2005 Monitoring Report
Hot Oil Pipeline Release

Nikiski, Alaska

ADEC Spill No. 1987230126701

Prepared for

Tesoro Alaska Company

Submitted: February 17, 2006
KSI Project No: 01-28

Kent & Sullivan, Inc.
Environmental Consultants

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1.0 FIELD ACTIVITIES

This report presents the results of monitoring performed in 2005 for a release area referred to as the Hot Oil Pipeline Release. The pipeline is owned by Tesoro Alaska Company and is located on the ConocoPhillips (Phillips) property located approximately eleven miles north of Kenai, Alaska (Figure 1). A previous report[1] provides a comprehensive summary of the release and findings from subsequent investigations.

Tesoro has monitored the area since 2001, which has included monitoring Cook Inlet beach area for seeps, measuring depth to water in two monitoring wells (Figure 2), and collecting representative groundwater samples. The work that was performed in 2005 is summarized in the following paragraphs.

1.1 COOK INLET SEEP INSPECTIONS

Tesoro personnel inspect the Cook Inlet beach on a monthly basis while performing other unrelated monitoring activities. Beach seeps have not been observed below the hot oil release area since 1997.

1.2 GROUNDWATER GAUGING

Depth to water and light non-aqueous phase liquid (LNAPL) are gauged in monitoring well B-1 on a biannual basis. Biannual gauging in well B-2 was discontinued in 2002 because Phillips installed a fence between the two wells which made access to well B-2 difficult. Table 1 is a tabulation of all gauging data, and Figure 3 is a time-series graph of the potentiometric surface elevations and LNAPL thickness.

1.3 GROUNDWATER SAMPLING

Groundwater samples were collected from source area well B-1 and downgradient well B-2 on March 17, 2005 and well B-1 was re-sampled on October 13, 2005. The March samples were collected using no-purge methods, and the sample in October was sampled after first purging three well volumes of groundwater. The samples were stored in one-liter glass jars preserved with hydrochloric acid (HCl). The sample bottles were placed in a cooled sample container and shipped under chain-of-custody procedures to the analytical laboratory. The samples were submitted to North Creek Analytical in Anchorage for diesel-range organics (DRO) using method AK 102.

Tables 2 and 3 are summaries of analytical data for wells B-1 and B-2, respectively, including the results from this quarter. Table 4 is a summary of field quality control data. Appendix A contains the laboratory reports.

[1] Kent & Sullivan, Inc., 2001, *1997 Release Investigation Report, Hot Oil Pipeline*, prepared for Tesoro Alaska Company, May 7, 2001.

2.0 FINDINGS

The no-purge sample collected from upgradient well B-1 in March was reported to contain 20 mg/L DRO and is suspected to have been impacted by sheens on the water table. The purged sample collected from well B-1 in October contained 6.57 mg/L DRO which is comparable to the DRO concentration in the 1994 concentration (9.23 mg/L). The DRO concentration in downgradient well B-2 was below the detection level.

3.0 DISCUSSION

The 2005 monitoring results indicate that LNAPL sheens remain on the groundwater in the source area near well B-1. The sheens impacted the analytical results for the March sample collected from well B-1. However, LNAPL thickness is not increasing and the results from the October sample show that groundwater concentrations are relatively stable or possibly decreasing (Figure 4). Downgradient water quality in well B-2 continues to show no impact from the presence of DRO in the well B-1 area.

Water quality in well B-1 will continue to be monitored annually and water levels semiannually. 2006 sampling will be conducted in the spring, and water levels will be measured in the spring and fall. A 2006 monitoring report will be submitted to the Alaska Department of Environmental Conservation at the end of the year.

Table 1

Historical Water Level Data

Well No	Gauge Date	Elevation TOC (ft MLLW)	DTW (feet)	DTO (feet)	Potentiometric Surface (ft MLLW)	LNAPL Thickness (feet)
B-1	29-May-97	92.63	52.35	52.06	40.52	0.29
	07-Jul-97	92.63	52.42	52.17	40.42	0.25
	23-Oct-97	92.63	53.17	52.94	39.65	0.23
	01-Nov-97	92.63	53.10	52.88	39.71	0.22
	15-Jan-98	92.63	53.09	52.88	39.71	0.21
	17-Apr-98	92.63	53.43	53.22	39.37	0.21
	06-Jul-98	92.63	53.64	53.37	39.21	0.27
	16-Oct-98	92.63	54.02	53.90	38.71	0.12
	30-Jun-99	92.63	52.49	--	40.14	--
	27-Oct-99	92.63	51.52	--	41.11	--
	09-Dec-99	92.63	50.86	--	41.77	--
	20-Jul-00	92.63	50.14	50.13	42.50	0.01
	27-Oct-00	92.63	50.35	--	42.28	--
	19-Mar-01	92.63	50.46	--	42.17	--
	11-Jul-01	92.63	48.60	--	44.03	--
	17-Apr-02	92.63	50.45	--	42.18	--
	18-Sep-02	92.63	49.50	--	43.13	--
	04-Mar-03	92.63	48.44	--	44.19	--
	26-Aug-03	92.63	49.45	--	43.18	--
	17-Mar-05	92.63	49.75	--	42.88	--
	27-Apr-05	92.63	49.33	--	43.30	--
	23-Jun-05	92.63	49.59	--	43.04	--
	19-Oct-05	92.63	49.12	--	43.51	--
B-2	29-May-97	95.58	58.23	--	37.35	--
	07-Jul-97	95.58	58.64	--	36.94	--
	23-Oct-97	95.58	60.26	--	35.32	--
	01-Nov-97	95.58	60.25	--	35.33	--
	15-Jan-98	95.58	60.57	--	35.01	--
	17-Apr-98	95.58	62.30	--	33.28	--
	06-Jul-98	95.58	63.62	--	31.96	--
	16-Oct-98	95.58	64.61	--	30.97	--
	18-Jan-99	95.58	64.99	--	30.59	--
	30-Jun-99	95.58	65.41	--	30.17	--
	27-Oct-99	95.58	65.37	--	30.21	--
	09-Dec-99	95.58	65.29	--	30.29	--
	20-Jul-00	95.58	57.82	--	37.76	--
	27-Oct-00	95.58	57.54	--	38.04	--
	19-Mar-01	95.58	58.30	--	37.28	--
	11-Jul-01	95.58	56.29	--	39.29	--
	17-Apr-02	95.58	57.12	--	38.46	--
	17-Mar-05	95.58	55.85	--	39.73	--
	27-Apr-05	95.58	55.98	--	39.60	--
	19-Oct-05	95.58	53.70	--	41.88	--
E-128	03-Jan-96	93.80	63.28	--	30.52	--
	01-Apr-96	93.80	64.08	--	29.72	--
	30-Jul-96	93.80	66.34	--	27.46	--

Table 1

Historical Water Level Data

Well No	Gauge Date	Elevation TOC (ft MLLW)	DTW (feet)	DTO (feet)	Potentiometric Surface (ft MLLW)	LNAPL Thickness (feet)
E-128	07-Oct-96	93.80	66.84	--	26.96	--
	08-Jan-97	93.80	67.57	--	26.23	--
	31-Mar-97	93.80	dry	--	dry	--
	29-May-97	93.80	68.09	--	25.71	--
	07-Jul-97	93.80	dry	--	dry	--
	15-Oct-97	93.80	68.12	--	25.68	--
	23-Oct-97	93.80	68.20	--	25.60	--
	01-Nov-97	93.80	68.13	--	25.67	--
	15-Jan-98	93.80	dry	--	dry	--
	17-Apr-98	93.80	dry	--	dry	--
	06-Jul-98	93.80	dry	--	dry	--
	28-Sep-98	93.80	dry	--	dry	--
	16-Oct-98	93.80	dry	--	dry	--
	08-Dec-98	93.80	68.17	--	25.63	--
	18-Jan-99	93.80	dry	--	dry	--
	30-Apr-99	93.80	63.70	--	30.10	--
	30-Jun-99	93.80	dry	--	dry	--
	02-Sep-99	93.80	67.90	--	25.90	--
	09-Sep-99	93.80	dry	--	dry	--
	28-Oct-99	93.80	64.76	--	29.04	--
	09-Dec-99	93.80	65.08	--	28.72	--
	29-Dec-99	93.80	65.10	--	28.70	--
	04-Jan-00	93.80	64.13	--	29.67	--
	05-Jan-00	93.80	63.64	--	30.16	--
	06-Jan-00	93.80	63.44	--	30.36	--
	10-Jan-00	93.80	62.62	--	31.18	--
	12-Jan-00	93.80	62.46	--	31.34	--
	13-Jan-00	93.80	62.42	--	31.38	--
	17-Jan-00	93.80	62.15	--	31.65	--
	25-Jan-00	93.80	61.37	--	32.43	--
	04-Feb-00	93.80	61.30	--	32.50	--
	25-Feb-00	93.80	60.47	--	33.33	--
	03-Mar-00	93.80	61.33	--	32.47	--
	10-Mar-00	93.80	61.17	--	32.63	--
	17-Mar-00	93.80	61.31	--	32.49	--
	07-Apr-00	93.80	61.02	--	32.78	--
	23-May-00	93.80	60.32	--	33.48	--
	20-Jul-00	93.80	61.43	--	32.37	--
	26-Oct-00	93.80	61.45	--	32.35	--
	08-Jan-01	93.80	61.65	--	32.15	--
	19-Mar-01	93.80	60.87	--	32.93	--
	11-Jul-01	93.80	59.80	--	34.00	--
	04-Oct-01	93.80	60.20	--	33.60	--
	28-Jan-02	93.80	60.99	--	32.81	--
	17-Apr-02	93.80	62.12	--	31.68	--
	01-Aug-02	93.80	59.56	--	34.24	--
	18-Sep-02	93.80	60.52	--	33.28	--
	05-Dec-02	93.80	59.27	--	34.53	--
	04-Mar-03	93.80	59.79	--	34.01	--

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Historical Water Level Data

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E-128	07-Jul-03	93.80	59.81	--	33.99	--
	26-Aug-03	93.80	60.37	--	33.43	--
	19-Sep-03	93.80	60.31	--	33.49	--
	27-Jan-04	93.80	60.11	--	33.69	--
	05-Mar-04	93.80	59.11	--	34.69	--
	09-Jul-04	93.80	57.85	--	35.95	--
	11-Oct-04	93.80	58.39	--	35.41	--
	26-Jan-05	93.80	58.02	--	35.78	--
	27-Apr-05	93.80	58.82	--	34.98	--
	23-Jun-05	93.80	58.15	--	35.65	--
	19-Oct-05	93.80	57.35	--	36.45	--
	16-Dec-05	93.80	57.43	--	36.37	--

Water level elevations are corrected for the presence of LNAPL assuming a product density of 0.83.

-- Not present.
ft MLLW Feet above mean lower low water.
DTO Depth to oil (in feet below TOC).
DTW Depth to groundwater (in feet below TOC).
TOC Top of casing.

Table 2

Compilation of Analytical Results - Well B-1

Analyte	Alaska GW Criteria	11/20/01	4/2/03	5/19/04	3/17/05	10/13/05
BTEX						
Benzene	*5*	1 U	0.4 U	--	--	--
Ethylbenzene	*700*	1 U	1 U	--	--	--
Toluene	*1000*	1 U	1 U	--	--	--
Xylenes	*10000*	1 U	2 U	--	--	--
PAH						
1,2-Dichlorobenzene	*600*	--	1 U	--	--	--
1,3-Dichlorobenzene	*1100*	--	1 U	--	--	--
1,4-Dichlorobenzene	*75*	--	0.5 U	--	--	--
Acenaphthene	*2200*	--	0.5 U	--	--	--
Acenaphthylene	*2200*	--	0.5 U	--	--	--
Anthracene	*11000*	--	0.2 U	--	--	--
Benzo(a)anthracene	*1*	--	0.2 U	--	--	--
Benzo(a)pyrene	*2*	--	0.2 U	--	--	--
Benzo(b)fluoranthene	*1*	--	0.2 U	--	--	--
Benzo(ghi)perylene	*1100*	--	0.2 U	--	--	--
Benzo(k)fluoranthene	*10*	--	0.2 U	--	--	--
Chlorobenzene	*100*	--	0.5 U	--	--	--
Chrysene	*100*	--	0.2 U	--	--	--
Dibenz(a,h)anthracene	*0.1*	--	0.2 U	--	--	--
Fluoranthene	*1460*	--	0.2 U	--	--	--
Fluorene	*1460*	--	**2.62**	--	--	--
Indeno(1,2,3-cd)pyrene	*1*	--	0.2 U	--	--	--
Naphthalene	*1460*	--	**1.9**	--	--	--
Phenanthrene	*11000*	--	**1.99**	--	--	--
Pyrene	*1100*	--	0.2 U	--	--	--
Total Hydrocarbons						
DRO	*1500*	--	--	**9230**	**20800 R**	**6570**

Concentrations are reported in ug/L.

Bold Analyte was detected.

-- Not analyzed.

R The datum is rejected due to possible contamination by groundwater sheens.

Table 3

Compilation of Analytical Results - Well B-2

Analyte	Alaska GW Criteria	1/25/2001	11/20/2001	4/2/03	5/19/04	3/17/2005
BTEX						
Benzene	*5*	0.5 U	1 U	0.4 U	--	--
Ethylbenzene	*700*	2 U	1 U	1 U	--	--
Toluene	*1000*	2 U	1 U	1 U	--	--
Xylenes	*10000*	2 U	1 U	2 U	--	--
PAH						
1,2-Dichlorobenzene	*600*	--	--	1 U	--	--
1,3-Dichlorobenzene	*1100*	--	--	1 U	--	--
1,4-Dichlorobenzene	*75*	--	--	0.5 U	--	--
Acenaphthene	*2200*	--	1.8 U	0.556 U	--	--
Acenaphthylene	*2200*	--	5.3 U	0.556 U	--	--
Anthracene	*11000*	--	0.66 U	0.222 U	--	--
Benzo(a)anthracene	*1*	--	0.05 U	0.222 U	--	--
Benzo(a)pyrene	*2*	--	0.07 U	0.222 U	--	--
Benzo(b)fluoranthene	*1*	--	0.04 U	0.222 U	--	--
Benzo(ghi)perylene	*1100*	--	0.11 U	0.222 U	--	--
Benzo(k)fluoranthene	*10*	--	0.06 U	0.222 U	--	--
Chlorobenzene	*100*	--	--	0.5 U	--	--
Chrysene	*100*	--	0.15 U	0.222 U	--	--
Dibenz(a,h)anthracene	*0.1*	--	0.1 U	0.222 U	--	--
Fluoranthene	*1460*	--	0.49 U	0.222 U	--	--
Fluorene	*1460*	--	0.46 U	0.222 U	--	--
Indeno(1,2,3-cd)pyrene	*1*	--	0.07 U	0.222 U	--	--
Naphthalene	*1460*	--	2.5 U	0.556 U	--	--
Phenanthrene	*11000*	--	0.64 U	0.222 U	--	--
Pyrene	*1100*	--	0.27 U	0.222 U	--	--
Total Hydrocarbons						
DRO	*1500*	**2670**	--	--	500 U	397 U
GRO	*1300*	90 U	--	--	--	--
RRO	*1100*	500 U	--	--	--	--

Concentrations are reported in ug/L.

Bold Analyte was detected.

-- Not analyzed.

BTEX Benzene, toluene, ethylbenzene, xylenes

DRO Diesel-range organics

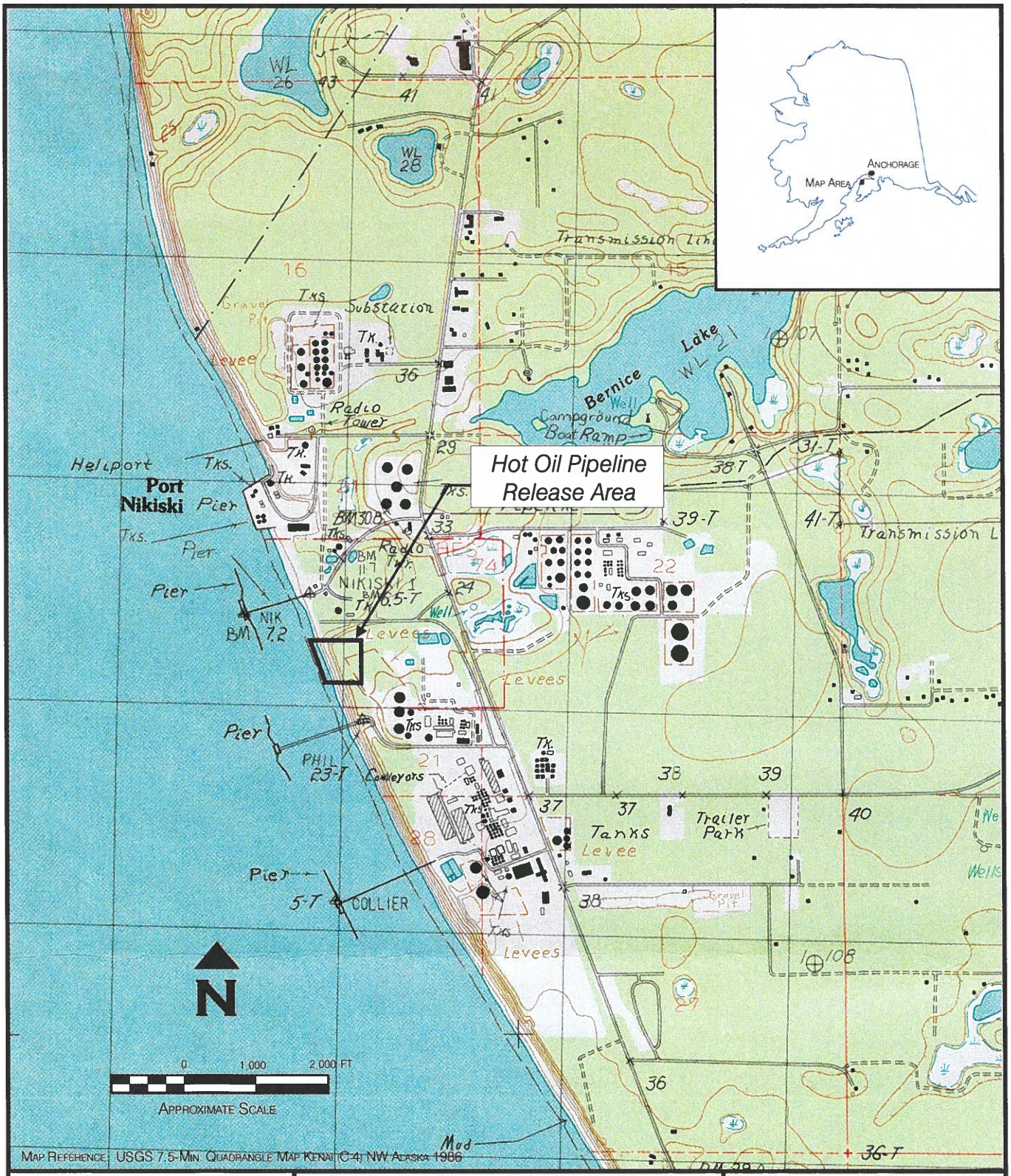
GRO Gasoline-range organics

PAH Polyaromatic hydrocarbons

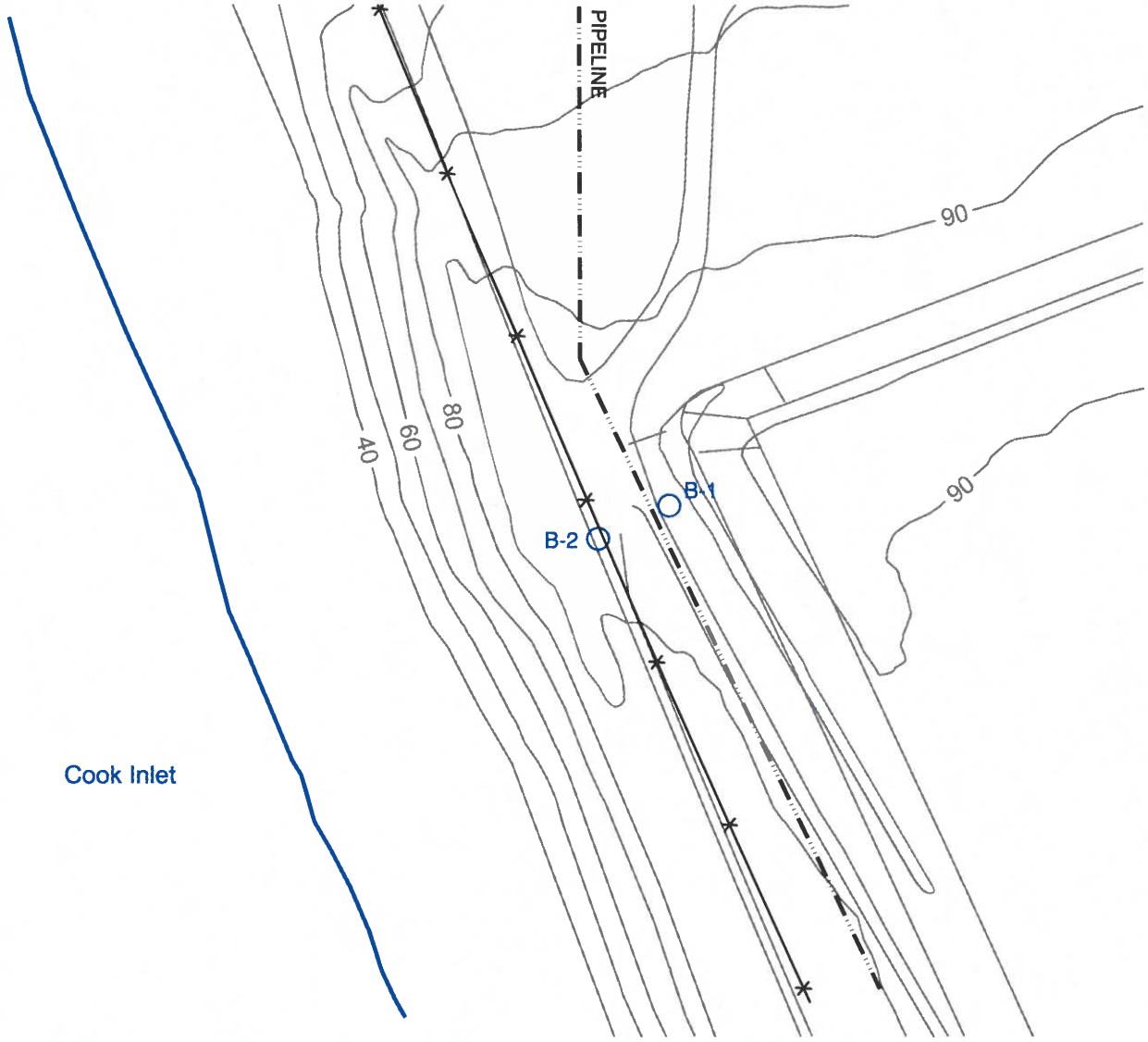
RRO Residual-range organics

Table 4
Field Quality Control Summary
Hot Oil Pipeline Release

Quality Control Designation	Tolerance	Results for This Project
Holding time to extract DRO	7 days at 4° ± 2° C	All samples within tolerance
Holding time to analyze DRO	< 40 days	All samples within tolerance
Completeness	85%	Within tolerance
Field duplicate RPD	<96%	Not collected
Trip blank	Less than PQL	Within tolerance



Kent & Sullivan, Inc.	Hot Oil Pipeline release	**Figure 1**
Project No. 01-28 S:\01-28\HotOilInv\Apr01Edits	**Tesoro Alaska Company**	**Site Location Map**



EXPLANATION

B-1 ○ Monitoring well

NORTH

Scale

0 100 200 feet

Well Location Map
Hot Oil Pipeline Release

TESORO ALASKA COMPANY

Date: 06/3/2004 Drawn by: BKJ

Proj. No.: 01-28 Checked by:

File: S:\01-28\Hot oil well location

KENT & SULLIVAN, INC.

FIGURE

2

Figure 3. Water Level and LNAPL Thickness Trends

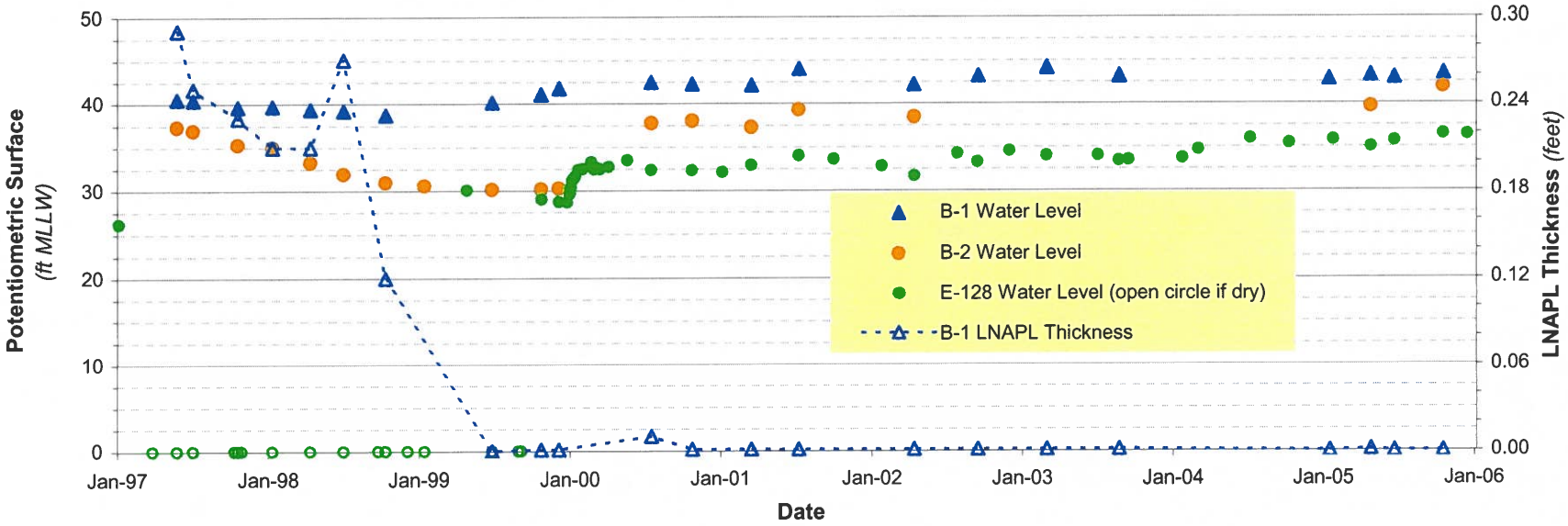


Figure 4. DRO Concentration Trends