Maul Foster & Alongi, Inc.

Environmental & Engineering Services

DUPLICATE

October 5, 2001
Project 9077.15.01

Dr. Mark Brearley
Unocal Asset Management Group
P.O. Box 2004
Edmonds, Washington 98020

Re: Results of Subsurface Investigation Activities, Former Unocal Bulk Fuel Terminal #0082, Chelan, Washington

Dear Mark:

In May 2000, Maul Foster & Alongi, Inc. (MFA) conducted subsurface investigation activities at the former Unocal Bulk Fuel Terminal #0082 (site) in Chelan, Washington. The purposes of the work were to evaluate the eastern extent of the petroleum hydrocarbon-impacted groundwater beneath the site, and to assess the current groundwater conditions.

BACKGROUND

Former Unocal Bulk Fuel Terminal #0082 is located at the intersection of Highway 97 and East Street in Chelan, Washington. The site is approximately 200 feet south of Lake Chelan. The location of the site is shown on Figure 1. The site is bounded to the north by Highway 97 and the Lady of the Lake ferry terminal; to the east and west by private residences; and to the south by a recreational area parking lot. From at least 1927 to 1989, Unocal used the site for bulk petroleum fuel storage and distribution. The structures at the site included an office, a warehouse, three gasoline aboveground storage tanks (ASTs), a diesel AST, a stove oil (heating oil) AST, four dispenser pumps, a heating oil underground storage tank (UST), two truck loading racks, and a truck unloading rack. The site was closed in 1989, and all of the tanks and structures were demolished and removed by 1992. The locations of the former tanks and structures are shown on Figure 2. The site is currently vacant.

In 1989, GeoEngineers conducted a subsurface investigation at the site to evaluate the potential presence of petroleum hydrocarbons in the soil and groundwater. The investigation consisted of collecting one surface soil sample (designated WH-1), excavating and sampling three test pits (TP-1, TP-2, and TP-3), and drilling and sampling three soil borings that were completed as groundwater monitoring wells (MW-1, MW-2, and MW-3). Groundwater samples were collected from the three wells. The locations of the surface soil sample, test pits, and monitoring wells are shown on Figure 2. The soil sample analytical results showed that samples from boring MW-1 [collected at depths of 15 and 20 feet below ground surface (bgs)] and from test pits TP-1 (collected at a depth 11 feet bgs), TP-2 (collected at depths of 5

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and 11 feet bgs), and TP-3 (collected at a depth of less than 6 inches bgs) contained total petroleum hydrocarbon (TPH) concentrations that exceeded the Model Toxics Control Act (MTCA) Method A cleanup level[1]. MW-1 was located near the former truck unloaders, TP-1 was located near the former truck loading rack, TP-2 was located near the pre-1968 former truck loading rack, and TP-3 was located at the former barrel storage area (Figure 2). The groundwater sample analytical results showed that the sample from MW-1 contained TPH, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations that exceeded the Method A cleanup levels. The groundwater sample from well MW-3 contained a TPH concentration that exceeded the Method A cleanup level. The results of the investigation were presented in GeoEngineers' report, *Report of Geotechnical Services, Subsurface Contamination Study*, dated March 14, 1990.

In April 1991, GeoEngineers drilled and sampled three additional soil borings that were completed as groundwater monitoring wells (MW-4, MW-5, and MW-6), and collected groundwater samples from all of the wells at the site. The well locations are shown on Figure 2. The soil sample analytical results showed that the sample collected from boring MW-5, at a depth of 20 feet bgs, contained benzene, TPH, TPH as gasoline (TPH-G), and TPH as diesel (TPH-D) concentrations above the MTCA Method A cleanup levels. MW-5 was located near the former truck unloaders (Figure 2). The groundwater sample analytical results showed that the samples from wells MW-1 and MW-5 contained BTEX and TPH-G concentrations that exceeded the Method A cleanup levels. The samples from wells MW-1, MW-2, MW-3 and MW-4 contained dissolved lead concentrations that exceeded the Method A cleanup level. The results of the assessment activities were presented in GeoEngineers' report, *Supplemental Report of Geotechnical Services, Subsurface Contamination Study*, dated September 3, 1991.

In November 1992, GeoEngineers collected a surface soil sample (designated S-1), and drilled and sampled an additional soil boring that was completed as a groundwater monitoring well (MW-7). The locations of S-1 and MW-7 are shown on Figure 2. The soil sample analytical results showed that S-1 contained total xylenes, TPH-G, and TPH-D concentrations that exceeded the MTCA Method A cleanup levels. S-1 was located near the former ASTs (Figure 2). The results of the investigation activities were described in GeoEngineers' report, *Progress Report No. 2, Quarterly Groundwater Monitoring and Supplemental Subsurface Explorations*, dated May 14, 1993.

In August 1995, GeoEngineers excavated and sampled 15 test pits (TP-1 through TP-15) to assess the lateral extents of the shallow, hydrocarbon-impacted soil at the site. The locations of the test pits are shown on Figure 2. The soil sample analytical results showed that samples

[1] Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels." Amended January 1996.

from test pits TP-4 (collected at a depth of 6 feet bgs) and TP-5 (collected at a depth of 13.5 feet bgs) contained TPH-G, TPH-D, and TPH as oil (TPH-O) concentrations that exceeded the MTCA Method A cleanup levels. A sample collected from TP-9, at a depth of approximately 10 feet bgs, contained a TPH-G concentration that exceeded the Method A cleanup level. A sample collected from TP-11, at a depth of approximately 6 feet bgs, contained a TPH-O concentration that exceeded the Method A cleanup level. TP-4 was located near the former truck loading rack, TP-5 was located near the former truck unloaders, TP-9 was located near the former ASTs, and TP-11 was located near the former heating oil UST (Figure 2). The results of the investigation were described in GeoEngineers' report, *Report of Environmental Services, Supplemental Subsurface Contamination and In-situ Testing*, dated January 18, 1996.

From 1991 to 1999, GeoEngineers collected groundwater samples from all of the monitoring wells at the site on a quarterly to semi-annual basis. From 1991 to 1999, the groundwater samples from wells MW-1 and MW-5 typically contained benzene, total xylenes, TPH-G, and TPH-D concentrations that exceeded the MTCA Method A cleanup levels. Between 1991 and 1997, several of the samples from MW-1 and MW-4 contained dissolved lead concentrations that exceeded the Method A cleanup level. However, after December 1997, the groundwater samples from MW-1 and MW-4 contained dissolved lead concentrations that were below the Method A cleanup level. The results of the quarterly and semi-annual sampling events were described in several GeoEngineers' reports from 1991 to 1999.

In April and May 2001, MFA conducted soil excavation activities at six areas of the site to remove the petroleum hydrocarbon-impacted soil that occurred at depths above the high seasonal groundwater table. The approximate areas of each soil excavation are shown on Figure 2. A total of approximately 300 cubic yards of impacted soil from the six excavations was hauled off site for disposal at the Waste Management landfill in East Wenatchee, Washington. MFA collected sidewall and/or floor samples at the extents of each of the excavations for laboratory analysis. The soil sample analytical results showed that the final excavation sidewall and floor samples contained petroleum hydrocarbon concentrations below the MTCA Method A cleanup levels. The results of the excavation activities were described in MFA's report, *Results of Soil Excavation Activities*, dated August 23, 2001.

Based on the geologic conditions encountered during the previous investigation and remediation activities, the soil beneath the site consists of gravel and sand with local silty zones to a depth of at least 33 feet bgs. Unconfined groundwater occurs at depths ranging from approximately 14 to 29 feet bgs. Due to fluctuations of the Lake Chelan water level, the groundwater level beneath the site fluctuates up to 14 feet and the groundwater flow direction is variable.

ASSESS GROUNDWATER CONDITIONS IN EASTERN PART OF SITE

On May 24, 2001, MFA drilled and installed a groundwater monitoring well (MW-8) near the eastern edge of the site to assess the eastern extent of the petroleum hydrocarbon-impacted groundwater. The location of MW-8 is shown on Figure 3. Cascade Drilling, Inc. (Cascade), of Woodinville, Washington, conducted the drilling and well installation activities under the direction of an MFA environmental scientist. The soil boring was drilled by using air rotary drilling methods, and soil samples were collected at 5-foot intervals by using a split-spoon sampler. The boring was extended to a depth of approximately 31 feet bgs. The boring was completed with 2-inch-diameter, schedule 40 PVC well casing and screen (20 slot). The well extended to a depth of approximately 30.5 feet bgs, and a 20-foot-long screen was installed from approximately 10 to 30 feet bgs. At ground surface, the top of the well was protected with a traffic-rated, flush-grade monument. A boring log for MW-8 that includes the well construction details is attached. Following installation, Cascade developed the well by using surging and bailing methods. The soil cuttings and development water are temporarily stored on site in properly labeled, 55-gallon drums, pending off-site disposal.

MFA screened each of the soil samples for the presence of petroleum hydrocarbons by using visual appearance, odor, and a photoionization detector (PID). Based on the field screening results, a selected soil sample collected at a depth above the high seasonal groundwater table was submitted to North Creek Analytical, Inc. (NCA), in Bothell, Washington, for analysis. The sample (designated MW8-12-0501) collected at a depth of approximately 12 feet bgs was analyzed for BTEX by EPA Method 8021B, TPH-G by Ecology Method NWTPH-Gx, and for TPH-D and TPH-O by Ecology Method NWTPH-Dx (after sulfuric acid/silica gel cleanup). The sample analytical results showed that sample MW8-12-0501 did not contain BTEX, TPH-G, TPH-D, or TPH-O concentrations above the method reporting limits (MRLs). A copy of the laboratory report is attached.

On May 25, 2001, MFA collected groundwater samples from all eight of the monitoring wells (MW-1 through MW-8) at the site for laboratory analysis. Prior to sampling, the depths to groundwater were measured in all of the wells by using an electronic water level probe. The depths to groundwater ranged from 19.46 to 25.02 feet. The depth to groundwater measurements were converted to groundwater elevations by using the results of a well elevation survey conducted by Erlandsen Associates Inc., of Chelan, Washington. The groundwater elevations in the wells ranged from 1,092.26 to 1,092.43 feet above mean sea level (msl), and the general groundwater flow direction beneath the site was to the northeast (Figure 3). The horizontal hydraulic gradients were relatively flat (0.0009 to 0.0035 feet per foot). The groundwater monitoring data from the May 2001 sampling event are presented in Table 1.

The depth to groundwater measurements were used to calculate the volume of standing water in each well casing (pore volume). Before sample collection, at least three pore volumes were removed from each well by using a disposable PVC bailer. Field parameters of pH, specific conductance, and temperature were measured following removal of each pore volume. A groundwater sample was collected following stabilization of the field parameters to less than 10 percent difference in measurements between pore volumes. Each sample was labeled, placed into an iced cooler, and submitted to NCA by using standard chain-of-custody protocol. A new disposable bailer was used to collect the sample set at each well. The purge water is temporarily stored on site in properly labeled, 55-gallon drums, pending off-site disposal.

The groundwater samples were analyzed for BTEX, TPH-G, TPH-D, and TPH-O. The analytical results showed that the samples from wells MW-1 and MW-5 contained TPH-D concentrations (889 and 8,250 micrograms per liter [µg/L], respectively) that exceeded the MTCA Method A cleanup level[2] (500 µg/L). The sample from MW-5 also contained benzene and TPH-G concentrations (56.2 and 1,740 µg/L, respectively) that exceeded the Method A cleanup levels (5 and 800 µg/L, respectively). The samples from wells MW-2, MW-3, MW-4, MW-6, MW-7, and MW-8 contained petroleum hydrocarbon concentrations that were below the Method A cleanup levels or the MRLs. The groundwater sample analytical results from the May 2001 event, and the previous groundwater sampling events, are presented in Table 2. The benzene concentrations in the May 2001 samples are also shown on Figure 3. A copy of the laboratory report is attached.

CONCLUSIONS

In May 2001, MFA conducted subsurface investigation activities at the site to evaluate the eastern extent of the petroleum hydrocarbon-impacted groundwater, and to assess the current groundwater conditions. On May 24, 2001, MFA drilled and installed a groundwater monitoring well (MW-8) to assess the eastern extent of the petroleum hydrocarbon-impacted groundwater. A selected soil sample (designated MW8-12-0501) from boring MW-8, collected at a depth above the high seasonal groundwater table, was submitted to NCA for analysis. The soil sample analytical results showed that sample MW8-12-0501 did not contain BTEX, TPH-G, TPH-D, or TPH-O concentrations above the MRLs.

On May 25, 2001, MFA collected groundwater samples from all eight of the monitoring wells (MW-1 through MW-8) at the site for laboratory analysis. At the time of sampling, the depths to groundwater in the wells ranged from 19.46 to 25.02 feet. The groundwater elevations in the wells ranged from 1,092,26 to 1,092.43 feet above msl, and the general groundwater flow

[2] Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels." Amended February 12, 2001.

direction beneath the site was to the northeast. The horizontal hydraulic gradients were relatively flat (0.0009 to 0.0035 feet per foot). The groundwater sample analytical results showed that the samples from wells MW-1 and MW-5 contained TPH-D concentrations (889 and 8,250 µg/L, respectively) that exceeded the MTCA Method A cleanup level. The sample from MW-5 also contained benzene and TPH-G concentrations (56.2 and 1,740 µg/L, respectively) that exceeded the Method A cleanup levels. The samples from wells MW-2, MW-3, MW-4, MW-6, MW-7, and MW-8 contained petroleum hydrocarbon concentrations that were below the Method A cleanup levels or the MRLs. Based on the groundwater sample analytical results, the groundwater that contains petroleum hydrocarbon concentrations greater than Method A cleanup levels only occurs near the former truck unloaders (wells MW-1 and MW-5), and the lateral extent of the impacted groundwater has been defined in all directions. The locations of wells MW-1 and MW-5 are shown on Figure 3.

If you have any questions, please call Elisabeth Silver at (425) 744-1489.

Sincerely,

Maul Foster & Alongi, Inc.

Elisabeth Silver
Project Geologist

Michael D. Staton, R.G.
Principal Geologist

Attachments: Limitations
Figure 1 – Site Location Map
Figure 2 – Site Map
Figure 3 – Groundwater Elevation Contour Map – May 25, 2001
Soil Boring Log
Laboratory Reports

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreements with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

Table 1

Groundwater Monitoring Data
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Top of Well Casing Elevation[a] (feet)	Date	Depth to Groundwater[b] (feet)	Groundwater Elevation (feet)
MW-1	1,112.38	05/25/01	20.02	1,092.36
MW-2	1,111.78	05/25/01	19.46	1,092.32
MW-3	1,112.15	05/25/01	19.82	1,092.33
MW-4	1,112.35	05/25/01	20.06	1,092.29
MW-5	1,112.20	05/25/01	19.84	1,092.36
MW-6	1,112.18	05/25/01	19.92	1,092.26
MW-7	1,117.45	05/25/01	25.02	1,092.43
MW-8	1,112.66	05/25/01	20.37	1,092.29

NOTE:

[a] Well elevations were surveyed relative to mean sea level on 7/12/01.

[b] The depths to groundwater were measured from the tops of the well casings.

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-1	12/04/1989	**270**	150	94	700	NA	NA	**3,800**[i]	NA
	04/09/1991	**280**	50	41	270	**2,800**[g]	<1,000[h,j]	NA	10
	08/27/1991	**84**	8.3	6.8	57	**3,000**[g]	**15,000**[h]	**5,300**[i]	12
	11/23/1991	**250**	71	43	350	**12,000**[g]	**19,000**[h]	**14,000**[i]	**59**
	02/20/1992	Well was dry at time of sampling.							
	05/21/1992	1.2	<0.5	0.57	4.3	**1,200**	**9,900**	**25,000**	**19**
	08/19/1992	**28**	5.0	4.7	24	570	**16,000**	NA	**17**
	11/12/1992	**75**	53	19	150	**1,600**	**12,000**	NA	NA
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	**15**	1.6	2.2	9.1	240	**18,000**	<3,800[j]	NA
	07/08/1994	0.88	<0.5	<0.5	<1.0	<50	**3,200**	**930**	6.4
	01/04/1995	**27**	0.83	2.4	4.9	730	**2,000**	**1,900**	7.1
	06/29/1995	0.69	<0.5	<0.5	<1.0	<50	**5,600**	**2,000**	5.5
	12/29/1995	**28**	4.4	1.2	33	200	**21,000**	**6,800**	6.2
	06/19/1996	**13.7**	<0.5	<0.5	2.29	411	**15,500**	**4,020**	4.1
	12/13/1996	**55**	9.2	15.8	112	**1,290**	**1,910**	<750[j]	<10
	07/01/1997	**5.4**	<0.5	<0.5	1.0	94.8	**1,200**	<750[j]	2.9
	12/30/1997	**33.6**	<25	<25	124	**10,490**	**4,800**	<750[j]	7.4
	06/12/1998	1.29	<0.5	<0.5	<1.0	<50	<250	<750[j]	4.6
	12/07/1998	**34.4**	7.21	15.8	115	**841**	**792**	<750[j]	4.7
	06/21/1999	1.31	0.10	<0.5	1.09	<50	<250	<750[j]	2.6
	05/25/2001	0.67	<0.5	<0.5	1.24	117	**889**	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-2	12/04/1989	<0.5	<0.5	<0.5	<0.5	NA	NA	230[i]	NA
	04/09/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	NA	9.0
	08/27/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<2.0
	11/23/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<3.0
	02/20/1992	Well was dry at time of sampling.							
	05/21/1992	<0.5	<0.5	<0.5	<0.5	<50	<500	<1,000[j]	3.3
	08/19/1992	Well was not sampled.							
	11/12/1992	<0.5	<0.5	<0.5	<0.5	<100	**1,000**	NA	NA
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	<0.5	<0.5	<0.5	<0.5	<100	<250	<750[j]	NA
	07/08/1994	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	01/04/1995	<0.5	<0.5	<0.5	<1.0	<50	340	**720**	NA
	06/29/1995	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	12/29/1995	<0.5	<0.5	<0.5	<1.0	<50	**2,000**	**1,400**	NA
	06/19/1996	<0.5	<0.5	<0.5	<1.0	<50	**518**	<750[j]	NA
	12/13/1996	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	07/01/1997	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	12/30/1997	NA	NA	NA	NA	NA	287	<750[j]	NA
	06/12/1998	NA	NA	NA	NA	<50	<250	<750[j]	NA
	12/07/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/21/1999	NA	NA	NA	NA	NA	<250	<750[j]	NA
	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-3	12/04/1989	<0.5	<0.5	<0.5	<0.5	NA	NA	**9,300**[i]	NA
	04/09/1991	3.9	<0.5	<0.5	1.6	<1,000[g,j]	<1,000[h,j]	NA	12
	08/27/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<2.0
	11/23/1991	1.2	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<3.0
	02/20/1992	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	**12,000**[h]	**6,600**[i]	<3.0
	05/21/1992	1.0	<0.5	<0.5	<0.5	100	**3,500**	**9,000**	2.9
	08/19/1992	4.4	<0.5	<0.5	<1.0	<50	**1,800**	NA	<2.0
	11/12/1992	<0.5	<0.5	<0.5	<0.5	<100	**1,800**	NA	NA
	02/25/1993	1.4	<0.5	<0.5	<0.5	<100	**2,600**	NA	NA
	08/24/1993	1.6	<0.5	<0.5	<0.5	<100	**1,000**	<750[j]	NA
	07/08/1994	0.95	<0.5	<0.5	<1.0	<50	**2,000**	**1,200**	NA
	01/04/1995	2.8	<0.5	<0.5	<1.0	59	**11,000**	**2,400**	NA
	06/29/1995	<0.5	<0.5	<0.5	<1.0	<50	**2,300**	**1,700**	NA
	12/29/1995	<0.5	<0.5	<0.5	<1.0	<50	**5,100**	**2,900**	NA
	06/19/1996	<0.5	<0.5	<0.5	<1.0	<50	**4,790**	**1,940**	NA
	12/13/1996	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	07/01/1997	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	12/30/1997	NA	NA	<0.5	NA	NA	280	<750[j]	NA
	06/12/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	12/07/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/21/1999	NA	NA	NA	NA	NA	<250	<750[j]	NA
	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-4	04/09/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	NA	**45**
	08/27/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	15
	11/23/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	15
	02/20/1992	Well was dry at time of sampling.							
	05/21/1992	<0.5	<0.5	<0.5	<0.5	<50	**600**	**2,100**	**41**
	08/19/1992	Well was not sampled.							
	11/12/1992	Well was not sampled.							
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	<0.5	<0.5	<0.5	<0.5	<100	280	<750[j]	NA
	07/08/1994	<0.5	<0.5	<0.5	<1.0	<50	**630**	**910**	2.9
	01/04/1995	<0.5	<0.5	<0.5	<1.0	<50	**750**	**880**	6.4
	06/29/1995	<0.5	<0.5	<0.5	<1.0	<50	490	**1,500**	2.2
	12/29/1995	<0.5	<0.5	<0.5	<1.0	<50	**1,700**	**1,400**	6.3
	06/19/1996	<0.5	<0.5	<0.5	<1.0	<50	**2,530**	**1,840**	5.7
	12/13/1996	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	<10
	07/01/1997	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	4.2
	12/30/1997	NA	NA	NA	NA	NA	<250	<750[j]	3.2
	06/12/1998	NA	NA	NA	NA	NA	<250	<750[j]	2.4
	12/07/1998	NA	NA	NA	NA	NA	<250	<750[j]	2.4
	06/21/1999	NA	NA	NA	NA	NA	<250	<750[j]	NA
	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-5	04/09/1991	**300**	20	78	410	**3,200[g]**	<1,000[h,j]	NA	<5.0
	08/27/1991	**270**	21	38	460	**7,000[g]**	**20,000[h]**	**2,500[i]**	<4.0
	11/23/1991	**280**	12	100	350	**6,000[g]**	**17,000[h]**	**9,400[i]**	<3.0
	02/20/1992	**220**	28	120	440	**4,000[g]**	**8,000[h]**	**5,200[i]**	<3.0
	05/21/1992	**160**	11	170	190	**2,500**	**9,900**	**6,800**	5.3
	08/19/1992	**130**	6.1	70	180	**2,200**	NA	NA	<2.0
	11/12/1992	**91**	5.8	<0.5	110	**2,100**	**15,000**	NA	NA
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	**86**	4.1	47	92	**1,500**	**11,000**	<3,800[j]	NA
	07/08/1994	**67**	3.5	43	130	**3,000**	**16,000**	**3,000**	NA
	01/04/1995	<0.5	0.91	20	53	**1,000**	**13,000**	**2,300**	NA
	06/29/1995	**73**	9.5	110	260	**3,300**	**11,000**	**2,900**	NA
	12/29/1995	**70**	2.6	37	47	**1,300**	**23,000**	**8,900**	NA
	06/19/1996	**43.1**	3.85	55.7	122	**2,200**	**17,500**	**5,540**	NA
	12/13/1996	**51.8**	2.94	34	65	**1,130**	**853**	<750[j]	NA
	07/01/1997	**87.7**	14.4	144	294	**3,890**	**557**	<750[j]	NA
	12/30/1997	**62.8**	6.01	55	155	**1,920**	**525**	<750[j]	NA
	06/12/1998	**88.1**	13.4	76.6	400	**3,800**	295	<750[j]	NA
	12/07/1998	**77**	8.74	68	260	**1,860**	388	<750[j]	NA
	06/21/1999	**31.1**	1.24	<0.5	74.9	**1,050**	468	<750[j]	NA
	05/25/2001	**56.2**	8.18	88.2	221	**1,740**	**8,250**	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-6	04/09/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	NA	<5.0
	08/27/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<2.0
	11/23/1991	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<3.0
	02/20/1992	<0.5	<0.5	<0.5	<0.5	<1,000[g,j]	<1,000[h,j]	<1,000[i,j]	<3.0
	05/21/1992	<0.5	<0.5	<0.5	<0.5	<50	<500	**1,700**	4.7
	08/19/1992	<0.5	<0.5	<0.5	<0.5	<50	<250	NA	<2.0
	11/12/1992	<0.5	<0.5	<0.5	<0.5	<100	<500	NA	NA
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	<0.5	<0.5	<0.5	<0.5	<100	NA	NA	NA
	07/08/1994	<0.5	<0.5	<0.5	<1.0	<50	360	**840**	NA
	01/04/1995	<0.5	<0.5	<0.5	<1.0	<50	470	**800**	NA
	06/29/1995	<0.5	<0.5	<0.5	<1.0	<50	260	**1,000**	NA
	12/29/1995	<0.5	<0.5	<0.5	<1.0	<50	270	**890**	NA
	06/19/1996	<0.5	<0.5	<0.5	<1.0	<50	NA	NA	NA
	12/13/1996	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	07/01/1997	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	12/30/1997	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/12/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	12/07/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/21/1999	NA	NA	NA	NA	NA	<250	<750[j]	NA
	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-7	11/15/1992	<0.5	<0.5	<0.5	0.7	<100	**1,700**	NA	NA
	02/25/1993	Well was dry at time of sampling.							
	08/24/1993	<0.5	<0.5	<0.5	<0.5	<100	<250	<750[j]	NA
	07/08/1994	<0.5	<0.5	<0.5	<1.0	<50	**600**	**1,300**	2.0
	01/04/1995	<0.5	<0.5	<0.5	<1.0	<50	**1,300**	**1,200**	<2.0
	06/29/1995	<0.5	<0.5	<0.5	<1.0	<50	370	**1,000**	NA
	12/29/1995	<0.5	<0.5	<0.5	<1.0	<50	**510**	**1,000**	NA
	06/19/1996	<0.5	<0.5	<0.5	<1.0	<50	**841**	**789**	NA
	12/13/1996	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	07/01/1997	<0.5	<0.5	<0.5	<1.0	<50	<250	<750[j]	NA
	12/30/1997	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/12/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	12/07/1998	NA	NA	NA	NA	NA	<250	<750[j]	NA
	06/21/1999	NA	NA	NA	NA	NA	<250	<750[j]	NA
	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

Table 2

Groundwater Sample Analytical Results
Former Unocal Bulk Fuel Terminal #0082
Chelan, Washington

Well Number	Date Collected	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	TPH-G[b] (µg/L)	TPH-D[c] (µg/L)	TPH-O[d] (µg/L)	Dissolved Lead[e] (µg/L)
MTCA Method A Cleanup Levels[f]		5	1,000	700	1,000	800	500	500	15
MW-8	05/25/2001	<0.5	<0.5	<0.5	<1.0	<50	<250	<500	NA

NOTES:

µg/L = micrograms per liter; approximates parts per billion.

Shaded values exceed MTCA Method A cleanup levels.

NA = Not analyzed.

[a] Benzene, toluene, ethylbenzene, and total xylenes by EPA Methods 8020 or 8021B.

[b] TPH as gasoline (TPH-G) by Ecology Methods WTPH-G or NWTPH-Gx.

[c] TPH as diesel (TPH-D) by Ecology Methods WTPH-D or NWTPH-Dx (after sulfuric acid/silica gel cleanup).

[d] TPH as oil (TPH-O) by Ecology Methods WTPH-418.1 or NWTPH-Dx (after sulfuric silica gel cleanup).

[e] Dissolved lead by EPA Method 7421.

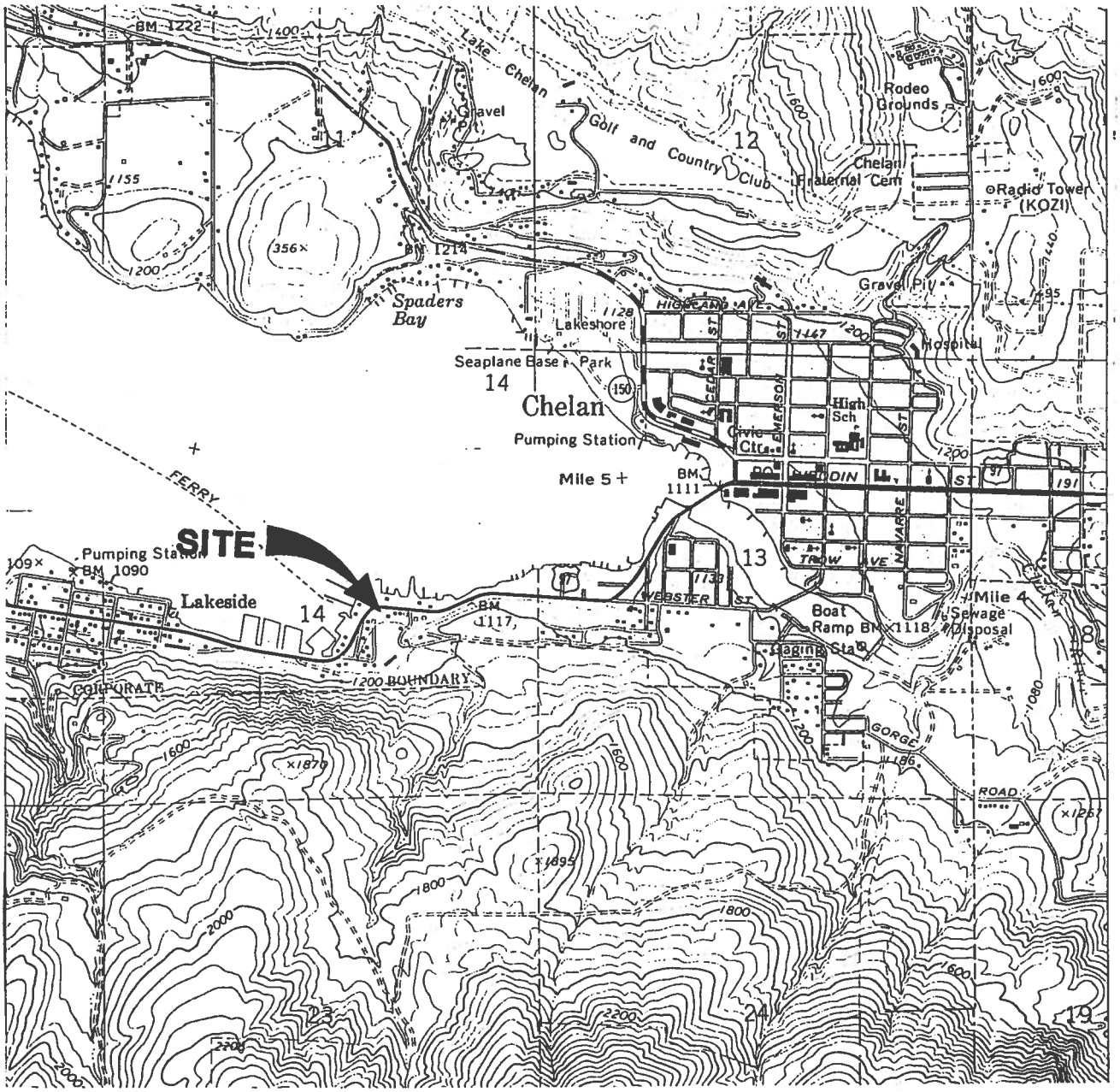
[f] Chapter 173-340 WAC, "Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels for Ground Water." Amended February 12, 2001.

[g] TPH-G by EPA Method 8015 modified.

[h] TPH-D by EPA Method 8015 modified.

[i] TPH-O by EPA Method 418.1.

[j] Method reporting limit exceeded the MTCA Method A cleanup level.



Base map prepared from USGS 7.5–minute Quadrangle of Chelon Washington (1987).

Maul Foster & Alongi, Inc.
Environmental & Engineering Services

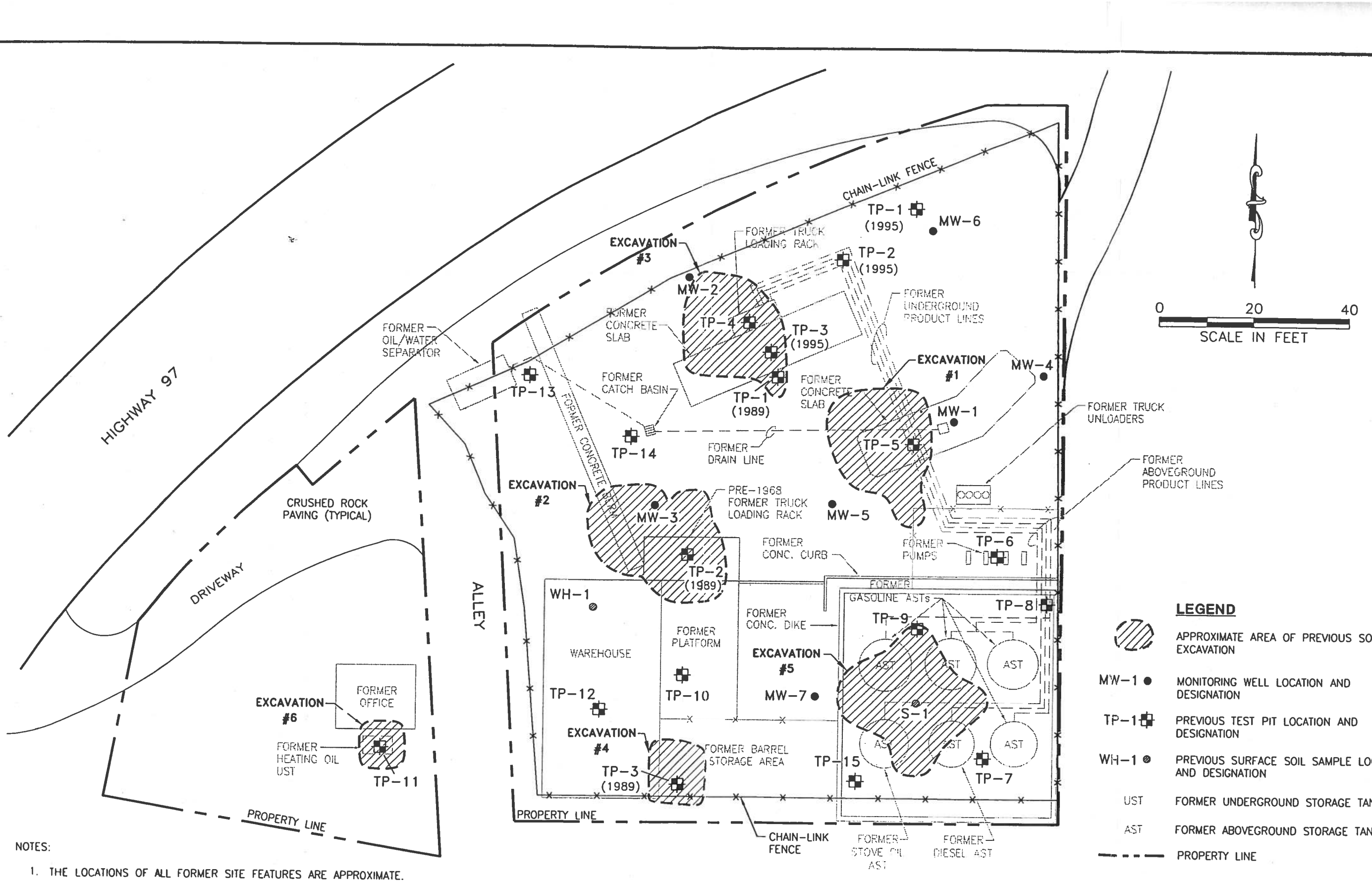
DATE 06/26/01
DWN. AJY
APPR. TMDS
REVIS. ____
PROJECT NO.
9077.015.001

Figure 1
FORMER UNOCAL BULK FUEL TERMINAL #0082
CHELAN, WASHINGTON

SITE LOCATION MAP

File: G:\9000\9077-015_UNOCAL CHELAN\001\001-01-A.DWG Last edited: JUN. 26, 01 @ 2:15 p.m. by: ayoung Xrefs: none Black/White

LAYOUT: 1



LEGEND

- APPROXIMATE AREA OF PREVIOUS SOIL EXCAVATION
- MW-1 ● MONITORING WELL LOCATION AND DESIGNATION
- TP-1 ⊕ PREVIOUS TEST PIT LOCATION AND DESIGNATION
- WH-1 ⊘ PREVIOUS SURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- UST FORMER UNDERGROUND STORAGE TANK
- AST FORMER ABOVEGROUND STORAGE TANK
- PROPERTY LINE

NOTES:

1. THE LOCATIONS OF ALL FORMER SITE FEATURES ARE APPROXIMATE.
2. ALL FACILITIES WERE DEMOLISHED AND REMOVED IN NOVEMBER 1992.

BASE MAP REFERENCE: DRAWING ENTITLED "FORMER SITE FACILITIES AND EXPLORATIONS", BY GEOENGINEERS, DATED MAY 7, 1998.

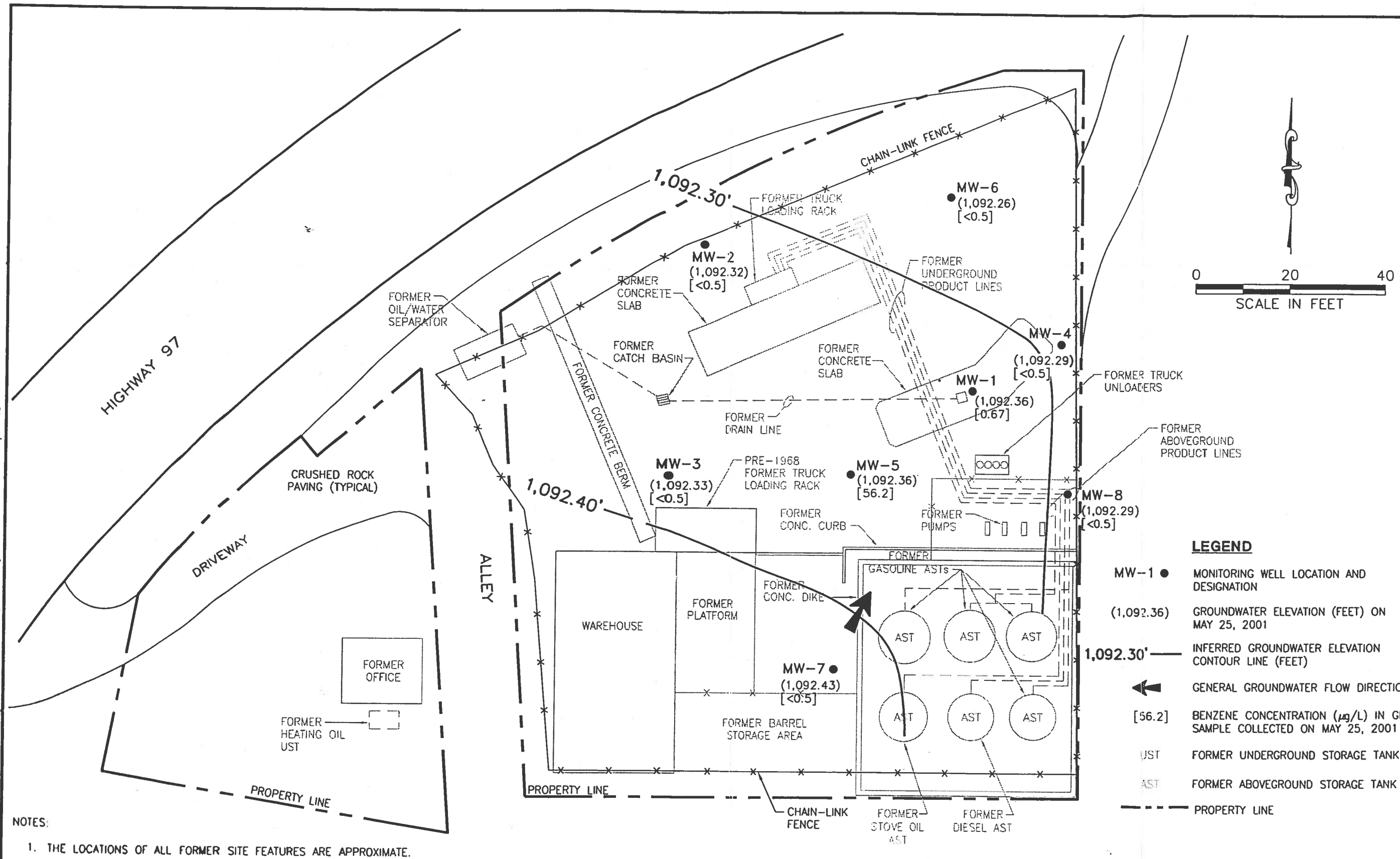
Maul Foster & Alongi, Inc.
Environmental & Engineering Services
17171 Bothell Way NE, Suite 264
Seattle, Washington 98155 (425) 744-1489

DATE 9/01
DWN. BDT
APPR. MDS
REVIS.
PROJECT NO.
9077.15.01

Figure 2
FORMER UNOCAL BULK FUEL TERMINAL #0082
CHELAN, WASHINGTON

SITE MAP

File \9077\15 01\001-C2.dwg Last Edited: SEP 29, 2001 By: blookey Xrefs: None Black/White



NOTES:

1. THE LOCATIONS OF ALL FORMER SITE FEATURES ARE APPROXIMATE.
2. ALL FACILITIES WERE DEMOLISHED AND REMOVED IN NOVEMBER 1992.

BASE MAP REFERENCE: DRAWING ENTITLED "FORMER SITE FACILITIES AND EXPLORATIONS", BY GEOENGINEERS, DATED MAY 7, 1998.

LEGEND

MW-1 ●	MONITORING WELL LOCATION AND DESIGNATION
(1,092.36)	GROUNDWATER ELEVATION (FEET) ON MAY 25, 2001
1,092.30'	INFERRED GROUNDWATER ELEVATION CONTOUR LINE (FEET)
◄	GENERAL GROUNDWATER FLOW DIRECTION
[56.2]	BENZENE CONCENTRATION (µg/L) IN GROUNDWATER SAMPLE COLLECTED ON MAY 25, 2001
UST	FORMER UNDERGROUND STORAGE TANK
AST	FORMER ABOVEGROUND STORAGE TANK
	PROPERTY LINE

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Figure 3
FORMER UNOCAL BULK FUEL TERMINAL #0082
CHELAN, WASHINGTON
GROUNDWATER ELEVATION CONTOUR MAP - MAY 25, 2001

File: \9077\15.01\001-03.dwg Last Edited: OCT 01, 2001 By: blookey Xrefs: None Black/White

SOIL BORING LOG

LABORATORY REPORTS

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
9077.015.001	MW-8	1 of 2

Project Name	Former Unocal Bulk Fuel Terminal #0082	TOC Elevation	1,112.66
Project Location	Chelan, Washington	Surface Elevation	1,113.20
Start/End Date	05/24/01 to 05/24/01	Northing	
Driller/Equipment	Cascade Drilling, Inc./Air Rotary	Easting	
Geologist/Engineer	G. Sandberg	Hole Depth	31.0-feet
Sample Method	Split-spoon	Outer Hole Diam	6-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Blow Counts	Type	Name	PID (ppm)	Lithologic Column	Soil Description
1									0 to 10.0 feet: SANDY GRAVEL (GW); medium orange-brown; medium to coarse; few cobbles; little medium-grained sand; very dense; moist; no hydrocarbon-like odors.
2									
3			10%	50/5"	SS		0		
4									
5									
6									
7									
8			10%	50/5"	SS		0		
9									
10									10.0 to 31.0 feet: SAND (SP); yellow-brown; medium-grained; trace medium-grained gravel; dense; moist; no hydrocarbon-like odors.
11									
12			100%	19	SS	MW8-12.0-0501*	0		
13				19					
14				21					
15									
16									
17			100%	22	SS		0		
18				18					
19				21					
20	▽								@ 20.0 feet: wet.

NOTES: (1) SS = 3.0-inch O.D. split-spoon sampler driven with a 140-pound hammer and a 30-inch drop.
(2) * = Sample submitted to laboratory for analysis.

▽ **Water level at time of drilling.**

GBLWC-PID&BLOWS C:\PROGRA~1\GINTW\MFA\PROJECTS\CHELAN.GPJ 9/29/01

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
9077.015.001	MW-8	2 of 2

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Blow Counts	Type	Name	PID (ppm)	Lithologic Column	Soil Description
21			100%	17	SS		0.2		10.0 to 31.0 feet: SAND (SP); continued.
22				30					
23				36					
24									
25									
26			100%	22	SS		0.1		
27				27					
28				30					
29									
30									
31									

Total Depth Drilled = 31.0 feet.
Total Depth Sampled = 27.5 feet.

WELL COMPLETION DETAILS

0 to 10.0 feet: 2-inch diameter, flush-threaded, Schedule 40 PVC blank riser pipe.
10.0 to 30.0 feet: 2-inch diameter, flush-threaded, Schedule 40 PVC well screen with 0.020-inch machine-cut slots.
30.0 to 30.5 feet: 2-inch diameter, Schedule 40 PVC well cap.

0 to 0.5 foot: Concrete.
0.5 to 8.0 feet: Hydrated, 3/8-inch bentonite chips.
8.0 to 31.0 feet: #2/12 Sand.

Monument: Traffic-rated, flush-grade in cement base.

NOTES: (1) SS = 3.0-inch O.D. split-spoon sampler driven with a 140-pound hammer and a 30-inch drop.
(2) * = Sample submitted to laboratory for analysis.

▽ **Water level at time of drilling.**

GBLWC-PID&BLOWS C:\PROGRA~1\GINTW\MFAI\PROJECTS\CHELAN.GPJ 9/29/01

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW8-12-0501	B1E0708-01	Soil	05/24/01 09:45	05/29/01 10:55
AS1-12.0-0501	B1E0708-02	Soil	05/24/01 16:40	05/29/01 10:55
AS2-12.0-0501	B1E0708-03	Soil	05/25/01 08:30	05/29/01 10:55
AS3-12.0-0501	B1E0708-04	Soil	05/25/01 11:11	05/29/01 10:55

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW8-12-0501 (B1E0708-01) Soil	**Sampled: 05/24/01 09:45**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	1F05022	06/05/01	06/06/01	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*89.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*92.0 %*	*50-150*			"	"	"	"	
AS1-12.0-0501 (B1E0708-02) Soil	**Sampled: 05/24/01 16:40**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	**1530**	100	mg/kg dry	20	1F05022	06/05/01	06/06/01	NWTPH-Gx/8021B	G-01
Benzene	ND	1.00	"	"	"	"	"	"	
Toluene	**1.07**	1.00	"	"	"	"	"	"	I-06
Ethylbenzene	**6.93**	1.00	"	"	"	"	"	"	
Xylenes (total)	**112**	2.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*%*	*50-150*			"	"	"	"	*S-01*
Surrogate: 4-BFB (PID)	*138 %*	*50-150*			"	"	"	"	
AS2-12.0-0501 (B1E0708-03) Soil	**Sampled: 05/25/01 08:30**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	1F05022	06/05/01	06/06/01	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*86.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*89.2 %*	*50-150*			"	"	"	"	

Scott A. Woerman, Project Manager

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AS3-12.0-0501 (B1E0708-04) Soil Sampled: 05/25/01 11:11 Received: 05/29/01 10:55									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	1F05022	06/05/01	06/06/01	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*87.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*93.5 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW8-12-0501 (B1E0708-01) Soil	**Sampled: 05/24/01 09:45**		**Received: 05/29/01 10:55**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	1F02001	06/02/01	06/06/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*61.5 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*76.7 %*	*50-150*			"	"	"	"	
AS1-12.0-0501 (B1E0708-02) Soil	**Sampled: 05/24/01 16:40**		**Received: 05/29/01 10:55**						
Diesel Range Hydrocarbons	**9570**	410	mg/kg dry	41	1F02001	06/02/01	06/07/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	1020	"	"	"	"	"	"	
Surrogate: 2-FBP	*%*	*50-150*			"	"	"	"	*S-01*
Surrogate: Octacosane	*96.7 %*	*50-150*			"	"	"	"	
AS2-12.0-0501 (B1E0708-03) Soil	**Sampled: 05/25/01 08:30**		**Received: 05/29/01 10:55**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	1F02001	06/02/01	06/06/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*60.9 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*75.3 %*	*50-150*			"	"	"	"	
AS3-12.0-0501 (B1E0708-04) Soil	**Sampled: 05/25/01 11:11**		**Received: 05/29/01 10:55**						
Diesel Range Hydrocarbons	**75.0**	10.0	mg/kg dry	1	1F02001	06/02/01	06/06/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*79.0 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*81.6 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW8-12-0501 (B1E0708-01) Soil	**Sampled: 05/24/01 09:45 Received: 05/29/01 10:55**								
Dry Weight	97.2	1.00	%	1	1F05012	06/05/01	06/06/01	BSOPSPL003R07	
AS1-12.0-0501 (B1E0708-02) Soil	**Sampled: 05/24/01 16:40 Received: 05/29/01 10:55**								
Dry Weight	88.3	1.00	%	1	1F05012	06/05/01	06/06/01	BSOPSPL003R07	
AS2-12.0-0501 (B1E0708-03) Soil	**Sampled: 05/25/01 08:30 Received: 05/29/01 10:55**								
Dry Weight	90.3	1.00	%	1	1F05012	06/05/01	06/06/01	BSOPSPL003R07	
AS3-12.0-0501 (B1E0708-04) Soil	**Sampled: 05/25/01 11:11 Received: 05/29/01 10:55**								
Dry Weight	95.6	1.00	%	1	1F05012	06/05/01	06/06/01	BSOPSPL003R07	

Scott A. Woerman, Project Manager

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F05022: Prepared 06/05/01 Using EPA 5030B (MeOH)										
Blank (1F05022-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.49*		"	*4.00*		*87.2*	*50-150*			
Surrogate: 4-BFB (PID)	*3.59*		"	*4.00*		*89.8*	*50-150*			
LCS (1F05022-BS1)										
Gasoline Range Hydrocarbons	25.0	5.00	mg/kg wet	25.0		100	70-130			
Surrogate: 4-BFB (FID)	*3.73*		"	*4.00*		*93.2*	*50-150*			
LCS (1F05022-BS2)										
Benzene	0.480	0.0500	mg/kg wet	0.500		96.0	70-130			
Toluene	0.488	0.0500	"	0.500		97.6	70-130			
Ethylbenzene	0.524	0.0500	"	0.500		105	70-130			
Xylenes (total)	1.58	0.100	"	1.50		105	70-130			
Surrogate: 4-BFB (PID)	*3.66*		"	*4.00*		*91.5*	*50-150*			
LCS Dup (1F05022-BSD1)										
Gasoline Range Hydrocarbons	25.0	5.00	mg/kg wet	25.0		100	70-130	0.00	25	
Surrogate: 4-BFB (FID)	*3.74*		"	*4.00*		*93.5*	*50-150*			
LCS Dup (1F05022-BSD2)										
Benzene	0.481	0.0500	mg/kg wet	0.500		96.2	70-130	0.208	25	
Toluene	0.492	0.0500	"	0.500		98.4	70-130	0.816	25	
Ethylbenzene	0.540	0.0500	"	0.500		108	70-130	3.01	25	
Xylenes (total)	1.59	0.100	"	1.50		106	70-130	0.631	25	
Surrogate: 4-BFB (PID)	*3.66*		"	*4.00*		*91.5*	*50-150*			

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F05022: Prepared 06/05/01 Using EPA 5030B (MeOH)										
Duplicate (1F05022-DUP1)					Source: B1F0055-01					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			40.6	50	
Surrogate: 4-BFB (FID)	*3.63*		"	*5.05*		*71.9*	*50-150*			
Duplicate (1F05022-DUP2)					Source: B1F0055-06					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND				50	
Surrogate: 4-BFB (FID)	*3.59*		"	*4.51*		*79.6*	*50-150*			
Matrix Spike (1F05022-MS1)					Source: B1F0055-05					
Gasoline Range Hydrocarbons	25.0	5.00	mg/kg dry	32.1	ND	75.0	60-140			
Surrogate: 4-BFB (FID)	*4.04*		"	*5.13*		*78.8*	*50-150*			
Matrix Spike (1F05022-MS2)					Source: B1F0055-11					
Benzene	0.507	0.0500	mg/kg dry	0.635	ND	79.4	60-140			
Toluene	0.535	0.0500	"	0.635	ND	83.7	60-140			
Ethylbenzene	0.573	0.0500	"	0.635	ND	90.2	60-140			
Xylenes (total)	1.72	0.100	"	1.91	ND	90.1	60-140			
Surrogate: 4-BFB (PID)	*3.96*		"	*5.08*		*78.0*	*50-150*			
Matrix Spike Dup (1F05022-MSD1)					Source: B1F0055-05					
Gasoline Range Hydrocarbons	25.7	5.00	mg/kg dry	32.1	ND	77.2	60-140	2.76	20	
Surrogate: 4-BFB (FID)	*4.01*		"	*5.13*		*78.2*	*50-150*			
Matrix Spike Dup (1F05022-MSD2)					Source: B1F0055-11					
Benzene	0.519	0.0500	mg/kg dry	0.635	ND	81.3	60-140	2.34	20	
Toluene	0.542	0.0500	"	0.635	ND	84.8	60-140	1.30	20	
Ethylbenzene	0.583	0.0500	"	0.635	ND	91.8	60-140	1.73	20	
Xylenes (total)	1.75	0.100	"	1.91	ND	91.6	60-140	1.73	20	
Surrogate: 4-BFB (PID)	*4.16*		"	*5.08*		*81.9*	*50-150*			

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F02001: Prepared 06/02/01 Using EPA 3550B										
Blank (1F02001-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*6.26*		"	*10.7*		*58.5*	*50-150*			
Surrogate: Octacosane	*8.11*		"	*10.7*		*75.8*	*50-150*			
LCS (1F02001-BS1)										
Diesel Range Hydrocarbons	50.0	10.0	mg/kg wet	66.7		75.0	50-150			
Surrogate: 2-FBP	*7.65*		"	*10.7*		*71.5*	*50-150*			
Duplicate (1F02001-DUP1)					**Source: B1E0617-01**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND				50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND				50	
Surrogate: 2-FBP	*7.35*		"	*11.6*		*63.4*	*50-150*			
Surrogate: Octacosane	*8.95*		"	*11.6*		*77.2*	*50-150*			
Duplicate (1F02001-DUP2)					**Source: B1E0700-01**					
Diesel Range Hydrocarbons	124	10.0	mg/kg dry		57.4			73.4	50	Q-14
Lube Oil Range Hydrocarbons	191	25.0	"		88.0			73.8	50	Q-14
Surrogate: 2-FBP	*11.1*		"	*16.1*		*68.9*	*50-150*			
Surrogate: Octacosane	*12.0*		"	*16.1*		*74.5*	*50-150*			

Scott A. Woerman, Project Manager

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F05012: Prepared 06/05/01 Using Dry Weight										
Blank (1F05012-BLK1)										
Dry Weight	100	1.00	%							

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17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/11/01 19:38

Notes and Definitions

G-01	Results reported for the gas range are primarily due to overlap from diesel range hydrocarbons.
I-06	The analyte concentration may be artificially elevated due to coeluting compounds or components.
Q-14	Visual examination indicates the RPD and/or matrix spike recovery is outside the control limit due to a non-homogeneous sample matrix.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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UNOCAL CHAIN OF CUSTODY REPORT

BIF0108

UNOCAL INFORMATION

Facility Number: Chelan Bulk #0082
Site Address: 500 East Gibson St
City, State, ZIP: Chelan, WA.
Site Release Number: Direct Billing to Mark Brearley-Unocal
Unocal Manager: Mark Brearley
CERT INFO: (check one) [X] Evaluation [ ] Remediation
[ ] Detection [ ] Demolition [ ] Closure [ ] Miscellaneous

CONSULTANT INFORMATION

Firm: Maul, Foster, & Alongi Project# 9077.015.001
Address: 17171 Bothell Way NE, #264
Seattle, WA. 98155
Phone: (425) 744-1489 Fax: (425) 744-0919
Project Manager: Mike Staton
Sample Collection by: G. Sandberg

Chain of Custody Record #:

Quality Assurance Data Level: [X] A [ ] B
A: Standard Summary
B: Standard + Chromatograms
Laboratory Turnaround Days: [X] 10 [ ] 5 [ ] 3 [ ] 2 [ ] 1

O OR O WA O AK (Φ) NW Series

SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONTAINERS	TPH-HCID	TPH-Gas	BTEX EPA 8021 Mod.	TPH-Gas + BTEX NWTPH-Gx/8021B	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	NCA SAMPLE NUMBER
1. MW4-12-0501	5/24/01 @ 0945	S	2				X			X								-01
2. AS1-12.0-0501	" @ 1040	S	2				X			X								-02
3. AS2-12.0-0501	5/25/01 @ 0830	S	2				X			X								-03
4. AS3-12.0-0501	" @ 1111	S	2				X			X								-04
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		

	Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1.		MFA	5/24/01 @ 1055		NCA	5/29/01 1055
2.						
3.						

Final Report Approval

Were all requested results provided? [yes] [no] Define
Were results within requested turnaround? [yes] [no] "No"
Final Approval Signature: on back
Firm: Date:

Page ____ of ____
Rev. UNO3.3, 2/99

Comments:
TPH-D & TPH-O by NWTPH-Dx (After Silica Gel cleanup)

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Case Narrative for B1E0721

Client: Maul Foster & Alongi
Project Manager: Mike Staton
Project Name: Chelan Bulk Terminal #0082

1.0 DESCRIPTION OF CASE

Eight water samples were submitted on May 29, 2001, for one or all of the following analyses: Volatile Petroleum Products and BTEX compounds by NWTPH-Gx/EPA 8021B and Semivolatile Petroleum Products by NWTPHDx with Acid/Silica Gel Clean-up.

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received on May 29, 2001 and logged in on May 30, 2001 at a temperature of 5.4 °C. No anomalies were associated with sample receipt.

3.0 PREPARATION AND ANALYSIS

Volatile Petroleum Products and BTEX compounds by NWTPH-Gx/EPA 8021B

No anomalies or discrepancies were associated with this analysis other than those already qualified in the data.

Semivolatile Petroleum Products by NWTPHDx with Acid/Silica Gel Clean-up

The surrogates, 2-FBP and Octocosane, fell outside of their established QC limits in sample MW-7-0501. It could not be determined whether the low recoveries were attributable to an extraction anomaly, the harshness of the acid/silica gel treatment or a matrix effect. Extra volume was available with which to conduct a re-extraction and re-analysis of the sample. The re-extraction was conducted outside the recommended holding time. As a consequence, both sets of results are reported. Furthermore, the results of the initial extraction should be considered with a low bias and the results of the second extraction estimated.

No additional anomalies or discrepancies were associated with this analysis.

"I certify that this data package is in compliance with the Contract both technically and for completeness, other than the conditions detailed above. Release of the data in this hard copy data package has been authorized by the Laboratory Director, as verified by the following signature."

Scott A. Woerman
Project Manager
North Creek Analytical - Bothell

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1-0501	B1E0721-01	Water	05/25/01 15:35	05/29/01 10:55
MW-2-0501	B1E0721-02	Water	05/25/01 14:30	05/29/01 10:55
MW-3-0501	B1E0721-03	Water	05/25/01 17:15	05/29/01 10:55
MW-4-0501	B1E0721-04	Water	05/25/01 16:40	05/29/01 10:55
MW-5-0501	B1E0721-05	Water	05/25/01 18:30	05/29/01 10:55
MW-6-0501	B1E0721-06	Water	05/25/01 15:00	05/29/01 10:55
MW-7-0501	B1E0721-07	Water	05/25/01 17:50	05/29/01 10:55
MW-8-0501	B1E0721-08	Water	05/25/01 12:45	05/29/01 10:55

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1-0501 (B1E0721-01) Water	**Sampled: 05/25/01 15:35**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	**117**	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	G-01
Benzene	**0.667**	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	**1.24**	1.00	"	"	"	"	"	"	I-06
Surrogate: 4-BFB (FID)	*92.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.5 %*	*50-150*			"	"	"	"	
MW-2-0501 (B1E0721-02) Water	**Sampled: 05/25/01 14:30**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.0 %*	*50-150*			"	"	"	"	
MW-3-0501 (B1E0721-03) Water	**Sampled: 05/25/01 17:15**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.4 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.5 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4-0501 (B1E0721-04) Water	**Sampled: 05/25/01 16:40**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*92.9 %*	*50-150*			"	"	"	"	
MW-5-0501 (B1E0721-05) Water	**Sampled: 05/25/01 18:30**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	**1740**	500	ug/l	10	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	**56.2**	5.00	"	"	"	"	"	"	
Toluene	**8.18**	5.00	"	"	"	"	"	"	
Ethylbenzene	**88.2**	5.00	"	"	"	"	"	"	
Xylenes (total)	**221**	10.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*97.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.8 %*	*50-150*			"	"	"	"	
MW-6-0501 (B1E0721-06) Water	**Sampled: 05/25/01 15:00**		**Received: 05/29/01 10:55**						
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.7 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-7-0501 (B1E0721-07) Water Sampled: 05/25/01 17:50 Received: 05/29/01 10:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*90.6 %*	*50-150*			"	"	"	"	
MW-8-0501 (B1E0721-08) Water Sampled: 05/25/01 12:45 Received: 05/29/01 10:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	1F05010	06/05/01	06/05/01	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*90.6 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1-0501 (B1E0721-01) Water Sampled: 05/25/01 15:35 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	**0.889**	0.250	mg/l	1	1E31022	05/31/01	06/08/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*80.7 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*96.1 %*	*50-150*			"	"	"	"	
MW-2-0501 (B1E0721-02) Water Sampled: 05/25/01 14:30 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/09/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*76.5 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*84.5 %*	*50-150*			"	"	"	"	
MW-3-0501 (B1E0721-03) Water Sampled: 05/25/01 17:15 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/08/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.4 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*78.7 %*	*50-150*			"	"	"	"	
MW-4-0501 (B1E0721-04) Water Sampled: 05/25/01 16:40 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/09/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.5 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*78.5 %*	*50-150*			"	"	"	"	
MW-5-0501 (B1E0721-05) Water Sampled: 05/25/01 18:30 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	**8.25**	0.250	mg/l	1	1E31022	05/31/01	06/08/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*97.3 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*83.6 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-6-0501 (B1E0721-06) Water Sampled: 05/25/01 15:00 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/09/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.6 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*79.8 %*	*50-150*			"	"	"	"	
MW-7-0501 (B1E0721-07) Water Sampled: 05/25/01 17:50 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/09/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*39.4 %*	*50-150*			"	"	"	"	X
Surrogate: Octacosane	*45.0 %*	*50-150*			"	"	"	"	X
MW-7-0501 (B1E0721-07RE1) Water Sampled: 05/25/01 17:50 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1F13012	06/13/01	06/15/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*68.8 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*73.1 %*	*50-150*			"	"	"	"	
MW-8-0501 (B1E0721-08) Water Sampled: 05/25/01 12:45 Received: 05/29/01 10:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	1E31022	05/31/01	06/09/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*56.4 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*65.0 %*	*50-150*			"	"	"	"	

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F05010: Prepared 06/05/01 Using EPA 5030B (P/T)										
Blank (1F05010-BLK1)										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	*43.3*		"	*48.0*		*90.2*	*50-150*			
Surrogate: 4-BFB (PID)	*45.9*		"	*48.0*		*95.6*	*50-150*			
LCS (1F05010-BS1)										
Gasoline Range Hydrocarbons	488	50.0	ug/l	500		97.6	70-130			
Surrogate: 4-BFB (FID)	*48.6*		"	*48.0*		*101*	*50-150*			
LCS (1F05010-BS2)										
Benzene	9.48	0.500	ug/l	10.0		94.8	70-130			
Toluene	9.77	0.500	"	10.0		97.7	70-130			
Ethylbenzene	10.3	0.500	"	10.0		103	70-130			
Xylenes (total)	31.0	1.00	"	30.0		103	70-130			
Surrogate: 4-BFB (PID)	*44.2*		"	*48.0*		*92.1*	*50-150*			
LCS Dup (1F05010-BSD1)										
Gasoline Range Hydrocarbons	496	50.0	ug/l	500		99.2	70-130	1.63	25	
Surrogate: 4-BFB (FID)	*48.2*		"	*48.0*		*100*	*50-150*			
LCS Dup (1F05010-BSD2)										
Benzene	9.61	0.500	ug/l	10.0		96.1	70-130	1.36	25	
Toluene	9.69	0.500	"	10.0		96.9	70-130	0.822	25	
Ethylbenzene	10.4	0.500	"	10.0		104	70-130	0.966	25	
Xylenes (total)	31.1	1.00	"	30.0		104	70-130	0.322	25	
Surrogate: 4-BFB (PID)	*44.2*		"	*48.0*		*92.1*	*50-150*			

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1F05010: Prepared 06/05/01 Using EPA 5030B (P/T)										
Duplicate (1F05010-DUP1)					**Source: B1E0721-05**					
Gasoline Range Hydrocarbons	1870	1000	ug/l		1740			7.20	25	
Surrogate: 4-BFB (FID)	*44.7*		"	*48.0*		*93.1*	*50-150*			
Matrix Spike (1F05010-MS1)					**Source: B1E0721-02**					
Gasoline Range Hydrocarbons	492	50.0	ug/l	500	ND	98.4	70-130			
Surrogate: 4-BFB (FID)	*46.6*		"	*48.0*		*97.1*	*50-150*			
Matrix Spike (1F05010-MS2)					**Source: B1E0721-04**					
Benzene	9.79	0.500	ug/l	10.0	ND	97.9	70-130			
Toluene	9.72	0.500	"	10.0	ND	96.1	70-130			
Ethylbenzene	10.3	0.500	"	10.0	ND	103	70-130			
Xylenes (total)	30.9	1.00	"	30.0	ND	103	70-130			
Surrogate: 4-BFB (PID)	*44.5*		"	*48.0*		*92.7*	*50-150*			
Matrix Spike Dup (1F05010-MSD1)					**Source: B1E0721-02**					
Gasoline Range Hydrocarbons	486	50.0	ug/l	500	ND	97.2	70-130	1.23	15	
Surrogate: 4-BFB (FID)	*47.3*		"	*48.0*		*98.5*	*50-150*			
Matrix Spike Dup (1F05010-MSD2)					**Source: B1E0721-04**					
Benzene	9.73	0.500	ug/l	10.0	ND	97.3	70-130	0.615	15	
Toluene	9.85	0.500	"	10.0	ND	97.4	70-130	1.33	15	
Ethylbenzene	10.5	0.500	"	10.0	ND	105	70-130	1.92	15	
Xylenes (total)	31.5	1.00	"	30.0	ND	105	70-130	1.92	15	
Surrogate: 4-BFB (PID)	*44.9*		"	*48.0*		*93.5*	*50-150*			

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Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E31022: Prepared 05/31/01 Using EPA 3520C/600 Series										
Blank (1E31022-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500	"							
Surrogate: 2-FBP	*0.238*		"	*0.320*		*74.4*	*50-150*			
Surrogate: Octacosane	*0.263*		"	*0.320*		*82.2*	*50-150*			
LCS (1E31022-BS1)										
Diesel Range Hydrocarbons	1.47	0.250	mg/l	2.00		73.5	50-150			
Surrogate: 2-FBP	*0.237*		"	*0.320*		*74.1*	*50-150*			
LCS Dup (1E31022-BSD1)										
Diesel Range Hydrocarbons	1.50	0.250	mg/l	2.00		75.0	50-150	2.02	50	
Surrogate: 2-FBP	*0.252*		"	*0.320*		*78.8*	*50-150*			
Batch 1F13012: Prepared 06/13/01 Using EPA 3520C/600 Series										
Blank (1F13012-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500	"							
Surrogate: 2-FBP	*0.223*		"	*0.320*		*69.7*	*50-150*			
Surrogate: Octacosane	*0.226*		"	*0.320*		*70.6*	*50-150*			
LCS (1F13012-BS1)										
Diesel Range Hydrocarbons	1.36	0.250	mg/l	2.00		68.0	50-150			
Surrogate: 2-FBP	*0.225*		"	*0.320*		*70.3*	*50-150*			
LCS Dup (1F13012-BSD1)										
Diesel Range Hydrocarbons	1.45	0.250	mg/l	2.00		72.5	50-150	6.41	50	
Surrogate: 2-FBP	*0.218*		"	*0.320*		*68.1*	*50-150*			

Scott A. Woerman, Project Manager

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Maul Foster & Alongi-Seattle	Project: Chelan Bulk Terminal #0082	
17171 Bothell Way NE #264	Project Number: 9077.015.001	**Reported:**
Seattle WA, 98155	Project Manager: Mike Staton	06/18/01 16:38

Notes and Definitions

G-01	Results reported for the gas range are primarily due to overlap from diesel range hydrocarbons.
I-06	The analyte concentration may be artificially elevated due to coeluting compounds or components.
X	See case narrative.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

UNOCAL CHAIN OF CUSTODY REPORT

B1E0721

UNOCAL INFORMATION

Facility Number: Chelan Bulk #0082
Site Address: 500 East Gibson St.
City, State, ZIP: Chelan, WA
Site Release Number: Direct Billing to Mark Brearley - Unocal
Unocal Manager: Mark Brearley
CERT INFO: (check one) [X] Evaluation [ ] Remediation
[ ] Detection [ ] Demolition [ ] Closure [ ] Miscellaneous

CONSULTANT INFORMATION

Firm: Maul, Foster, & Alongi Project# 9077.015.001
Address: 17171 Bothell Way NE, #204
Seattle, WA. 98155
Phone: (425) 744-1489 Fax: (425) 744-0919
Project Manager: Mike Stator
Sample Collection by: G. Sandberg

Chain of Custody Record #:

Quality Assurance Data Level:
[X] A [ ] B
A: Standard Summary
B: Standard + Chromatograms

Laboratory Turnaround Days:
[X] 10 [ ] 5 [ ] 3 [ ] 2 [ ] 1

○ OR ○ WA ○ AK (X) NW Series

SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONTAINERS	TPH-HCID	TPH-Gas	BTEX EPA 8021 Mod.	TPH-Gas + BTEX NWTPH-G/8021B	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	NCA SAMPLE NUMBER
1. MW-1-0501	5/29/01 @ 1535	W	4				X			X								-01
2. MW-2-0501	1430						X			X								-02
3. MW-3-0501	1715						X			X								-03
4. MW-4-0501	1640						X			X								-04
5. MW-5-0501	1830						X			X								-05
6. MW-6-0501	1500						X			X								-06
7. MW-7-0501	1750						X			X								-07
8. MW-8-0501	5/29/01 @ 1245						X			X								-08
9.																		
10.																		

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1.	MFA	5/29/01 @ 1055		NCA	5/29/01 1055
2.					
3.					

Final Report Approval

Were all requested results provided? [yes] [no] Define
Were results within requested turnaround? [yes] [no] "No"
Final Approval Signature: on back
Firm: Date:

Page ____ of ____

Comments: TPH-D & TPH-O by NWTPH-Dx (After Silica Gel Cleanup)

Rev. UNO3.3, 2/99