

WST 1975
Unocal 5472
King/Seattle

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DATE: January 26, 1998

TOSCO MARKETING COMPANY QUARTERLY REPORT

DEPT. OF ECOLOGY

Tosco Facility: 5472 Address: 3460 1st Avenue South, Seattle, Washington
Tosco Environmental Manager: Timothy D. Johnson
Consulting Co./Contact Person: Environmental Resolutions, Inc., John Meyer
ERI Project No.: 03102313
Primary Agency/Regulatory ID No.: Washington State Department of Ecology UST

WORK PERFORMED THIS QUARTER(S) [Fourth - 1997]:

1. Fourth quarter groundwater monitoring, sampling, and report

WORK PROPOSED FOR NEXT QUARTER [First - 1998]:

1. First quarter groundwater monitoring and sampling.

Current Phase of Project:	Monitoring	(Assmnt, Remed., etc.)
Frequency of Sampling:	Quarterly	(Quarterly, etc.)
Frequency of Monitoring:	Quarterly	(Monthly, etc.)
Are Liquid Phase Hydrocarbons Present On-site:	No	(Yes/No)
Cumulative LPH Recovered to Date:	Unknown	(gallons)
LPH Recovered This Quarter:	None	(gallons)
Bulk Soil Removed to Date:	Unknown	(cubic yards)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Water Wells or Surface Waters w/in a 2000'		
Radius & Their Respective Directions:	Unknown	(Distance and Direction)
Current Remediation Techniques:	None	(SVES, LPH Removal,
Permits for Discharge:	None	(NPDES, POTW, etc.)
Approximate Depth to Groundwater:	4 to 7 feet	(Measured Feet)
Groundwater Gradient:	West and South	(Direction)
	0.003 vertical feet per linear foot	(Magnitude)

Discussion: On December 18, 1997, Environmental Resolutions, Inc., (ERI) gauged and sampled 7 groundwater monitoring wells. Off-site monitoring well MW-10 could not be accessed. Results indicated groundwater present approximately 4 to 7 feet bgs with a gradient generally directed toward the west and south. No liquid-phase hydrocarbons were observed in any well.

Groundwater samples collected from MW-1, MW-8, MW-9, and MW-12 contained TPH-G, TPH-D, and benzene concentrations exceeding MTCA Method A Cleanup Levels. Concentrations of TPH-Q, ethylbenzene, and total xylenes also exceeded MTCA Method A Cleanup levels in one or more of the same samples. No analyte concentrations exceeding MTCA Method A Cleanup Levels were detected in groundwater samples collected from MW-6, MW-7, and MW-11.

Summary of Unusual Activity: None
Agency Directive Requirements: None
Recommended Activities: Continue quarterly groundwater sampling

ATTACHED:

- Plate P-1 - Groundwater Sample Analyses Map, 12/18/97
- Table 1 - Groundwater Analytical Results
- Laboratory Reports and Chain-of-Custody Documentation

Prepared by:

John K. Meyer, R.G.
Environmental Resolutions, Inc.

cc: Washington State Department of Ecology

Independent Action Report Update

to Name: UNOCAL #5472

ic. #: 1975 Date of Report: 1-26-98

ounty: King Date Report Rec'd: 1-28-98

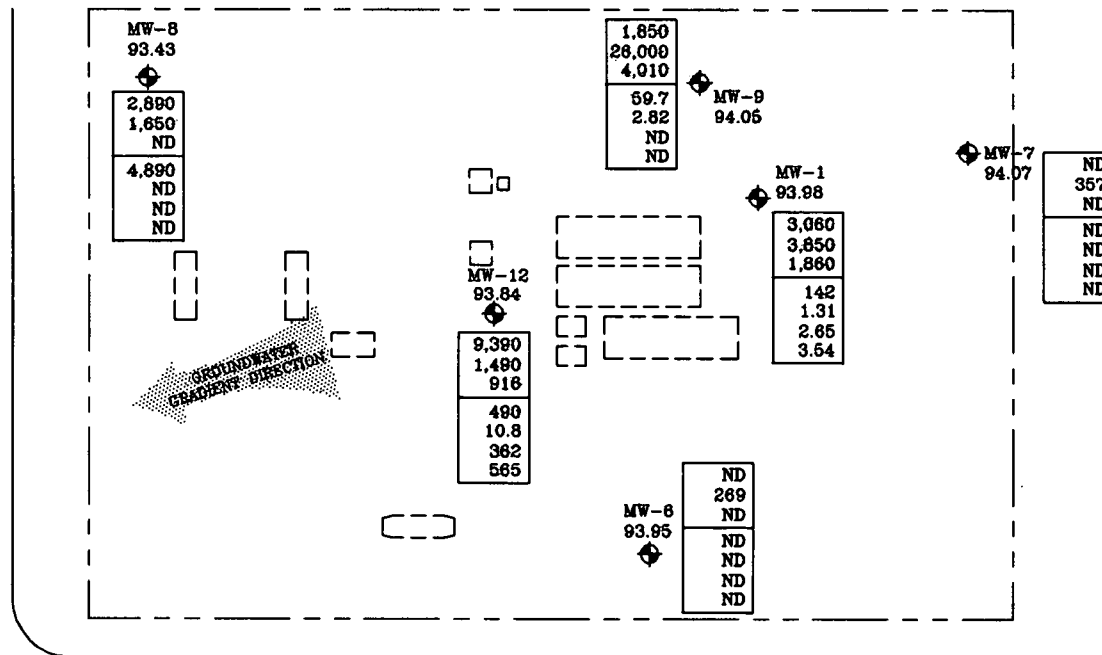
viewed by: Ben Amosah-Peron

Comments (please include: free prod., tank info., contaminant migration,
GW depth & flow, cons. trends, PCS treated?):

Elevated TPH & Benzene levels
in 4 of 6 MWS.

INTERIM

1ST AVENUE SOUTH



SOUTH SPOKANE STREET

Laboratory Results
in ug/L (ppb)

3,060	Total Petroleum Hydrocarbons as Gasoline
3,850	Total Petroleum Hydrocarbons as Diesel
1,860	Total Petroleum Hydrocarbons as Oil
142	Benzene
1.31	Toluene
2.65	Ethylbenzene
3.54	Total Xylenes

Numbers in Red Exceed
MTCA Method A Cleanup Levels
ND = Not Detected

SOURCE: Modified
from maps provided by
Tosco Marketing Company

FN 5472



GROUNDWATER SAMPLE ANALYSES MAP - 12/18/97

TOSCO FACILITY 5472

3460 1st Avenue South
Seattle, Washington

EXPLANATION

MW-1	Groundwater Monitoring Well
93.98	Groundwater Elevation
NM	Not Measured
NS	Not Sampled

PROJECT NO.

31023

PLATE

P-1

DATE: 1/26/98

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5472
3460 1st Avenue South
Seattle, Washington
Page 1 of 3

Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	Diss. Pb
MW-1 99.52	02/25/91	5.43	92.59	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	10/19/92	7.20	92.60	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	08/26/93	7.36	92.27	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	10/13/94	8.23	91.55	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	04/25/95	5.62	93.90	30,000	16,000	9,600	890	<4.0	340	290	--
	07/12/95	--	--	13,000	4,900	<8,000	1,000	<8.0	360	210	<2.0
	10/12/95	6.15	93.41	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	01/22/96	5.10	94.35	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	04/10/96	5.86	93.76	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	07/29/96	5.83	93.69	6,700	6,210	2,960	763	5.50	169	22.6	--
	10/25/96	6.32	93.37	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	03/05/97	4.96	94.56	4,240	3,860	2,100	114	<2.50	18.7	<5.00	--
	03/05/97 ^{NP}	4.96	94.56	8,160	634	<750	40.7	<2.50	68.9	15.3	--
	06/19/97	5.66	93.87	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	09/16/97	6.56	92.96	LPH	LPH	LPH	LPH	LPH	LPH	LPH	LPH
	12/18/97	5.54	93.98	3,060	3,850	1,860	142	1.31	2.65	3.54	--
MW-6 99.67	02/25/91	5.69	92.50	--	--	--	<1.0	<1.0	<1.0	<1.0	--
	10/19/92	7.64	92.03	<1,000	<250	--	19	<1.0	<1.0	<1.0	8
	08/26/93	6.33	93.34	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	<3
	10/13/94	7.90	91.77	<50	450	<750	<0.50	<0.50	<0.50	<1.0	40
	04/25/95	5.63	94.04	<50	330	1,300	<0.50	<0.50	<0.50	<1.0	<2.0
	07/12/95	--	--	<50	550	1,200	<0.50	<0.50	<0.50	<1.0	<2.0
	10/12/95	6.50	93.17	<50	530	970	<0.50	<0.50	<0.50	<1.0	--
	01/22/96	5.08	94.59	<50	610	<750	<0.50	<0.50	<0.50	<1.0	--
	04/10/96	5.73	93.94	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	07/29/96	5.55	94.12	<5	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	10/25/96	6.25	93.42	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	03/05/97	5.09	94.58	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	--
	03/05/97 ^{NP}	5.52	94.15	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	--
	06/19/97 ^{NP}	5.52	94.15	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	--
	09/16/97 ^{NP}	6.35	93.32	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	--
	12/18/97	5.72	93.95	<50.0	269	<750	<0.500	<0.500	<0.500	<1.00	--
MW-7 98.50	02/25/91	4.33	92.68	--	--	--	11	<1.0	<1.0	<1.0	--
	10/19/92	5.98	92.52	<1,000	620	--	6	<1.0	<1.0	<1.0	<5
	08/26/93	6.16	92.34	<100	<250	<750	12	<0.50	<0.50	<0.50	<3
	10/13/94	6.56	91.94	<50	540	<750	3.3	<0.50	<0.50	<1.0	110
	04/25/95	4.45	93.05	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	<2.0
	07/12/95	--	--	<50	2,000	2,100	<0.50	<0.50	<0.50	<1.0	<2.0
	10/12/95	4.90	93.60	<50	<250	950	<0.50	<0.50	<0.50	<1.0	--
	01/22/96	3.89	94.61	<50	520	<750	1.5	<0.50	<0.50	<1.0	--
	04/10/96	4.63	93.87	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	07/29/96	4.55	93.95	<50	<250	<750	<0.50	<0.05	<0.05	<0.10	--
	10/25/96	4.98	93.52	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	03/05/97	3.94	94.56	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	03/05/97 ^{NP}	3.94	94.56	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	06/19/97 ^{NP}	4.57	93.93	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	09/16/97 ^{NP}	5.29	93.21	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--
	12/18/97	4.43	94.07	<50.0	357	<750	<0.500	<0.500	<0.500	<1.00	--
MTCA Method A Cleanup Level				1,000 ^a			5	40	30	20	5

Continued on Page 2.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5472
3460 1st Avenue South
Seattle, Washington
Page 2 of 3

Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	Diss. Pb
MW-8 98.96	02/25/91	5.44	92.06	--	--	--	7	16	29	32	--
	10/19/92	7.17	91.79	4,900	330	--	7,200	32	610	1,500	<5
	08/26/93	6.91	92.05	7,600	660	--	16,000	410	800	670	<3
	10/13/94	7.40	91.56	2,200	740	1,200	19,000	<40	<40	63	4.6
	04/25/95	5.41	93.55	6,700	1,600	1,200	10,000	200	340	1,000	<2.0
	07/12/95	--	--	4,800	1,500	1,000	8,700	<8.0	130	690	<2.0
	10/12/95	6.48	92.48	3,500	1,500	1,100	11,000	16	18	69	--
	01/22/96	5.10	94.35	2,600	2,500	1,000	8,600	<20	<20	23	--
	04/10/96	5.63	93.33	2,300	2,000	750	3,400	<20	<20	21	--
	07/29/96	4.22	94.74	3,000	1,000	<750	8,660	<25.0	<25.0	<50.0	--
	10/25/96	6.03	92.93	3,600	<250	<750	3,500	<25.0	<25.0	50.3	--
	03/05/97	4.91	94.05	3,490	398	<750	3,970	<10.0	<10.0	<20.0	--
	03/05/97 ^{NP}	4.91	94.05	7,730	375	<750	830	<5.0	11.5	<10.0	--
	06/19/97 ^{NP}	5.46	93.50	6,220	621	<750	1,870	<12.5	13.1	<25.0	--
	09/16/97 ^{NP}	6.28	92.21	3,310	292	<750	4,380	<10	11.5	<20	--
	12/18/97	5.53	93.43	2,890	1,650	<750	4,890	<25.0	<25.0	<50.0	--
MW-9 98.66	02/25/91	4.55	92.62	--	--	--	14,100	19,400	1,300	10,320	--
	10/19/92	6.47	92.19	6,800	36,000	--	6,000	160	350	1,500	<5
	08/26/93	6.48	92.05	6,800	4,400	<750	7,100	100	630	1,300	<3
	10/13/94	7.00	91.66	2,700	4,100	<750	3,000	11	190	140	7.9
	04/25/95	4.70	93.96	6,300	2,500	1,000	360	3.7	210	310	<2.0
	07/12/95	--	--	1,600	2,600	1,300	68	<2.0	62	72	<2.0
	10/12/95	5.15	93.51	4,600	8,800	6,000	930	17	240	310	--
	01/22/96	4.06	94.60	4,000	9,200	1,900	110	<2.0	100	100	--
	04/10/96	4.86	93.80	3,800	3,000	1,000	170	<2.0	170	49	--
	07/29/96	4.71	93.95	1,600	990	890	1,060	<12.5	17.0	<25.0	--
	10/25/96	5.22	93.44	2,100	1,910	<750	687	9.31	9.91	<10.0	--
	03/05/97	4.11	94.55	1,030	22,400	2,240	49.4	<0.50	15.6	<1.0	--
	03/05/97 ^{NP}	4.11	94.55	2,120	8,150	1,060	48.4	<1.0	17.9	2.11	--
	06/19/97 ^{NP}	4.78	93.88	710	1,450	<750	104	<2.5	13.6	5.14	--
	09/16/97 ^{NP}	5.59	93.07	778	469	<750	664	6.27	2.27	4.61	--
	12/18/97	4.61	94.05	1,850	26,000	4,010	69.7	2.82	<2.50	<5.00	--
MW-10 99.62	02/25/91	--	--	4,200	<250	--	2,000	9.0	200	1,300	72
	10/19/92	7.52	92.10	--	--	--	--	--	--	--	--
	08/26/93	7.44	92.18	1,700	<250	<750	88	3.7	60	97	<3
	10/13/94	7.96	91.66	720	260	<750	730	6.1	1.1	160	26
	04/25/95	5.79	93.83	3,000	46	990	2,100	21	47	270	<2.0
	07/12/95	--	--	1,800	66	<750	2,600	27	<20	290	<2.0
	10/12/95	6.85	92.77	2,200	420	<750	2,100	19	7.8	99	--
	01/22/96	5.82	93.80	1,900	440	<750	1,200	12	23	39	--
	04/10/96	6.08	93.54	1,500	300	<750	920	19	15	60	--
	07/29/96	5.24	94.38	<2,500	260	<750	3,660	27.6	<25.0	<50.0	--
	10/25/96	--	--	--	--	--	--	--	--	--	--
	03/05/97	--	--	--	--	--	--	--	--	--	--
	06/19/97 ^{NP}	5.95	93.67	53	<250	<750	691	7.48	<5.0	20.3	--
	09/16/97 ^{NP}	6.80	92.82	736	<250	<750	1,170	9.747	3.11	18.2	--
	12/18/97	--	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Level				1,000 ^a			5	40	30	20	5

Continued on Page 3.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5472
3460 1st Avenue South
Seattle, Washington
Page 3 of 3

Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	Diss. Pb
MW-11	02/25/91	—	—	—	—	—	—	—	—	—	—
99.70	10/19/92	7.97	91.73	<1,000	<250	—	<0.1	<1.0	<1.0	<1.0	<5
	08/26/93	7.59	92.11	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	<3
	10/13/94	8.20	91.50	<50	300	1,100	<0.50	<0.50	<0.50	<1.0	<2.0
	04/25/95	6.00	93.70	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	<2.0
	07/12/95	—	—	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	<2.0
	10/12/95	7.0	92.70	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	01/22/96	—	—	—	—	—	—	—	—	—	—
	04/10/96	5.97	93.73	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	07/29/96	5.84	93.86	<50	<250	<750	<0.50	<0.50	<0.50	<0.10	—
	10/25/96	6.55	93.15	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	03/05/97	5.41	94.29	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	03/05/97 ^{NP}	5.41	94.29	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	06/19/97 ^{NP}	5.81	93.89	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	09/16/97 ^{NP}	6.31	93.39	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	—
	12/18/97	6.21	93.49	<50.0	285	<750	<0.500	<0.500	<0.500	<1.00	—
MW-12	02/25/91	—	—	—	—	—	—	—	—	—	—
100.32	10/19/92	8.37	91.95	8,500	830	—	7,600	1,800	180	1,810	<5
	08/26/93	8.11	92.21	—	—	—	—	—	—	—	<2.0
	10/13/94	8.66	91.66	18,000	3,000	<750	3,300	91	1,100	360	<2.0
	04/25/95	6.40	93.92	32,000	2,600	2,000	1,700	41	470	1,100	<2.0
	07/12/95	—	—	14,000	8,600	<8,000	3,600	100	1,000	2,100	<2.0
	10/12/95	7.45	92.87	7,400	2,800	1,300	940	7.5	310	740	—
	01/22/96	7.70	92.62	33,000	1,700	1,100	1,400	260	1,200	3,300	—
	04/10/96	6.53	93.79	20,000	1,300	<750	390	7.7	690	940	—
	07/29/96	6.24	94.08	16,100	1,400	<750	3,300	<25.0	636	1,320	—
	10/25/96	7.08	93.24	9,900	290	<750	2,660	<25.0	492	1,040	—
	03/05/97	5.78	94.54	17,900	372	<750	662	727	15	1,610	—
	03/05/97 ^{NP}	5.78	94.54	14,500	431	<750	637	<10.0	646	968	—
	06/19/97 ^{NP}	6.45	93.87	14,900	666	<750	336	<10.0	626	667	—
	09/16/97 ^{NP}	7.30	93.02	8,460	666	<750	686	<10.0	344	248	—
	12/18/97	6.48	93.84	9,390	1,490	916	490	10.8	362	666	—
MTCA Method A Cleanup Level				1,000 ^a	5	40	30	20	5		

EXPLANATION:

All concentrations in ug/L (ppb).

Wellhead elevations taken from prior consultant's reports.

DTW = Depth to water in feet below top of casing.

GW Elev. = Groundwater elevation relative to top of casing elevations; Corrected for free product where applicable using a specific gravity of 0.75.

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Ecology Method WTPH-G.

TPH-D and TPH-O = Total Petroleum Hydrocarbons as Diesel and Oil, respectively, by Ecology Method WTPH-D (extended).

B = Benzene; T = Toluene; E = Ethylbenzene; X = Total Xylenes.

BTEX = Aromatic compounds by EPA Method 8020.

Diss. Pb = Dissolved Lead by EPA Method 7421.

LPH = Liquid-phase petroleum hydrocarbons present; no sample collected.

— = Not sampled.

< = Less than the stated laboratory reporting limit.

^{NP} = Sample collected without purging.

^a Total Petroleum Hydrocarbons.

October 1994 results are for total lead.

Shaded values equal or exceed MTCA Method A Cleanup Levels.

Data collected before 12/18/97 are taken from prior consultants.



NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

ERI
1921 Edmonds Drive SE
Renton, WA 98055

Project: TOSCO #5472
Project Number: 31023
Project Manager: John Meyer

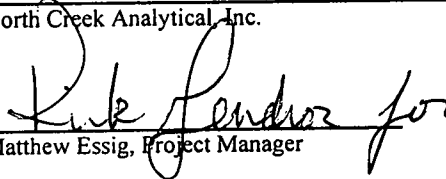
Sampled: 12/18/97
Received: 12/19/97
Reported: 12/31/97 12:41

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-1	B712451-01	Water	12/18/97
MW-6	B712451-02	Water	12/18/97
MW-7	B712451-03	Water	12/18/97
MW-8	B712451-04	Water	12/18/97
MW-9	B712451-05	Water	12/18/97
MW-11	B712451-06	Water	12/18/97
MW-12	B712451-07	Water	12/18/97

North Creek Analytical, Inc.

*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.*


Matthew Essig, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

ERI	Project: TOSCO #5472	Sampled: 12/18/97
1921 Edmonds Drive SE	Project Number: 31023	Received: 12/19/97
Renton, WA 98055	Project Manager: John Meyer	Reported: 12/31/97 12:41

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-1								
B712451-01								Water
Gasoline Range Hydrocarbons	1270776	12/30/97	12/31/97		125	3060	ug/l	
Benzene	"	"	"		1.25	142	"	
Toluene	"	"	"		1.25	1.31	"	
Ethylbenzene	"	"	"		1.25	2.65	"	
Xylenes (total)	"	"	"		2.50	3.54	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		120	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		88.7	"	
MW-6								
B712451-02								Water
Gasoline Range Hydrocarbons	1270776	12/30/97	12/30/97		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		78.1	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		81.7	"	
MW-7								
B712451-03								Water
Gasoline Range Hydrocarbons	1270776	12/30/97	12/30/97		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		79.0	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		84.0	"	
MW-8								
B712451-04								Water
Gasoline Range Hydrocarbons	1270776	12/30/97	12/30/97		2500	2890	ug/l	
Benzene	"	"	"		25.0	4890	"	
Toluene	"	"	"		25.0	ND	"	
Ethylbenzene	"	"	"		25.0	ND	"	
Xylenes (total)	"	"	"		50.0	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		87.9	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		74.8	"	
MW-9								
B712451-05								Water
Gasoline Range Hydrocarbons	1270776	12/30/97	12/31/97		250	1850	ug/l	1,2
Benzene	"	"	"		2.50	59.7	"	

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

Matthew Essig, Project Manager

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NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

ERI	Project: TOSCO #5472	Sampled: 12/18/97
1921 Edmonds Drive SE	Project Number: 31023	Received: 12/19/97
Renton, WA 98055	Project Manager: John Meyer	Reported: 12/31/97 12:41

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-9 (continued)				B712451-05			Water	
Toluene	1270776	12/30/97	12/31/97		2.50	2.82	ug/l	
Ethylbenzene	"	"	"		2.50	ND	"	
Xylenes (total)	"	"	"		5.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		94.2	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		91.7	"	
MW-11				B712451-06			Water	
Gasoline Range Hydrocarbons	1270776	12/30/97	12/30/97		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		80.8	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		82.5	"	
MW-12				B712451-07			Water	
Gasoline Range Hydrocarbons	1270776	12/30/97	12/30/97		250	9390	ug/l	
Benzene	"	"	"		2.50	490	"	
Toluene	"	"	"		2.50	10.8	"	
Ethylbenzene	"	"	"		2.50	362	"	
Xylenes (total)	"	"	"		5.00	565	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		136	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		109	"	

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

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ERI	Project: TOSCO #5472	Sampled: 12/18/97
1921 Edmonds Drive SE	Project Number: 31023	Received: 12/19/97
Renton, WA 98055	Project Manager: John Meyer	Reported: 12/31/97 12:41

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended) North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-1				B712451-01			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	3.85	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	1.86	"	
Surrogate: 2-FBP	"	"	"	50.0-150		83.1	%	
MW-6				B712451-02			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	0.269	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		76.2	%	
MW-7				B712451-03			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	0.357	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		79.0	%	
MW-8				B712451-04			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	1.65	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		94.2	%	
MW-9				B712451-05			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/29/97		1.25	26.0	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		3.75	4.01	"	
Surrogate: 2-FBP	"	"	"	50.0-150		109	%	
MW-11				B712451-06			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	0.285	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		82.0	%	
MW-12				B712451-07			Water	
Diesel Range Hydrocarbons	1270629	12/23/97	12/26/97		0.250	1.49	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	0.916	"	
Surrogate: 2-FBP	"	"	"	50.0-150		85.2	%	

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

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ERI
1921 Edmonds Drive SE
Renton, WA 98055

Project: TOSCO #5472
Project Number: 31023
Project Manager: John Meyer

Sampled: 12/18/97
Received: 12/19/97
Reported: 12/31/97 12:41

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1270776										
Blank										
Date Prepared: 12/30/97										
1270776-BLK1										
Extraction Method: EPA 5030 (P/T)										
Gasoline Range Hydrocarbons	12/30/97			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	48.0		37.5	"	50.0-150	78.1			
Surrogate: 4-BFB (PID)	"	48.0		39.8	"	50.0-150	82.9			
LCS										
1270776-BS1										
Gasoline Range Hydrocarbons	12/30/97	500		525	ug/l	75.0-125	105			
Surrogate: 4-BFB (FID)	"	48.0		44.2	"	50.0-150	92.1			
Duplicate										
1270776-DUP1 B712404-03										
Gasoline Range Hydrocarbons	12/30/97		2390	2070	ug/l			25.0	14.3	
Surrogate: 4-BFB (FID)	"	48.0		49.1	"	50.0-150	102			
Duplicate										
1270776-DUP2 B712553-01										
Gasoline Range Hydrocarbons	12/30/97		18000	17200	ug/l			25.0	4.55	
Surrogate: 4-BFB (FID)	"	48.0		44.7	"	50.0-150	93.1			
Matrix Spike										
1270776-MS1 B712404-04										
Benzene	12/30/97	10.0	ND	9.23	ug/l	70.0-130	92.3			
Toluene	"	10.0	ND	9.21	"	70.0-130	92.1			
Ethylbenzene	"	10.0	ND	9.21	"	70.0-130	92.1			
Xylenes (total)	"	30.0	ND	27.3	"	70.0-130	91.0			
Surrogate: 4-BFB (PID)	"	48.0		39.7	"	50.0-150	82.7			
Matrix Spike Dup										
1270776-MSD1 B712404-04										
Benzene	12/30/97	10.0	ND	9.45	ug/l	70.0-130	94.5	15.0	2.36	
Toluene	"	10.0	ND	9.54	"	70.0-130	95.4	15.0	3.52	
Ethylbenzene	"	10.0	ND	9.52	"	70.0-130	95.2	15.0	3.31	
Xylenes (total)	"	30.0	ND	28.2	"	70.0-130	94.0	15.0	3.24	
Surrogate: 4-BFB (PID)	"	48.0		39.7	"	50.0-150	82.7			

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

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ERI	Project: TOSCO #5472	Sampled: 12/18/97
1921 Edmonds Drive SE	Project Number: 31023	Received: 12/19/97
Renton, WA 98055	Project Manager: John Meyer	Reported: 12/31/97 12:41

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1270629										
Blank										
Date Prepared: 12/23/97										
1270629-BLK1										
Diesel Range Hydrocarbons	12/26/97			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	"			ND	"	0.750				
Surrogate: 2-FBP	"	0.364		0.275	"	50.0-150	75.5			
LCS										
1270629-BS1										
Diesel Range Hydrocarbons	12/26/97	2.00		2.39	mg/l	60.0-140	120			
Surrogate: 2-FBP	"	0.364		0.328	"	50.0-150	90.1			
Duplicate										
1270629-DUP1 B712451-03										
Diesel Range Hydrocarbons	12/26/97		0.357	0.329	mg/l			44.0	8.16	
Surrogate: 2-FBP	"	0.687		0.555	"	50.0-150	80.8			
Duplicate										
1270629-DUP2 B712475-02										
Diesel Range Hydrocarbons	12/26/97		0.265	0.261	mg/l			44.0	1.52	
Surrogate: 2-FBP	"	0.687		0.486	"	50.0-150	70.7			

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

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ERI	Project: TOSCO #5472	Sampled: 12/18/97
1921 Edmonds Drive SE	Project Number: 31023	Received: 12/19/97
Renton, WA 98055	Project Manager: John Meyer	Reported: 12/31/97 12:41

Notes and Definitions

#	Note
---	------

1 This sample appears to contain extractable diesel range organics.

2 Analysis reflects that sample is not homogeneous.

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

Recov. Recovery

RPD Relative Percent Difference

North Creek Analytical, Inc.

Matthew Essig, Project Manager

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**NORTH
CREEK
ANALYTICAL**
Environmental Laboratory Services

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CHAIN OF CUSTODY REPORT

Work Order #

B712451

REPORT TO: ERI			INVOICE TO: TORCO			TURNAROUND REQUEST in Business Days * <table border="1"><tr><td colspan="2">Organic & Inorganic Analyses</td></tr><tr><td>☒ 10</td><td>☐ 7</td></tr><tr><td>☐ 5</td><td>☐ 4</td></tr><tr><td>☐ 3</td><td>☐ 2</td></tr><tr><td>☐ 1</td><td>☐ Same Day</td></tr><tr><td colspan="2">Fuels & Hydrocarbon Analyses</td></tr><tr><td>☐ 5</td><td>☐ 3-4</td></tr><tr><td>☐ 2</td><td>☐ 1</td></tr><tr><td>☐ Same Day</td><td></td></tr></table> OTHER Specify: _____ * Turnaround Requests less than standard may incur Rush Charges.			Organic & Inorganic Analyses		☒ 10	☐ 7	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ Same Day	Fuels & Hydrocarbon Analyses		☐ 5	☐ 3-4	☐ 2	☐ 1	☐ Same Day	
Organic & Inorganic Analyses																										
☒ 10	☐ 7																									
☐ 5	☐ 4																									
☐ 3	☐ 2																									
☐ 1	☐ Same Day																									
Fuels & Hydrocarbon Analyses																										
☐ 5	☐ 3-4																									
☐ 2	☐ 1																									
☐ Same Day																										
ATTENTION: John Meyer			ATTENTION: DATA/7754722511/500																							
ADDRESS: 1921 EDWARDS DR SE Renton, WA 98055			ADDRESS: 970/840/11000/255472																							
PHONE: (425) 227-0280 FAX: X 0225			P.O. NUMBER: _____ NCA QUOTE #: _____																							
PROJECT NAME: TORCO 5472 1ST			Analysis Request: TDH-6/BTE TDH-D (ext)																							
PROJECT NUMBER: 31023																										
SAMPLED BY: J Meyer																										
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)				MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS																		
1. MW-1	12/14/97	B712451-01	X	X		W	3																			
2. MW-6		-02	X	X																						
3. MW-7		-03	X	X																						
4. MW-8		-04	X	X																						
5. MW-9		-05	X	X																						
6. MW-11		-06	X	X																						
7. MW-12		-07	X	X																						
8.																										
9.																										
10.																										
RELINQUISHED BY (Signature): [Signature] DATE: 12/18/97			RECEIVED BY (Signature): [Signature] DATE: 12/17/97																							
PRINT NAME: John Meyer FIRM: ERI TIME: _____			PRINT NAME: Andrew Gilligan FIRM: NCA-B TIME: 22:00																							
RELINQUISHED BY (Signature): _____ DATE: _____			RECEIVED BY (Signature): _____ DATE: _____																							
PRINT NAME: _____ FIRM: _____ TIME: _____			PRINT NAME: _____ FIRM: _____ TIME: _____																							
ADDITIONAL REMARKS: _____																										
PAGE _____ OF _____																										