Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326 Cannon Air Force Base, New Mexico

Analytical Results for Samples Collected September 21-22, 2000

Prepared for

United States Air Force Air Combat Command
Cannon Air Force Base, New Mexico 88103

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INTRODUCTION

This report presents the results of the soil-gas and soil samples collected for the year 2000 evaluation of bioventing soil remediation at Solid Waste Management Unit (SWMU) number 70-Oil/Water Separator No. 326 on Cannon Air Force Base (CAFB), New Mexico. Soil-gas samples were collected by the U.S. Geological Survey September 21-22, 2000. CAFB is located in east-central New Mexico about 7 miles west of Clovis as shown on figure 1. The sampling site (SWMU #70) is located on the north side of the base as shown on figure 2. The SWMU was used for the recovery of petroleum products generated from wash water effluent from JP-4 fuel truck maintenance operations at Building 326 (fig. 3). This effluent contained JP-4 fuel, and petroleum and synthetic lubricating oils. The oil/water separator, active since 1960, is a two-compartment underground unit with a 50-gallon oil/water separator compartment and a detached 220-gallon underground oil storage tank. Recovered petroleum products were directed to the 220-gallon holding tank and the wastewater was discharged into a leach well. The leach well is approximately 5 feet in diameter and 5 feet deep. Overflows from the oil/water separator that discharged into the leach well are the suspected source of contamination. Soil-gas and soil monitoring was initiated in May 1994 by Engineering Science, Inc. under a "bioventing pilot test." A detailed work plan for the pilot test and interim pilot test results are found in Engineering-Science, Inc. (1994a and 1994b respectively). Soil-gas and soil sampling was performed in this investigation to evaluate if concentrations of fuel contaminants have been below regulatory standards. This sampling is performed in accordance with the Bioventing Field Sampling Plan (Engineering Science Inc., 1992).

METHOD OF STUDY AND RESULTS

The purpose of the field soil-gas sampling on September 21-22, 2000 was to determine if an in situ respiration test would be needed. The objective of the in situ respiration test is to determine the rate at which soil bacteria are degrading petroleum hydrocarbons. The respiration test would be performed at any vapor MP where bacterial biodegradation of hydrocarbons is indicated by low oxygen levels (0 to 2 percent (%)) and elevated carbon dioxide concentrations in the soil gas (5 to 20 %) (Hinchee and others, 1992). The soil-gas monitoring locations at SWMU 70 are three vapor monitoring point wells (MPA, MPB, and MPC), and one vent well (VW) as shown in figure 3. Construction diagram of a MP and a VW are shown in figures 4 and 5, respectively. Field soil-gas measurements were taken from all MP's

and the VW (table 1). For the last three years samples have been tested in the field by using a flow-through gas chamber and peristaltic pump. This year all samples will be collected directly from the ball valves for each vapor monitoring point. Each sample was tested for the following constituents: carbon dioxide using Dragger tubes; oxygen using an oxygen meter (MSA Oxygen Indicator, model 246RA); volatile hydrocarbons using a HNU photoionization detector (PID), model PI101; and benzene, toluene, ethylbenzene, and xylenes (BTEX) using portable gas chromatograph (GC), Photovac photoionization gas chromatograph, model 10550. As indicated by the results in the table 1, none of the vapor MP's had low oxygen levels; none of the vapor MP's had elevated carbon dioxide concentrations. Thus, in situ respiration tests were not performed.

Quality Assurance / Quality Control (QA/QC) Samples for Soil-Gas Field Measurements

Three types of QA/QC samples (instrument-blank samples, ambient conditions/ syringe-blank samples, and field-standard samples) were analyzed periodically during the field testing to insure valid sample results. The purpose of an instrument-blank sample is to determine if samples could be contaminated by compounds within the plumbing of the gas chromatograph (precolumn, analytical column, injection septum, etc.). This QA/QC sample is analyzed by cycling the field gas chromatograph as if a gas sample was going to be injected into the instrument, but no injection was done. Instrument blanks were run at the beginning of each sample day, and whenever there was an indication that compounds from previously injected samples might still be in the gas chromatograph plumbing.

The purpose of an ambient-conditions/syringe-blank sample is to determine if ambient air or residuals within syringe could contaminate soil-gas samples. This QA/QC sample is analyzed by injecting ambient air into the gas chromatograph using the same gas-tight syringe as soil-gas samples. Ambient-conditions/syringe-blank samples were analyzed at the beginning of each sample day, and whenever there was an indication that either ambient air or compound residuals within a sample syringe could influence sample results.

The purpose of a field-standard sample is to tentatively identify and estimate concentrations of compounds in the soil-gas samples. Field-standard samples are analyzed by injecting a specific volume of headspace gas from a 40 milliliter (ml) vial containing 20 ml of water spiked with known concentrations of benzene, tolu-

ene, ethylbenzene, p-xylene, m-xylene, and o-xylene. Field standards were made fresh each day from certified stock standards and ultrapure deionized water. The field standard was allowed to equilibrate for at least 10 minutes prior to the first analysis. The headspace sample is extracted from the vial through a septum cap with a gas-tight syringe used for standard samples only. Compounds were tentatively identified in soil-gas samples based on matching the elution times of peaks on the soil-gas sample chromatogram with peaks on the field-standard sample chromatogram. Tentative identifications were only made for compounds in the field-standard sample. Concentration estimates were based on relative peak heights of a tentatively-identified compound on the soil-gas sample chromatogram versus the peak height for a known concentration of the compound on the field-standard sample chromatogram. The estimated concentrations are expressed as micrograms per liter (µg/L), in water, because the headspace concentrations in field-standard sample are based on chemical equilibrium between the gaseous headspace and the spiked water in the vial.

Vapor Monitoring Points A, B, and C and Vent Well

Soil-gas samples were collected for laboratory analysis (table 2) from monitoring points that were originally sampled (VW, MPA-5, and MPC-50 sampled by Engineering-Science, Inc. on May 2 - 16, 1994) to confirm the field soil-gas measurements. The soil-gas samples were collected in one-liter SUMMA® canisters and sent to Severn Trent Services, Santa Ana, California and analyzed for BTEX and total volatile petroleum hydrocarbons by U.S. Environmental Protection Agency method TO-3. Soil-gas field samples were collected and analyzed with gas chromatograph at the vapor monitoring points and at the vent well on September 21-22, 2000 (table 1). This task had been done previously July 22, 1997, August 11, 1998 and September 22, 1999, the discussion here focuses on the changes in soil-gas concentrations from the previous three years. At these locations soil-gas samples were collected directly into a gas-tight syringe from the ball valves at each vapor monitoring point, after the soil gas had been evacuated for several minutes with a peristaltic pump.

In 1997, soil-gas samples from MPA-5 (5 foot depth) and MPA-25 (25 foot depth) were uncontaminated, and the chromatograms for the samples from MPA-50, MPA-70 and MPA-110 (50, 70, and 110 foot depths, respectively) had two late eluting peaks; the earlier of the two correlated well with ethylbenzene. Estimated ethylbenzene concentrations decreased from more than 415 µg/L at a depth

of 50 feet to 28 µg/L at 110 feet.

In 1998, the sample from MPA-5 was clean, but the sample from MPA-25 was slightly contaminated as evidenced by numerous small peaks. The samples from MPA-50 and MPA-70 were uncontaminated, and the sample from MPA-110 had numerous, very small peaks and the same two late peaks present in 1997. The estimated ethylbenzene concentration at 110 feet was 8 µg/L in 1998.

In 1999, the sample from MPA-5 was clean, MPA-25, MPA-50, MPA-70 and MPA-110 had traces of contamination as indicated by numerous small peaks. MPA-50 showed the greatest concentrations of contamination, specifically in the two later eluting peaks, which correlated with ethylbenzene and xylene. Even though MPA-50 showed a small amount of contamination in 1999, and none in 1998, the concentration for both ethylbenzene and xylene were only slightly greater than 1 µg/L (Table 1). The concentrations for MPA-110 were greatly reduced from 1998.

In 2000, the samples from MPA-25 and MPA-110 were clean, MPA-5, MPA-50, and MPA-70 had traces of contamination as indicated by the few peaks on the gas chromatograph. MPA-50 still showed the highest concentrations of contamination, which correlated with the standard's chromatograph of ethylbenzene and xylene. However, with the exception of MPA-5 all samples declined in concentrations of contamination from the previous years. MPA-5 sample results had only a minimal increase in concentration from the previous year, which also correlated with the standard, indicating xylene.

All the soil-gas field samples from MPB (5, 25, 50, 70, and 110) were contaminated in 1997. The chromatograms for the samples from MPB-5 and MPB-25 had the same two late eluting peaks as MPA-50, MPA-70 and MPA-110. The estimated ethylbenzene concentrations were 29 µg/L and 117 µg/L, respectively. The chromatogram for MPB-25 also had numerous earlier eluting peaks. The soil-gas sample from MPB-50 had the highest level of contamination in 1997; followed by samples from MPB-70 and MPB-110, respectively. The chromatograms for these three samples had numerous early peaks and two later eluting peaks that correlated with ethylbenzene and xylene. The estimated concentrations from shallow to deep were 2,140 µg/L, greater than 476 µg/L, and 238 µg/L for ethylbenzene; and 2,250 µg/L, greater than 490 µg/L, and 375 µg/L for xylene.

In 1998 the soil-gas field sample chromatograms from MPB-5, MPB-25, and MPB-110 showed only traces of contamination, although the concentrations are probably greatest at MPB-110. The highest level of contamination in 1998 was in the sample from MPB-70 followed by the sample from MPB-50. The estimated contaminant concentrations in the soil-gas sample from MPB-70 were 39 µg/L ethylbenzene, 7 µg/L toluene, and greater than 2 µg/L benzene. The estimated concentrations for the sample from MPB-50 were 8 µg/L toluene and greater than 2 µg/L benzene. Even though these two soil-gas samples were the most contaminated in 1998; the level of contamination had dropped by at least a factor of 10 from 1997.

In 1999, the soil-gas field sample chromatograms from MPB-5, MPB-70 and MPB-110 showed only traces of contamination. The highest level of contamination in 1999 was in sample collected from MPB-50, followed by the sample from MPB-25 (Table 1). The estimated contaminant concentrations in the soil-gas sample from MPB-50 were 42 µg/L for ethylbenzene, 20 µg/L for xylene, and 5 µg/L for toluene. The estimated concentrations for sample MPB-25 were greater than 2 for both ethylbenzene and toluene. The trend for the 1999 soil-gas samples compared to the 1998 samples, appears that the higher concentrations of contaminates are migrating towards the surface.

In 2000, soil-gas sample from MPB-5 was clean, and the samples from MPB-70 and MPB-110 showed only traces of contamination. The highest levels of contamination in 2000 was in sample collected from MPB-50, and followed again by the sample from MPB-25 (Table 1). The estimated contaminant concentrations in the soil-gas sample from MPB-50 were 36 µg/L for ethylbenzene, 18 µg/L for xylene, and 4 µg/L for toluene. The estimated concentrations for sample MPB-25 were 4 µg/L for ethylbenzene and less than 1 µg/L for both toluene and xylene. The trend for the 2000 soil-gas samples of the MPB vapor points showed a decline in concentrations of contaminates.

All the soil-gas field samples from MPC (5, 25, 50, 70, and 110) were contaminated in 1997. The chromatograms had numerous early peaks and two later eluting peaks that correlated with ethylbenzene and xylene. The estimated concentrations from shallow to deep were 127 µg/L, 58 µg/L, 416 µg/L, 35 µg/L, and 31 µg/L for ethylbenzene; and 176 µg/L, 71 µg/L, 141 µg/L, 35 µg/L, and 40 µg/L for xylene.

In 1998 all the soil-gas field samples from MPC were uncontaminated, except for MPC-5. The sample from MPC-5 had estimated concentrations of 8 µg/L ethylbenzene and 1 µg/L toluene.

In 1999 all the soil-gas field samples from MPC were uncontaminated, except for MPC-5 (Table 1). The sample from MPC-5 had estimated concentrations of 4 µg/L ethylbenzene and 5 µg/L toluene.

In 2000, all soil-gas field samples showed at least a trace of contamination (Table 1). As the previous years MPC-5 had the highest concentrations of contamination, with an estimation of 3 µg/L of toluene and 2 µg/L of ethylbenzene. The sample for MPC-25 had estimated concentrations of greater than 1 µg/L of toluene and 2 µg/L of ethylbenzene. The sample for MPC-50 had estimated concentrations of greater than 1 µg/L for both ethylbenzene and xylene. Sample MPC-70 had estimated concentrations of less than 1 µg/L for both ethylbenzene and xylene, MPC-110 had an estimated concentration of less than 1 µg/L of ethylbenzene. The trend for the 2000 soil-gas samplesof the MPC vapor points showed an increase in concentrations. However, the increase of contamination concentrations is slight, and these are estimations.

Soil-gas field samples were taken from the vent well in 1997, 1998, 1999 and 2000. The usefulness of these sample results is questionable because of the design and use of this well. Atmospheric air is continually pumped into the vent well flushing soil gas from surrounding sediments. The pump is only turned off during periods of soil gas sampling. The 1997 sample was contaminated, and the estimated contaminant concentrations were 20 µg/L ethylbenzene and 28 µg/L xylene. The 1998 through 2000 samples were uncontaminated.

Soil Samples

Soil samples were collected from two auger holes in 1997 and one auger hole in 1998. Soil samples were collected for both field and laboratory analysis. The field samples were tested for volatile hydrocarbons using a photoionization detector (PID) and BTEX using a portable gas chromatograph (GC). The laboratory analyzed for BTEX, Diesel Range Organics (DRO), and Soil Moisture.

In 1999 Cannon Air Force Base Environmental Department concluded that the laboratoy analysis of the soil-gas collected in the SUMMA canisters along with the field soil-gas measurements from the monitoring points would be sufficient infor-

mation to evaluate the SWMU #70 site. No soil samples were collected in 1999 or in 2000.

SUMMARY AND CONCLUSIONS

In summary, estimated contaminant concentrations dropped significantly from 1997 to 1998, however there was only minor changes in concentrations in 1999 and in 2000. The prevalent, tentatively-identified contaminants in 1997 were ethylbenzene and xylene. Estimated concentrations were as highest for each in the soil-gas sample from MPB-50; 2,140 µg/L and 2,250 µg/L, respectively. In 1998 ethylbenzene was only tentatively identified in four samples, and the largest estimated concentration was 39 µg/L in soil-gas sample from MPB-70. No xylene was tentatively identified in 1998. Small amounts of toluene and benzene were tentatively identified in some of the 1998 soil-gas samples.

In 1999 ethylbenzene was tentatively identified in the majority of the monitoring points, with the exception of the MPC points. Ethlybenzene was identified more frequently than in 1998, however the concentrations were on a decline, with the exception of MPB-50, concentration of 42 µg/L. No benzene was tentatively identfied in 1999. Small amounts of xylene and toluene were tentatively identified in some of the 1999 soil-gas samples. MPB-50 had a highest estimated concentration of xylene, 20 µg/L.

In 2000 ethylbenzene is still tentatively identified in the majority of the monitoring points, with the exception this year in the MPA points. However, the concentrations are on a decline. No benzene was identfied again in 2000. Small amounts of xylene and toluene are still tentatively identified in some of the 2000 soil-gas samples, however there is a decline in concentrations from 1999.

The results from both field and laboratory analysis indicate very minor changes in the concentration of contaminates between the samples collected in 1998 through 2000, however there is a noticeable decline. The amount of oxygen versus carbon dioxide measured (Table 1) in the monitoring points suggest a very low level of biological activity. This would suggest that the organics have not been totally degraded around the vent well and that vapors may be moving along the different horizons away from the site.

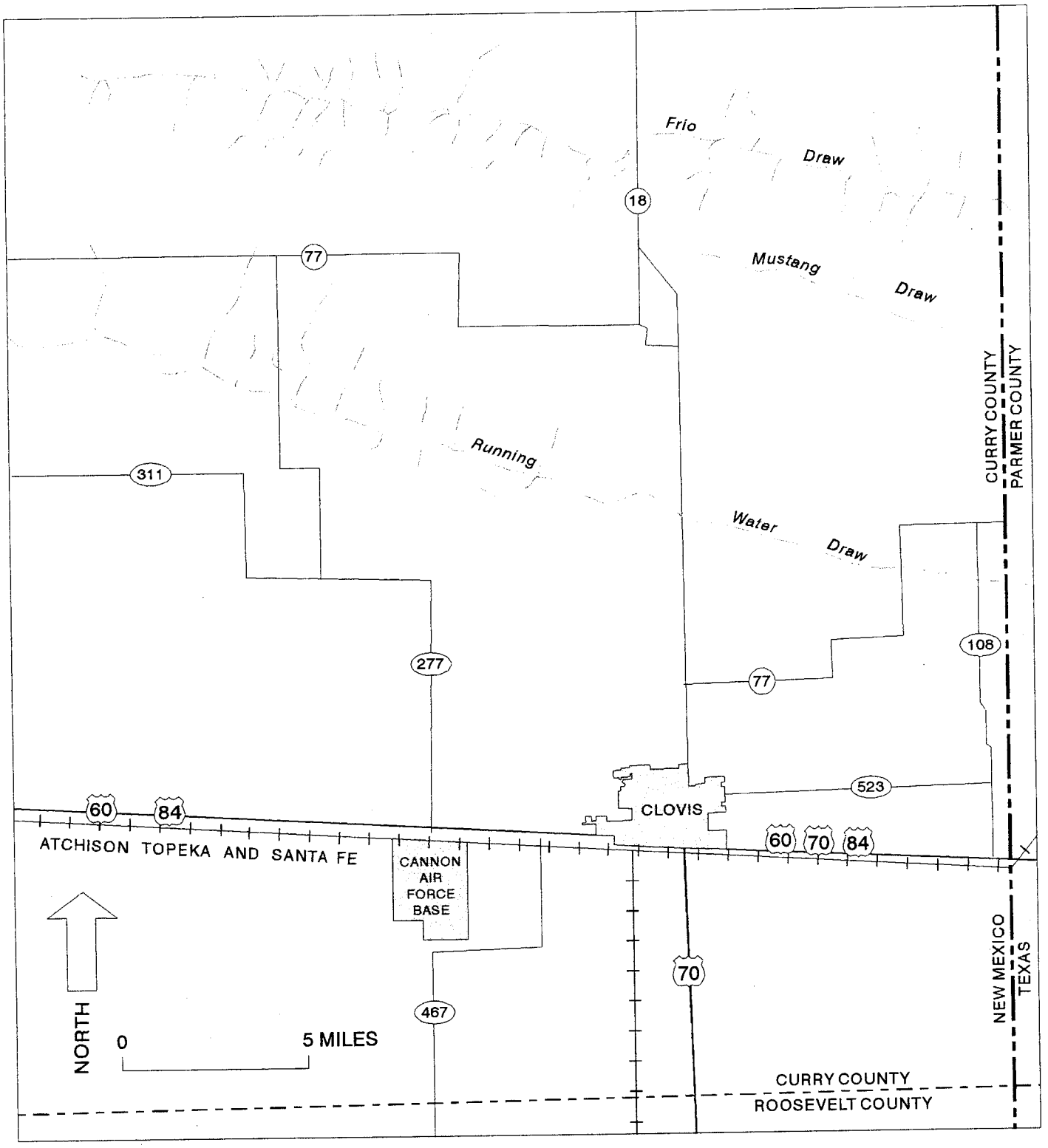
REFERENCES

Engineering-Science, Inc., 1992, Field Sampling Plan for AFCEE Bioventing: Report prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas by Engineering-Science, Inc., January 1992.

Engineering-Science, Inc., 1994a, Draft Part I, Pilot Test Work Plan for SWMU #70-Oil/Water Separator No. 326, Cannon AFB, New Mexico: Report prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas, and 27 CES/CEV Cannon AFB, New Mexico by Engineering-Science, Inc., August 1994, 15 p. and appendixes.

Engineering-Science, Inc., 1994b, Draft Part II, Interim Pilot Test Results Report for SWMU #70-Oil/Water Separator No. 326, Cannon AFB, New Mexico: Report prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas, and 27 CES/CEV, Cannon Air Force Base, New Mexico, by Engineering-Science, Inc., August 1994, 31 p. and appendixes.

Hinchee, R.E., S.K. Ong, R.N. Miller, D.C. Downey, and R. Frandt, 1992, Test Plan and Technical Protocol for a Field Treatability Test for Bioventing: Report prepared for the USAF Center for Environmental Excellence, Brooks Air Force Base, Texas by Hinchee et.al., May 1992.



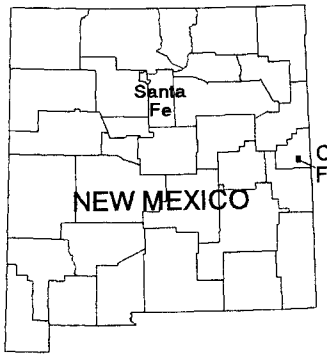


Figure 1. Location of Cannon Air Force Base, New Mexico.

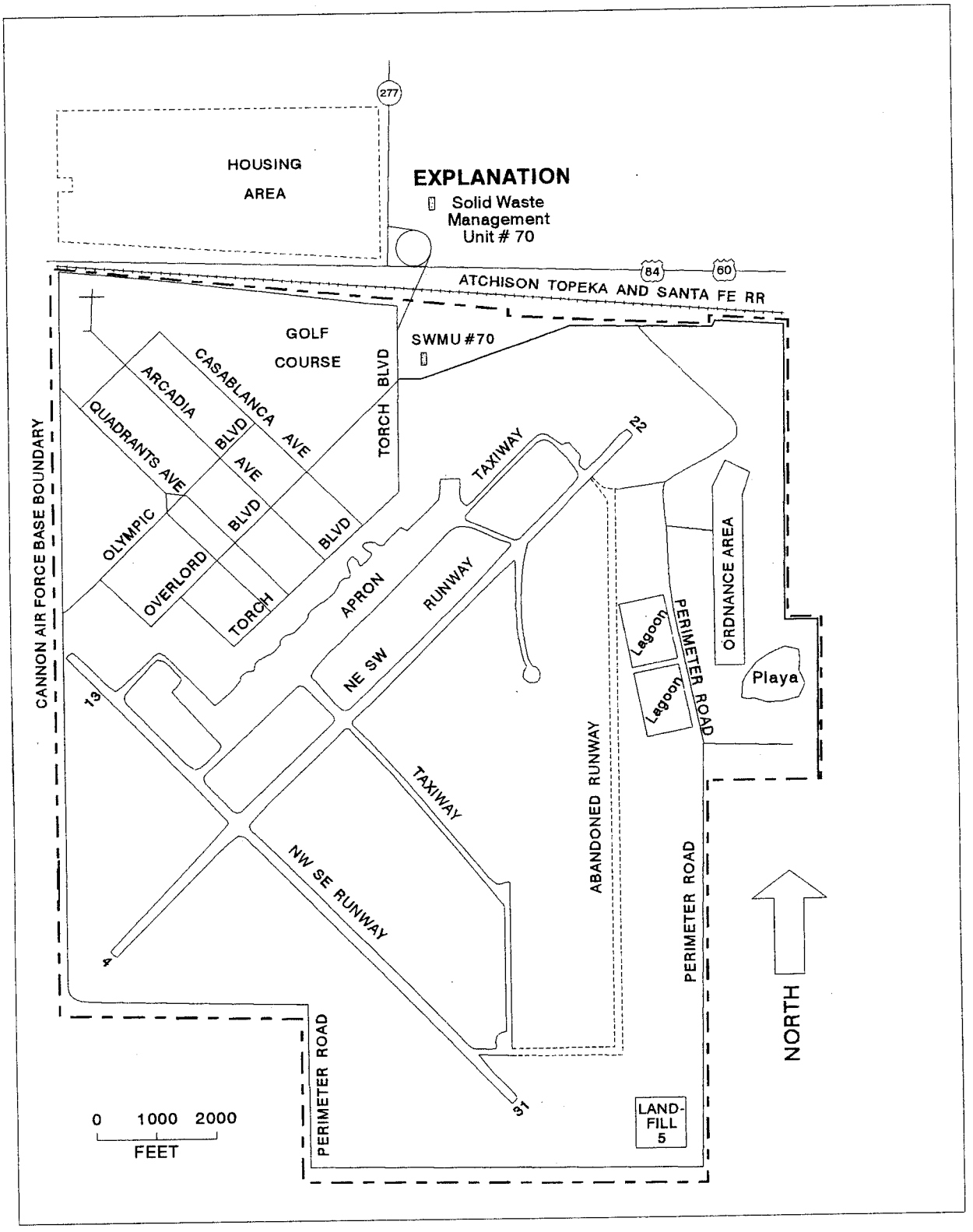


Figure 2. Cannon Air Force Base and location of Solid Waste Management Unit (SWMU) # 70 Oil/Water Separator No. 326.

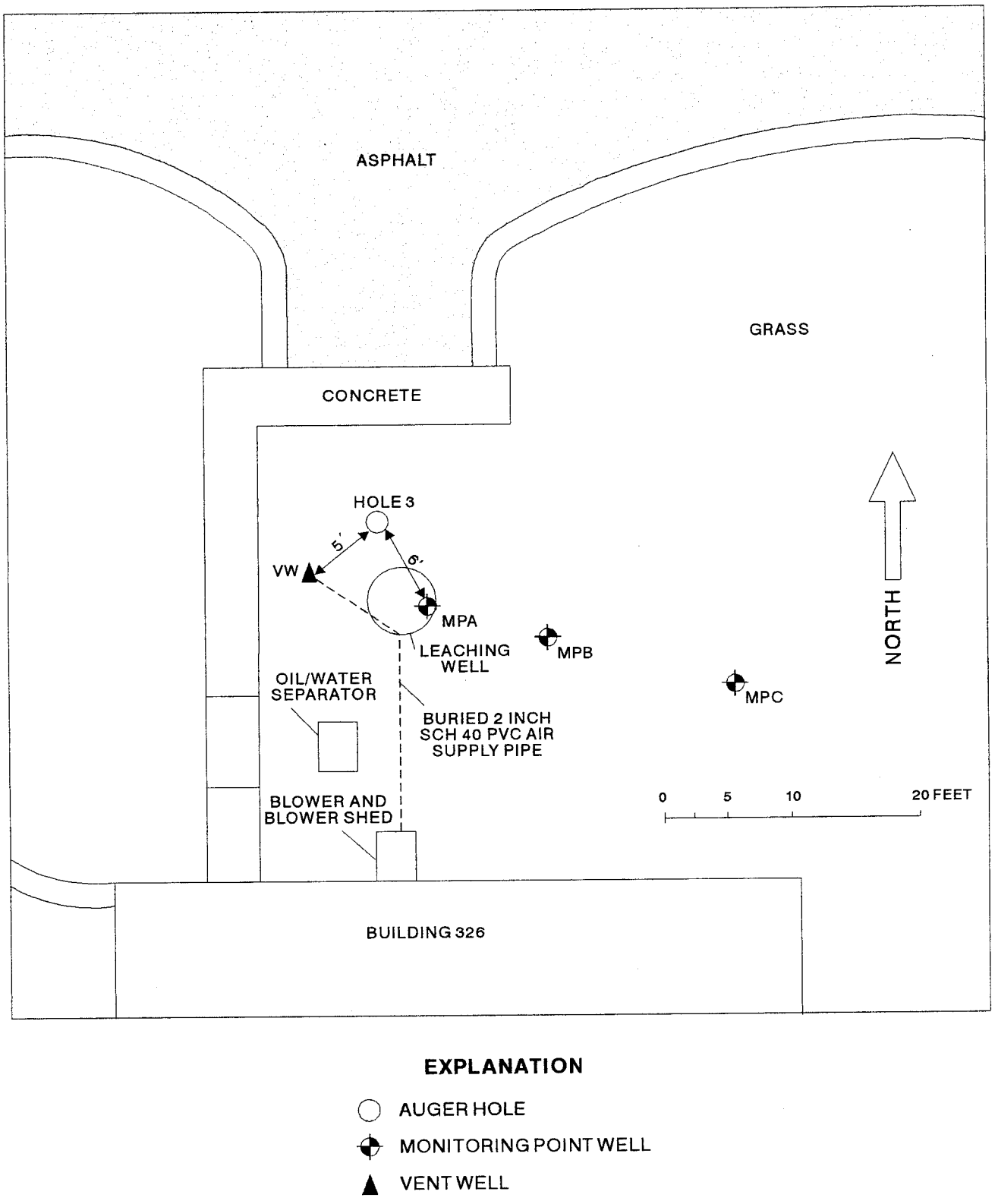


Figure 3. Location of vent well, monitoring point wells, and auger hole, Solid Waste Management Unit (SWMU) # 70 Oil/Water Separator No. 326 at Cannon Air Force Base, New Mexico.

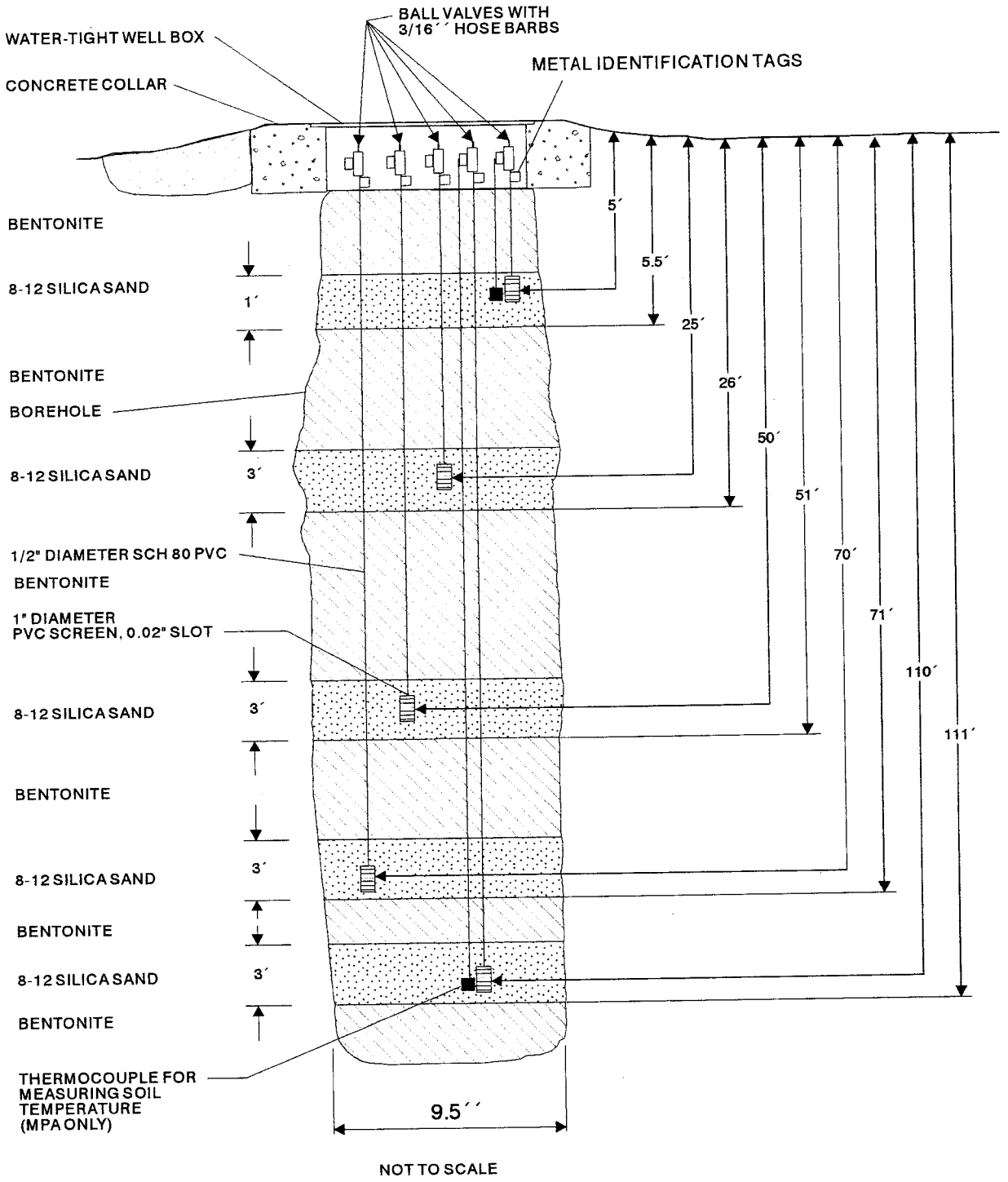


Figure 4. Monitoring point well construction diagram.

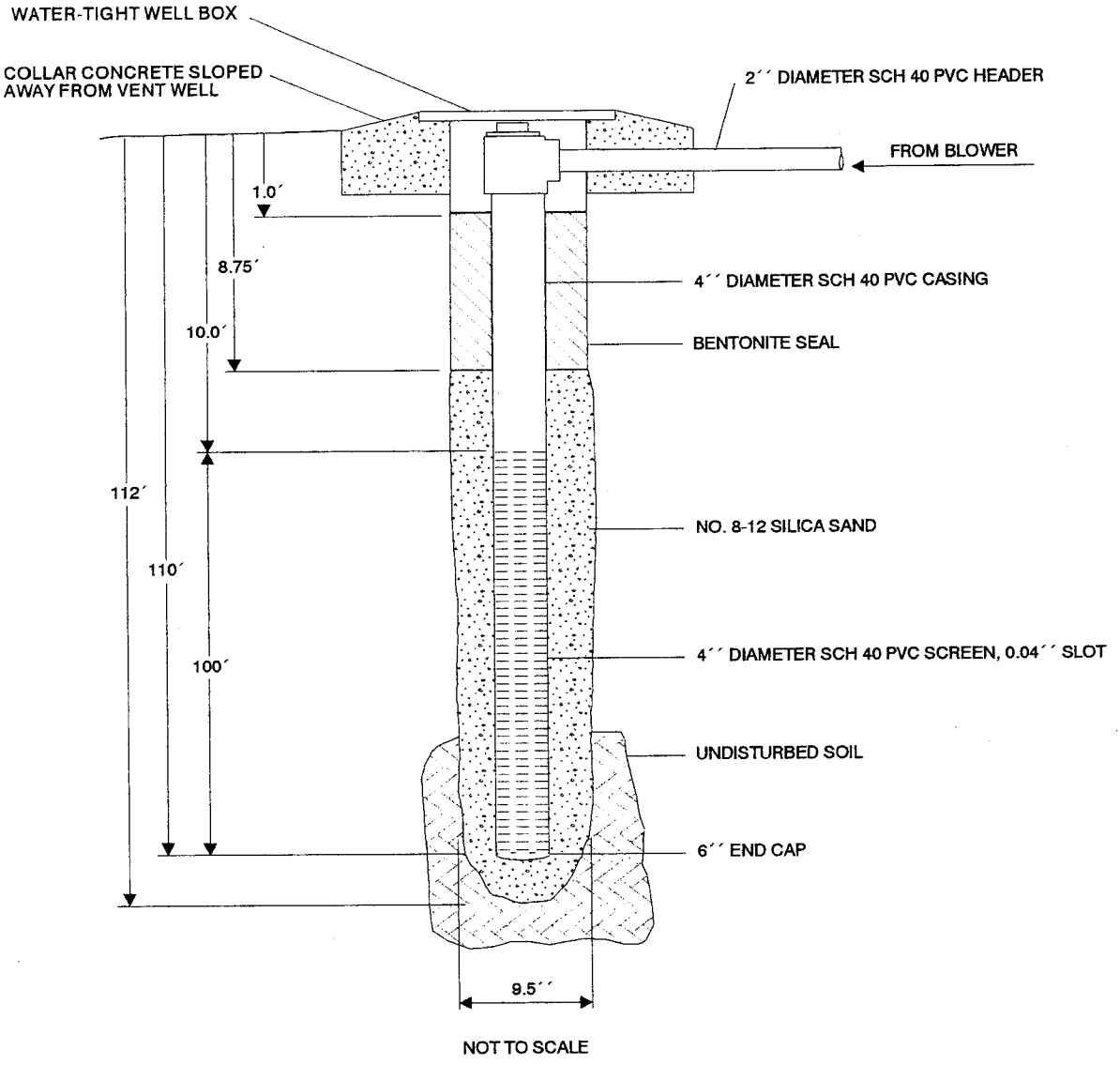


Figure 5. Vent well construction diagram.

Table 1.-- Summary of soil-gas field measurements from the vent well (VW) and vapor monitoring point wells MPA, MPB, and MPC at SWMU #70 (Oil/Water Separator No. 326) Cannon Air Force Base, New Mexico, September 21-22, 2000

[O_2, oxygen; CO_2, carbon dioxide; PID, photoionization detector; %, percent; ppm, parts per million; µg/L, micrograms per liter; ND, not detected; <, less than; >, greater than]

Vapor monitoring point-Depth (feet)	O_2 (%)	CO_2 (%)	PID (ppm)	Portable gas chromatograph*			
				Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)
VW-10 to 110	20.8	0.0	0.0	ND	ND	ND	ND
MPA-5	20.6	0.0	1.0	ND	ND	ND	<1
MPA-25	20.6	0.0	1.0	ND	ND	ND	ND
MPA-50	20.2	2.0	2.0	ND	ND	>1	<1
MPA-70	20.4	1.0	5.0	ND	ND	<1	ND
MPA-110	20.3	0.0	0.5	ND	ND	ND	ND
MPB-5	20.8	0.5	1.0	ND	ND	ND	ND
MPB-25	20.2	2.0	15.0	ND	<1	4	<1
MPB-50	19.6	1.5	60.0	ND	4	36	18
MPB-70	19.6	1.0	10.0	ND	ND	>2	>1
MPB-110	20.0	1.0	1.0	ND	ND	>1	>1
MPC-5	20.2	1.5	5.0	ND	3	2	ND
MPC-25	20.0	2.0	15.0	ND	>1	2	ND
MPC-50	20.0	1.0	15.0	ND	ND	>1	>1
MPC-70	20.3	1.0	5.0	ND	ND	<1	<1
MPC-110	20.5	0.5	1.0	ND	ND	<1	ND

*. Compound identifications using portable gas chromatograph are tentative and the reported concentrations should be viewed as estimates.

Table 2.--Analytical results of soil-gas samples from the vent well (VW), and vapor monitoring point wells MPA-5 and MPC-50 at SWMU #70 (Oil/Water Separator No. 326) Cannon Air Force Base, New Mexico, September ~~23, 1999~~ 21, 2000

[ppmv, parts per million-volume per volume; ppm, parts per million; RL, reporting limit; ND, not detected; c, sample chromatographic pattern is not indicative of the standard pattern used to calibrate the gas chromatograph]; J, estimated results, results is less than RL.

Sample location	Analyte, Method, and Unit									
	Benzene, TO-3, ppmv		Toluene, TO-3, ppmv		Ethylbenzene, TO-3, ppmv		Xylenes, (total) TO-3, ppmv		Total volatile petroleum hydrocarbons as gasoline, TO-3, ppm	
	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
VW	ND	0.041	ND	0.041	ND	0.041	ND	0.041	1.0 J	2.0
MPA-5	ND	0.041	ND	0.041	ND	0.041	0.065	0.041	5.1	2.0
MPC-50	ND	0.041	0.39	0.041	1.9	0.041	6.0	0.15	100	2.1
AMBIENT BLANK	ND	0.041	ND	0.041	ND	0.041	ND	0.041	0.76 J	2.0

APPENDIX I

Analytical Results from Severn Trent Services Laboratory

ANALYTICAL REPORT

SWMV #70

Lot #: M0I280127

Richard Daddow

US Geological Survey

SEVERN TRENT LABORATORIES, INC.

Marisol Tabirara
Project Manager

September 29, 2000

RAW DATA PACKAGE
EPA CLP SOW FORMAT
(TO-3)

LOT #: MQ1280127

I. SUMMARY REPORT

	Completed
1. **SPACER PAGE - SUMMARY REPORT**	✓
2. REPORT COVER LETTER	✓
3. REPORT NARRATIVE	NA
4. SAMPLE RESULTS SUMMARY PAGES	✓
5. QC RESULTS SUMMARY PAGES	✓
6. BLANK RESULTS SUMMARY PAGES	✓
7. CANISTER DATA SHEETS	✓
8. CANISTER QC CERTIFICATION FORMS & QUANT/CHRO	✓
9. SAMPLE CHAIN OF CUSTODY (Original)	✓

II. RAW DATA PACKAGE

1. **SPACER PAGE - SAMPLE ANALYSIS**	✓
2. INJECTION LOG BENCHSHEETS FOR SHIFTS (chronological order by instrument)	✓
(For all samples in package in ascending order):	
3. QUANTITATION REPORT (Must have RTs)	✓
4. CHROMATOGRAM (peaks labeled and target compound RTs)	✓
(Initial Calibration in chronological order by instrument):	
5. **SPACER PAGE - CALIBRATION**	✓
6. INITIAL CALIBRATION SUMMARY PAGES	✓
7. QUANT REPORT AND CHROMATOGRAM FOR EACH STD IN ICAL	✓
(Continuing Calibrations in chronological order by instrument):	
8. CONTINUING CALIBRATION SUMMARY REPORT	✓
9. QUANT REPORT AND CHROMATOGRAM	✓
(QA/QC in chronological order by instrument):	
10. **SPACER PAGE - QA/QC**	✓
11. METHOD BLANK SUMMARY FORMS	✓
12. METHOD BLANK QUANT REPORT + CHROMATOGRAM	✓
13. LCS/LCSD SUMMARY FORMS	✓
14. LCS/LCSD QUANT REPORTS + CHROMATOGRAMS	✓

Pre-Assembled by: J. Olc 092900
(Initial/Date)

Reviewed by: NK 092900 MT 9/29/00
(Initial/Date)

ANALYTICAL METHODS SUMMARY

M0I280127

PARAMETER	ANALYTICAL METHOD
BTEX by TO-3	EPA-19 TO-3
TPH by TO-3	EPA-19 TO-3

References:

EPA-19 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA/600/4-89/017, June 1988.

SAMPLE SUMMARY

M0I280127

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DL6K1	001	AMBIENT BLANK-00	09/21/00	09:35
DL6K3	002	MPC50-00	09/21/00	10:00
DL6K4	003	MPA5-00	09/21/00	10:10
DL6K6	004	VW-00	09/21/00	10:20

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

EXECUTIVE SUMMARY - Detection Highlights

M0I280127

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
AMBIENT BLANK-00 09/21/00 09:35 001				
TPH (as Gasoline)	0.76	2.0	ppm(v/v)	EPA-19 TO-3
	Qualifiers: J,MBE			
MPC50-00 09/21/00 10:00 002				
Toluene	0.39	0.041	ppm(v/v)	EPA-19 TO-3
Ethylbenzene	1.9	0.041	ppm(v/v)	EPA-19 TO-3
Xylenes (total)	6.0	0.15	ppm(v/v)	EPA-19 TO-3
TPH (as Gasoline)	100	2.1	ppm(v/v)	EPA-19 TO-3
MPA5-00 09/21/00 10:10 003				
Xylenes (total)	0.065	0.041	ppm(v/v)	EPA-19 TO-3
TPH (as Gasoline)	5.1	2.0	ppm(v/v)	EPA-19 TO-3
VW-00 09/21/00 10:20 004				
TPH (as Gasoline)	1.0 J,MBE	2.0	ppm(v/v)	EPA-19 TO-3

US GEOLOGICAL SURVEY

Client Sample ID: AMBIENT BLANK-00

GC Volatiles

Lot-Sample #...:	M0I280127-001	**Work Order #...:**	DL6K1101	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 09:35	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273425	**Analysis Time..:**	12:53		
Dilution Factor:	2.03				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.041	ppm(v/v)	0.010
Toluene	ND	0.041	ppm(v/v)	0.012
Ethylbenzene	ND	0.041	ppm(v/v)	0.0081
Xylenes (total)	ND	0.041	ppm(v/v)	0.016

US GEOLOGICAL SURVEY

Client Sample ID: AMBIENT BLANK-00

GC Volatiles

Lot-Sample #...:	M0I280127-001	Work Order #...:	DL6K1102	Matrix.....:	AIR
Date Sampled...:	09/21/00 09:35	Date Received..:	09/26/00 10:30		
Prep Date.....:	09/29/00	Analysis Date..:	09/29/00		
Prep Batch #...:	0273426	Analysis Time..:	12:53		
Dilution Factor:	2.03				
Analyst ID.....:	358011	Instrument ID..:	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
TPH (as Gasoline)	0.76 J,MBE	2.0	ppm(v/v)	0.61

NOTE(S):

J Estimated result. Result is less than RL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

MBE This analyte is present in the associated method blank.

US GEOLOGICAL SURVEY

Client Sample ID: MPC50-00

GC Volatiles

Lot-Sample #...:	M0I280127-002	**Work Order #...:**	DL6K3101	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:00	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273425	**Analysis Time..:**	13:16		
Dilution Factor:	2.07				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.041	ppm(v/v)	0.010
Toluene	**0.39**	**0.041**	**ppm(v/v)**	**0.012**
Ethylbenzene	**1.9**	**0.041**	**ppm(v/v)**	**0.0083**

US GEOLOGICAL SURVEY

Client Sample ID: MPC50-00

GC Volatiles

Lot-Sample #...:	M0I280127-002	**Work Order #...:**	DL6K3201	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:00	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273425	**Analysis Time..:**	14:50		
Dilution Factor:	7.51				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Xylenes (total)	**6.0**	**0.15**	**ppm(v/v)**	**0.060**

US GEOLOGICAL SURVEY

Client Sample ID: VW-00

GC Volatiles

Lot-Sample #...:	M0I280127-004	**Work Order #...:**	DL6K6101	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:20	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273425	**Analysis Time..:**	14:27		
Dilution Factor:	2.05				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.041	ppm(v/v)	0.010
Toluene	ND	0.041	ppm(v/v)	0.012
Ethylbenzene	ND	0.041	ppm(v/v)	0.0082
Xylenes (total)	ND	0.041	ppm(v/v)	0.016

US GEOLOGICAL SURVEY

Client Sample ID: MPC50-00

GC Volatiles

Lot-Sample #...:	M0I280127-002	**Work Order #...:**	DL6K3102	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:00	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273426	**Analysis Time..:**	13:16		
Dilution Factor:	2.07				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
TPH (as Gasoline)	**100**	**2.1**	**ppm(v/v)**	**0.62**

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

US GEOLOGICAL SURVEY

Client Sample ID: MPA5-00

GC Volatiles

Lot-Sample #...:	M0I280127-003	**Work Order #...:**	DL6K4101	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:10	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273425	**Analysis Time..:**	14:04		
Dilution Factor:	2.05				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.041	ppm(v/v)	0.010
Toluene	ND	0.041	ppm(v/v)	0.012
Ethylbenzene	ND	0.041	ppm(v/v)	0.0082
Xylenes (total)	**0.065**	**0.041**	**ppm(v/v)**	**0.016**

US GEOLOGICAL SURVEY

Client Sample ID: MPA5-00

GC Volatiles

Lot-Sample #...:	M0I280127-003	Work Order #...:	DL6K4102	Matrix.....:	AIR
Date Sampled...:	09/21/00 10:10	Date Received..:	09/26/00 10:30		
Prep Date.....:	09/29/00	Analysis Date..:	09/29/00		
Prep Batch #...:	0273426	Analysis Time..:	14:04		
Dilution Factor:	2.05				
Analyst ID.....:	358011	Instrument ID..:	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
TPH (as Gasoline)	5.1	2.0	ppm(v/v)	0.62

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

US GEOLOGICAL SURVEY

Client Sample ID: VW-00

GC Volatiles

Lot-Sample #...:	M0I280127-004	**Work Order #...:**	DL6K6102	**Matrix.....:**	AIR
Date Sampled...:	09/21/00 10:20	**Date Received..:**	09/26/00 10:30		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273426	**Analysis Time..:**	14:47		
Dilution Factor:	2.05				
Analyst ID.....:	358011	**Instrument ID..:**	GC6		
		Method.....:	EPA-19 TO-3		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
TPH (as Gasoline)	**1.0 J,MBE**	**2.0**	**ppm(v/v)**	**0.62**

NOTE(S):

J Estimated result. Result is less than RL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

MBE This analyte is present in the associated method blank.

APPENDIX II

Laboratory Quality Assurance / Quality Control Results

COPY FOR YOUR INFORMATION

CONTRACT LABORATORY DATA-REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Laboratory Lot Number: MOI280127

Data reviewer: Richard Daddow Review date: 10/14/00

District, Project, & Account #: New Mexico Cannon AFB (4635-36004)

Sample collection date: 9/21/00 Sample matrix/no.: air sampler

No. of sample types in lot: Environmental 3 Trip blank _____ Equip. blank _____

MS/MSD _____ Other: ambient blank - 1

2.0 INVOICE STATUS FOR LOT: OK Invoice copy attached X

3.0 DATA REPORTS

Date of Lab analytical report: 9/29/00 Number of copies: bound _____ unbound 3

No. of volumes of raw-data report: 1 No. of CD copies of raw-data report: _____

Raw-data report reviewed? Yes _____ No X

Comments—Data Reports:

Raw-data results included with one copy of unbound analytical report.

4.0 SAMPLE ANALYSES *(Page numbers listed in worksheet refer to lab analytical report)*

4.1 Were accelerated turn-around times (TATs) requested for analyses? Yes ___ No X

If yes, list TAT period and if completed: _____

4.2 Were analyses on chain-of-custody (COC) form performed by lab? YES X NO ___

If **no**, list missing or cancelled analyses and reason for non-performance: _____

TO-3 analyses were performed by the STL Los Angeles laboratory

4.3 Were the samples properly preserved, labeled, no lab log-in problems, and(or) at appropriate temperature (<6 deg. C) upon receipt by the laboratory: Yes X No _____

If **no**, list sample/lab IDs, and associated problems with when delivered at laboratory:

Laboratory Lot No: MDI280127

4.4 Were preparation (extraction) and(or) analysis holding times met? Yes X No ___

If **no**, list analytical methods and sample/lab IDs for samples that exceeded holding-time limits:

4.5 Did surrogate recoveries meet QC acceptance criteria? Yes ___ No ___ NA X

If **no**, list methods, surrogates, associated sample/lab IDs, lab report page #s: ___

4.6 Were dilution factors greater than 1 for ***organic*** analyses? Yes X No ___ NA ___

If **yes**, list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ___ high-analyte levels ___ matrix interferences ___ other ___

TO-3 - all samples

4.7 Were dilution factors greater than 1 for **inorganic** analyses? Yes ___ No ___ NA X

If **yes**, list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ___ high-analyte levels ___ matrix interferences ___ other ___

4.8 Additional comments about sample analyses: ___

Laboratory Lot No: MOI 280127

5.0 QUALITY CONTROL (QC) ANALYSES and RESULTS

5.1 Did lab control samples (LCS/LSCD) meet percent recoveries (%R) criteria? Yes X No ___

If **no**, list method, analytes, LCS/LCSD, and report page #s: ___

5.2 Were any target analytes detected in the **Laboratory Method Blanks**? Yes X No ___

If **yes**, list method, analytes, report page #s: TO-3 TPH 0.33J ppm

5.3 Did the **MS/MSD** results meet %R or RPD acceptance criteria? Yes ___ No ___ NA ___

Note: matrix spike and matrix spike duplicate (MS/MSD) data are used to evaluate the effect of sample matrix on the analytical process and should be only used in conjunction with other available lab QC data. In some cases, MS samples not directly associated with this lot may be used by the laboratory.

List analytical method and if MS samples are associated with this lot.

If did not meet acceptance criteria also list analytes; MS, MSD or RPD; and lab report page #:

___ associated MS lot # yes ___ no ___

___ associated MS lot # yes ___ no ___

___ associated MS lot # yes ___ no ___

___ associated MS lot # yes ___ no ___

___ associated MS lot # yes ___ no ___

___ associated MS lot # yes ___ no ___

No MS results reported for method(s): TO-3

5.4 Additional comments about QC results: ___

Laboratory Lot No: MOI280127

6.0 ANALYTICAL METHODS USED in this LABORATORY LOT NUMBER

_____ VOCs by GC/MS--method 8260B *[water (W) or solids (S) analysis holding-time (HT) of 14 days]*

_____ Gasoline Range Organics (GRO) + BTEX--method 8015M-GRO *[W and S: analysis HT 14 days]*

_____ Diesel Range Organics-method 8015M-DRO *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

_____ Pesticides by GC--method 8081A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

_____ PCBs by GC--method 8082 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

_____ Pesticides by GC--method 8141A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

_____ Herbicides by GC--method 8151A *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

_____ SVOCs by GC/MS--method 8270C *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

_____ Dioxins and Furans--methods 8280 or 8290 *[W and S: prep HT 30 days; analysis HT 45 days]*

_____ PAHs by HPLC method 8310 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

_____ Explosives by HPLC method 8330 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

_____ Hexane extractable materials (HEM and SGT-HEM)--method 1664 *[W: analysis HT 28 days]*

_____ Total organic carbon (TOC)--methods 415.1 or 9060 *[W: analysis HT 28 days]*

_____ Dissolved organic carbon (DOC)--methods 415.1 or 9060 *[W: analysis HT 28 days]*

_____ Total organic halides (TOX)--method 9020 *[W: analysis HT 28 days]*

_____ Metals by ICP--method 6010B/200.7 Dissolved_____Total_____ *[W and S: analysis HT 180 days]*

_____ Metals by ICP/MS--method 6020/200.8 Dissolved_____ Total_____ *[W and S: analysis HT 180 days]*

_____ Metals by GFAA methods *[W and S: analysis HT 180 days]* Methods:Sb-7041, As-7060, Cd-7131 Cr-7191, Pb-7421, Se-7740, Tl-7841 List GFAA metals: _____

_____ Hexavalent chromium--method 7196 *[W: analysis HT **24-48 hours**]*

_____ Mercury by CVAA--method 7470A (W) and 7471A (S) *[W and S: analysis HT 28 days]*

_____ Inorganic anions--method 300 *[W: analysis HT **48 hours**- NO_2, NO_3, ortho-P; HT 28 days--Br,Cl ,F, SO_4]*

_____ Total dissolved solids (TDS)--method 160.1 and(or) TSS--method 160.2 *[W: analysis HT 7 days]*

_____ Total alkalinity--method 310.1 *[W: analysis HT 14 days]*

_____ Nitrogen, ammonia--method 350.1 *[W: analysis HT 28 days]*

_____ Nitrogen, TKN--method 351.2 *[W: analysis HT 28 days]*

_____ Nitrogen, nitrate + nitrite--method 353.2 *[W: analysis HT 28 days]* NO_3 or NO_2 only *[HT **48 hours**]*

_____ Nitrogen, nitrite--method 354.1 *[W: analysis HT **48 hours**]*

_____ Total phosphorus--method 365.3 *[W: analysis HT 28 days]*

_____ Cyanide, total and amenable--methods 9010B or 9012A *[W and S: analysis HT 14 days]*

X Other analyses: BTEX by TO-3 and TPH by TO-3

QC DATA ASSOCIATION SUMMARY

M0I280127

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	AIR	EPA-19 TO-3		0273425	
	AIR	EPA-19 TO-3		0273426	
002	AIR	EPA-19 TO-3		0273425	
	AIR	EPA-19 TO-3		0273426	
003	AIR	EPA-19 TO-3		0273425	
	AIR	EPA-19 TO-3		0273426	
004	AIR	EPA-19 TO-3		0273425	
	AIR	EPA-19 TO-3		0273426	

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: M0I280127
MB Lot-Sample #: M0I290000-425

Work Order #...: DLAPE101

Matrix.....: AIR

Analysis Date..: 09/29/00
Dilution Factor: 1

Prep Date.....: 09/29/00
Prep Batch #...: 0273425

Analyst ID.....: 358011

Analysis Time..: 12:28
Instrument ID..: GC6

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.020	ppm(v/v)	EPA-19 TO-3
Toluene	ND	0.020	ppm(v/v)	EPA-19 TO-3
Ethylbenzene	ND	0.020	ppm(v/v)	EPA-19 TO-3
Xylenes (total)	ND	0.020	ppm(v/v)	EPA-19 TO-3

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: M0I280127
MB Lot-Sample #: M0I290000-426

Work Order #...: DLAPK101

Matrix.....: AIR

Prep Date.....: 09/29/00
Prep Batch #...: 0273426

Analysis Time..: 12:28
Instrument ID..: GC6

Analysis Date..: 09/29/00
Dilution Factor: 1

Analyst ID.....: 358011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
TPH (as Gasoline)	0.33 J	1.0	ppm(v/v)	EPA-19 TO-3

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: M0I280127
LCS Lot-Sample#: M0I290000-425
Prep Date.....: 09/29/00
Prep Batch #...: 0273425
Dilution Factor: 1
Analyst ID.....: 358011

Work Order #...: DLAPE102-LCS
DLAPE103-LCSD
Analysis Date..: 09/29/00
Analysis Time..: 11:47
Instrument ID..: GC6

Matrix.....: AIR

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**0.0963**	**0.0968**	**ppm(v/v)**	**100**		**EPA-19 TO-3**
	0.0963	**0.0964**	**ppm(v/v)**	**100**	**0.37**	**EPA-19 TO-3**
Toluene	**0.0955**	**0.0977**	**ppm(v/v)**	**102**		**EPA-19 TO-3**
	0.0955	**0.0971**	**ppm(v/v)**	**102**	**0.61**	**EPA-19 TO-3**

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: M0I280127
LCS Lot-Sample#: M0I290000-426
Prep Date.....: 09/29/00
Prep Batch #...: 0273426
Dilution Factor: 1
Analyst ID.....: 358011

Work Order #...: DLAPK102-LCS
DLAPK103-LCSD
Analysis Date..: 09/29/00
Analysis Time..: 10:48
Instrument ID..: GC6

Matrix.....: AIR

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
TPH (as Gasoline)	**10.0**	**11.5**	**ppm(v/v)**	**115**		**EPA-19 TO-3**
	10.0	**11.4**	**ppm(v/v)**	**114**	**0.17**	**EPA-19 TO-3**

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Volatiles

Client Lot #...: M0I280127
LCS Lot-Sample#: M0I290000-425
Prep Date.....: 09/29/00
Prep Batch #...: 0273425
Dilution Factor: 1
Analyst ID.....: 358011

Work Order #...: DLAPE102-LCS
DLAPE103-LCSD
Analysis Date..: 09/29/00
Analysis Time..: 11:47
Instrument ID..: GC6

Matrix.....: AIR

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**100**	**(70 - 130)**			**EPA-19 TO-3**
	100	**(70 - 130)**	**0.37**	**(0-20)**	**EPA-19 TO-3**
Toluene	**102**	**(70 - 130)**			**EPA-19 TO-3**
	102	**(70 - 130)**	**0.61**	**(0-20)**	**EPA-19 TO-3**

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Volatiles

Client Lot #...:	M0I280127	**Work Order #...:**	DLAPK102-LCS	**Matrix.....:**	AIR
LCS Lot-Sample#:	M0I290000-426		DLAPK103-LCSD		
Prep Date.....:	09/29/00	**Analysis Date..:**	09/29/00		
Prep Batch #...:	0273426	**Analysis Time..:**	10:48		
Dilution Factor:	1	**Instrument ID..:**	GC6		
Analyst ID.....:	358011				

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
TPH (as Gasoline)	**115**	**(60 - 120)**			**EPA-19 TO-3**
	114	**(60 - 120)**	**0.17**	**(0-20)**	**EPA-19 TO-3**

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

SEVERN TRENT SERVICES

CANISTER QC CERTIFICATION

Date Cleaned/Batch: 09-13-00 B

Date of QC: 9-14-00

Data File Number: 11B09141

Canister ID Numbers

* 12827	9248 B ✓
9424 BB ✓	12473 ✓
GL0109	A-182 ✓
92015	A-151
9139 B	A-277
12265	93051

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria of 0.20ppb or the method detection limit (MDL), whichever is greater.

*INDICATES THE CAN OR CANS WHICH WERE SCREENED.

AA
Reviewed By:

9-14-00
Date:

STL LOS ANGELES

AIR TOXICS - TO14

Data file : \\SANP2014\MSA_DD\chem\gcmsa.i\000914.b\MB09141.D
Lab Smp Id: Client Smp ID: METHOD BLANK
Inj Date : 14-SEP-2000 11:57
Operator : DLK Inst ID: gcmsa.i
Smp Info : ,METHOD BLANK,SCREEN CAN 12827
Misc Info : 1,1,500,500,3,,BLANK,ALL.sub,0
Comment :
Method : \\SANP2014\MSA_DD\chem\gcmsa.i\000914.b\TO14.m
Meth Date : 14-Sep-2000 10:46 target Quant Type: ISTD
Cal Date : 14-SEP-2000 09:39 Cal File: CC09142.D
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ALL.sub
Target Version: 4.03
Processing Host: SANP2014

Concentration Formula: Amt * DF * (FinalPres / InitPres)*(CalVol / SmpVol)

Name	Value	Description
DF	1.000	Dilution Factor
FinalPres	1.000	FinalPres
InitPres	1.000	InitPres
CalVol	500.000	CalVol
SmpVol	500.000	SmpVol

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppbv)	FINAL (ppbv)
* 28 Bromochloromethane	49	7.479	7.461	(1.000)	288332	50.0000	
$ 35 1,2-Dichloroethane-d4	65	8.362	8.344	(0.911)	290901	47.6725	47.67
* 40 1,4-Difluorobenzene	114	9.174	9.157	(1.000)	774573	50.0000	
43 1-Butanol	56	9.156	9.377	(1.224)	15396		ND (a) AL 9/14/00
$ 49 Toluene-d8	98	11.629	11.674	(1.268)	573092	43.4315	43.43
* 60 Chlorobenzene-d5	117	14.491	14.579	(1.000)	572388	50.0000	
$ 70 4-Bromofluorobenzene	95	17.246	17.282	(1.190)	650340	49.1087	49.11
73 Cyclohexanone	55	17.273	17.098	(1.192)	988		ND (a)
74 Cellosolve Acetate	43	17.326	17.135	(1.196)	97		ND (a)

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File: \\SANP2014\MSA_DD\chem\gcmsa.i\000914.B\MB09141.D

Date : 14-SEP-2000 11:57

Client ID: METHOD BLANK

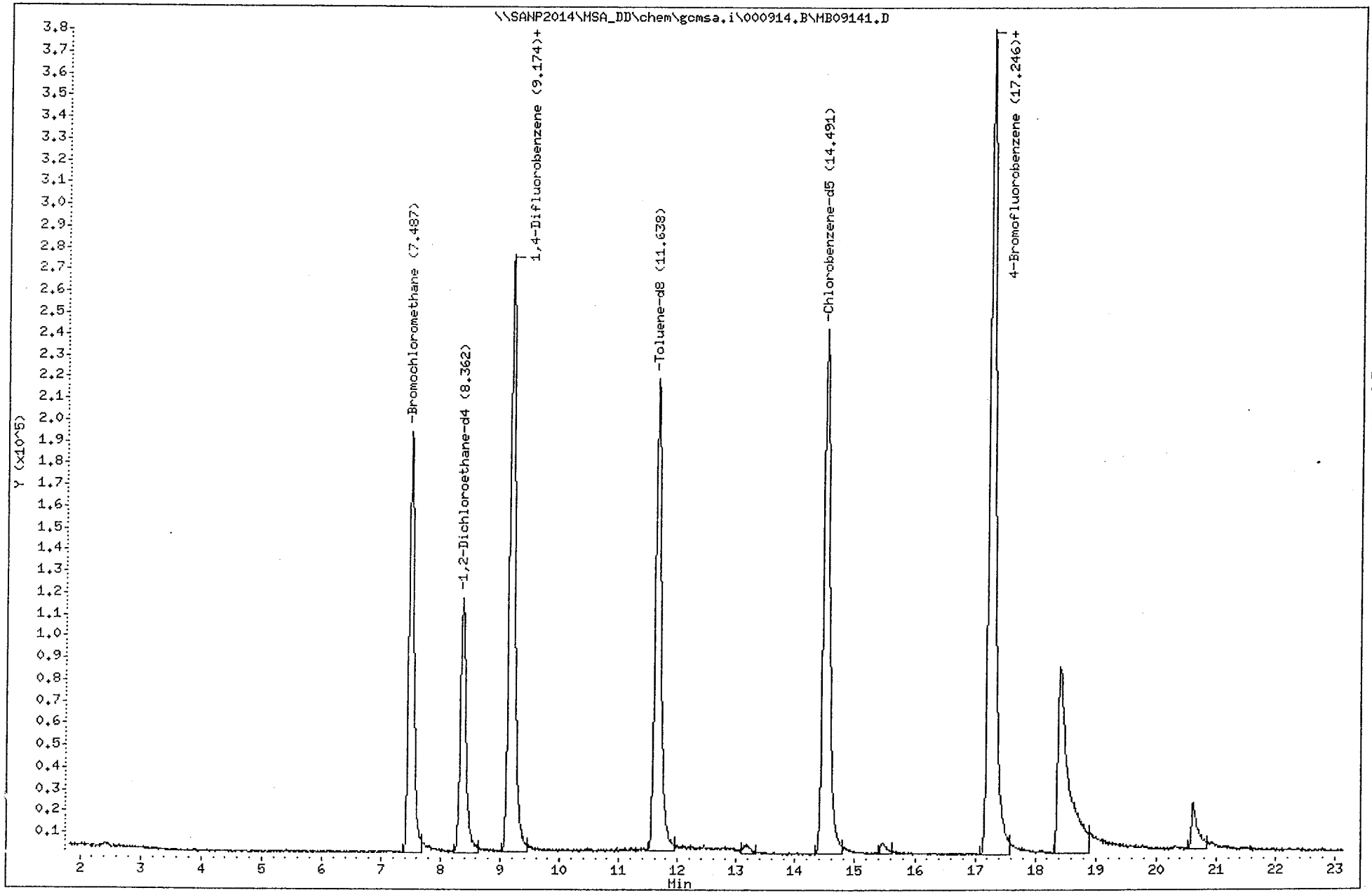
Sample Info: ,METHOD BLANK,SCREEN CAN 12827

Column phase: J&W DB-624

Instrument: gcmsa.i

Operator: DLK

Column diameter: 0.53



Chain of Custody Record

Quanterra

AIRBILL # 812157680089
CUSTODY SEAL 135626

QUA-4124 0797

Client	Project Manager	Date	Chain of Custody Number
U.S. GEOLOGICAL SURVEY	FRED GEBHARDT	9-25-00	37826
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
5338 MONTGOMERY NE SUITE 400	505 8307978	MOI280127	
City / State / Zip Code	**Site Contact**	**Lab Contact**	
ALBUQUERQUE / NM / 87109		SONJA PABIRARA	
Project Name	**Carrier/Waybill Number**		
SWMU #70			
Contract/Purchase Order/Quote No.			
KAREN KUOPPALA			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	GAS	Containers & Preservatives: Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/ NaOH	Summa	Analysis: TPH	BTEX	METHOD TO-3	Special Instructions/ Conditions of Receipt
AMBIENT BLANK-00	9-21-00	0935				✓							✓	✓	✓	✓	
MPC50-00	"	1000				✓							✓	✓	✓	✓	
MPA5-00	"	1010				✓							✓	✓	✓	✓	
VW-00	"	1020				✓							✓	✓	✓	✓	

II-16

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Fredrick E. Gebhardt	9-25-00	1430	1. ~~Received By~~: TO FEDERAL EXPRESS	9-25-00	1430
2. Relinquished By: FED EX	9/26/00	1030	2. Received By: [signature]	9/26/00	1030
3. Relinquished By:	Date	Time	3. Received By:	Date	Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

APPENDIX III

Field Data

Sample container and preservation requirements

Parameters and methods	Bottle Size and Type	Preservatives
Soil-gas: Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), and Total Volatile Petroleum Hydrocarbon (TVPH) by TO-3	One-liter SUMMA® canister	None

SEVERN TRENT SERVICES

CANISTER FIELD DATA RECORD

CLIENT: USGS

CANISTER SERIAL #: 6 12473

DATE CLEANED: 9/13B

CLIENT SAMPLE #: AMBIENT BLANK-00

SITE LOCATION: CAFB

VFR ID: _____

Duration of comp. : _____ hrs. / mins.

Flow setting: _____ ml/min

Initials: _____

READING	TIME	Vac. (inches Hg) Or PRESS. (psig)	DATE	INITIALS
INITIAL VACUUM CHECK		30"	9/19/00	(illegible)
INITIAL FIELD VACUUM	0930	28"	9/21/00	JB.
FINAL FIELD READING	0935	2"	9/21/00	JB.
GAUGE READING UPON RECEIPT				

LABORATORY CANISTER PRESSURIZATION			
INITIAL VACUUM (inches Hg and PSIA)	12.02	092000	DO
FINAL PRESSURE (PSIA)	24.44	↓	↓

Pressurization Gas: _____

COMMENTS:

COMPOSITE TIME (HOURS)	FLOW RATE RANGE (ml/min)
0.5 Hours	158 – 166.7
1	79.2 – 83.3
2	39.6 – 41.7
4	19.8 – 20.8
6	13.2 – 13.9
8	9.9 – 10.4
10	7.92 – 8.3
12	6.6 – 6.9
24	3.5 – 4.0

SEVERN TRENT SERVICES

2

CANISTER FIELD DATA RECORD

CLIENT: USGS

CANISTER SERIAL #: 6 A-182

DATE CLEANED: 9/13B

CLIENT SAMPLE #: MPC50-00

SITE LOCATION: CAFB

VFR ID: _____

Duration of comp. : _____ hrs. / mins.

Flow setting: _____ ml/min

Initials: _____

READING	TIME	Vac. (inches Hg) Or PRESS. (psig)	DATE	INITIALS
INITIAL VACUUM CHECK		30"	9/19/00	~~M~~
INITIAL FIELD VACUUM	0955	28	9/21/00	JM
FINAL FIELD READING	1000	2	9/21/00	JM
GAUGE READING UPON RECEIPT				

LABORATORY CANISTER PRESSURIZATION			
INITIAL VACUUM (inches Hg and PSIA)	11.89	092800	DO
FINAL PRESSURE (PSIA)	24.61	↓	↓

Pressurization Gas: _____

COMMENTS:

COMPOSITE TIME (HOURS)	FLOW RATE RANGE (ml/min)
0.5 Hours	158 – 166.7
1	79.2 – 83.3
2	39.6 – 41.7
4	19.8 – 20.8
6	13.2 – 13.9
8	9.9 – 10.4
10	7.92 – 8.3
12	6.6 – 6.9
24	3.5 – 4.0

SEVERN TRENT SERVICES

3

CANISTER FIELD DATA RECORD

CLIENT: USGS

CANISTER SERIAL #: 9248B

DATE CLEANED: 9/13B

CLIENT SAMPLE #: MPA5-00

SITE LOCATION: CAFB

VFR ID: _____

Duration of comp. : _____ hrs. / mins.

Flow setting: _____ ml/min

Initials: _____

READING	TIME	Vac. (inches Hg) Or PRESS. (psig)	DATE	INITIALS
INITIAL VACUUM CHECK		30"	9/19/00	~~M~~
INITIAL FIELD VACUUM	1005	28	9/21/00	JH
FINAL FIELD READING	1010	1	9/21/00	JH
GAUGE READING UPON RECEIPT				

LABORATORY CANISTER PRESSURIZATION			
INITIAL VACUUM (inches Hg and PSIA)	11.99	092800	PD
FINAL PRESSURE (PSIA)	24.55	↓	↓

Pressurization Gas: _____

COMMENTS:

COMPOSITE TIME (HOURS)	FLOW RATE RANGE (ml/min)
0.5 Hours	158 – 166.7
1	79.2 – 83.3
2	39.6 – 41.7
4	19.8 – 20.8
6	13.2 – 13.9
8	9.9 – 10.4
10	7.92 – 8.3
12	6.6 – 6.9
24	3.5 – 4.0

SEVERN TRENT SERVICES

4

CANISTER FIELD DATA RECORD

CLIENT: USGS

CANISTER SERIAL #: 9424BB

DATE CLEANED: 9/13B

CLIENT SAMPLE #: VW-00

SITE LOCATION: CAFB

VFR ID: _____

Duration of comp. : _____ hrs. / mins.

Flow setting: _____ ml/min

Initials: _____

READING	TIME	Vac. (inches Hg) Or PRESS. (psig)	DATE	INITIALS
INITIAL VACUUM CHECK		30"	9/19/00	~~H~~
INITIAL FIELD VACUUM	1015	28	9/21/00	JH.
FINAL FIELD READING	1020	1	9/21/00	JH.
GAUGE READING UPON RECEIPT				

LABORATORY CANISTER PRESSURIZATION			
INITIAL VACUUM (inches Hg and PSIA)	24.51	092800	DO
FINAL PRESSURE (PSIA)	11.98	↓	↓

Pressurization Gas: _____

COMMENTS:

COMPOSITE TIME (HOURS)	FLOW RATE RANGE (ml/min)
0.5 Hours	158 – 166.7
1	79.2 – 83.3
2	39.6 – 41.7
4	19.8 – 20.8
6	13.2 – 13.9
8	9.9 – 10.4
10	7.92 – 8.3
12	6.6 – 6.9
24	3.5 – 4.0

9/20/00 CAFB

1500 FRED GEBHARDT FROM USGS NM DISTRICT ARRIVES AT CAFB ENVIRONMENTAL OFFICES. MET WITH JOHN PIKE & SANFORD HUTSELL TO DISCUSS WORKING AT THE SWMU #70 SITE BEGINNING TOMORROW

ALSO DISCUSSED WAS POSSIBLE GEOPROBE WORK ON ANOTHER SITE ON BASE. PLUS A GROUND-WATER LEVEL MONITORING SETUP FOR CANNON AFB. ASKED JOHN ABOUT THE RESTRICTIONS ON RADIO TRANSMISSON FREQUENCIES. HE WASN'T CLEAR ON ANY RESTRICTIONS, HE WILL DO FURTHER INVESTIGATION.

ALSO MET WITH SCOTT MENDENHALL IN REGARDS TO A ASBESTOS LANDFILL, WILL ~~CHECK~~ RECON THE LANDFILL ON FRIDAY THE 22ND, AND DISCUSS OPTIONS.

1600 FINISHED DISCUSSING WORK WITH CAFB ENVIRONMENTAL. WILL HEAD TO MOTEL AND MAKE UP STANDARDS FOR THE G.C. AND GET THE G.C. UP AND RUNNING

9/21/00 SWMU #70

0730 ARRIVED AT SWMU #70 SITE ON CAFB. DISCUSSED WHAT WORK WILL BE PERFORM WITH REFUELING MAINTANCE PERSONNEL.

WILL NOW SET UP THE G.C. AND RUN EQUIPMENT BLANKS AND STANDARDS.

GAS CHROMATOGRAPH (G.C) PHOTOVAC 10-S 50 SERIAL # 6180151.

BTEX STANDARD PREPARED BY SUPELCO

B- BENZENE E - ETHYLBENZENE

T- TOLUENE X - XYLENE (m, O, P)

LOT : LA82384 EXP APR/2002

20 ug/ml IN METHANOL

MADE TWO STANDARDS ONE WITH 3 µ/L BTEX TO 20 ml DI WATER, OTHER 5 µ/L BTEX 20 ml DI WATER.

0915 G.C. IS UP AND RUNNING. RAN A INSTRUMENT BLANK, SYRINGE BLANK, AND TWO STANDARDS. FIRST STANDARD IS 5 µ/L BTEX, SHOT 50 µ/L @ GAIN OF 50. SECOND WAS 5 µ/L BTEX 100 µ/L @ GAIN 50.

9/21/00

0935 COLLECTED FIRST SUMMA CANISTER SAMPLE - AMBIENT BLANK-00. WILL COLLECT ~~ON~~ ALL SUMMA SAMPLES BEFORE BEGINNING SCREENING ~~EACH~~ FOR O_2, CO_2, & VOLITILES.

~~THIS YEAR WILL COLLECT AN ADDITIONAL SUMMA SAMPLE AT MPB-50, DUE TO LARGE READING ON G.C. LAST YEAR~~

MY MISTAKE W/ AMBIENT BLANK NOT ENOUGH CANISTERS

1000 COLLECTED SUMMA CANISTER SAMPLE MPC50-00.

1010 COLLECTED SUMMA CANISTER SAMPLE MPA5-00

1020 COLLECTED SUMMA CANISTER SAMPLE VW-00

1030 WILL NOW PREPARE TO COLLECT FIELD PARAMETERS FROM MONITORING POINTS & VENT WELL. THE PROCEDURES FOR THIS COLLECTION WILL BE DIFFERENT THAN THE PREVIOUS TWO YEARS. THE SAMPLE CHAMBER WILL NOT BE USED. ALL SAMPLES WILL BE COLLECTED DIRECTLY FROM THE PORTS. SAMPLES COLLECTED ARE: O_2 FROM MSA PASSPORT METER CO_2 FROM DETECTOR TUBES; VOC FROM HNU PID AND G.C. SAMPLES.

9/21/00

1040 STARTED PURGING VW WELL.

1045 COLLECTED FIELD PARAMETERS FOR VW

O_2 = 20.8 CO_2 = 0 HNU = 0

INJECTED 50 µL WITH A GAIN OF 50 INTO G.C.

1055 G.C. RESULTS FOR VW = NEGATIVE

1100 STARTED PURGING MPC 5

1105 COLLECTED FIELD PARAMETERS O_2 = 20.2 CO_2 = 1.5

HNU = 5 INJECTED 20-20

1115 G.C. RESULTS - POSITIVE. STARTED PURGING

MPC - 25

1120 FIELD PARAMETERS O_2 = 20.0 CO_2 = 2

HNU = 15 INJECTED 20-20

1130 G.C RESULTS - POSITIVE STARTED PURGING

mPC - 50

1135 FIELD PARAMETERS O_2 = 20.0 CO_2 = 1

HNU = 15 INJECTED 20-20

1145 G.C. RESULTS - POSITIVE STARTED PURGING

mPC - 70

1150 FIELD PARAMETER O_2 = 20.3 CO_2 = 1

HNU - 5 INJECTED 50 - 20.

1200 G.C. RESULTS - TRACE. STARTED PURGING

mPC - 110.

1205 FIELD PARAMETERS O_2 = 20.5 CO_2 = 0.5

HNU = 1 INJECTED 50-50.

1215 G.C. RESULTS - TRACE. WILL MOVE TO

mPB VAPOR POINTS, BUT FIRST WILL RUN

G.C. BLANKS

9/21/00

1240 STARTED PURGING MPB - 5

1245 COLLECTED FIELD PARAMETERS FOR MPB-5
O_2 = 20.8 CO_2 = 0.5 HNU = 1
INJECTED 50 - 50

1255 G.C. RESULTS - NEGATIVE. STARTED PURGING
MPB - 25.

1300 FIELD PARAMETERS O_2 = 20.2 CO_2 = 2
HNU = 15 INJELTED 20 - 20.

1315 G.C. RESULTS = POSITIVE STARTED PURGING
MPB - 50.

1320 FIELP PARAMETERS O_2 = 19.6 CO_2 = 1.5
HNU = 60 INJECTED 20 - 20

1325 SWAMPED THE G.C. WILL NEED TO FLUSH
THE SYSTEM & RUN BLANKS.

1415 INJECTED 10 μL WITH GAIN OF 20

1430 G.C. RESULTS FOR MPB 50 - POSITIVE.
STARTED PURGING MPB - 70.

1435 FIELD PARAMETERS O_2 = 19.6 CO_2 = 1
HNU = 10. INJECTED 20 - 20.

1450 G.C. RESULTS - POSITIVE. STARTED PURGING
MPB - 110~~0~~.

1500 FIELD PARAMETERS O_2 = 20.0 CO_2 = 1
HNU = 1. INJECTED 50 - 50.

1510 G.C. RESULTS - TRACE. WILL RUN G.C. BLANKS
THEN PACK UP EQUIPMENT AND CALL IT A DAY.

9/22/00

0735 FRED GEBHARDT ARRIVES AT SWMU #70 SITE WILL FIRST MAKE STANDARDS FOR G.C. THEN RUN BLANKS.

0915 STARTED PURGING MPA-5.

0925 COLLECTED FIELD PARAMETERS O_2 = 20.6 CO_2 = 0 HNU = 0.5 INJECTED 50-50

0935 G.C. RESULTS - ~~NEGATIVE~~ TRACE. STARTED PURGING MPA-25

0940 FIELD PARAMETERS O_2 = 20.6 CO_2 = 0 HNU = 1 INJECTED 50-50

0950 G.C. RESULTS - ~~TRACE~~ NEGATIVE, STARTED PURGING MPA 70

~~0955~~

1005 FIELD PARAMETERS O_2 = 20.4 CO_2 = 1 HNU = 5 INJECTED 50-50

1015 GC RESULTS - TRACE. STARTED PURGING MPA 110.

1020 FIELD PARAMETERS O_2 = 20.3 CO_2 = 0 HNU = .5 INJECTED 50-50

1025 GC RESULTS NEGATIVE. BEGAN PURGING ON MPA - 50.

1030 FIELD PARAMETERS O_2 = 20.2 CO_2 = 2 HNU = 2

1040 G.C. RESULTS - TRACE. WILL NOW RUN G.C. BLANKS, THEN PACK UP AND HEAD BACK TO ABQ.