TRANSMITTAL

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To: Lynn Hornecker **Date:** 25 November 2002

From: David Kelly DK

Subject: Interim Data Summary – UST Cluster 2 Soil Vapor Extraction Testing

Performance evaluation testing was conducted in the former location of underground storage tank (UST) Cluster 2 to evaluate the long-term effectiveness of soil vapor extraction (SVE) at remediating the petroleum hydrocarbons in the soil. The work was completed in accordance with the *Soil Vapor Extraction Optimization for the Remediation of UST Cluster 1 and Site Verification Activities at Various Sites Work Plan, Revision 2*, Attachment 5. The performance evaluation testing fieldwork was conducted from 26 June through 4 December 2001. A transmittal dated 22 July 2002 presented the preliminary results of the performance evaluation testing. The transmittal also included proposed soil sampling to evaluate the effectiveness of the performance evaluation testing. The soil sampling was conducted 21-22 October 2002. This transmittal provides the results of the soil sampling.

Previous investigations at UST Cluster 2 identified petroleum impacted soil and groundwater after removal of three 210,000-gallon concrete and steel USTs (CL-7, CL-8, and CL-9). The layout of the tank and associated loading stations are included in Attachment 1. The tanks had been used to store JP-4 and JP-5. Each tank had included a "dry well" (a cobble filled pit located near the east side of the tank) that had been used to dispose of water collected in the sumps at the bottom of the tank. Impacted soil was found at the former locations of each of the dry wells with the largest area of affected soil near the dry well adjacent to tank CL-9. Total petroleum hydrocarbon (TPH) concentrations as high as 29,000 milligrams per kilogram (mg/kg) were detected in soil samples collected between tank CL-9 and the dry well. Attachment 1 includes analytical results from soil samples collected in 1995 and 1996.

Based on the results of previous investigations, a corrective action plan (CAP) was prepared which evaluated alternatives for site remediation. Based on the evaluation, a combination of bioventing for soil remediation and biospraging for groundwater remediation were proposed in the CAP (TtEMI 1998). Detailed designs were prepared for the implementation of the corrective action alternative (TtEMI 1999). The remediation system was constructed in the fall of 1999. The system was started 31 January 2000 and operated through 2 June 2000. The system operated in SVE and biosparge mode to attempt to recover as much of the volatile contaminants as possible. During the operation of the SVE system the petroleum hydrocarbon vapor concentrations from the extraction wells decreased significantly from the initial concentrations. Approximately 3,200 pounds of petroleum hydrocarbons were recovered by the SVE system. SVE proved to be cost effective at removing contamination during the initial SVE/biosparge system operation. The majority of the contamination at UST Cluster 2 had a relatively high volatility, which was not consistent with assumptions made in the CAP. SVE performance evaluation testing was conducted to further evaluate the effectiveness of SVE and to minimize the spread of contaminants in the vadose zone.

Performance evaluation testing was conducted from 26 June 2001 through 4 December 2001 using the existing wells, piping, and instrumentation. In general the soil gas data from the performance evaluation testing indicates a significant decrease in TVPH concentration over time in each of the wells. Wells CL2-BV-01, CL2-BV-02, and CL1-BV-03 showed large decreases in TVPH (FID) concentrations initially (within the first 500 hours) followed by gradual decreases for the remainder of the testing. Well CL2-BV-04 showed gradual decrease in TVPH (FID) concentration from the start of the testing. Approximately 2400 pounds of petroleum hydrocarbons were removed during the performance evaluation testing. Only wells CL2-BV-01 and CL2-BV-02 showed significant increases in TVPH (FID) concentrations during the rebound testing.

In accordance with Attachment 5 of the work plan, soil samples were collected from the UST Cluster 2 site to evaluate effectiveness of the SVE/sparge system operation and the performance evaluation testing and to determine additional soil remediation requirements at the site. The figure included in Attachment 2 shows the actual sample locations. Some locations were adjusted in the field from the proposed locations to accommodate surface structures and underground piping. The soil samples were collected using direct-push technology and were analyzed at an off-site laboratory. The samples were analyzed for total petroleum hydrocarbons in the gasoline, jet fuel, diesel, and motor oil ranges and for volatile organic compounds. Selected samples were also analyzed for leachable diesel and motor oil by the California Waste Extraction Test using de-ionized water (DI-WET). The preliminary analytical results are included in Attachment 3. The data has not been validated and may change prior to final reporting.

Sample Number	Depth (ft bgs)	TVPH by PID* (ppm)	Comment
CL2-GP-01(22)	22	0	No indication of petroleum hydrocarbon impact below 35 ft bgs.
CL2-GP-01(35)	35	0	
CL2-GP-02(27)	27	0	No indication of petroleum hydrocarbon impact below 35 ft bgs.
CL2-GP-02(35)	35	0	
CL2-GP-03(25)	25	0	No indication of petroleum hydrocarbon impact below 35 ft bgs.
CL2-GP-03(35)	35	0	
CL2-GP-04(25)	25	582	Strong petroleum hydrocarbon odor and high PID reading below 35 ft bgs. Sample collected above water table (42 ft bgs).
CL2-GP-04(30)	30	1140	
CL2-GP-04(35)	35	332	
CL2-GP-04(42)	42	1800	
CL2-GP-05(25)	25	50	Slight petroleum hydrocarbon smell and low PID reading below 35 ft bgs. Sample collected above the water table (40 ft bgs).
CL2-GP-05(30)	30	0	
CL2-GP-05(35)	35	0	
CL2-GP-05(40)	40	140	
CL2-GP-06(25)	25	8	Max sample depth of 30 ft bgs due to gravel/cemented soil. No sample collected at 35 ft bgs.
CL2-GP-06(35)	35	NA	

Vapor concentration measured using hand-held photo ionization detector in the field.

The concentration of petroleum hydrocarbons at sample location CL2-GP-01, near the UST CL-8 dry well, were below the reporting limits, which are significantly less than the concentrations previously measured at location SB2-9. The data indicates that the SVE testing effectively remediated the petroleum hydrocarbons in the vadose zone near UST CL-8.

The concentration of petroleum hydrocarbons at sample locations CL2-GP-02 and CL2-GP-03 were also below the reporting limits. These samples further define the extent of impact in the vadose zone around the UST CL-9 dry well and indicate a reduction of the downgradient extent of the vadose zone plume.

Results from all samples collected from location CL2-GP-04 indicated relatively high concentrations of gasoline and diesel. These samples were collected at the location of the former dry well and indicate that the dry well was the likely source of the petroleum impact to soil and groundwater at the UST Cluster 2 site. The concentrations at location CL2-GP-04 are significantly less than the previously measured maximum concentration at location SB2-6 (29000 mg/kg), which was approximately 20 feet from the former dry well. Sample CL2-GP-04(25) was analyzed for leachable diesel and motor oil by the DI-WET because the sample contained the highest concentrations of VOCs. Sample CL2-GP-04(42) was also analyzed by the DI-WET because the sample contained the highest diesel concentration. The results from both samples indicate that a fraction of the petroleum hydrocarbons remaining in the soil at UST Cluster 2 is leachable.

Location CL2-GP-05 was approximately 5 feet west of SB2-6 and the results from the samples collected at 30 ft bgs indicate a significant decrease in petroleum hydrocarbon concentrations in that area of the vadose zone plume, from 29000 mg/kg at location SB2-6 in July 1995 to 5 mg/kg at location CL2-GP-05.

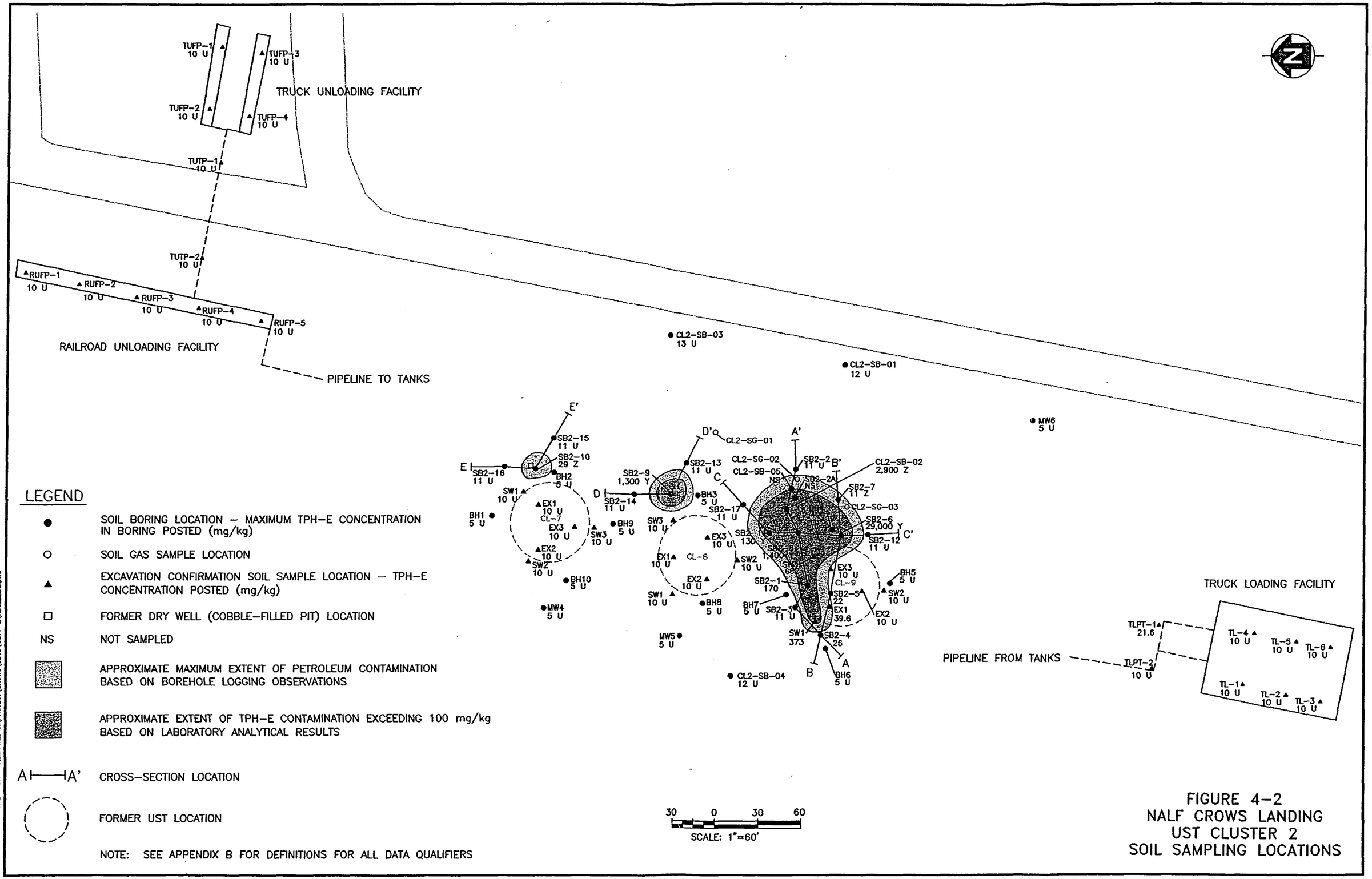
Only one sample could be collected from location CL2-GP-06 because the direct push drilling method could not effectively penetrate the gravel material used to backfill the tank excavation. The sample collected from 25 ft bgs (the base of the former tank excavation) at location CL2-GP-06 had a low concentration of diesel and indicates that the SVE testing effectively remediated the area of the vadose zone plume below and near the former tank location.

In general the data indicates that the system operation in SVE/biosparge mode and the SVE performance evaluation testing were effective at reducing the petroleum hydrocarbon concentrations in the vadose zone soil at UST Cluster 2, and at reducing the size of the vadose zone plume. Results from the area where the highest petroleum hydrocarbon concentrations were previously measured in soil near the UST CL-9 and the impacted area near the dry well at CL-8 now indicates that the concentrations are near or below the method detection limits. Petroleum hydrocarbons remain near the dry well at UST CL-9 that include volatile compounds and have a potential to leach and impact groundwater. Recent groundwater data does not indicate that significant leaching is occurring. Addition SVE from the vent wells located near the UST CL-9 dry well (CL2-BV-01 and CL2-BV-02) could further reduce the petroleum hydrocarbons in the vadose zone at UST Cluster 2.

CC: B Hulet
T Barry
Project File

ATTACHMENT 1

HISTORICAL DATA



LEGEND

- ● SOIL BORING LOCATION – MAXIMUM TPH–E CONCENTRATION IN BORING POSTED (mg/kg)
- ○ SOIL GAS SAMPLE LOCATION
- ▲ EXCAVATION CONFIRMATION SOIL SAMPLE LOCATION – TPH–E CONCENTRATION POSTED (mg/kg)
- □ FORMER DRY WELL (COBBLE–FILLED PIT) LOCATION
- NS NOT SAMPLED
- APPROXIMATE MAXIMUM EXTENT OF PETROLEUM CONTAMINATION BASED ON BOREHOLE LOGGING OBSERVATIONS
- APPROXIMATE EXTENT OF TPH–E CONTAMINATION EXCEEDING 100 mg/kg BASED ON LABORATORY ANALYTICAL RESULTS
- A—A' CROSS–SECTION LOCATION
- FORMER UST LOCATION

NOTE: SEE APPENDIX B FOR DEFINITIONS FOR ALL DATA QUALIFIERS

FIGURE 4–2
NALF CROWS LANDING
UST CLUSTER 2
SOIL SAMPLING LOCATIONS

DATE: 01-30-97 TWL DN FILENAME: C:\PROJECT\CROWS\0319\UST1-2\XSCL2LOC.DWG

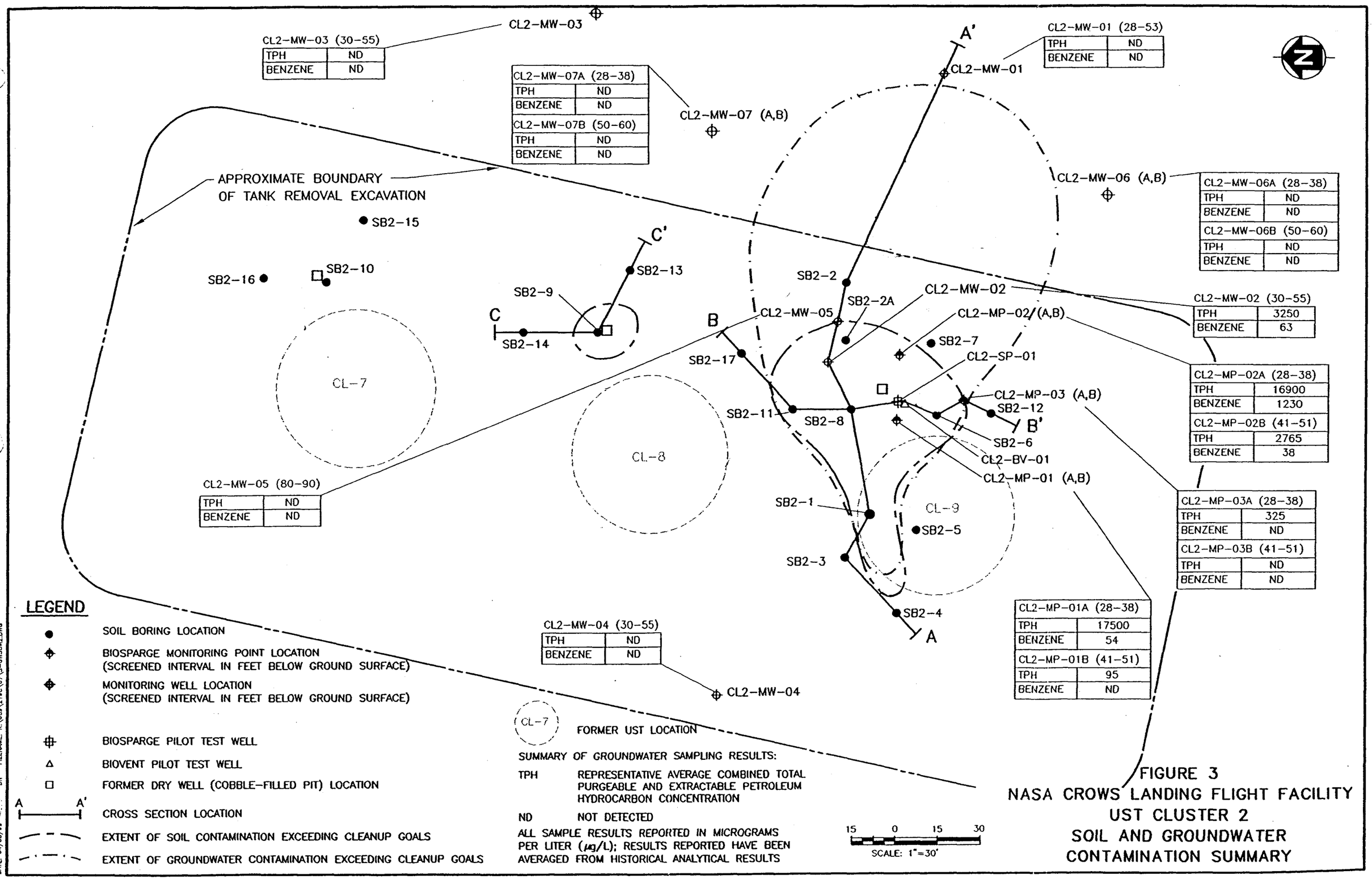


FIGURE 3
NASA CROWS LANDING FLIGHT FACILITY
UST CLUSTER 2
SOIL AND GROUNDWATER
CONTAMINATION SUMMARY

TA 4-4
NALF CROWS LANDING
UST CLUSTER 2
SOIL ANALYSIS RESULTS SUMMARY

	Soil Boring Samples										
Borehole Number (Well Number)	MW5 (MW5)	MW6 (MW6)	SB2-1	SB2-2	SB2-2A	SB2-3	SB2-4	SB2-5	SB2-6	SB2-7	SB2-8
Date Sampled	Oct-90	Oct-90	Jul-95	Jul-95	Jul-95 (1)	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95
Sample Depth (bgs)	20 feet	20 feet	27 feet	21 feet		23 feet	21 feet	32 feet	23 feet	21 feet	26 feet
TPH-E	5U	5U	170Y	11U		11U	23Z	12U	410Y	11U	1400Y
Benzene	0.05U	0.05U	2.9UJ-H	0.005U		0.006U	0.006UJ-K	0.006UJ-K	0.29UJ-H	0.005U	0.047J
Toluene	0.05U	0.05U	2.9UJ-H	0.005U		0.006U	0.006U	0.006UJ-K	0.29UJ-H	0.005U	0.29U
Ethylbenzene	0.05U	0.05U	2.9UJ-H	0.005U		0.006UJ-K	0.006UJ-K	0.006UJ-K	0.29UJ-H	0.005U	2.6
Xylene(s)	0.05U	0.05U	2.9UJ-H	0.016U		0.017UJ-K	0.018UJ-K	0.018UJ-K	0.29UJ-H	0.016U	1.2
Sample Depth (bgs)	25 feet	25 feet	36 feet	28.5 feet		29 feet	29 feet	36 feet	30 feet	29 feet	36 feet
TPH-E	5U	5U	12U (1U)	11U		12U	12U	22Z	29000Y (2Z)	12U	570Y
Benzene	0.05U	0.05U	0.006UJ-K (2R)	0.006U		0.006U	0.006UJ-K	0.006UJ-K	2.8UJ-H (2R)	0.006U	0.29U
Toluene	0.05U	0.05U	0.006UJ-K (2R)	0.006U		0.006U	0.006U	0.006UJ-K	2.8UJ-H (2R)	0.006U	0.29U
Ethylbenzene	0.05U	0.05U	0.006U (2R)	0.006U		0.006UJ-K	0.006UJ-K	0.006UJ-K	7.8J-H (85J-H)	0.006U	0.29U
Xylene(s)	0.05U	0.05U	0.018UJ-K (5R)	0.017U		0.018UJ-K	0.017UJ-K	0.016UJ-K	2.8UJ-H (5R)	0.018U	0.078J
Sample Depth (bgs)	35 feet	35 feet		36 feet		37 feet	36 feet		38 feet	36 feet	
TPH-E	5U	5U		11U		12U	26Z		5200Y	11Z	
Benzene	0.05U	0.05U		0.006UJ-K		0.006U	0.006UJ-K		3.3UJ-H	0.006U	
Toluene	0.05U	0.05U		0.006UJ-K		0.006U	0.006UJ-K		3.3UJ-H	0.006U	
Ethylbenzene	0.05U	0.05U		0.006UJ-K		0.006UJ-K	0.006UJ-K		6.1J-H	0.006U	
Xylene(s)	0.05U	0.05U		0.017UJ-K		0.019UJ-K	0.018UJ-K		3.3UJ-H	0.017U	

Deionized water-waste extraction test (DI-WET) analyses shown in parentheses next to total concentrations
Total concentrations in milligrams per kilogram (mg/kg), DI-WET concentrations in micrograms per liter (ug/L)

TABLE 4-4
NALF CROWS LANDING
UST CLUSTER 2
SOIL ANALYSIS RESULTS SUMMARY

	Soil Boring Samples									
Borehole Number (Well Number)	SB2-9	SB2-10	SB2-11	SB2-12	SB2-13	SB2-14	SB2-15	SB2-16	SB2-17	CL2-SB-01 (CL2-MW-01)
Date Sampled	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95	Jul-95	Aug-95	Nov-95
Sample Depth (bgs)	22 feet	21 feet	26 feet	23 feet	21 feet	25.5 feet	16 feet	21 feet	22 feet	33 feet
TPH-E	1300Y	29Z	130Y	11U	11U	11U	11U	11U	11U	12U
Benzene	0.27U	0.006U	0.006R	0.006U	0.005U	0.006U	0.006U	0.005U	0.006U	0.006U
Toluene	0.27U	0.006U	0.006R	0.006U	0.005U	0.006U	0.006U	0.005U	0.006U	0.006U
Ethylbenzene	4	0.006U	0.006R	0.006U	0.005U	0.006UJ-K	0.006UJ-K	0.005UJ-K	0.006UJ-K	0.006U
Xylene(s)	5	0.017U	0.017R	0.017U	0.016U	0.017UJ-K	0.017UJ-K	0.016UJ-K	0.017UJ-K	0.018U
Sample Depth (bgs)	36 feet	31 feet	36.5 feet	32 feet	27 feet	31.5 feet	26 feet	27 feet	29 feet	54 feet
TPH-E	12U (1U)	12U	11U (1U)	11U	11U	12U	11U	11U	12U	12U
Benzene	0.006U (2U)	0.006U	0.006UJ-HK (2U)	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U
Toluene	0.006U (3J-B)	0.006U	0.006UJ-H (2U)	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	0.006U
Ethylbenzene	0.006U (2U)	0.006U	0.006UJ-HK (2U)	0.006U	0.006U	0.006UJ-K	0.006UJ-K	0.006UJ-K	0.006UJ-K	0.006U
Xylene(s)	0.018U (5U)	0.018U	0.017UJ-HK (5U)	0.017U	0.017U	0.018UJ-K	0.017UJ-K	0.017UJ-K	0.018UJ-K	0.018U
Sample Depth (bgs)		36.5 feet		37 feet	36 feet	37 feet	36 feet	35.5 feet	35.5 feet	
TPH-E		12U		12U	12U	12U	12U	12U	12U	
Benzene		0.006U		0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	
Toluene		0.006U		0.006U	0.006U	0.006U	0.006U	0.006U	0.006U	
Ethylbenzene		0.006U		0.006U	0.006U	0.006UJ-K	0.006UJ-K	0.006UJ-K	0.006UJ-K	
Xylene(s)		0.019U		0.018U	0.018U	0.018UJ-K	0.018UJ-K	0.018UJ-K	0.018UJ-K	

Deionized water-waste extraction test (DI-WET) analyses shown in parentheses next to total concentrations
Total concentrations in milligrams per kilogram (mg/kg), DI-WET concentrations in micrograms per liter (ug/L)

TA 4-4
NALF CROWS LANDING
UST CLUSTER 2
SOIL ANALYSIS RESULTS SUMMARY

	Soil Boring Samples			
Borehole Number (Well Number)	CL2-SB-02 (CL2-MW-02)	CL2-SB-03 (CL2-MW-03)	CL2-SB-04 (CL2-MW-04)	CL1-SB-05 (CL2-MW-05)
Date Sampled	Nov-95	Nov-95	Apr-96	Apr-96 (2)
Sample Depth (bgs)	26 feet	39 feet	35 feet	
TPH-E	2700Z (2Z)	13U	12U	
Benzene	1.2U (18)	0.006U	0.006U	
Toluene	1.2U (5U)	0.006U	0.006U	
Ethylbenzene	10 (200)	0.006U	0.006U	
Xylene(s)	8.2 (110)	0.019U	0.018UJ-K	
Sample Depth (bgs)	35 feet			
TPH-E	2900Z			
Benzene	0.59U			
Toluene	0.59U			
Ethylbenzene	5.6			
Xylene(s)	1.8U			
Sample Depth (bgs)				
TPH-E				
Benzene				
Toluene				
Ethylbenzene				
Xylene(s)				

Deionized water-waste extraction test (DI-WET) analyses shown in parentheses next to total concentrations
Total concentrations in milligrams per kilogram (mg/kg), DI-WET concentrations in micrograms per liter (ug/L)

ATTACHMENT 2

SOIL SAMPLE LOCATIONS AND PRELIMINARY ANALYTICAL RESULTS

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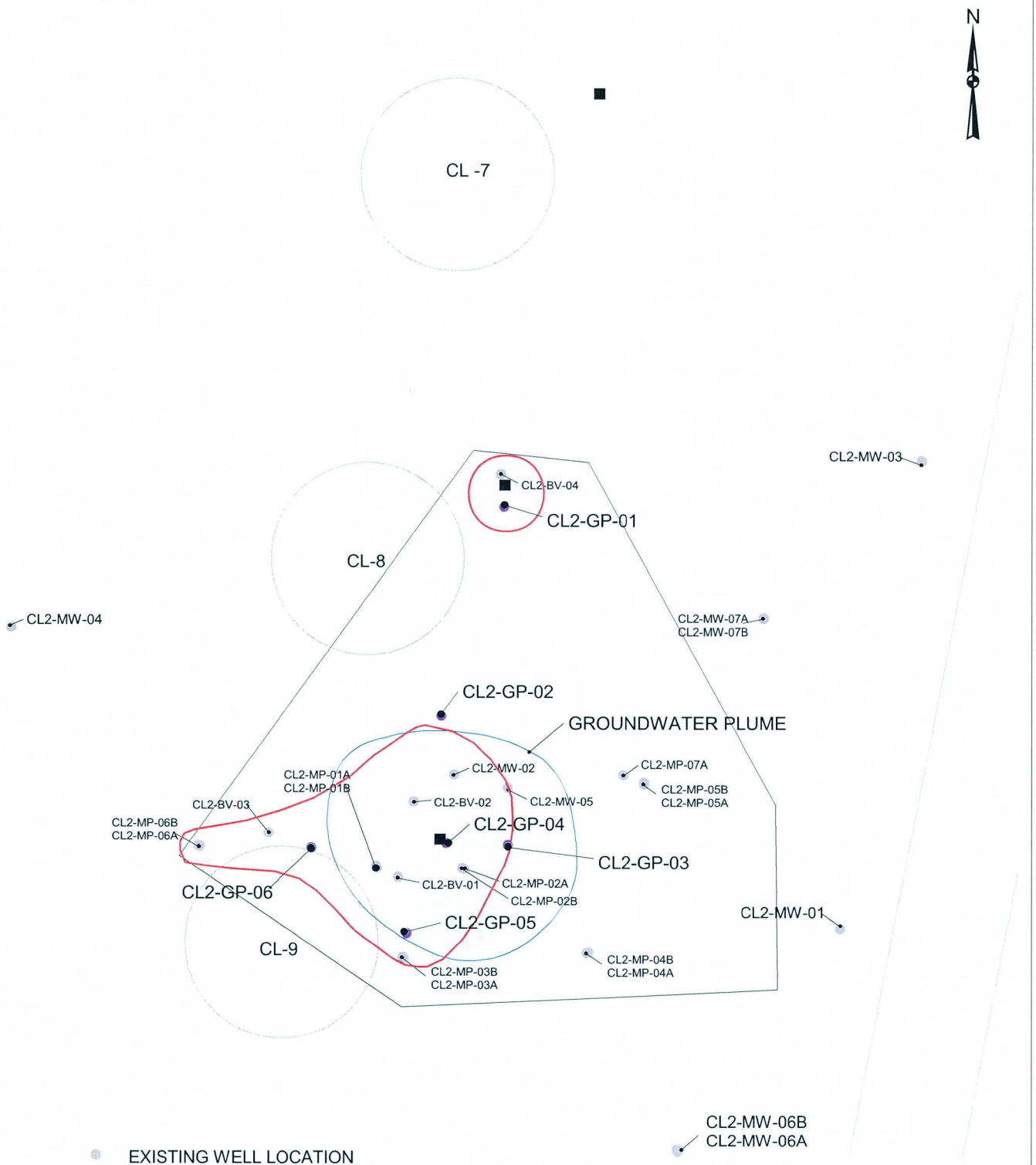

EXISTING WELL LOCATION

FORMER DRY WELL LOCATION

SOIL SAMPLE LOCATION

SCALE:

9 0 9 18 27 36 45 Feet

UST CLUSTER 2
SOIL SAMPLE LOCATIONS

NASA CROWS LANDING FLIGHT FACILITY
CROWS LANDING, CALIFORNIA

UST Cluster 2
Soil Sampling October 2002
Preliminary Data Summary

	Method	Action Level[c]								
Sample ID			**CL2-GP-01**		**CL2-GP-02**		**CL2-GP-03**		**CL2-GP-04**	
Sample Depth (ft bgs)			**22**	**35**	**27**	**35**	**25**	**35**	**25**	**30**
TPH-gasoline[a]	**M8015V**	**5 mg/kg**	<0.49 mg/kg	**0.009J** mg/kg	<0.45 mg/kg	**0.01J** mg/kg	<0.45 mg/kg	<0.47 mg/kg	**220 mg/kg**	**180 mg/kg**
TPH-jet fuel	**M8015V**	**5 mg/kg**	<0.49 mg/kg	<0.49 mg/kg	<0.45 mg/kg	<0.44 mg/kg	<0.45 mg/kg	<0.47 mg/kg	<57 mg/kg	<60 mg/kg
TPH-diesel[b] (JP-5)	**M8015E**	**100 mg/kg**	<11 mg/kg	**3J** mg/kg	<11 mg/kg	<11 mg/kg	<12 mg/kg	<11 mg/kg	**4100 mg/kg**	**4200 mg/kg**
TPH-diesel[b] (JP-5)	**DI-WET**								**67** mg/L	
TPH-motor oil	**M8015E**	**100 mg/kg**	<11 mg/kg	<12 mg/kg	<11 mg/kg	<11 mg/kg	<12 mg/kg	<11 mg/kg	<570 mg/kg	<570 mg/kg
TPH-motor oil	**DI-WET**								<2 mg/L	
acetone	**8260**		<93 ug/kg	<98 ug/kg	<86 ug/kg	<86 ug/kg	<93 ug/kg	<87 ug/kg	<23000 ug/kg	<24000 ug/kg
benzene	**8260**	**1000** ug/kg	<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	<1100 ug/kg	<1200 ug/kg
sec-butylbenzene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**1000J** ug/kg	<1200 ug/kg
ethylbenzene	**8260**	**29000** ug/kg	<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	<1100 ug/kg	<1200 ug/kg
isopropylbenzene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**96J** ug/kg	<1200 ug/kg
p-isopropyltoluene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**3800** ug/kg	**410J** ug/kg
MEK	**8260**		<93 ug/kg	<98 ug/kg	<86 ug/kg	<86 ug/kg	<93 ug/kg	<87 ug/kg	<23000 ug/kg	<24000 ug/kg
methylene chloride	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**2000** ug/kg	**1000** ug/kg
MTBE	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	<1100 ug/kg	<1200 ug/kg
napthalene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**9600** ug/kg	**4300** ug/kg
n-propylbenzene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	<1100 ug/kg	<1200 ug/kg
toluene	**8260**	**42000** ug/kg	<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	<1100 ug/kg	<1200 ug/kg
1,2,4-trimethylbenzene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**13000** ug/kg	**300J** ug/kg
1,3,5-trimethylbenzene	**8260**		<4.6 ug/kg	<4.9 ug/kg	<4.3 ug/kg	<4.3 ug/kg	<4.7 ug/kg	<4.4 ug/kg	**5100** ug/kg	**170J** ug/kg
xylenes	**8260**	**17000** ug/kg	<9.3 ug/kg	<9.8 ug/kg	<8.6 ug/kg	<8.6 ug/kg	<9.3 ug/kg	<8.7 ug/kg	<2300 ug/kg	<2400 ug/kg

Detections are bolded

Detections above the Action Levels are shaded

[a] Not gasoline - longer chain hydrocarbons in gasoline range

[b] Not diesel - similar to JP-5

[c] Action levels proposed in Corrective Action Plan

UST Cluster 2
Soil Sampling October 2002
Preliminary Data Summary

	Method	Action Level[c]								
Sample ID			**CL2-GP-04**			**CL2-GP-05**			**CL2-GP-06**	
Sample Depth (ft bgs)			**35**	**42**	**25**	**30**	**35**	**40**	**25**	**35**
TPH-gasoline[a]	**M8015V**	**5 mg/kg**	**60 mg/kg**	**1300 mg/kg**	**0.2J mg/kg**	**0.02J mg/kg**	**0.01J mg/kg**	**0.09J mg/kg**	**0.2J mg/kg**	
TPH-jet fuel	**M8015V**	**5 mg/kg**	<30 mg/kg	<590 mg/kg	<0.46 mg/kg	<0.47 mg/kg	<0.45 mg/kg	<0.49 mg/kg	<0.57 mg/kg	
TPH-diesel[b] (JP-5)	**M8015E**	**100 mg/kg**	**2900 mg/kg**	**5300 mg/kg**	**1600 mg/kg**	**5J mg/kg**	<11 mg/kg	**240 mg/kg**	**73 mg/kg**	
TPH-diesel[b] (JP-5)	**DI-WET**			**190 mg/L**						
TPH-motor oil	**M8015E**	**100 mg/kg**	<590 mg/kg	<590 mg/kg	<110 mg/kg	**3J mg/kg**	<11 mg/kg	<12 mg/kg	**4J mg/kg**	
TPH-motor oil	**DI-WET**			<17 mg/L						
acetone	**8260**		<12000 ug/kg	<24000 ug/kg	<97 ug/kg	**29J ug/kg**	<91 ug/kg	<12000 ug/kg	**35J ug/kg**	
benzene	**8260**	**1000 ug/kg**	<590 ug/kg	<1200 ug/kg	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
sec-butylbenzene	**8260**		<590 ug/kg	**230J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
ethylbenzene	**8260**	**29000 ug/kg**	<590 ug/kg	**120J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
isopropylbenzene	**8260**		<590 ug/kg	<1200 ug/kg	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
p-isopropyltoluene	**8260**		<590 ug/kg	**450J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
MEK	**8260**		<12000 ug/kg	<24000 ug/kg	<97 ug/kg	<96 ug/kg	<91 ug/kg	<12000 ug/kg	<100 ug/kg	
methylene chloride	**8260**		**590J ug/kg**	**1000 ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	**580J ug/kg**	<5.2 ug/kg	
MTBE	**8260**		<590 ug/kg	<1200 ug/kg	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
napthalene	**8260**		**470J ug/kg**	**640J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
n-propylbenzene	**8260**		<590 ug/kg	**87J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
toluene	**8260**	**42000 ug/kg**	<590 ug/kg	<1200 ug/kg	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
1,2,4-trimethylbenzene	**8260**		**45J ug/kg**	**320J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
1,3,5-trimethylbenzene	**8260**		<590 ug/kg	**240J ug/kg**	<4.8 ug/kg	<4.8 ug/kg	<4.6 ug/kg	<590 ug/kg	<5.2 ug/kg	
xylenes	**8260**	**17000 ug/kg**	<1200 ug/kg	**170J ug/kg**	<9.7 ug/kg	<9.6 ug/kg	<9.1 ug/kg	<1200 ug/kg	<10 ug/kg	

UNABLE TO COLLECT SAMPLE

Detections are bolded

Detections above the Action Levels are shaded

[a] Not gasoline - longer chain hydrocarbons in gasoline range

[b] Not diesel - similar to JP-5

[c] Action levels proposed in Corrective Action Plan

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APCL Analytical Report

Submitted to:
Shaw E & I
Attention: Rose Condit
4005 Port Chicago Highway
Concord CA 94520-1120
Tel: (925)288-9898 Fax: (925)827-5927

Service ID #: 801-025599
Collected by:
Collected on: 10/21/02

Received: 10/22/02
Extracted: 10/22-24/02
Tested: 10/22-28/02
Reported: 10/30/02

Sample Description: Soil and Water
Project Description: 800063 Crows Landing

Analysis of Water and Soil Samples

I . Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result RB 10/21/02 02-05599-8
Dilution Factor				1
GASOLINE RANGE ORGANICS	M8015V	mg/L	0.05	0.03J
Dilution Factor				1
JP-4	M8015V	mg/L	0.05	<0.05
Dilution Factor				0.96
DIESEL RANGE ORGANICS	M8015E	mg/L	0.1	<0.096
Dilution Factor				0.96
MOTOR OIL RANGE ORGANICS	M8015E	mg/L	0.1	<0.096
VOLATILE ORGANICS				
Dilution Factor				1
ACETONE	8260B	µg/L	10	<10
BENZENE	8260B	µg/L	0.5	<0.5
BROMOBENZENE	8260B	µg/L	0.5	<0.5
BROMOCHLOROMETHANE	8260B	µg/L	0.5	<0.5
BROMODICHLOROMETHANE	8260B	µg/L	0.5	<0.5
BROMOFORM	8260B	µg/L	0.5	<0.5
BROMOMETHANE	8260B	µg/L	0.5	<0.5
2-BUTANONE (MEK)	8260B	µg/L	10	<10
N-BUTYLBENZENE	8260B	µg/L	0.5	<0.5
SEC-BUTYLBENZENE	8260B	µg/L	0.5	<0.5
TERT-BUTYLBENZENE	8260B	µg/L	0.5	<0.5
CARBON DISULFIDE	8260B	µg/L	10	<10
CARBON TETRACHLORIDE	8260B	µg/L	0.5	<0.5
CHLOROBENZENE	8260B	µg/L	0.5	<0.5
DIBROMOCHLOROMETHANE	8260B	µg/L	0.5	<0.5
CHLOROETHANE	8260B	µg/L	0.5	<0.5
CHLOROFORM	8260B	µg/L	0.5	<0.5
CHLOROMETHANE	8260B	µg/L	0.5	<0.5
2-CHLOROTOLUENE	8260B	µg/L	0.5	<0.5
4-CHLOROTOLUENE	8260B	µg/L	0.5	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/L	0.5	<0.5
1,2-DIBROMOETHANE (EDB)	8260B	µg/L	0.5	<0.5
DIBROMOMETHANE	8260B	µg/L	0.5	<0.5
1,2-DICHLOROBENZENE	8260B	µg/L	0.5	<0.5
1,3-DICHLOROBENZENE	8260B	µg/L	0.5	<0.5
1,4-DICHLOROBENZENE	8260B	µg/L	0.5	<0.5
DICHLORODIFLUOROMETHANE	8260B	µg/L	0.5	<0.5
1,1-DICHLOROETHANE	8260B	µg/L	0.5	<0.5
1,2-DICHLOROETHANE	8260B	µg/L	0.5	<0.5
1,1-DICHLOROETHENE	8260B	µg/L	0.5	<0.5

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Component Analyzed	Method	Unit	PQL	Analysis Result RB 10/21/02 02-05599-8
CIS-1,2-DICHLOROETHENE	8260B	µg/L	0.5	<0.5
TRANS-1,2-DICHLOROETHENE	8260B	µg/L	0.5	<0.5
1,2-DICHLOROPROPANE	8260B	µg/L	0.5	<0.5
1,3-DICHLOROPROPANE	8260B	µg/L	0.5	<0.5
2,2-DICHLOROPROPANE	8260B	µg/L	0.5	<0.5
1,1-DICHLOROPROPENE	8260B	µg/L	0.5	<0.5
CIS-1,3-DICHLOROPROPENE	8260B	µg/L	0.5	<0.5
TRANS-1,3-DICHLOROPROPENE	8260B	µg/L	0.5	<0.5
ETHYLBENZENE	8260B	µg/L	0.5	<0.5
HEXACHLOROBUTADIENE	8260B	µg/L	0.5	<0.5
2-HEXANONE	8260B	µg/L	10	<10
ISOPROPYLBENZENE (CUMENE)	8260B	µg/L	0.5	<0.5
P-ISOPROPYLTOLUENE	8260B	µg/L	0.5	<0.5
METHYLENE CHLORIDE	8260B	µg/L	0.5	<0.5
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/L	10	<10
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/L	1	<1
NAPHTHALENE	8260B	µg/L	0.5	<0.5
N-PROPYLBENZENE	8260B	µg/L	0.5	<0.5
STYRENE	8260B	µg/L	0.5	<0.5
1,1,1,2-TETRACHLOROETHANE	8260B	µg/L	0.5	<0.5
1,1,2,2-TETRACHLOROETHANE	8260B	µg/L	0.5	<0.5
TETRACHLOROETHENE	8260B	µg/L	0.5	<0.5
TOLUENE	8260B	µg/L	0.5	<0.5
1,2,3-TRICHLOROBENZENE	8260B	µg/L	0.5	<0.5
1,2,4-TRICHLOROBENZENE	8260B	µg/L	0.5	<0.5
1,1,1-TRICHLOROETHANE	8260B	µg/L	0.5	<0.5
1,1,2-TRICHLOROETHANE	8260B	µg/L	0.5	<0.5
TRICHLOROETHENE	8260B	µg/L	0.5	<0.5
TRICHLOROFLUOROMETHANE	8260B	µg/L	0.5	<0.5
1,2,3-TRICHLOROPROPANE	8260B	µg/L	0.5	<0.5
1,2,4-TRIMETHYLBENZENE	8260B	µg/L	0.5	<0.5
1,3,5-TRIMETHYLBENZENE	8260B	µg/L	0.5	<0.5
VINYL CHLORIDE	8260B	µg/L	0.5	<0.5
XYLENE (TOTAL)	8260B	µg/L	1	<1
T-BUTYL ALCOHOL	8260B	µg/L	20	<20

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APCL Analytical Report

II . Analysis of Soil Samples

Component Analyzed	Method	Unit	PQL	Analysis Result CL-99-38 02-05599-1	CL2-GP-02-22 02-05599-2	CL2-GP-01-22 02-05599-3
PERCENT MOISTURE	ASTM-D2216	W%	0.5	12.4	10.5	12.6
Dilution Factor				0.78	0.81	0.85
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	<0.45	<0.45	<0.49
Dilution Factor				0.78	0.81	0.85
JP-4	M8015V	mg/kg	0.5	<0.45	<0.45	<0.49
Dilution Factor				1	1	1
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	<11	<11	<11
Dilution Factor				1	1	1
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<11	<11	<11
VOLATILE ORGANICS						
Dilution Factor				0.82	0.77	0.81
ACETONE	8260B	µg/kg	100	<94	<86	<93
BENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
BROMOBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
BROMOCHLOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
BROMODICHLOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
BROMOFORM	8260B	µg/kg	5	<4.7	<4.3	<4.6
BROMOMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
2-BUTANONE (MEK)	8260B	µg/kg	100	<94	<86	<93
N-BUTYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
SEC-BUTYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TERT-BUTYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CARBON DISULFIDE	8260B	µg/kg	100	<94	<86	<93
CARBON TETRACHLORIDE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CHLOROFORM	8260B	µg/kg	5	<4.7	<4.3	<4.6
CHLOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
2-CHLOROTOLUENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
4-CHLOROTOLUENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<4.7	<4.3	<4.6
DIBROMOMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1-DICHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2-DICHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1-DICHLOROETHENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<4.7	<4.3	<4.6

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL-99-38 02-05599-1	CL2-GP-02-27 02-05599-2	CL2-GP-01-22 02-05599-3
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
ETHYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
2-HEXANONE	8260B	µg/kg	50	<47	<43	<46
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<4.7	<4.3	<4.6
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
METHYLENE CHLORIDE	8260B	µg/kg	5	<4.7	<4.3	<4.6
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<47	<43	<46
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<4.7	<4.3	<4.6
NAPHTHALENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
N-PROPYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
STYRENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TETRACHLOROETHENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TOLUENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TRICHLOROETHENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.7	<4.3	<4.6
VINYL CHLORIDE	8260B	µg/kg	5	<4.7	<4.3	<4.6
XYLENE (TOTAL)	8260B	µg/kg	10	<9.4	<8.6	<9.3
T-BUTYL ALCOHOL	8260B	µg/kg	20	<19	<17	<19

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-01-35 02-05599-4	CL2-GP-02-35 02-05599-5	CL2-GP-03-25 02-05599-6	CL2-GP-03-35 02-05599-7
PERCENT MOISTURE	ASTM-D2216	W%	0.5	16.1	12.5	15.3	11.6
Dilution Factor				0.83	0.77	0.77	0.83
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	0.009J	0.01J	<0.45	<0.47
Dilution Factor				0.83	0.77	0.77	0.83
JP-4	M8015V	mg/kg	0.5	<0.49	<0.44	<0.45	<0.47
Dilution Factor				1	1	1	1
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	3J	<11	<12	<11
Dilution Factor				1	1	1	1
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<12	<11	<12	<11
VOLATILE ORGANICS							
Dilution Factor				0.82	0.75	0.79	0.77
ACETONE	8260B	µg/kg	100	<98	<86	<93	<87
BENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
BROMOBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
BROMOCHLOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
BROMODICHLOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
BROMOFORM	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
BROMOMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
2-BUTANONE (MEK)	8260B	µg/kg	100	<98	<86	<93	<87
N-BUTYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
SEC-BUTYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TERT-BUTYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CARBON DISULFIDE	8260B	µg/kg	100	<98	<86	<93	<87
CARBON TETRACHLORIDE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CHLOROFORM	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CHLOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
2-CHLOROTOLUENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
4-CHLOROTOLUENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
DIBROMOMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1-DICHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2-DICHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1-DICHLOROETHENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-01-35 02-05599-4	CL2-GP-02-35 02-05599-5	CL2-GP-03-25 02-05599-6	CL2-GP-03-35 02-05599-7
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
ETHYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
2-HEXANONE	8260B	µg/kg	50	<49	<43	<47	<44
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
METHYLENE CHLORIDE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<49	<43	<47	<44
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
NAPHTHALENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
N-PROPYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
STYRENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TETRACHLOROETHENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TOLUENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TRICHLOROETHENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
VINYL CHLORIDE	8260B	µg/kg	5	<4.9	<4.3	<4.7	<4.4
XYLENE (TOTAL)	8260B	µg/kg	10	<9.8	<8.6	<9.3	<8.7
T-BUTYL ALCOHOL	8260B	µg/kg	20	<20	<17	<19	<17

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
† All results are reported on dry basis for soil samples.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

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APCL Analytical Report

Submitted to:
Shaw E & I
Attention: Rose Condit
4005 Port Chicago Highway
Concord CA 94520-1120
Tel: (925)288-9898 Fax: (925)827-5927

Service ID #: 801-025631
Collected by:
Collected on: 10/22/02

Received: 10/23/02
Extracted: 10/24/02
Tested: 10/24-28/02
Reported: 10/30/02

Sample Description: Soil from Crows Landing
Project Description: 800063 Cluster 2 Confirmation.

Analysis of Soil Samples

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-04-25 02-05631-1	CL2-GP-04-30 02-05631-2	CL2-GP-04-35 02-05631-3
PERCENT MOISTURE	ASTM-D2216	W%	0.5	12.2	16.6	15.9
Dilution Factor				100	100	50
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	220 [a]	180 [a]	60 [a]
Dilution Factor				100	100	50
JP-4	M8015V	mg/kg	0.5	<57	<60	<30
Dilution Factor				50	50	50
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	4,100 [b]	4,200 [b]	2,900 [b]
Dilution Factor				50	50	50
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<570	<600	<590
VOLATILE ORGANICS						
Dilution Factor				200	200	100
ACETONE	8260B	µg/kg	100	<23000	<24000	<12000
BENZENE	8260B	µg/kg	5	<1100	<1200	<590
BROMOBENZENE	8260B	µg/kg	5	<1100	<1200	<590
BROMOCHLOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
BROMODICHLOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
BROMOFORM	8260B	µg/kg	5	<1100	<1200	<590
BROMOMETHANE	8260B	µg/kg	5	<1100	<1200	<590
2-BUTANONE (MEK)	8260B	µg/kg	100	<23000	<24000	<12000
N-BUTYLBENZENE	8260B	µg/kg	5	<1100	<1200	<590
SEC-BUTYLBENZENE	8260B	µg/kg	5	1,000J	<1200	<590
TERT-BUTYLBENZENE	8260B	µg/kg	5	<1100	<1200	<590
CARBON DISULFIDE	8260B	µg/kg	100	<23000	<24000	<12000
CARBON TETRACHLORIDE	8260B	µg/kg	5	<1100	<1200	<590
CHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
CHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
CHLOROFORM	8260B	µg/kg	5	<1100	<1200	<590
CHLOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
2-CHLOROTOLUENE	8260B	µg/kg	5	<1100	<1200	<590
4-CHLOROTOLUENE	8260B	µg/kg	5	<1100	<1200	<590
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<1100	<1200	<590
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<1100	<1200	<590
DIBROMOMETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,1-DICHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,2-DICHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,1-DICHLOROETHENE	8260B	µg/kg	5	<1100	<1200	<590

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-04-25 02-05631-1	CL2-GP-04-30 02-05631-2	CL2-GP-04-35 02-05631-3
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<1100	<1200	<590
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<1100	<1200	<590
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<1100	<1200	<590
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<1100	<1200	<590
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<1100	<1200	<590
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<1100	<1200	<590
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<1100	<1200	<590
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<1100	<1200	<590
ETHYLBENZENE	8260B	µg/kg	5	<1100	<1200	<590
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<1100	<1200	<590
2 HEXANONE	8260B	µg/kg	50	<11000	<12000	<5900
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	96J	<1200	<590
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	3,800	410J	<590
METHYLENE CHLORIDE	8260B	µg/kg	5	2,000	1,000	590J
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<11000	<12000	<5900
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<1100	<1200	<590
NAPHTHALENE	8260B	µg/kg	5	9,600	4,300	470J
N-PROPYLBENZENE	8260B	µg/kg	5	<1100	<1200	<590
STYRENE	8260B	µg/kg	5	<1100	<1200	<590
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
TETRACHLOROETHENE	8260B	µg/kg	5	<1100	<1200	<590
TOLUENE	8260B	µg/kg	5	<1100	<1200	<590
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<1100	<1200	<590
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<1100	<1200	<590
TRICHLOROETHENE	8260B	µg/kg	5	<1100	<1200	<590
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<1100	<1200	<590
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<1100	<1200	<590
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	13,000	300J	45J
1,3,5 TRIMETHYLBENZENE	8260B	µg/kg	5	5,100	170J	<590
VINYL CHLORIDE	8260B	µg/kg	5	<1100	<1200	<590
XYLENE (TOTAL)	8260B	µg/kg	10	<2300	<2400	<1200
T-BUTYL ALCOHOL	8260B	µg/kg	20	<4600	<4800	<2400

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-04-42 02-05631-4
PERCENT MOISTURE	ASTM-D2216	W%	0.5	14.9
Dilution Factor				1000
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	1,300 [a]
Dilution Factor				1000
JP-4	M8015V	mg/kg	0.5	<590
Dilution Factor				50
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	5,300 [b]
Dilution Factor				50
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<590
VOLATILE ORGANICS				
Dilution Factor				200
ACETONE	8260B	µg/kg	100	<24000
BENZENE	8260B	µg/kg	5	<1200
BROMOBENZENE	8260B	µg/kg	5	<1200
BROMOCHLOROMETHANE	8260B	µg/kg	5	<1200
BROMODICHLOROMETHANE	8260B	µg/kg	5	<1200
BROMOFORM	8260B	µg/kg	5	<1200
BROMOMETHANE	8260B	µg/kg	5	<1200
2-BUTANONE (MEK)	8260B	µg/kg	100	<24000
N-BUTYLBENZENE	8260B	µg/kg	5	<1200
SEC-BUTYLBENZENE	8260B	µg/kg	5	230J
TERT-BUTYLBENZENE	8260B	µg/kg	5	<1200
CARBON DISULFIDE	8260B	µg/kg	100	<24000
CARBON TETRACHLORIDE	8260B	µg/kg	5	<1200
CHLOROBENZENE	8260B	µg/kg	5	<1200
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<1200
CHLOROETHANE	8260B	µg/kg	5	<1200
CHLOROFORM	8260B	µg/kg	5	<1200
CHLOROMETHANE	8260B	µg/kg	5	<1200
2-CHLOROTOLUENE	8260B	µg/kg	5	<1200
4-CHLOROTOLUENE	8260B	µg/kg	5	<1200
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<1200
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<1200
DIBROMOMETHANE	8260B	µg/kg	5	<1200
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<1200
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<1200
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<1200
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<1200
1,1-DICHLOROETHANE	8260B	µg/kg	5	<1200
1,2-DICHLOROETHANE	8260B	µg/kg	5	<1200
1,1-DICHLOROETHENE	8260B	µg/kg	5	<1200
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<1200
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<1200
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<1200
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<1200
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<1200

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-04-42 02-05631-4
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<1200
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<1200
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<1200
ETHYLBENZENE	8260B	µg/kg	5	120J
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<1200
2-HEXANONE	8260B	µg/kg	50	<12000
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<1200
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	450J
METHYLENE CHLORIDE	8260B	µg/kg	5	1,000
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<12000
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<1200
NAPHTHALENE	8260B	µg/kg	5	640J
N-PROPYLBENZENE	8260B	µg/kg	5	87J
STYRENE	8260B	µg/kg	5	<1200
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<1200
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<1200
TETRACHLOROETHENE	8260B	µg/kg	5	<1200
TOLUENE	8260B	µg/kg	5	<1200
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<1200
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<1200
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<1200
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<1200
TRICHLOROETHENE	8260B	µg/kg	5	<1200
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<1200
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<1200
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	320J
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	240J
VINYL CHLORIDE	8260B	µg/kg	5	<1200
XYLENE (TOTAL)	8260B	µg/kg	10	170J
T-BUTYL ALCOHOL	8260B	µg/kg	20	<4700

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-25 02-05631-5	CL2-GP-05-30 02-05631-6
PERCENT MOISTURE	ASTM-D2216	W%	0.5	12.3	11.1
Dilution Factor				1	1
Dilution Factor				0.81	0.83
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	0.2J [a]	0.02J
Dilution Factor				0.81	0.83
JP-4	M8015V	mg/kg	0.5	<0.46	<0.47
Dilution Factor				10	1
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	1,600 [b]	5J [b]
Dilution Factor				10	1
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<110	3J

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Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-25 02-05631-5	Analysis Result CL2-GP-05-30 02-05631-6
VOLATILE ORGANICS					
Dilution Factor				0.85	0.85
ACETONE	8260B	µg/kg	100	<97	29J
BENZENE	8260B	µg/kg	5	<4.8	<4.8
BROMOBENZENE	8260B	µg/kg	5	<4.8	<4.8
BROMOCHLOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
BROMODICHLOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
BROMOFORM	8260B	µg/kg	5	<4.8	<4.8
BROMOMETHANE	8260B	µg/kg	5	<4.8	<4.8
2-BUTANONE (MEK)	8260B	µg/kg	100	<97	<96
N-BUTYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
SEC-BUTYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
TERT BUTYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
CARBON DISULFIDE	8260B	µg/kg	100	<97	<96
CARBON TETRACHLORIDE	8260B	µg/kg	5	<4.8	<4.8
CHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
CHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
CHLOROFORM	8260B	µg/kg	5	<4.8	<4.8
CHLOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
2-CHLOROTOLUENE	8260B	µg/kg	5	<4.8	<4.8
4-CHLOROTOLUENE	8260B	µg/kg	5	<4.8	<4.8
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<4.8	<4.8
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<4.8	<4.8
DIBROMOMETHANE	8260B	µg/kg	5	<4.8	<4.8
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
1,1-DICHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
1,2-DICHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
1,1-DICHLOROETHENE	8260B	µg/kg	5	<4.8	<4.8
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.8	<4.8
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.8	<4.8
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.8	<4.8
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<4.8	<4.8
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.8	<4.8
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<4.8	<4.8
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.8	<4.8
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.8	<4.8
ETHYLBENZENE	8260B	µg/kg	5	<4.8	<4.8

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-25 02-05631-5	CL2-GP-05-30 02-05631-6
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<4.8	<4.8
2-HEXANONE	8260B	µg/kg	50	<48	<48
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<4.8	<4.8
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<4.8	<4.8
METHYLENE CHLORIDE	8260B	µg/kg	5	<4.8	<4.8
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<48	<48
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<4.8	<4.8
NAPHTHALENE	8260B	µg/kg	5	<4.8	<4.8
N-PROPYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
STYRENE	8260B	µg/kg	5	<4.8	<4.8
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
TETRACHLOROETHENE	8260B	µg/kg	5	<4.8	<4.8
TOLUENE	8260B	µg/kg	5	<4.8	<4.8
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<4.8	<4.8
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<4.8	<4.8
TRICHLOROETHENE	8260B	µg/kg	5	<4.8	<4.8
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<4.8	<4.8
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<4.8	<4.8
1,2,4 TRIMETHYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.8	<4.8
VINYL CHLORIDE	8260B	µg/kg	5	<4.8	<4.8
XYLENE (TOTAL)	8260B	µg/kg	10	<9.7	<9.6
T-BUTYL ALCOHOL	8260B	µg/kg	20	<19	<19

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-35 02-05631-7
PERCENT MOISTURE	ASTM-D2216	W%	0.5	10.1
Dilution Factor				0.81
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	0.01J
Dilution Factor				0.81
JP-4	M8015V	mg/kg	0.5	<0.45
Dilution Factor				1
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	<11
Dilution Factor				1
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<11

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Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-35 02-05631-7
VOLATILE ORGANICS				
Dilution Factor				0.82
ACETONE	8260B	µg/kg	100	<91
BENZENE	8260B	µg/kg	5	<4.6
BROMOBENZENE	8260B	µg/kg	5	<4.6
BROMOCHLOROMETHANE	8260B	µg/kg	5	<4.6
BROMODICHLOROMETHANE	8260B	µg/kg	5	<4.6
BROMOFORM	8260B	µg/kg	5	<4.6
BROMOMETHANE	8260B	µg/kg	5	<4.6
2-BUTANONE (MEK)	8260B	µg/kg	100	<91
N-BUTYLBENZENE	8260B	µg/kg	5	<4.6
SEC-BUTYLBENZENE	8260B	µg/kg	5	<4.6
TERT-BUTYLBENZENE	8260B	µg/kg	5	<4.6
CARBON DISULFIDE	8260B	µg/kg	100	<91
CARBON TETRACHLORIDE	8260B	µg/kg	5	<4.6
CHLOROBENZENE	8260B	µg/kg	5	<4.6
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<4.6
CHLOROETHANE	8260B	µg/kg	5	<4.6
CHLOROFORM	8260B	µg/kg	5	<4.6
CHLOROMETHANE	8260B	µg/kg	5	<4.6
2-CHLOROTOLUENE	8260B	µg/kg	5	<4.6
4-CHLOROTOLUENE	8260B	µg/kg	5	<4.6
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<4.6
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<4.6
DIBROMOMETHANE	8260B	µg/kg	5	<4.6
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<4.6
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<4.6
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<4.6
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<4.6
1,1-DICHLOROETHANE	8260B	µg/kg	5	<4.6
1,2-DICHLOROETHANE	8260B	µg/kg	5	<4.6
1,1-DICHLOROETHENE	8260B	µg/kg	5	<4.6
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.6
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<4.6
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.6
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<4.6
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<4.6
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<4.6
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.6
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<4.6
ETHYLBENZENE	8260B	µg/kg	5	<4.6
2-HEXANONE	8260B	µg/kg	50	<46
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<4.6

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-35 02-05631-7
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<4.6
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<4.6
METHYLENE CHLORIDE	8260B	µg/kg	5	<4.6
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<46
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<4.6
NAPHTHALENE	8260B	µg/kg	5	<4.6
N-PROPYLBENZENE	8260B	µg/kg	5	<4.6
STYRENE	8260B	µg/kg	5	<4.6
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.6
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<4.6
TETRACHLOROETHENE	8260B	µg/kg	5	<4.6
TOLUENE	8260B	µg/kg	5	<4.6
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<4.6
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<4.6
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<4.6
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<4.6
TRICHLOROETHENE	8260B	µg/kg	5	<4.6
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<4.6
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<4.6
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.6
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<4.6
VINYL CHLORIDE	8260B	µg/kg	5	<4.6
XYLENE (TOTAL)	8260B	µg/kg	10	<9.1
T-BUTYL ALCOHOL	8260B	µg/kg	20	<18

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-40 02-05631-8	CL-99-39 02-05631-9
PERCENT MOISTURE	ASTM-D2216	W%	0.5	15.5	15.4
Dilution Factor				0.82	1
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	0.09J [a]	-
Dilution Factor				0.82	1
JP-4	M8015V	mg/kg	0.5	<0.49	-
Dilution Factor				1	50
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	-	40 [a]
Dilution Factor				1	50
JP-4	M8015V	mg/kg	0.5	-	<30
Dilution Factor				1	20
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	240 [b]	2,600 [b]
Dilution Factor				1	20
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	<12	<240

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Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-40 02-05631-8	CL-99-39 02-05631-9
VOLATILE ORGANICS					
Dilution Factor				100	200
ACETONE	8260B	µg/kg	100	<12000	<24000
BENZENE	8260B	µg/kg	5	<600	<1200
BROMOBENZENE	8260B	µg/kg	5	<590	<1200
BROMOCHLOROMETHANE	8260B	µg/kg	5	<590	<1200
BROMODICHLOROMETHANE	8260B	µg/kg	5	<590	<1200
BROMOFORM	8260B	µg/kg	5	<590	<1200
BROMOMETHANE	8260B	µg/kg	5	<590	<1200
2-BUTANONE (MEK)	8260B	µg/kg	100	<12000	<24000
N-BUTYLBENZENE	8260B	µg/kg	5	<590	<1200
SEC-BUTYLBENZENE	8260B	µg/kg	5	<590	<1200
TERT-BUTYLBENZENE	8260B	µg/kg	5	<590	<1200
CARBON DISULFIDE	8260B	µg/kg	100	<12000	<24000
CARBON TETRACHLORIDE	8260B	µg/kg	5	<590	<1200
CHLOROBENZENE	8260B	µg/kg	5	<590	<1200
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<590	<1200
CHLOROETHANE	8260B	µg/kg	5	<590	<1200
CHLOROFORM	8260B	µg/kg	5	<590	<1200
CHLOROMETHANE	8260B	µg/kg	5	<590	<1200
2-CHLOROTOLUENE	8260B	µg/kg	5	<590	<1200
4-CHLOROTOLUENE	8260B	µg/kg	5	<590	<1200
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<590	<1200
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<590	<1200
DIBROMOMETHANE	8260B	µg/kg	5	<590	<1200
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<590	<1200
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<590	<1200
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<590	<1200
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<590	<1200
1,1-DICHLOROETHANE	8260B	µg/kg	5	<590	<1200
1,2-DICHLOROETHANE	8260B	µg/kg	5	<590	<1200
1,1-DICHLOROETHENE	8260B	µg/kg	5	<590	<1200
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<590	<1200
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<590	<1200
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<590	<1200
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<590	<1200
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<590	<1200
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<590	<1200
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<590	<1200
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<590	<1200
ETHYLBENZENE	8260B	µg/kg	5	<590	<1200

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-05-40 02-05631-8	CL-99-39 02-05631-9
2-HEXANONE	8260B	µg/kg	50	<5900	<12000
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<590	<1200
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<590	<1200
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<590	<1200
METHYLENE CHLORIDE	8260B	µg/kg	5	580J	1,000J
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<5900	<12000
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<590	<1200
NAPHTHALENE	8260B	µg/kg	5	<590	<1200
N-PROPYLBENZENE	8260B	µg/kg	5	<590	<1200
STYRENE	8260B	µg/kg	5	<590	<1200
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<590	<1200
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<590	<1200
TETRACHLOROETHENE	8260B	µg/kg	5	<590	<1200
TOLUENE	8260B	µg/kg	5	<590	<1200
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<590	<1200
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<590	<1200
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<590	<1200
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<590	<1200
TRICHLOROETHENE	8260B	µg/kg	5	<590	<1200
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<590	<1200
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<590	<1200
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<590	<1200
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<590	<1200
VINYL CHLORIDE	8260B	µg/kg	5	<590	<1200
XYLENE (TOTAL)	8260B	µg/kg	10	<1200	<2400
T-BUTYL ALCOHOL	8260B	µg/kg	20	<2400	<4700

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
† All results are reported on dry basis for soil samples.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
(a) Not a typical gas pattern. Most of the peaks in the chromatogram correspond to the heavier portion of the chain.
(b) Similar to JP-5.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

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APCL Analytical Report

Submitted to:
Shaw E & I
Attention: Rose Condit
4005 Port Chicago Highway
Concord CA 94520-1120
Tel: (925)288-9898 Fax: (925)827-5927

Service ID #: 801-025655
Collected by: TF/RC
Collected on: 10/23/02

Received: 10/24/02
Extracted: 10/25/02
Tested: 10/24-27/02
Reported: 10/30/02

Sample Description: Soil
Project Description: 800063 Crows Landing

Analysis of Soil Samples

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-06-25 02-05655-1
PERCENT MOISTURE	ASTM-D2216	W%	0.5	15.4
Dilution Factor				0.96
GASOLINE RANGE ORGANICS	M8015V	mg/kg	0.5	0.2J [a]
Dilution Factor				0.96
JP-4	M8015V	mg/kg	0.5	<0.57
Dilution Factor				1
DIESEL RANGE ORGANICS	M8015E	mg/kg	10	73
Dilution Factor				1
MOTOR OIL RANGE ORGANICS	M8015E	mg/kg	10	4J
VOLATILE ORGANICS				
Dilution Factor				0.88
ACETONE	8260B	µg/kg	100	35J
BENZENE	8260B	µg/kg	5	<5.2
BROMOBENZENE	8260B	µg/kg	5	<5.2
BROMOCHLOROMETHANE	8260B	µg/kg	5	<5.2
BROMODICHLOROMETHANE	8260B	µg/kg	5	<5.2
BROMOFORM	8260B	µg/kg	5	<5.2
BROMOMETHANE	8260B	µg/kg	5	<5.2
2-BUTANONE (MEK)	8260B	µg/kg	100	<100
N-BUTYLBENZENE	8260B	µg/kg	5	<5.2
SEC-BUTYLBENZENE	8260B	µg/kg	5	<5.2
TERT-BUTYLBENZENE	8260B	µg/kg	5	<5.2
CARBON DISULFIDE	8260B	µg/kg	100	<100
CARBON TETRACHLORIDE	8260B	µg/kg	5	<5.2
CHLOROBENZENE	8260B	µg/kg	5	<5.2
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<5.2
CHLOROETHANE	8260B	µg/kg	5	<5.2
CHLOROFORM	8260B	µg/kg	5	<5.2
CHLOROMETHANE	8260B	µg/kg	5	<5.2
2-CHLOROTOLUENE	8260B	µg/kg	5	<5.2
4-CHLOROTOLUENE	8260B	µg/kg	5	<5.2
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<5.2
1,2-DIBROMOETHANE (EDB)	8260B	µg/kg	5	<5.2
DIBROMOMETHANE	8260B	µg/kg	5	<5.2
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<5.2
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<5.2
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<5.2
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<5.2

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Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-06-25 02-05655-1
1,1-DICHLOROETHANE	8260B	µg/kg	5	<5.2
1,2-DICHLOROETHANE	8260B	µg/kg	5	<5.2
1,1-DICHLOROETHENE	8260B	µg/kg	5	<5.2
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<5.2
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<5.2
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<5.2
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<5.2
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<5.2
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<5.2
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<5.2
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<5.2
ETHYLBENZENE	8260B	µg/kg	5	<5.2
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<5.2
2-HEXANONE	8260B	µg/kg	50	<52
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<5.2
P-ISOPROPYLTOLUENE	8260B	µg/kg	5	<5.2
METHYLENE CHLORIDE	8260B	µg/kg	5	<5.2
4-METHYL-2-PENTANONE (MIBK)	8260B	µg/kg	50	<52
METHYL-T-BYTYL ETHER (MTBE)	8260B	µg/kg	5	<5.2
NAPHTHALENE	8260B	µg/kg	5	<5.2
N-PROPYLBENZENE	8260B	µg/kg	5	<5.2
STYRENE	8260B	µg/kg	5	<5.2
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<5.2
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<5.2
TETRACHLOROETHENE	8260B	µg/kg	5	<5.2
TOLUENE	8260B	µg/kg	5	<5.2
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<5.2
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<5.2
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<5.2
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<5.2
TRICHLOROETHENE	8260B	µg/kg	5	<5.2
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<5.2
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<5.2
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<5.2
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<5.2
VINYL CHLORIDE	8260B	µg/kg	5	<5.2
XYLENE (TOTAL)	8260B	µg/kg	10	<10
T-BUTYL ALCOHOL	8260B	µg/kg	20	<21

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
† All results are reported on dry basis for soil samples.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
(a) Not a typical gas pattern. Most of the peaks in the chromatogram correspond to the heavier portion of the chain.

Respectfully submitted,

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APCL Analytical Report

Submitted to:
Shaw E & I
Attention: Rose Condit
4005 Port Chicago Highway
Concord CA 94520-1120
Tel: (925)288-9898 Fax: (925)827-5927

Service ID #: 801-025773
Collected by:
Collected on: 10/22/02

Received: 10/23/02
Extracted: 10/31-11/04/02
Tested: 11/05/02
Reported: 11/07/02

Sample Description: Soil from Cluster 2 Confirm.
Project Description: 800063 Crows Landing

Analysis of Soil Samples [a]

Component Analyzed	Method	Unit	PQL	Analysis Result CL2-GP-04-25 02-05773-1	CL2-GP-04-42 02-05773-2
Dilution Factor				20	167
DI WET DIESEL RANGE ORGANICS	M8015E	mg/L	0.1	67 [b]	190 [b]
Dilution Factor				20	167
DI WET MOTOR OIL RANGE ORGANICS	M8015E	mg/L	0.1	<2	<17

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit
N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.
J: Reported between PQL and MDL.
Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0
[a] Additional analysis for 02-5631 requested on 10/31/02.
[b] Similar to Jp-5.

Respectfully submitted,

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