenzo(a,h)anthracene	0.30	µg/L	<	0.30	µg/L
Fluoranthene	2.1	µg/L	<	2.1	µg/L
Fluorene	2.1	µg/L	<	2.1	µg/L
Indeno(1,2,3-cd)pyrene	0.43	ug/L	<	0.43	ug/L
Naphthalene	10	µg/L	<	10	µg/L

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226639

REPORT NUMBER : D93-12122-3
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	83.9 %

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226640

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-3
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-4A 3-6708
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

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Martin Jeffus
General Manager

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Fax. 214-258-5592

226641

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-3
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-4A 3-6708
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	0.002 mg/L	< 0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226642

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-2
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-4A 3-6702
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA3-104

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/Kg

NDRC Laboratories, Inc. Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

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Tel. 214-238-5591
Fax. 214-238-5592

226643

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-2
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-4A 3-6702
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3550
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 670
QC BATCH NO : 8310_3550_004

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Acenaphthene	1210	µg/Kg	4340	µg/Kg
Acenaphthylene	1540	µg/Kg	< 1540	µg/Kg
Anthracene	442	µg/Kg	506	µg/Kg
Benzo(a)anthracene	8.7	µg/Kg	2630	µg/Kg
Benzo(b)fluoranthene	12.1	µg/Kg	2500	µg/Kg
Benzo(k)fluoranthene	11.4	µg/Kg	1840	µg/Kg
Benzo(g,h,i)perylene	50.9	µg/Kg	2420	µg/Kg
Benzo(a)pyrene	15.4	µg/Kg	2570	µg/Kg
Chrysene	101	µg/Kg	2740	µg/Kg
Dibenz(a,h)anthracene	20.1	µg/Kg	< 20.1	µg/Kg
Fluoranthene	141	µg/Kg	4150	µg/Kg
Fluorene	141	µg/Kg	< 141	µg/Kg
Indeno(1,2,3-cd)pyrene	28.8	µg/Kg	1390	µg/Kg
Naphthalene	1210	µg/Kg	2190	µg/Kg

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NDRC Laboratories

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Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226644

REPORT NUMBER : D93-12127-2
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Phenanthrene	429	µg/Kg	994	µg/Kg
Pyrene	181	µg/Kg	4340	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226645

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-2
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-4A 3-6702
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 30-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_027

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	65 mg/Kg

NDRC Laboratories, Inc. Martin Jeffus

Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226646

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-2
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-4A 3-6702
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	2 mg/Kg	35 mg/Kg

Dilution Factor : 10
Prepared using EPA 3051 on 26-OCT-1993 by JK
Analyzed using EPA 7421 on 5-NOV-1993 by MES
QC Batch No : 6017

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
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Fax. 214-238-5592

226647

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-2
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-5A 3-6707
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA1-101

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Chloromethane	10.0 µg/L	< 10.0 µg/L
Bromomethane	10.0 µg/L	< 10.0 µg/L
Vinyl chloride	10.0 µg/L	< 10.0 µg/L
Chloroethane	10.0 µg/L	< 10.0 µg/L
Methylene chloride	5.0 µg/L	< 5.0 µg/L
Acetone	100 µg/L	< 100 µg/L
Carbon disulfide	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethene	5.0 µg/L	< 5.0 µg/L
1,1-Dichloroethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethene	5.0 µg/L	< 5.0 µg/L
Chloroform	5.0 µg/L	< 5.0 µg/L
1,2-Dichloroethane	5.0 µg/L	< 5.0 µg/L
2-Butanone	50.0 µg/L	< 50.0 µg/L
1,1,1-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Carbon tetrachloride	5.0 µg/L	< 5.0 µg/L
Vinyl acetate	50.0 µg/L	< 50.0 µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax 214-258-5592

226648

REPORT NUMBER : D93-12122-2
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Bromodichloromethane	5.0 µg/L	< 5.0 µg/L
1,2-Dichloropropane	5.0 µg/L	< 5.0 µg/L
cis-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Trichloroethene	5.0 µg/L	< 5.0 µg/L
Chlorodibromomethane	5.0 µg/L	< 5.0 µg/L
1,1,2-Trichloroethane	5.0 µg/L	< 5.0 µg/L
Benzene	5.0 µg/L	< 5.0 µg/L
trans-1,3-Dichloropropene	5.0 µg/L	< 5.0 µg/L
Bromoform	5.0 µg/L	< 5.0 µg/L
2-Chloroethylvinyl ether	10.0 µg/L	< 10.0 µg/L
4-Methyl-2-pentanone	50.0 µg/L	< 50.0 µg/L
2-Hexanone	50.0 µg/L	< 50.0 µg/L
Tetrachloroethene	5.0 µg/L	< 5.0 µg/L
Toluene	5.0 µg/L	< 5.0 µg/L
1,1,2,2-Tetrachloroethane	5.0 µg/L	< 5.0 µg/L
Chlorobenzene	5.0 µg/L	< 5.0 µg/L
Ethylbenzene	5.0 µg/L	< 5.0 µg/L
Styrene	5.0 µg/L	< 5.0 µg/L
Xylenes	5.0 µg/L	< 5.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1,2-Dichloroethane-d4 (SS)	50.0 µg/L	95.2 %
Toluene-d8 (SS)	50.0 µg/L	103 %
Bromofluorobenzene (SS)	50.0 µg/L	97.0 %

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226649

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-2
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-5A 3-6707
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : BSR
ANALYZED ON : 29-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA1-101

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/L

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Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226650

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-2
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-5A 3-6707
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3520
PREPARED BY : CLT
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 29-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 10
QC BATCH NO : 8310_3520_002

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Acenaphthene	18 µg/L	< 18 µg/L
Acenaphthylene	23 µg/L	< 23 µg/L
Anthracene	6.6 µg/L	< 6.6 µg/L
Benzo(a)anthracene	0.13 µg/L	< 0.13 µg/L
Benzo(b)fluoranthene	0.18 µg/L	< 0.18 µg/L
Benzo(k)fluoranthene	0.17 µg/L	< 0.17 µg/L
Benzo(g,h,i)perylene	0.76 µg/L	< 0.76 µg/L
Benzo(a)pyrene	0.23 µg/L	< 0.23 µg/L
Chrysene	1.5 µg/L	< 1.5 µg/L
Dibenzo(a,h)anthracene	0.30 µg/L	< 0.30 µg/L
Fluoranthene	2.1 µg/L	< 2.1 µg/L
Fluorene	2.1 µg/L	< 2.1 µg/L
Indeno(1,2,3-cd)pyrene	0.43 ug/L	< 0.43 ug/L
Naphthalene	18 µg/L	< 18 µg/L

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226651

REPORT NUMBER : D93-12122-2
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Phenanthrene	6.4 µg/L	< 6.4 µg/L
Pyrene	2.7 µg/L	< 2.7 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
1-Fluoronapthalene (SS)	100 mg/L	87.9 %

NDRC Laboratories, Inc. Martin Jeffus dn
Martin Jeffus
General Manager

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226652

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-2
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-5A 3-6707
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 28-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : L23-10

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	0.5 mg/L	< 0.5 mg/L

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226053

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12122-2
REPORT DATE : 6-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Liquid
ID MARKS : SW-5A 3-6707
: Base Service Station
PROJECT : Carswell (3-6706-6712)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Lead /1	0.002 mg/L	0.002 mg/L

Dilution Factor : 1
Prepared using EPA 3015 on 26-OCT-1993 by CEL
Analyzed using EPA 7421 on 4-NOV-1993 by AH
QC Batch No : 5941

NDRC Laboratories, Inc. Martin Jeffus dm

Martin Jeffus
General Manager

Inchcape Testing Services
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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226654

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-1
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-5A 3-6701
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYSIS METHOD : EPA 8240 /1
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : VOA3-104

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Chloromethane	10.0	µg/Kg	<	10.0	µg/Kg
Bromomethane	10.0	µg/Kg	<	10.0	µg/Kg
Vinyl chloride	10.0	µg/Kg	<	10.0	µg/Kg
Chloroethane	10.0	µg/Kg	<	10.0	µg/Kg
Methylene chloride	5.0	µg/Kg	<	5.0	µg/Kg
Acetone	100	µg/Kg	<	100	µg/Kg
Carbon disulfide	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
1,1-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chloroform	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
2-Butanone	50	µg/Kg	<	50	µg/Kg
1,1,1-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Carbon tetrachloride	5.0	µg/Kg	<	5.0	µg/Kg
Vinyl acetate	50.0	µg/Kg	<	50.0	µg/Kg

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226655

REPORT NUMBER : D93-12127-1
ANALYSIS METHOD : EPA 8240 /1

VOLATILE ORGANICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Bromodichloromethane	5.0	µg/Kg	<	5.0	µg/Kg
1,2-Dichloropropane	5.0	µg/Kg	<	5.0	µg/Kg
cis-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Trichloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Chlorodibromomethane	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2-Trichloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Benzene	5.0	µg/Kg	<	5.0	µg/Kg
trans-1,3-Dichloropropene	5.0	µg/Kg	<	5.0	µg/Kg
Bromoform	5.0	µg/Kg	<	5.0	µg/Kg
2-Chloroethylvinyl ether	10.0	µg/Kg	<	10.0	µg/Kg
4-Methyl-2-pentanone	50.0	µg/Kg	<	50.0	µg/Kg
2-Hexanone	50.0	µg/Kg	<	50.0	µg/Kg
Tetrachloroethene	5.0	µg/Kg	<	5.0	µg/Kg
Toluene	5.0	µg/Kg	<	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	5.0	µg/Kg	<	5.0	µg/Kg
Chlorobenzene	5.0	µg/Kg	<	5.0	µg/Kg
Ethylbenzene	5.0	µg/Kg	<	5.0	µg/Kg
Styrene	5.0	µg/Kg	<	5.0	µg/Kg
Xylenes	5.0	µg/Kg	<	5.0	µg/Kg

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL		SPIKE RECOVERED	
1,2-Dichloroethane-d4 (SS)	50.0	µg/Kg	112	%
Toluene-d8 (SS)	50.0	µg/Kg	93.9	%
Bromofluorobenzene (SS)	50.0	µg/Kg	100	%

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Inchcape Testing Services
NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-258-5591
Fax. 214-258-5592

226656

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-1
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-5A 3-6701
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
ANALYZED BY : JKA
ANALYZED ON : 27-OCT-1993
ANALYSIS METHOD : EPA 624/8240 /1
QC BATCH NO : VOA3-104

TENTATIVELY IDENTIFIED COMPOUNDS			
COMPOUND	RETENTION TIME	FRACTION	RESULT
No compounds detected		VOA	< 10 µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226657

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-1
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-5A 3-6701
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 3550
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 8310 /1
ANALYZED BY : PJR
ANALYZED ON : 26-OCT-1993
DILUTION FACTOR : 1
METHOD FACTOR : 670
QC BATCH NO : 8310_3550_004

POLYNUCLEAR AROMATIC HYDROCARBONS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Acenaphthene	1210	µg/Kg	< 1210	µg/Kg
Acenaphthylene	1540	µg/Kg	< 1540	µg/Kg
Anthracene	442	µg/Kg	< 442	µg/Kg
Benzo(a)anthracene	8.7	µg/Kg	< 8.7	µg/Kg
Benzo(b)fluoranthene	12.1	µg/Kg	< 12.1	µg/Kg
Benzo(k)fluoranthene	11.4	µg/Kg	< 11.4	µg/Kg
Benzo(g,h,i)perylene	50.9	µg/Kg	< 50.9	µg/Kg
Benzo(a)pyrene	15.4	µg/Kg	< 15.4	µg/Kg
Chrysene	101	µg/Kg	< 101	µg/Kg
Dibenz(a,h)anthracene	20.1	µg/Kg	< 20.1	µg/Kg
Fluoranthene	141	µg/Kg	< 141	µg/Kg
Fluorene	141	µg/Kg	< 141	µg/Kg
Indeno(1,2,3-cd)pyrene	28.8	µg/Kg	< 28.8	µg/Kg
Naphthalene	1210	µg/Kg	< 1210	µg/Kg

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
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226658

REPORT NUMBER : D93-12127-1
ANALYSIS METHOD : EPA 8310 /1

POLYNUCLEAR AROMATIC HYDROCARBONS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Phenanthrene	429	µg/Kg	<	429	µg/Kg
Pyrene	181	µg/Kg	<	181	µg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226659

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-1
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-5A 3-6701
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993
PREPARATION METHOD : EPA 9071
PREPARED BY : YC
PREPARED ON : 26-OCT-1993
ANALYSIS METHOD : EPA 418.1 /1
ANALYZED BY : MTR
ANALYZED ON : 30-OCT-1993
DILUTION FACTOR : 1
QC BATCH NO : 9071_3540_027

TOTAL RECOVERABLE PETROLEUM HYDROCARBON		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbon	10 mg/Kg	< 10 mg/Kg

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

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NDRC Laboratories

1089 E. Collins Blvd.
Richardson, TX 75081
Tel. 214-238-5591
Fax. 214-238-5592

226660

DATE RECEIVED : 25-OCT-1993

REPORT NUMBER : D93-12127-1
REPORT DATE : 9-NOV-1993

SAMPLE SUBMITTED BY : US Army Corps of Engineers
ADDRESS : 4815 Cass St.
: Dallas, TX 75235-8011
ATTENTION : Ms. Janice Stewart

SAMPLE MATRIX : Soil
ID MARKS : SED-5A 3-6701
: Base Service Station
PROJECT : Carswell (3-6701-6704)
DATE SAMPLED : 22-OCT-1993

TOTAL METALS			
TEST REQUESTED		DETECTION LIMIT	RESULTS
Lead	/1	10 mg/Kg	64 mg/Kg

Dilution Factor : 50
Prepared using EPA 3051 on 26-OCT-1993 by JK
Analyzed using EPA 7421 on 5-NOV-1993 by MES
QC Batch No : 6017

NDRC Laboratories, Inc. Martin Jeffus dm
Martin Jeffus
General Manager

Chain of Custody Forms

for

Surface Water and Shallow Soil Samples

MIPR# E87930087	CHEST# C-92	C/SEAL# C-92-1022

226662

CHAIN OF CUSTODY
TRAVEL BLANKS

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 10-22-93 Time: 0900

Site: Base Service Station Sample No. TB-1A

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

Analysis Requested: VOLATILE ORGANICS EPA Method 8240

Water Source: Distilled Water

Signature of Sampler: Beverly Post

SAMPLES CONTAINED IN THIS COOLER

No. of Vials	Sample Number	SWD Lab Number
3	TB-1A	3-6766
	Total No. of Vials Shipped	

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Beverly Post		10-22-93	1015
	Linda Smith	102593	0830

MIPR# E87930087	SWD LAB# 3-6705	CHEST# C-15	TEMP.

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

226663

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 1000
Site: Base Service Station	Sample No. SED-2A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-2A	1 ft			4	C-15-1022

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method	*
	VOC	8240	{2}
	TRPH and Pb	418.1 & 7421	[1]
	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dingsdale		10-22	
	Randy Smith	25OCT93	0850

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226664

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB#36704	CHEST# C-15	TEMP.

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

226665

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 1000
Site: Base Service Station	Sample No. SED-2AQC
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-2AQC	1ft			4	C-15-1022

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method	*
	VOC	8240	{2}
	TRPH and Pb	418.1 & 7421	[1]
	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Beverly Post		10-22-93	1215
	Rudy Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP. 225665

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6705	CHEST# C-15	TEMP.

226667

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 1000
Site: Base Service Station	Sample No. SED-2AQA
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-2AQA	1 ft			4	C-15-1022

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method	*
	VOC	8240	{2}
	TRPH and Pb	418.1 & 7421	[1]
	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		10-22	
	[signature]	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226668

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6711	CHEST# C-73	TEMP.

226669

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 0930
Site: Base Service Station	Sample No. SW-2A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-73	C-73-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (Chest - C-92)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Beverly Post		10-22-93	1210
	Paula Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

225670

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6712	CHEST# C-15	TEMP.

226671

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 10-22-93 Time: 1000

Site: Base Service Station Sample No. SW-2AQC

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-15	C-15-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (Chest C-92)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dryadah		10-22	
	Randy Smith	25 Oct 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

226672

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6713	CHEST# C-15	TEMP.

226673

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE Date: 10-22-93 Time: 1000

Site: Base Service Station Sample No. SW-2AQA

Technical Mgr.: Deborah Fitzgerald Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-15	C-15-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (Chest C-12)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dugdale		10-22	
	Randy Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226674

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6710	CHEST# C-73	TEMP.

226675

CHAIN OF CUSTODY
RINSATE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 0911
Site: Base Service Station	Sample No. EB-2A
Technical Mgr.: Deborah Fitzgerald	Phone No. 817-334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-73	C-73-1022

* LEGEND: [] = 1L Plastic () = 1L Amber glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	BTEX/MTBE ((Not -9))	8020	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Lead	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
Beverly Post		10-22-93	1215
	Randy Smith	25 OCT 93	0830

MIPR# E87930087	SWD LAB# 3-6709	CHEST# C-92	TEMP.

226676

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 1100
Site: Base Service Station	Sample No. SW-3A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1	3	C-92	C-92-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (Chest C-92)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
[signature]		10-22	
	[signature]	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226677

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6702	CHEST# C-97	TEMP.

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

226678

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 1115
Site: Base Service Station	Sample No. SED-4A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-4A				4	C-97-1022

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method	*
	VOC	8240	{2}
	TRPH and Pb	418.1 & 7421	[1]
	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dugdale		10-22	
	Ronda Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226679

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6708	CHEST# C-97	TEMP.

226680

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 11:15
Site: Base Service Station	Sample No. SW-4A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-97	C-97-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (Chest C-92)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dryedale		10-22	
	Randy Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

CHAIN OF CUSTODY PAGE 2 OF 2 226681
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-6701	CHEST# C-97	TEMP.

CHAIN OF CUSTODY PAGE 1 OF 2
SOIL SAMPLES

226682

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 11:45
Site: Base Service Station	Sample No. SED-5A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

4 Jars per Sample	Sample No. & Depths				Total Jars	C/Seal No.
	SED-5A				4	C-97-1022
	1 gt					

* LEGEND: [] = 1/2L Jar {2} = 125ml Jar

PARAMETERS

	Parameter	Test Method	*
	VOC	8240	{2}
	TRPH and Pb	418.1 & 7421	[1]
	PAH	8310	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Ingsdale		10-22	
	Randy Smith	25 Oct 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

226683

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

MIPR# E87930087	SWD LAB# 3-677	CHEST# C-97	TEMP.

226684

CHAIN OF CUSTODY
SURFACE WATER SAMPLES

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, Texas

Location: CARSWELL AIR FORCE BASE	Date: 10-22-93 Time: 11:45
Site: Base Service Station	Sample No. SW-5A
Technical Mgr.: Deborah Fitzgerald	Phone No. (817) 334-3221

CONTAINERS

Glass	Plastic	Vial	Chest No.	Custody Seal
3	1		C-97	C-97-1022

* LEGEND: [] = 1L Plastic () = 1L Amber Glass {} = 40ML Vial

PARAMETERS

	Parameter	Test Method	*
	VOC (C-92)	8240	{3}
	TRPH	418.1	(2)
	PAH	8310	(1)
	Pb	7421	[1]

CUSTODY RECORD

Relinquished by	Received by	Date	Time
J. Dugdale		10-22	
	Randy Smith	25 OCT 93	0830

MIPR# E87920309	SWD LAB#	CHEST#	TEMP.

226685

CHAIN OF CUSTODY PAGE 2 OF 2
REQUIRED DETECTION LIMITS (DL's)

U.S. Army Corps of Engineers
Fort Worth District, Fort Worth, TX.

PARAMETER	**TEST METHOD**	**DL's (WATER)** (ug/L)	**DL's (SOIL)** (mg/Kg)	**DL's (TCLP)** (ug/L)
Arsenic	7060	10	0.2	100
Barium	6010	10.0	1.0	100
Cadmium	7131	1	0.5	100
Chromium	6010	50	1.0	500
Lead	7421	10	1.0	200
Mercury	7471	0.2	0.01	10
Nickel	6010	50	1.0	200
Selenium	7740	20	0.1	100
Silver	6010	10.0	1.0	100
Zinc	6010	20	1.0	100

NOTE: If TCLP analysis is required, add **test method 1311** to the other test methods.

QA/QC Report

for

Surface Water and Shallow Soil Samples

U.S. ARMY CORPS OF ENGINEERS
Southwestern Division Laboratory
Environmental Services Section
4815 Cass Street
Dallas, Texas 75235
214/905-9130

226687

CASE NARRATIVE

Three soil samples, four water samples, one travel blank, one rinsate blank, one soil quality control sample, one soil quality assurance sample, one water quality control sample and one water quality assurance sample arrived at Southwestern Division Laboratory on 25 October 1993 from Carswell AFB. The samples arrived in good condition and with complete chain of custodies. The analyses for the field samples, trip blanks, quality control samples and rinsate blanks were contracted out to a Corps of Engineers' validated laboratory, NDRC Laboratories, Inc. The polynuclear aromatic hydrocarbons (PAH) analyses for the quality assurance samples were contracted out to a Corps of Engineers' validated laboratory, Southwest Research Institute. All other analyses for the quality assurance samples were contracted out to a Corps of Engineers' validated laboratory, Environmental Testing and Consulting, Inc.

The data package from NDRC Laboratories, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods within proper holding times. All matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions.

- For samples 6701-6704, the MS/MSD recoveries for lead were outside of control limits due to the high concentration of the analyte. Acceptable LCS recoveries validated the data.

The method blanks were all free of contamination.

The data package from Environmental Testing and Consulting, Inc. was received complete with all required internal quality control information. All analyses were performed using specified methods and within proper holding times. The volatile organic analysis for sample 3-6705 was rerun to double check the concentration of methylene chloride. The concentration was determined to be less than the detection limit. All duplicates, matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions.

- For sample 3-6705, the MS/MSD recoveries for lead were outside of control limits due to matrix interference. An acceptable LCS recovery validated the data.
- No MSD was run for for TPH due to insufficient amount of sample for sample 3-6713. Acceptable MS and LCS recoveries validated the data.
- For sample 3-6705, MS was outside of control limits for VOA for methyl ethyl ketone, tetrachloroethene and 1,4-chloroethyl vinyl ether. Acceptable LCS recoveries validated the data.

- For sample 3-6713, MS was outside of control limits for VOA for 2-chloroethyl vinyl ether, methylene chloride and 1,1,2,2-tetrachloroethane. Acceptable LCS recoveries validated the data.

All method blanks were free of contamination.

The data package from Southwest Research Institute was received complete with all required internal quality control information. All analyses were performed using specified methods and within proper holding times. All duplicates, matrix spike, surrogate and laboratory control recoveries were within control limits with the following exceptions.

- MS/MSD outside of control limits for anthracene, chrysene, naphthalene, acenaphthene and benzo(a)pyrene for PAH for sample 3-6705.
- For sample 3-6713, there was insufficient sample for a matrix spike/matrix spike duplicate so a blank spike/blank spike duplicate was performed instead.
- The blank spike was outside of control limits for anthracene for sample 3-6713. An acceptable LCS recovery validated the data.

All method blanks appear to have been free of contamination.

Following is a synopsis of the quality assurance samples and their related QC and field samples:

Customer Sample No.: SED-2A, SED-2A QC, SED-2A QA
SWD Lab Sample No.: 3-6703, 3-6704, 3-6705

Parameter	Field	QC	QA	Units	Comment
Lead	52	55	55.3	mg/Kg	Agree
VOA	No Hits 12 TICs	No Hits 10 TICs	No Hits 10 TICs	µg/Kg	Agree
PAH:					
anthracene	629	<442	400	µg/Kg	Agree
benzo(a)anthracene	2040	769	410	µg/Kg	Agree
benzo(b)fluor-anthene	1450	< 12.1	354	µg/Kg	Disag
benzo(g,h,i)-perylene	1540	653	505	µg/Kg	Agree
benzo(a)pyrene	1580	602	460	µg/Kg	Agree
chrysene	2040	789	1147	µg/Kg	Agree
fluoranthene	6240	2090	2450	µg/Kg	Agree
indeno(1,2,3-cd)-pyrene	665	240	390	µg/Kg	Agree
naphthalene	3910	1360	<165205	µg/Kg	Agree
phenanthrene	1780	530	1030	µg/Kg	Agree
pyrene	3670	1400	<24781	µg/Kg	Agree
dibenzo(a,h)-anthracene	< 20.1	< 20.1	128	µg/Kg	Disag
acenaphthylene	<1540	<1540	670	µg/Kg	Agree
TRPH	110	210	30	mg/Kg	Disag

226690

Following is a synopsis of the quality assurance samples and their related QC and field samples:

Customer Sample No.: SW-2A, SW-2A QC, SW-2A QA
SWD Lab Sample No.: 3-6711, 3-6712, 3-6713

Parameter	Field	QC	QA	Units	Comment
Lead	0.002	0.003	< 0.001	mg/L	Agree
VOA:					
toluene	112	95.8	82	µg/L	Agree
ethylbenzene	10.7	7.0	6	µg/L	Agree
xylenes	103	88.3	103	µg/L	Agree
benzene	< 5.0	< 5.0	73	µg/L	Disag
	11 TICS	11 TICs	10 TICs		
PAH	No Hits	No Hits	No Hits	µg/L	Agree
TRPH	< 0.5	< 0.5	1.0	mg/L	Agree

226691

PROJECT: Carswell AFB Data check time: 5 hr

SAMPLES: 6701-6713

REPORT DATE: 22 November 1993

QUALITY CONTROL CHECKLIST

Chain of Custody Check

1. Do sample ID numbers agree with the C.O.C? [Y] [N]
2. Do site and location agree with the C.O.C? [Y] [N]
3. Do sampling dates agree with the C.O.C? [Y] [N]
4. Do method numbers agree with the C.O.C? [Y] [N]
5. Are all samples and analyses accounted for? [Y] [N]

Data Check

1. Holding Times
   a) TRPH [In] [Out]
   b) BTEX/MTBE [In] [Out]
   c) PAH [In] [Out]
   d) Lead [In] [Out]
   e) VOA [In] [Out]

2. Do detection limits and dilution factors agree? [Y] [N]

3. Are units correct? [Y] [N]

QC Check

1. MS/MSD [In] [Out]

2. RPD for MS/MSD [In] [Out]

3. LCS and/or Blank Spike [In] [Out]

4. Blanks [Below DL] [Above DL]

5. Acceptable Surrogates [Y] [N]

6. RPD for duplicates [In] [Out]

7. Tuning and calibration check [Y] [N]

Comments

MS/MSD out for Pb (6701-04) due to high concentration of analyte. MS/MSD out for anthracene, chrysene, naphthalene, acenaphthene and benzo(a)pyrene for PAH in soil (6705).

Blank spike out for anthracene for PAH for water (3-6713).
There was insufficient sample for MS/MSD for PAH for water so a blank spike/blank spike duplicate was performed (3-6713).
MS/MSD out for Pb (3-6705).
VOA for 3-6705 was rerun to check abnormally high methylene chloride concentration. Determined that the high concentration was an anomally and that the true methylene chloride concentration was less than the detection limit.
No MSD was run for TPH due to insufficient sample (3-6713).
MS was out for VOA in soil for methyl ethyl ketone, tetrachloroethene and 1,4-chloroethyl vinyl ether (3-6705).
MS was out for VOA in water for methylene chloride, 2-chloroethyl vinyl ether and 1,1,2,2-tetrachloroethane (3-6713).

TAB

APPENDIX D

226694

Disposition of IDW

from

Soil Borings

3 Drums to City of Garland

226695

INNOVATIVE SUPPORT GROUP, INC.

Providing Technical Support For The
Environmental & Construction Industries

11736 Fernald Ave.
Dallas, Texas 75218-1520
(214) 328-3668 • Fax (214) 328-3668

CLASS II INDUSTRIAL WASTE MANIFEST

Part A: Generator

Company Name: Army Corp of Engineers EPA No.: N/A

Business Address: x Carswell Airforce Base ft. Worth TWC No.: N/A

Address (Shipment Origin): x Same

Ph. No.: 817/334-3222 Contact: Mr. Robert BEHM

Solid Waste	Waste Code No.	Quantity/Amt.	Mode
3-55-Gallon Drums	N/A	Approx. 1 cu.yd	14' Tandem Axle Trailer

x Robert C. Behm
Signature of Authorized Agent Date: x 6/1/93

Part B: Transporter

Transporter: Innovative Support Group, Inc. EPA No.: N/A

Business Address: 11736 Fernald Ave. TWC No.: 47042

Ph. No.: 214/328-3668 Contact: Chris Roberts

Date Transported: 6/1/93

William C. Roberts
Signature of Authorized Agent Date: May 30, 1993

Part C: Disposal Facility/Landfill/Site

Disposal Name: City of Garland Municipal Landfill EPA No.: N/A

Facility Address: 3639 w/ Castle Rd, Garland, Tx. TWC No.: N/A

Phone No.: 214/414-5083

Date Received: 1 w/ 6-1-93

Steve Langer
Signature of Authorized Agent Date: 6-1-93

226696

SOIL DISPOSAL
DOCUMENTATION

Originating Site: ACOE Bldg 14/Fed Ctr. Ft. Worth, Tx
Transporter: ISG
Date Of Removal: June 1, 1993
Transport Equipment: 14' Tandem Axle Trailer
Waste Type: Special Waste - Soil Only
Quantity: Three (3) 55-Gallon Drums
Destination: City of Garland Landfill

Page: 1 of 1

THIS SIDE OUT

CITY OF GARLAND – LANDFILL

BUSINESS NAME ACOE.
DESCRIPTION
CONTAINER
LOCATION
SIGNATURE

TIME 04:54 PM 01 JUN 93
ID NO. 6
WEIGHIN 7060 LB

RATE/TON 0
AMOUNT 0.00

NET 0.700 TON

KETARE 2.830 TON
GROSS 3.530 TON

08646 COG 85-54

MOBLEY COMPANY
UST REMEDIATION FLUID / OFF-SPECIFICATION PRODUCT MANIFEST

No. 06058

CHARACTERIZATION INFORMATION

226697

P.O. DACA63-M-93-K124

Generating Facility Name: Fort Worth Federal Center

Generating Facility Address: Ft Worth, TX Bldg #14

Business Name:

Mailing Address:

Telephone (817) 334 3222

Contractor Name/Contact:

Process Generating the Fluid (Check the Appropriate Process/Fluid Type):

Underground Storage Tank Remediation/Corrective Action
- ☐ Unleaded Gasoline
- ☐ Diesel
- ☐ Aviation Fuel
- ☑ Tank Hold Evacuation
- ☐ UST Monitoring Well Fluid

Maintenance of PST
- ☐ Unleaded Gasoline
- ☐ Diesel
- ☐ Aviation Fuel
- ☐ Fuel Oil

Total Quantity (Gallons): Bulk ( ) Drum Evacuation (✓) 280

I certify that the material removed from the above premises is not hazardous waste as identified in 40 CFR Part 261, and does not contain spent solvents or PCBs as identified in 40 CFR Part 761.

Generator Representative (Print): Robert McVay Title: Geologist

Signature: Robert McVay Date of Service: 7/6/93

TRANSPORTER INFORMATION

Name Mobley Co., Inc. Telephone 800-999-8628

EPA Transporter ID TXD000807925 State ID 40303 Truck No. 62

Driver's Name (Print) Doug Nelson Trucked Direct to Plant? Y / (N)

7/6/93 Date

Doug Nelson Driver's Signature

MOBLEY COMPANY CORSICANA FUEL FACILITY

Address: 2124 Highway 31 East

City/State: Corsicana, TX 75110

Telephone: 903-874-1188

EPA ID TXD988059291 TWC Reg. No. 20095

I certify that I have received into this facility the above listed product.

Facility Operator's Name (Print) Rodney DeRoo

7-7-93 Date Received

Rodney DeRoo Facility Operator's Signature

White - Generator - Original Canary - TSD Pink - Transporter Gold - Generator's 1st Copy

THE PRINT SHOP-MARSHALL
REV. 9-92

226698

Disposition of IDW

from

Well Borings and Groundwater Sampling

MOBLEY COMPANY
UST REMEDIATION FLUID / OFF-SPECIFICATION PRODUCT MANIFEST

№ 66351

CHARACTERIZATION INFORMATION

226699

Generating Facility Name: CARSWELL AFB CONVERSION AGENCY

Generating Facility Address: CARSWELL AFB TX

Business Name: U.S. AIR FORCE

Mailing Address: 301 SPTG/CEV

Telephone (817) 782-6256

Contractor Name/Contact: ENVIRONMENTAL SUPPORT GROUP

Process Generating the Fluid (Check the Appropriate Process/Fluid Type):

Underground Storage Tank Remediation/Corrective Action
- ☐ Unleaded Gasoline
- ☐ Diesel
- ☐ Aviation Fuel
- ☐ Tank Hold Evacuation
- ☑ UST Monitoring Well Fluid

Maintenance of PST
- ☐ Unleaded Gasoline
- ☐ Diesel
- ☐ Aviation Fuel
- ☐ Fuel Oil

Total Quantity (Gallons): Bulk ( ) _____ Drum Evacuation (✓) 525 gal

I certify that the material removed from the above premises is not hazardous waste as identified in 40 CFR Part 261, and does not contain spent solvents or PCBs as identified in 40 CFR Part 761.

Generator Representative (Print): LANCE E. KEY Title: Environmental Prot. Spec.

Signature: Lance E. Key Date of Service: 5-5-94

TRANSPORTER INFORMATION

Name Mobley Co., Inc. Telephone 800-999-8628

EPA Transporter ID TXD000807925 State ID 40303 Truck No. 75

Driver's Name (Print) PAUL JACOBS Trucked Direct to Plant? Y / (N)

5-5-94 (Date) _____ (Driver's Signature)

MOBLEY COMPANY CORSICANA FUEL FACILITY

Address: 2124 Highway 31 East

City/State: Corsicana, TX 75110

Telephone: 903-874-1188

EPA ID TXD988059291 TWC Reg. No. 20095

I certify that I have received into this facility the above listed product.

Facility Operator's Name (Print) Rodney DeRoo

5-6-94 (Date Received) Rodney DeRoo (Facility Operator's Signature)

White - Generator - Original Canary - TSD Pink - Transporter Gold - Generator's 1st Copy

THE PRINT SHOP-MARSHALL
REV. 9-92

INNOVATIVE SUPPORT GROUP, INC.

Providing Technical Support For The
Environmental & Construction Industries

11736 Fernald Ave.
Dallas, Texas 75218-1520
(214) 328-3668 • Fax (214) 328-3668

22670

CLASS II INDUSTRIAL WASTE MANIFEST

Part A: Generator

Company Name: U.S. AIR FORCE EPA No.: TX0571924042

Business Address: 301 SPTG/CEV TWC No.: 65004

Address (Shipment Origin): CARSWELL AFB, TX 76127

Ph. No.: (817) 782-6256 Contact: LANCE E. KEY

Solid Waste	Waste Code No.	Quantity/Amt.	Mode
Drill Soil Cuttings	CLVV4892	8.0 cubic yds	29-55-Gallon Drums

Lance E. Key GS-12
Signature of Authorized Agent

Date: May 9, 1994

Part B: Transporter

Transporter: Innovative Support Group, Inc. EPA No.: N/A

Business Address: 11736 Fernald Ave. TWC No.: 47042

Ph. No.: 214/328-3668 Contact: Chris Roberts

Date Transported: May 9, 1994

W.C. Roberts
Signature of Authorized Agent

Date: 5/9/94

Part C: Disposal Facility/Landfill/Site

Disposal Name: _____ EPA No.: _____

Facility Address: C.S.C. DISPOSAL AND LANDFILL. INC.
P.O. Box 236
Avalon. Texas 76623
(214) 627-3413 TWC No.: _____

Phone No.: _____

Date Received: _____

Signature of Authorized Agent

Date: 5-9-94

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

2267 '1

Form approved. OMB No. 2050-0039, expires 09/30/94

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. TX0571924042	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
U.S. AIR FORCE
301 SPTG/CEV
CARSWELL AFB TX 76127
4. Generator's Phone (817) 782-6256

A. State Manifest Document Number: 00619306
State Generator's ID:
5. Transporter 1 Company Name: Innovative Support Group Inc
6. US EPA ID Number:
State Transporter's ID:
7. Transporter 2 Company Name:
8. US EPA ID Number:
Transporter's Phone:
9. Designated Facility Name and Site Address
CSC Disposal + Land Fill
403 Powell
Avalon, Tx. 76623
10. US EPA ID Number:
State Facility's ID:
Facility's Phone:

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
	a. Drill soil Cuttings Non Haz.			8	Yds
	b.				
	c.				
	d.				

J. Additional Descriptions for Materials Listed Above
K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year
William C. Kobert	William C. Kobert	05	09	94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date: Month	Day	Year

FACILITY

19. Discrepancy Indication Space

C.S.C. DISPOSAL AND LANDFILL INC
P.O. Box 236
Avalon, Texas 76623
(214) 627-3413

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date: Month	Day	Year

White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE