FAX

TO: John Beane, MDEP

FAX: Carol White

DATE August 13, 2007

SUBJECT: Winthrop Commerce Drilling logs and Draft report

John

my meet was rescheduled for down here - so I will try faxing these. I will call to make sure you get them

report & Baring logs B-1 through B-10

DRAFT

FREE PRODUCT EXPLORATION PROGRAM
WINTHROP COMMERCE CENTER - WINTHROP, MAINE
LUST SITE (A-157-05) - June 2007

BACKGROUND

In April 2005 heavy, No. 6 fuel oil seeped into Mill Stream at the site of the Winthrop Commerce Center site (the former Carleton Woolen Mill) located on in Winthrop, Maine. The oil was mobilized during the high water table conditions associated with the spring melt-out, discharged into Mill Stream and was transported down stream to Annabessacook Lake. Before the response actions could be fully implemented, free phase No. 6 oil was transported to the most northern portion of the shoreline along the lake and coated a portion of the shoreline presenting an environmental risk to the aquatic life in the area.

In November 2005, Campbell Environmental conducted an environmental investigation at the Carleton Woolen Mill (Campbell, 2006). Subsurface investigations at the mill site in the vicinity of the former boiler room determined that petroleum-contaminated soil was present in the several soil borings at this location. According to historical information, an oil sump was located between the pump house, the retaining wall and the boiler house and was identified as the likely conduit of fuel oil contamination to the subsurface soils. In 2006, following identification of the fuel-oil contaminated soil, the Maine DEP conducted a major soil removal program that included demolition of the boiler room and excavation of petroleum-contaminated soils to the bedrock surface.

According the MDEP reports, the discharge of No. 6 oil to Mill Stream resumed in mid-April of 2007, during another period spring high water. The probable source of the discharge was identified as a pocket of contaminated soil/bedrock in the vicinity of the former boiler room. John Beane of the MDEP speculated that free product was still trapped in bedrock fractures beneath the former boiler room and that during periods of high water table buoyant forces and/or the differential head between the bedrock aquifer and the stream, acted to force the oil up and out into the stream . The MDEP estimated that over 100 gallons of oil had been discharged during the spring of 2007. In the spring/summer of 2007, MDEP undertook a program to evaluate and remediate the remaining No. 6 oil at the site.

PURPOSE

The purpose of this project was to determine whether shallow bedrock fractures in the area of the former boiler room contain enough separate phase #6 fuel oil to cause the observed discharges to Mill Stream, and to supply data to support potential remediation of the contamination.

FIELD INVESTIGATIONS

On June 6 through 22, 2007 Mike Nadeau of Northeast Test Borings, Inc., Gorham, Maine, drilled ten borings into bedrock in the parking lot behind the mill building. The ten borings - designated as B-1 through B-10 - were installed immediately adjacent to the retaining wall in the parking lot, parallel to Mill Stream. The location of the borings are shown on Figure___. The boring locations were determined in the field by John Beane of the Maine Department of Environmental Protection; Carol White and John Beane oversaw the drilling and logged the borings; and Carol White, John Beane and Tom Benn conferred in the field on the progress, oil containment and procedural modifications during the drilling.

During drilling of B-7 drill water and oil was observed discharging from the base of the retaining wall. In order to contain any drilling-related discharge, a coffer dam was constructed in Mill Stream adjacent to retaining wall by EPI. The purpose of the dam was to contain and sorb any oil that seeped out in to the stream as a result of the drilling. Drilling was temporarily halted while the dam was being constructed to minimize the potential for environmental damage and to allow for safe working conditions. Drilling resumed in mid-June once the dam was completed and oil discharge could be contained

The program consisted of drilling ten borings spaced approximately 10' apart, through the overburden and into shallow bedrock. The borings were drilled through the overburden using either hollow stem augers or 4-inch diameter steel casing. In each boring a 4-inch diameter steel casing was set into the top of rock (without grouting) to a depth of 0.5 to 5 feet below the top of rock, and then we drilled 10 to 20' into the bedrock using Nx core barrel (3-inch nominal diameter). Boreholes were left open hole; no PVC wells were installed in the borings. Drilling tools were steam cleaned between borings when necessary. Bedrock core was logged on site by either Carol White or John Beane. Drilling and rock cores were observed for signs of free oil, fractures, litho logy and the degree of weathering along the fractures. One each boring was completed, a flush-mount steel locking road box was installed over each bedrock borehole and casing.

In addition to the 10 bedrock borings, two shallow overburden wells were installed to determine if pump able quantities of product were present in the overburden. One boring was installed adjacent to B-7 , and designated B-7A and the second boring was installed next B-8 and identified as B-

8A. On July 5 (?) the driller returned the site and installed 2-inch diameter PVC monitoring wells in each of the shallow overburden borings.

ESSENTIAL FINDINGS

Based on the results of the boring program the bedrock in the area consists of a micaeous, interbedded calc-silicate quartzite and schist with occasionally quartz zones. The rock appears to be relatively "tight" hydraulically with no significant primary porosity in the bulk rock. The primary avenue for oil and groundwater transport are the limited, generally high angle fractures that were observed in the bedrock core with dips typically ranging from 70 to 85 degrees. In the majority of the borings a significant fracture was observed in the upper 5-feet of the bedrock which may represent a shallow, semi-continuous horizontal sheet joint. In a few of the borings, most notably B-1, B-2 and B-3, the rock was very tight and the majority of the breaks appeared to be the result drilling, rather than naturally-occurring openings. Table 1 summarizes the important fracture and petroleum observations in each of the 10 borings. Logs of the rock core are contained in appendix A and photos are presented in Appendix B.

Significant quantities of fuel oil were observed in the overburden and shallow bedrock in borings B-7 and B-8. During drilling, significant quantities of oil was observed on the drill rods and in the drilling water from a depth of about 12' to 17' below ground surface. The oil caused the rods to become very slippery and messy, slowing the progress considerably. It was difficult to determine if oil was present on the bedrock fractures in these two borings due the oil in the wash water, but an oily sheen was noted on several fracture surfaces. It appears likely that a slight depression in the bedrock surface in the vicinity of these borings may encourage the oil to pool at this location. The contaminated aquifer showed a high degree of hydraulic connection to the stream as evidenced by the almost immediate discharge of oil and drill cuttings into the stream containment once the bedrock surface was reached. This condition supports the model that the oil in at the top of rock/shallow bedrock is the source of the discharge to Mill stream during periods of recharge and high water table. The direct connection and significant amount of oil discharging during drilling suggests that flushing the aquifer would likely be successful in removing free phase product.

Table 1 Winthrop Commerce Center - Bedrock Boring Summary

Boring Number	TOC ELEV	Depth to water 7-10-07	Water Table Elevation	Total Boring Depth BGS	Depth to Bedrock	Bedrock Elevation	Significant Fracture , Depth BGS
B-1	98.61	13.88	84.73	31.5	15.1	83.51	18 - 18.5
B-2	98.69	15.33	83.36	35	15	83.69	15.8 ?
B-3	98.54	15.42	83.12	35	15.1	83.44	17.8 - 18
B-4	98.45	14.92	83.53	35	16.5	81.95	17.5 - 17.8
B-5	98.26	14.78	83.48	35	16.5	81.76	17 ?
B-6	97.93	15.4	82.53	39	16.1	81.83	17 & 21
B-7B	97.58						1
B-7O	97.51	15.48	82.03	29	17.5	80.01	18.2-18.6
B-8B	97.42	>15.2	<82.22				
B-8O	97.49	15.46	82.03	30	17	80.49	none shallow
B-9	97.37	15.24	82.13	27	17	80.37	23 & 26
B-10	97.09	12.78	84.31	25	13.8	83.29	17'

BEDROCK CORE LOG

PROJECT Winthrop Commerce Spill BORING NO. B-1 PAGE 1 OF 3

JOB NO. A-157-05 DRILLER Mike Nadeau + Crew

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15-31.5

AZIMUTH — INCLINATION vertical LOGGED BY C White (NAME) 6/11/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING SL-SLIGHT MOD-MODERATE SEV-SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
15	wx @ [illegible] weathering zone? Conc 14.5-15' with gravel in core barrel bit; 0° rod scale		4.0/4.5	70%	see photos	auger to 15'; pond 4ø casing to interbedded qtzite, wx 15' layering 1-2" thick 70-80° dip intermittent water return 15-19.5' Mike decides to put 3ø casing to 19.5'
16						
17	sl rusty, wx					
18						
19	no core 19-19.5					
19.5	R-2 19.5-21.5					casing to 19.5'
20	competent; wx fract; no signs of wx		1.9/2.0	60%		water return; clean interbedded qtzite schist; qtz bands up to 3"
21						
	R-3 21.5-26.5					
22			4.8/5.0	90%		

BEDROCK CORE LOG

PROJECT Winthrop Commerce BORING NO. B-1 PAGE 2 OF 3

~~JOB~~ Spill NO. A-157-05 DRILLER Mike Madeau & Cory

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 15-31.5

AZIMUTH ____ INCLINATION ____ LOGGED BY C White (NAME) 6/11/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT)	D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
22				D			larger layering →
							6-8" chlorite dk gy to sl purple gy v. competent
23							
24				D			
25							
26							very competent clean; no oil
		R-4 26.5-31.5					
		splinted core & drilled		5.0/5.0	100%		very competent
27				D			
30							

BEDROCK CORE LOG

PROJECT Windhrop Commerce Center BORING NO. B-1 PAGE 3 OF 3

JOB NO. A-157-05 DRILLER Mike Nadeau & Cory NTB

CORE DIAMETER (IN.) Nx 3Ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 15.-31.5

AZIMUTH — INCLINATION vert LOGGED BY CAQuite (NAME) 6/11/07 (DATE)

BREAKS IN CORE	MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D	CORE BROKEN BY DRILLER
M	CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
28					see photos	
29						Same as above
30			D			
31	bk along bedding D		D			
	BOB 31.5					BOB 31.5

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-2 PAGE 1 OF 3

JOB NO. A-157-03 DRILLER M. Nadeau = NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15-35

AZIMUTH ____ INCLINATION vert LOGGED BY J. Brann / CWhite (NAME) 6.12.07 (DATE)

BREAKS IN CORE: | MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE | MEASURED HIGH-ANGLE JOINT (JT = JOINT) | D CORE BROKEN BY DRILLER | M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
15			4.9/5.0	100%		Interbedded Bchist'd gneiss
16	Sl. Wx					very competent
17		D				JB notes: driller lost water R-1 to R-2
18		D				
19						no. oil visible
20	R-2 20-25		5.0/5.0	100%		same as above v. competent
21						
22						

BEDROCK CORE LOG

PROJECT Withrop Commerce Center BORING NO. B-2 PAGE 2 OF 3

JOB NO. A-157-05 DRILLER Nadeau NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15-35

AZIMUTH ____ INCLINATION vert LOGGED BY JBeane / CWhite (NAME) 6/12/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT)

D CORE BROKEN BY DRILLER

M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
22						
23		D				very compact no oil
24						
25	R-3 25-30					
26		4.9 / 5.0	100%	100%		same as above
27	wx					
28						
29						

BEDROCK CORE LOG

PROJECT _____ BORING NO. _____ PAGE ___ OF ___

JOB NO. _____ DRILLER _____

CORE DIAMETER (IN.) _____ ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL _____

AZIMUTH _____ INCLINATION _____ LOGGED BY _____ (NAME) _____ (DATE)

BREAKS IN CORE

- MEASURED BREAKS OR PARTINGS ACROSS CORE
- CHIPS, CAVITY, LOST CORE
- MEASURED HIGH-ANGLE JOINT (JT = JOINT)
- D — CORE BROKEN BY DRILLER
- M — CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	ROD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
29						
30	R-4-30-35					Same as above
31						* no fractures in entire run 5' strct
32						
33						
34						
35						BOB 35.0

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center Sp.11 BORING NO. B-3 PAGE 1 OF 3

~~JOB~~ NO. A 157-05 DRILLER Mike Nadeau & Cary NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15.1-35

AZIMUTH — INCLINATION vert LOGGED BY J. Beane / C. White (NAME) 6-12-07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
15.1	R-1 15.1 – 20'		5.0 / 5.0 hrs	100%	see photos	Auger to top of rock @ 15.1 4ø casing to 15'
16						water return during drilling est 80% water return clean Mike
17						no obvious fractures during drilling
		F				rock very hard
18	rubble					
19						
						stop for day J. Beane to log on 6/13
20						
			5.2 / 5.0	100%	100%	no water loss
21						
22						

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-3 PAGE 2 OF 3

Spill
JOB NO. A-159-05 DRILLER Mike Nadra NTB

CORE DIAMETER (IN.) Nx 3Ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15-31.5

AZIMUTH — INCLINATION vert LOGGED BY J Brand / C White (NAME) 6-13 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
22	Sa				see photos	2.4 Interbedded gneiss & schist / very hard
23						
24						no water loss
25	R-3 25-30'					
	wbbb		4.8 / 5.0 = 98%	98%		no water loss * rock tight : no sig. fractures
26						
27						
28						
29						

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-3 PAGE 3 OF 3

JOB NO. A-157-05 DRILLER Mike Nadeau

CORE DIAMETER (IN.) NX 3" ø ELEVATION (FT) INTERVAL – DEPTH (FT) INTERVAL 15.1-35

AZIMUTH _____ INCLINATION _____ LOGGED BY J Brane / S Aiken (NAME) 6-12-07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT: JOINT)

D CORE BROKEN BY DRILLER

M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
29					see chart	
		D				
	R-4 30-35'					
30			5.0/5.0	100%		
		D	100%			similar to above v. competent rk no water loss
31						
32		D				* J. Brane notes 6-12-07 "discharge of oil from base of wall 2-3 cm blebs w/ sheen"
33		D				
34						
35						BOB 35'

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-9 PAGE 1 OF 3

JOB NO. _____ DRILLER Mike Nadeau & Cory

CORE DIAMETER (IN.) NX 2⅞ ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL 35

AZIMUTH — INCLINATION vertical LOGGED BY C.A. White (NAME) 6/6/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
16.5		16.5 top of rock. R-1					granite cap rock
17		lost water after fracture @ ~ 17.5' no return on wash water dropped 3" @ 17.5		3.3'/3.5'	2.9/3.5'		foliated granofels or metavolcanic quartz banding; bedding @ ~ 15-85° angle; competent, massive, no rusty cracks
18							
19			D?				calc silicate & qtz schist interbedded
20		R-2 20-25'		5.0/5.0	4.7/5.0 100%		foliated banded qtzite/schist micaceous 15° dip to 70° mechanical break
21			D				
22							* no water return pumped 250 g / 5' run
23							

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-4 PAGE 2 OF 3

JOB NO. _____ DRILLER Mike Nadeau & Cory

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL 35

AZIMUTH — INCLINATION vertical LOGGED BY C White (NAME) 6/6/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT)

D CORE BROKEN BY DRILLER

M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
23		D				rock similar to above
24						banded calc-silicate qtzite - schist
						* lost all drilling water
25	B-3 25-30	D				
26			4.8' / 5.0	100%		interbedded qtzite / schist
	* wx, rusty green slimy discolor					Calcite — reacts to HCL
27						soft @ 27-28' chlorite/talcite
28	calcite pyrite micaceous partings	M				core very competent
		D				
29						
30						

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-4 PAGE 3 OF 3

JOB NO. _____ DRILLER Mike Nadeau & Cory Northeast Test

CORE DIAMETER (IN.) Nx 2 ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL _____

AZIMUTH _____ INCLINATION vertical LOGGED BY CAwhite (NAME) 6/6/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
30			100%	100%		1:15 J Beane arrives * similar to above appear to be all mechanical breaks core very competent no evidence of oil
31		D				
32		D				
33						no water return during drilling driller estimates 500 - 1000 g during drilling
34		D				
35						BOB 35' measured depth 34.7 from GS ▽ @ ~ 12' no obvious oil in Bit

BEDROCK CORE LOG

PROJECT Winthrop Commerce BORING NO. B-5 PAGE 1 OF 3

JOB NO. A-157-05 DRILLER Mike Nadeau & Cory

CORE DIAMETER (IN.) Nx 3"ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 16.5-35

AZIMUTH — INCLINATION vertical LOGGED BY Carol White (NAME) 8/7/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT= JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING SL-SLIGHT MOD-MODERATE SEV-SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
1						
16.5	Start @ 16.5'		2.6/2.5	0.6/2.5		Auger boring to 16.1 4ø casing to 16'; wash out
17	wx rusty					* no water return
	wx; mod rusty		100%	24%	see photos	tricone to 20' wash out
18	clean					core blocking no water return
19	break along bedding wx rusty	D				
20	R-2 20-25					
		D?	4.5/5.0	3.4/5.0		banded quartzite & schist competent
21	rusty wx		90%	60%		
22						
23						

BEDROCK CORE LOG

PROJECT Winthrop Commerce BORING NO. B-5 PAGE 2 OF 3

JOB NO. A-157-05 DRILLER Mike Nadeau

CORE DIAMETER (IN.) NX 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 16.5-30

AZIMUTH — INCLINATION vert LOGGED BY Carol White (NAME) 6/7/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT= JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	ROD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
23						
24						hot water return
25	R-3 25-30					
26		D	4.9/5.0 98%	100%	see photos	similar quartzite schist & calcite
27		D				
28	clay					
29		D?				
30						stop for day @ 30'

BEDROCK CORE LOG

PROJECT Winthrop Commerce BORING NO. B-5 PAGE 3 OF 3

JOB NO. _____ DRILLER Mike & Cary

CORE DIAMETER (IN.) NX 3" ø ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL 16.5-35

AZIMUTH _____ INCLINATION vertical LOGGED BY Carol White (NAME) 6/8/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D = CORE BROKEN BY DRILLER; M = CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING SL-SLIGHT MOD-MODERATE SEV-SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
30	rubble driller?		0		see photos	last run mechanical breaks only
			5.2/5.0	100%		core blocking driller grinding core
31		D				
32						rock appears very competent - partings along bedding
33	no Wx on fractures					no water return est 800 s lost during drilling
	competent					
34						
35						35' BOB

6/8/07 meas bottom 34.2' below GS - may have left core on bottom

BEDROCK CORE LOG

PROJECT Winthrop Commerce Spill BORING NO. B-6 PAGE 1 OF 4

JOB NO. A-157-05 DRILLER Mike Nadeau & Cory Northern Test Borings

CORE DIAMETER (IN.) Nx = 3Ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 16.1-39

AZIMUTH — INCLINATION vertical LOGGED BY Carol White (NAME) 6/7/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D = CORE BROKEN BY DRILLER; M = CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
16.1						1-10' grind through concrete 10-16 silty overburden oily sheen in overburden
17.	fracture lost circulation				no core	* 17- large frac; lost circ.
			no core			no core
18	Rdlw core to 20'					Cored w/ 3" to 20'
19						change water- water * another oily sheen showed up in water
20	R-1 = 20-25					Top of Rock @ 16'
			3.8/5.0	60%	Start core.	
21	fracture no drop in rods but lost circ again		76%		See photos	micaceous banded qtzite/schist 70-85° dip on beds tight. no partings on fol/bedding
22						
23						

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-6 PAGE 2 OF 4

JOB NO. A-157-05 DRILLER Mike Nadeau & Cory NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 20-39

AZIMUTH ____ INCLINATION ____ LOGGED BY Carol White (NAME) 6/7/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE
DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
23				3.8/5.0			competent w/ bedded calc silicate
24		rusty Wx missing core down the hole					blk albiting; rusty blebs
		R-2 - 25-29'					
29				5.2/4.0	90%		picked up core from last run
25		Wx; rusty					
26		fracture rubble Wx; rusty stain water bearing		healed			banded qtzite/schist fizz to calcu
27							beds ~ 80°
28							dk gray micaceous w/ lmrg qtz seams along brk
29							

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-6 PAGE 3 OF 4

JOB NO. A-157.05 DRILLER Mike Nadeau & Corey NTB

CORE DIAMETER (IN.) Nx 3Ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 20-39

AZIMUTH INCLINATION Vert LOGGED BY CA White (NAME) 6/7/07 (DATE)

BREAKS IN CORE: X = MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D = CORE BROKEN BY DRILLER; M = CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
29	R-3 29-34					
30	healed fracture		healed			bedding @ 75°
31	WX		calcite			interbedded gneiss schist w/ calcite & 20 barrels
32						limy
33			D?			
34	R-4 34-39					
35			qtz 5.0 ft D 100%	100%		Δ to qtz only - no metaseds v. hard, blocky, white 100% quartz

wash water - white

BEDROCK CORE LOG

PROJECT Winthrop Commerce BORING NO. B-6 PAGE 4 OF 4

JOB NO. A-157-05 DRILLER Mike Nadeau

CORE DIAMETER (IN.) 3" Nx core ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 20-39

AZIMUTH — INCLINATION vert LOGGED BY CAWhite (NAME) 6/7/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT= JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
36			D				
37							layered interbedded qtzite schist tiny layers
38			D				competent no evidence of oil infloc.
39							BOB 39.0'

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-7 PAGE 1 OF 2

JOB NO. A-157-05 DRILLER Mike Nadeau - NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 17.5-29 6-5-07

AZIMUTH INCLINATION vertical LOGGED BY CAW (NAME) 6/18/07 (DATE)

BREAKS IN CORE: MEASURED BREAKS ON PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
17.5	R-1 17.5-20					Top of rock @ 17.5' boulder? 15-17' - roller core
18	fract wx rusty splotches v wx		1.9/2.5 76%	50%	see photos	grn. bedded gneiss limestone * fracture 18.2-18.6
19						terminate drilling @ 6/8/07 J Reave - oil seep called response for boom
20	R-2 20-24'					re-start drilling oil seeping into stream
21	washed fract oily blebs on core		4.3/4.0 108%	100%		re-start 6-18-07 - ream hole to 20' install casing oily blebs on core
22		wx				oil in stream during drilling wash water Cap by boom roller dam [sandbag boom]
23		D				
24						* accident @ nearby building

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-7 PAGE 2 OF 2

JOB NO. A-157-05 DRILLER Mike Nadeau

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 17.5-29

AZIMUTH — INCLINATION vert LOGGED BY CAW (NAME) 6/18/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT. JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED-WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
24							
						sea photos	
25				4.9/5.0	92%		interbedded gneiss/schist
				98%			calcsilicate rich zones
							bedding 0.5 - 2"
26		Wx; rusty, calcite on surface.					healed frac.
							competent
27							
							oily wash water
28				fresh			
							call to JB - terminate boring @ 29'
29							BOB 29.0'

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-8 PAGE 1 OF 2

JOB NO. A-157-05 DRILLER Mike Nadeau

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL _____ DEPTH (FT) INTERVAL 17-30'

AZIMUTH _____ INCLINATION vertical LOGGED BY C White (NAME) 6/18/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE	D CORE BROKEN BY DRILLER
CHIPS, CAVITY, LOST CORE	
MEASURED HIGH-ANGLE JOINT (JT= JOINT)	M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
17				1.5/30	50%		top of rock: ~17' boulder 15-17'
18		WX frac					driller starts coring @ 17' (may be 18')
19		no core					no core @ bottom oil staining
20		R-2 20-25 roller cones on top rusty blebs		4.6/5.0	~40%	see photos	may have ground away roller cone to 20'
21			clean				oil blebs on outside after oil wash
22		WX sl stain					
23			fresh				oil stain on 3" 12' - 17' rods very oily - slipping
24							Bruce Hunt. MDEP stops by

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-8 PAGE 2 OF 2

JOB NO. A-159-05 DRILLER Mike Nadeau NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 10-30'

AZIMUTH ____ INCLINATION vertical LOGGED BY CAWhite / JBeane (NAME) 6/19/07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE	D CORE BROKEN BY DRILLER
CHIPS, CAVITY, LOST CORE	
MEASURED HIGH-ANGLE JOINT (JT = JOINT)	M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
24							
25		R-3 25-30					6-19-07
				4.5/5.0	80%	see photos	V. oily rods - slipping
26							lots of oil blobs on wash water
27		V. visible oily stain					oil on core, iridescent sheen - in place?
28							* Mike says heavy oil stain on rods from 12-17' (top of rock)
29				f			
30		BOB					BOB 30.0'

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-9 PAGE 1 OF 2

JOB NO. A-15705 DRILLER Mike Nadeau NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 17-27'

AZIMUTH ____ INCLINATION vertical LOGGED BY CA White / JS Beine (NAME) 6-19-07 (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE	D CORE BROKEN BY DRILLER
CHIPS, CAVITY, LOST CORE	
MEASURED HIGH-ANGLE JOINT (JT = JOINT)	M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
17		R-1 = 17-22'		4.1/5.0	40%		rock @ 17
18		WX		80%			wx blk oil blobs
		WX				see photos	
19							dlk gray banded gneiss/schist competent; no partings along bedding
20			D				JB notes * losing little water minimal oil in wash
21							fracture all appear mechanical
22		R-2 22-27'					
23		23' - fracture foliation // to fractures no visible oil	D			photos	most water discharged at base wall drilling water evident in stream, cap by coffer-dam * lost circ @ 23 breaks along bedding planes
27							

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center (Spill) BORING NO. B-9 PAGE 1 OF 2

JOB NO. A-157-05 DRILLER Mike Nadeau NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 17-27

AZIMUTH ____ INCLINATION Vertical LOGGED BY J Beane / C White (NAME) 6-19-07 (DATE)

BREAKS IN CORE: | MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT) | D CORE BROKEN BY DRILLER | M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
25					photos	thinly bedded
		D				1-2" bedding partings along beds
26	no oil WX rusty					
	JB notes 26.25 rusty frac.	D				
27	BOB 27					BOB 27.0

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-10/B-10A PAGE 1 OF 2

JOB NO. A-157-05 DRILLER Mike Nadeau NTB

CORE DIAMETER (IN.) NX 3" ø ELEVATION (FT) INTERVAL ____ DEPTH (FT) INTERVAL 15-25

AZIMUTH ____ INCLINATION vertical LOGGED BY J Beane / Clients (NAME) 6/28/07 (DATE)

| MEASURED BREAKS OR PARTINGS ACROSS CORE	D CORE BROKEN BY DRILLER
CHIPS, CAVITY, LOST CORE	
MEASURED HIGH-ANGLE JOINT (JT = JOINT)	M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
15		bedrock ? boulder ?		4.0/5.0 90%	3.5/5.0 70%		Thought Top of rock 13.8' boulder ⇒ rolled core to 16'
16							JB notes ⊗ drilling water discharges from base of wall into stream; no visible oil bit burned up @ 16' ? replace bit not sure that it is rock ⊗ set hole 3' over
17		Rubble, WX					JB 17.0 high > fracture w/ calcite
18							
19							interbedded qtzite schist
20		RE 20-25		4.9/5.0 98%	2.8/5.0 56%	see photos	JB: lost very little water no oil sheen observed
21							
22							

BEDROCK CORE LOG

PROJECT Winthrop Commerce Center BORING NO. B-10 PAGE 2 OF 2

JOB NO. A-157-05 DRILLER Nadeau NTB

CORE DIAMETER (IN.) Nx 3" ø ELEVATION (FT) INTERVAL DEPTH (FT) INTERVAL 15-25

AZIMUTH _____ INCLINATION vertical LOGGED BY JBeane/CWhite (NAME) 6/15/07 (DATE)

BREAKS IN CORE: | MEASURED BREAKS ON PARTINGS ACROSS CORE; | CHIPS, CAVITY, LOST CORE; | MEASURED HIGH-ANGLE JOINT (JT = JOINT)

D CORE BROKEN BY DRILLER

M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
22	7.9 – 7.6		D		see photos	interbedded qtzite schist
23						
			D			
24						mechanical core break
			D			
			D			
			D			
25						BOB 25'

Department of Environmental Protection
Oil Remediation Program

TO: Winthrop Commerce Center (WCC) Remediation File;
DEP Spill # A-157-2005

FROM: Tom Benn, Project Manager

DATE: July 13, 2007

SUBJECT: DEP Workplan Presentation and Project Update to WCC Owners

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On July 13, 2007 at 9:00 AM DEP Project Team members John Beane, Fred Lavallee and Tom Benn, accompanied by Brian Fons and Jeremy _____ representing Environmental Project's Inc (EPI) met at the Winthrop Commerce Center (WCC) with business owners Lou Carrier, and Ken Lajoie. The purpose of the meeting was for DEP to report on our efforts at the Mill to collect free product $# 6 oil at the stream, and remedial measures undertaken and planned to remove these discharges. We met at the site, and observed the ongoing work in Mill Stream to armor the cofferdam, sheet-poly placement on the streambed inside the cofferdam, and oil discharge collection, and soil removal done using hand tools on the island. We observed free-product oil entering the coffererdam from the streambed and the retainer wall. Jeremy reported that ~ 20 gallons of # 6 oil has been collected since digging began several days ago. Contaminated debris, and soil is being collected in a rolloff container staged on-site. Several digital photos of the work are available.

The group then met at a upstairs conference room, where we presented the DEP's 2007 Remediation Workplan which was drafted by Fred and reviewed by all team members. Items 1,2,3, and 4a of the workplan have been completed. Tom Benn provided a brief overview of the project work, and cost expended to date, and outlined our schedule for additional remedial work. John Beane described the well installation at the wall, and explained the hydrogeologic information gained about the site. He further explained the information gathered from previous work and provided additional information and some historic knowledge gained about the site which is helpful to our remediation plan.

Fred Lavallee presented the workplan in much more detail and led discussions on the plans phased approach. After cofferdam construction and oil contaminated material is removed from the "island" DEP will begin shallow bedrock flushing using heated water to liberate the # 6 oil. Soil excavations will then commence, followed by excavation flushing, and installation of a well sump. Future work is outlined in Items 4b, and 5 – 13 of the 2007 Workplan. Fred provided a project schedule chart for the owners. DEP received good input from the owners on our work to date. The owners explained their plans for future building occupancy and they offered their support for the project. We discussed sediment characterization work done in the Upper Basin of Annabessacook Lake, and briefed the owners that additional sampling work is planned by DEP's Land and Water Quality staff.

The meeting ended at ~ 10:30 AM.

DEP staff met with EPI officials to discuss operational concerns and coordination of remediation efforts. We left the site at ~ 11:00 AM.

DRAFT

Free Product Exploration Report
Annabessacook Inlet Delta
Winthrop Commerce Center LUST Site (A-157-05)

July 12, 2007

John E. Beane, Ph.D., C.G., Senior Environmental Hydrogeologist

On Monday June 11, 2007 Sean Dougherty, Fred Lavallee, Peter Blanchard and John Beane of the Maine Department of Environmental Protection conducted a reconnaissance investigation of the occurrence of sunken #6 fuel oil at the inlet delta at the north end of Annabessacook Lake. The written work plan for this investigation is attached.

Objectives

This sampling program is intended to determine whether sunken separate phase #6 fuel oil from either the 2007 or 2005 discharges can be found easily in and surrounding the distributary channels at the inlet of Annabessacook Lake.

Field Methods

Sample locations were pre-selected using the orthophoto layer of ARCMAP to focus on locations within and immediately surrounding the distributary channels of the delta. The Division of Response Services provided a boat that served as a sampling platform. The pre-selected locations were entered into a GPS unit that was used to guide the boat to the planned sampling locations. Grab samples of the uppermost sediments were collected using a petit ponar dredge. The boat was navigated to planned sampling locations and anchored there. GPS was used to document the sampling location to ± 1 meter accuracy, but drift of the boat due to wind and current increased the error to as much as ±5 meters. The locations where the samples were actually collected are shown on Figure 1.

Sediment samples were emptied from the dredge into a large stainless steel bowl. The samples were observed for odor, sheen, separate phase oil and oil stained detritus. Grain size, vegetation and debris (wood, glass, leaves) were noted. Photographs illustrating sediment features and the occurrence of sunken oil were taken.

Three sediment samples that appeared to contain discrete blebs of oil were submitted for laboratory analysis for diesel range organics (DRO). One sample of water from the surface of the lake was submitted for laboratory analysis for DRO and semi-volatile organics (SVOC).

Results

The raw observations are compiled in Table 1. Sample locations are shown on Figure 1.

Generally, the grain size of the sediments decrease with distance from the inlet (culvert under Route 202) along the axis of the main distributary channel, and with perpendicular distance from the axis of the channel.

Table 1. Sediment Sample Descriptions

Annabessacook Inlet Delta Free Product Exploration

Sample Location	Depth (feet)	Grain Size	Free Oil	Odor	Comment
SP-01	17	lag gravel?	no	no	minimal recovery
SP-02a	13	glaciomarine silt/clay	no	no	erosional location in channel
SP-02b	13	coarse sand	no	no	
SP-03a	3.3	med.-coarse sand, pebbles	sheen	no	10 cm brown glass
SP-03b	3.3	med.-coarse sand	1-3 mm blebs of black oil that disperse to sheen	no	lab sample for DRO
SP-04a	3	medium sand	abundant millimeter-sized blebs of black oil	no	brick clasts, plastic fragments, 8 cm segmented worm
SP-04b	3	medium sand	abundant 1-2 mm blebs of black oil	no	lab sample for DRO
SP-05	3	fine sand and silt	1-2 mm blebs of black oil adhering to tree leaves	no	
SP-06	2.7	very fine and silt	abundant 1 mm blebs, lots of sheen on pond surface from anchor and dredge		leaves, twigs, pond weed
SP-07	2.4	very fine and organic silt	small blebs of black oil, some sheen on pond	no	abundant pond weed
SP-08		very fine to medium sand and organic silt	sparse oil blebs		
SP-09		fine sand	few 1 mm oil blebs	no	twigs, maple seeds, leaves
SP-10		very fine and organic silt	abundant 1-3 mm blebs of black oil	no	
SP-11		silt	few small oil blebs	no	abundant pond weed roots
SP-12		very fine and organic silt	millimeter-sized blebs, abundant sheen	no	leaves, maple seeds, twigs
SP-13	2.3	very fine and organic silt	rare 1 mm oil blebs	no	
SP-14	2.5	organic-rich silt	rare 1 mm oil blebs	no	
SP-15		very fine sand and silt	few oil blebs	no	Pickerel weed roots
SP-16		very fine and organic silt	abundant 1-3 mm blebs of black oil	no	lab sample for DRO
SP-18		fine and very fine sand, little silt	abundant 1 mm oil blebs		

Samples points for which no depths were recorded were all in less than four feet of water.

There was no visual evidence of oil in samples SP-1 and SP-2. Both were collected from high-energy environments characterized by erosion. The samples were of pre-lake deposits, lag gravel, and course sand.

All of the other sediment samples showed visual evidence of black oil contamination. The oil was observed in two modes of occurrence: 1) as separate individual 1-3 millimeter blebs of black oil entrained in the upper centimeter or so of sediment, and 2) as 1-3 millimeter blebs and stains adhering to waterlogged tree leaves, maple seeds and twigs. Both occurrences would float up on the water in the bowl and disperse as a sheen. In those same locations the anchor and the sample dredge would usually mobilize oil from the bottom directly to the lake surface where it would spread out as a sheen.

The appearance of the oil in the sediment was the same in all locations where it was encountered, but the abundance of small oil blebs in the sediments appeared to vary systematically. The greatest abundance was found in the main channel where the grain size transitioned from fine and medium sand to very fine sand with abundant organic silt (Samples SP-04 and SP-06). The observations of oil abundance in the sediment samples were corroborated by a corresponding increased abundance of oil mobilized to the lake surface by the anchor and the dredge.

The area of investigation was not large enough to document the extent of contamination at the distal edge of the delta.

Deviations from Work Plan

The work plan called for collecting two samples at each location, one from each side of the boat. After the first several locations it was apparent that the distribution of sunken oil was so broad and the mode of occurrence was so consistent that the second sample at each location was providing no additional useful data. Thereafter, only one sample was obtained at each location.

Water depth was not recorded at every sample location. Those samples were collected from depths of two to four feet. The entire inlet delta is quite shallow except where the channel enters the lake at the culvert under the highway.

Laboratory Analytical Results

Three sediment samples were collected and submitted to the Maine Health and Environmental Testing Laboratory for Diesel Range Organics (DRO) analysis. One sample of the surface water was collected and analyzed for semi-volatile organic compounds by EPA method 8270. The analyses for DRO and semi-volatile organics of a sample of the neat product collected from Mill Stream by Peter Blanchard on April 24, 2007 are also reported here so that the composition of the oil can be compared to the composition of the contamination in the lake sediments.

The neat product sample was a sample of floating black oil collected from the surface of Mill Stream by Peter Blanchard (OHMS III) on April 24, 2007. The analysis for Diesel Range Organics (DRO) showed that only 180,000 micrograms per kilogram of the sample fell in the diesel range. That is only 180 parts per million that was within the target range of the method. Presumably the remainder of the sample was made up of hydrocarbons with longer retention times and higher molecular weights than diesel range organics. DRO may be an effective method for estimating the abundance of diesel, #2 fuel oil or kerosene in environmental samples, but it appears to be largely insensitive to #6 fuel oil. If we had had these results before doing the sediment sampling program we would probably have chosen not to analyze the sediments for DRO.

The DRO concentrations reported for sediment samples SP3B, SP4B and SP16 were 110,000, 94,000 and 410,000 micrograms per kilogram (or parts per billion), respectively. The chromatograms were consistent with #6 fuel oil contamination, but they were also consistent with naturally occurring organic matter.

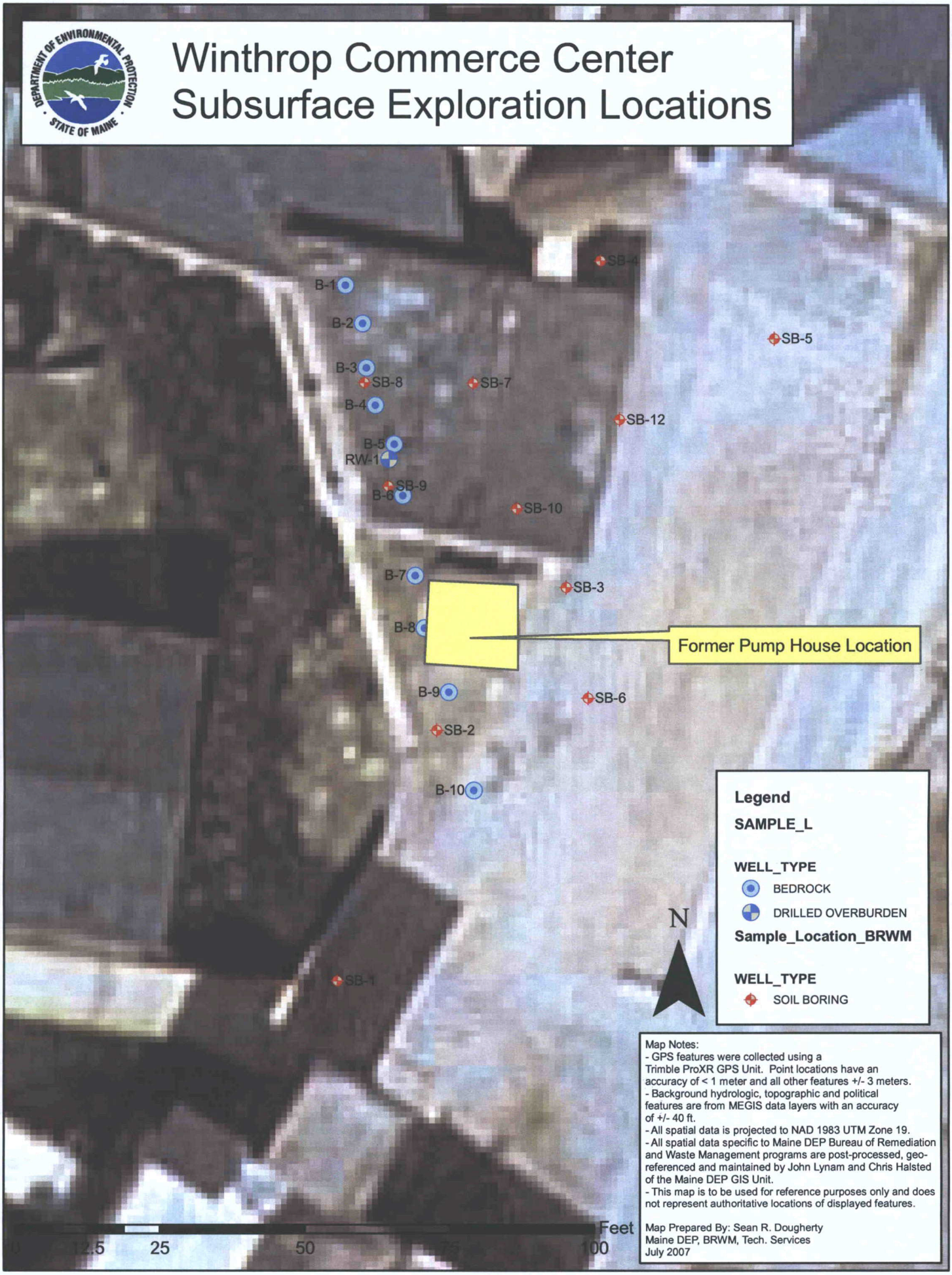
No polynuclear aromatic hydrocarbons (PAH) were detected in the surface water sample from Waypoint 17.

Summary

Reconnaissance sampling of the sediments at the surface of the Annabessacook Lake inlet delta showed that sunken black oil was widely distributed as small droplets of oil that adhered to the sediment particles and organic detritus. Although the oil was widespread, none of the samples could be described as heavily oiled. Oil droplets larger than about 3 mm were not observed. When the sediments were disturbed by the dredge or the anchor some of the oil droplets would float to the surface of the lake and spread out into oil sheens as large as several centimeters across. There is some potential for the sunken oil to make small spot stains on wildlife or on boats.

The laboratory analyses were not particularly sensitive to the target contaminant and they are sensitive to interference from naturally occurring organic compounds. The analyses provide little trustworthy information beyond the field observations themselves.

Winthrop Commerce Center
Subsurface Exploration Locations



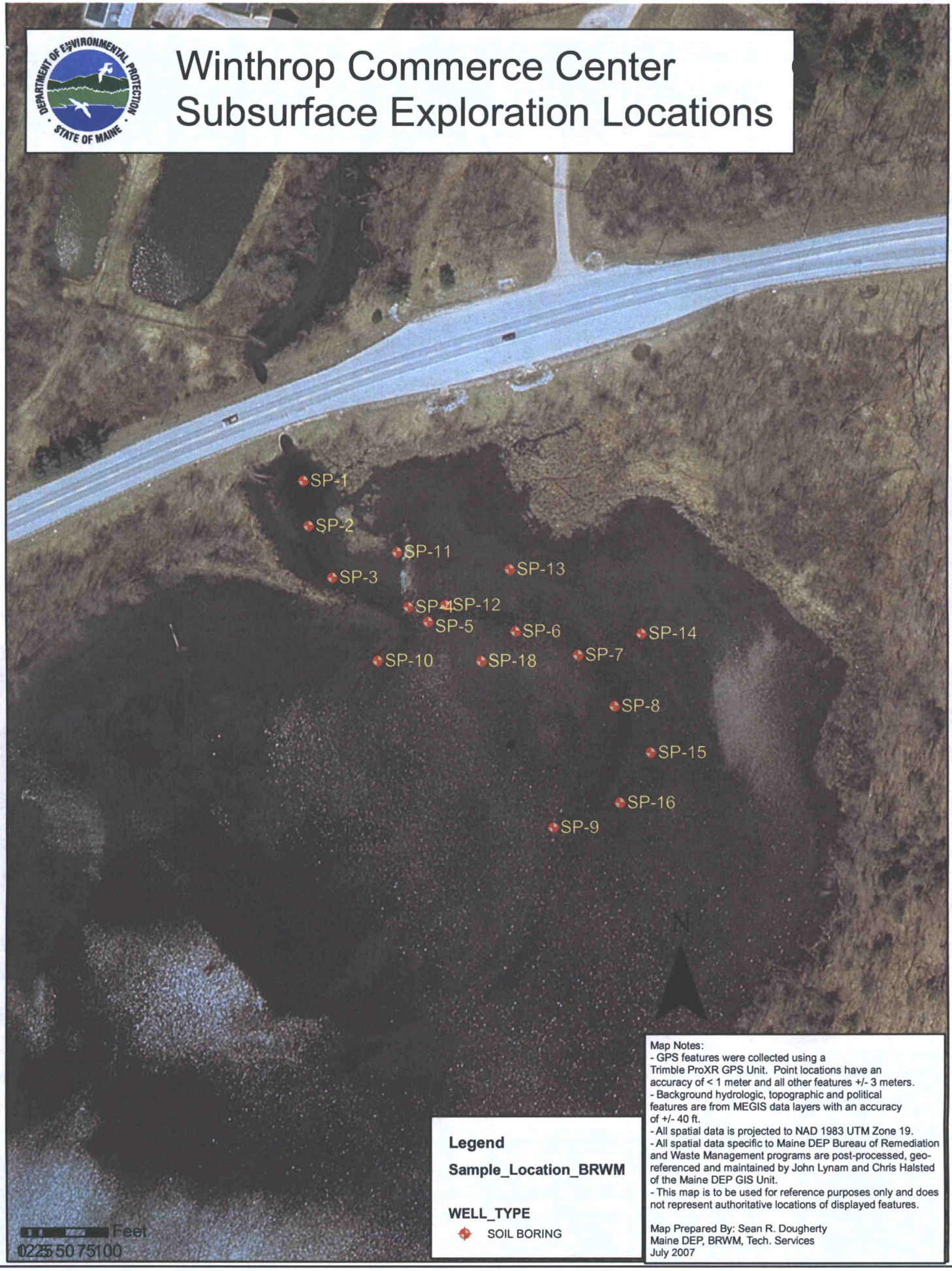
Map Notes:
- GPS features were collected using a Trimble ProXR GPS Unit. Point locations have an accuracy of < 1 meter and all other features +/- 3 meters.
- Background hydrologic, topographic and political features are from MEGIS data layers with an accuracy of +/- 40 ft.
- All spatial data is projected to NAD 1983 UTM Zone 19.
- All spatial data specific to Maine DEP Bureau of Remediation and Waste Management programs are post-processed, geo-referenced and maintained by John Lynam and Chris Halsted of the Maine DEP GIS Unit.
- This map is to be used for reference purposes only and does not represent authoritative locations of displayed features.

Map Prepared By: Sean R. Dougherty
Maine DEP, BRWM, Tech. Services
July 2007

In-Channel Samples

Out-of-Channel Samples

0 200 400 800 Feet



Winthrop Commerce Center
Subsurface Exploration Locations

Legend

Sample_Location_BRWM

WELL_TYPE

SOIL BORING

Map Notes:
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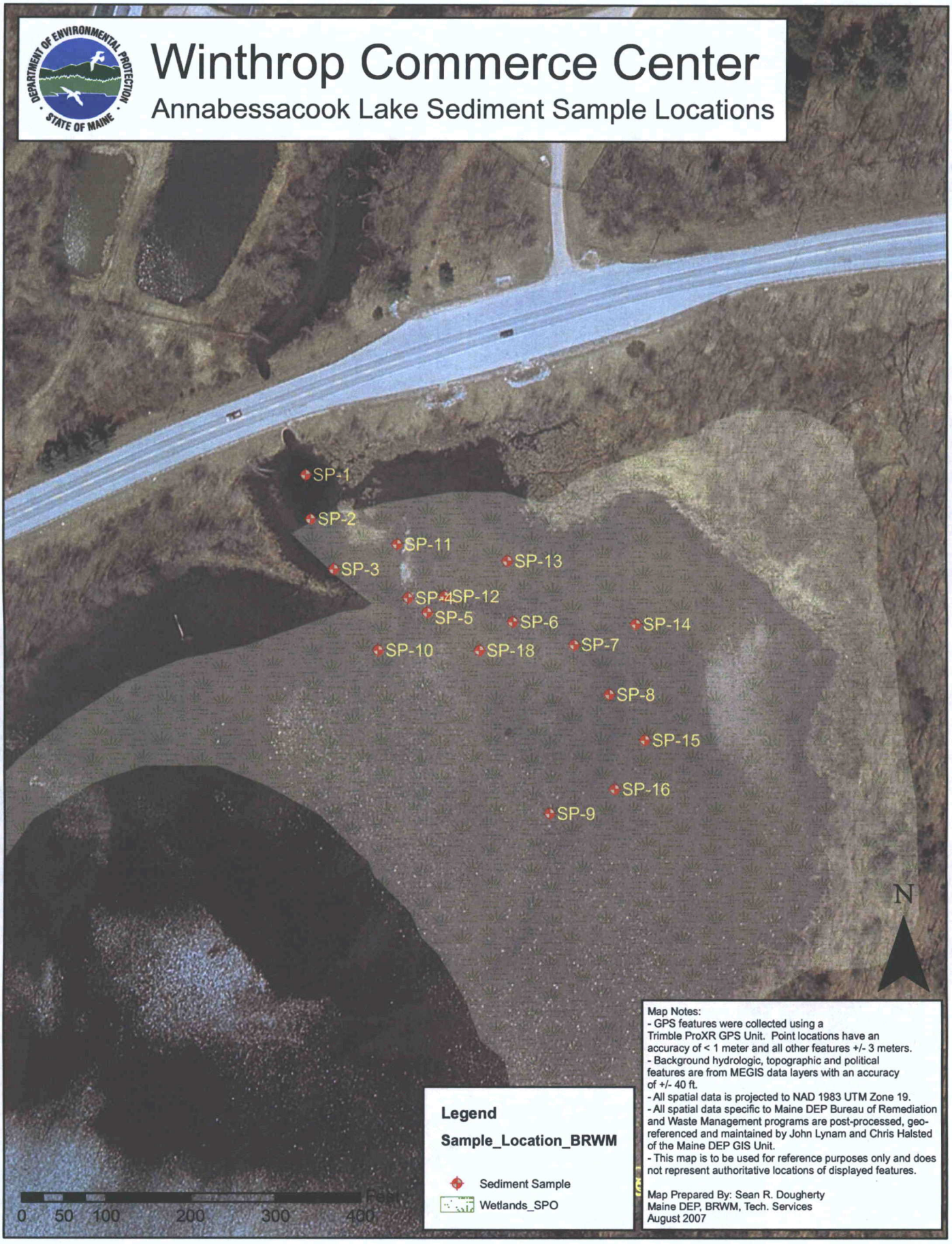
Map Prepared By: Sean R. Dougherty
Maine DEP, BRWM, Tech. Services
July 2007


Winthrop Commerce Center
Annabessacook Lake Sediment Sample Locations
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF MAINE
SP-1
SP-2
SP-11
SP-3
SP-13
SP-12
SP-5
SP-6
SP-14
SP-10
SP-18
SP-7
SP-8
SP-15
SP-16
SP-9
N
Legend
Sample_Location_BRWM
Sediment Sample
Wetlands_SPO
0 50 100 200 300 400
Map Notes:
- GPS features were collected using a Trimble ProXR GPS Unit. Point locations have an accuracy of < 1 meter and all other features +/- 3 meters.
- Background hydrologic, topographic and political features are from MEGIS data layers with an accuracy of +/- 40 ft.
- All spatial data is projected to NAD 1983 UTM Zone 19.
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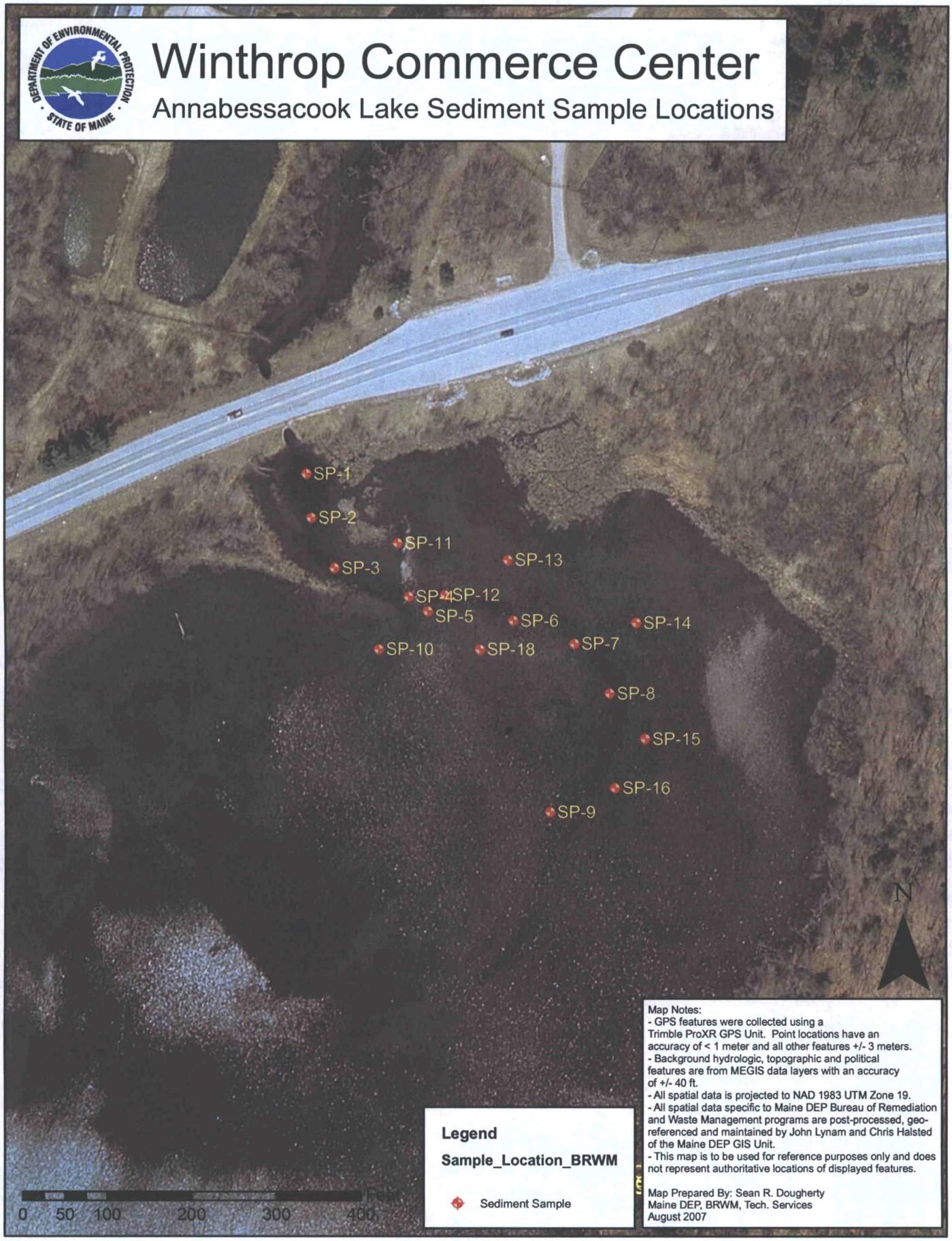
- This map is to be used for reference purposes only and does not represent authoritative locations of displayed features.
Map Prepared By: Sean R. Dougherty
Maine DEP, BRWM, Tech. Services
August 2007


Winthrop Commerce Center
Annabessacook Lake Sediment Sample Locations
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF MAINE
SP-1
SP-2
SP-11
SP-3
SP-13
SP-4
SP-12
SP-5
SP-6
SP-14
SP-10
SP-18
SP-7
SP-8
SP-15
SP-16
SP-9
N
0 50 100 200 300 400
Legend
Sample_Location_BRWM
Sediment Sample
Map Notes:
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- This map is to be used for reference purposes only and does not represent authoritative locations of displayed features.
Map Prepared By: Sean R. Dougherty
Maine DEP, BRWM, Tech. Services
August 2007

Small black stains on bowl are oil stains from the sediment samples.

Photograph of weedy silty sediment showing swirl of black oil on water surface.

Photograph of weedy silty sediment showing swirl of black oil on water surface.

State of Maine
Health and Environmental Testing Lab
221 State Street Station #12 Augusta, ME 04333-0012
Phone (207) 287 – 2727 Fax (207) 287-4525

Chain - of - Custody

C024082

Sample Date: 6/11/07
Town/County: Winthrop/Kennebec
Project Name: Winthrop

Company: Maine DEP	Appropriation/PO# 014 06A 1517 447	Compliance sample Y / N
Contact: John E. Beane	Bill To:	Copy To:
Address: #17 SHS	Address:	Address
Augusta 04333		
Phone: Fax:	Phone: Fax:	Phone: Fax:
e-Mail address:	e-Mail address:	e-Mail address

Sample ID	Sample time	Preservation	Container vol	Container type	Quantity	Grab or Composite	Matrix: Ground Water / Waste Water / Drinking Water / Solids / Other	Analyses Required	HETL Number
SP3B	12:00				1	G	S	DRO	C024082-001
SP4B	12:20				1	G	S	DRO	002
SP16	13:10				1	G	S	DRO	003
Waypoint 17	13:45		1L	✓	1	G	W	SVOCW	004

Notes: Please include DRO chromatogram with result

Sampled By John E Beane Date/Time 6/11/07 Received By [signature] Date/Time JUN 11 '07 PM 4:11:36

Relinquished By Date/Time Received By Date/Time

Relinquished By Date/Time Received By Date/Time

Rush (Yes or No)	Fax Results (Yes or No)	Custody seal intact (Yes or No)	Temperature on Arrival // °C

If the sample is deemed hazardous it may be returned to the client at your expense for proper disposal
By signing this Chain-of-Custody you agree that the limit of The HETL's liability to be the cost of the analytical fees in question

rev 5/17/05

MAINE HEALTH AND ENVIRONMENTAL
TESTING LABORATORY
221 State Street, Station #12
Department of Health and Human Services
Augusta, Maine 04333
Tel. No. 207-287-1716
Fax. No. 207-287-6832

PUBLIC HETL

Logged: 6/11/2007 4:15:00PM
Folder/ Invoice # C024082

JOHN BEANE
DEPT OF ENVIRONMENTAL PROTECTION
17 SHS
AUGUSTA ME 04333 **Fax#:**

Office Use Only:
Summary
DEPP

Project Name: WINTHROP

Released: 7/16/2007

No. of Samples in Folder 4

Case #:

C024082001, C024082002, C024082003
C024082004

COPY

CERTIFICATION

The HETL hereby certifies that all test results for this sample were analyzed by the method listed, including preservation, preparation , and holding times, unless otherwise indicated.

John A. Krueger, Director Richard French, Quality Assurance Officer

If we can be of further assistance to you, Please Call us at 287-1716

Approved by:

CC:

7/16/2007 9:41:55AM

Continued from Previous Page HETL Sample Number: **C024082004**

HETL Sample Number: C024082004 Default: Description: **WAYPOINT 17**

Matrix: **NP-H20** Sample Point:

Sampler: JOHN BEANE Sample Date: **6/11/2007** Time: **13:45:00**

Method: **8270C** Analyst **JIM EATON** Analysis Datetime: **07/06/07**

Preparation Method: 8270 Sep Fun Liq Liq **Prepared by:** JIM EATON

Date Prepared	Time Prepared	Amount Extracted	Extraction pH	Final Amount of Extract
06/18/2007				

Analyte	Result	Units	RL	MCL	Qualifiers
1,2,4-Trichlorobenzene	<1	ug/L	1.0		
2,4,5-Trichlorophenol	<1	ug/L	1.0		
2,4,6-Trichlorophenol	<1	ug/L	1.0		
2,4-Dichlorophenol	<1	ug/L	1.0		
2,4-Dinitrotoluene	<5	ug/L	5.0		
2,6-Dinitrotoluene	<5	ug/L	5.0		
2-Chloronaphthalene	<1	ug/L	1.0		
2-Chlorophenol	<1	ug/L	1.0		
2-Methylnaphthalene	<1	ug/L	1.0		
2-Methylphenol	<1	ug/L	1.0		
2-Nitroaniline	<5	ug/L	5.0		
2-Nitrophenol	<1	ug/L	1.0		
3,3-Dichlorobenzidine	<1	ug/L	1.0		
3-Nitroaniline	<5	ug/L	5.0		
4-Bromophenylphenylether	<1	ug/L	1.0		
4-Chloroaniline	<5	ug/L	5.0		
4-Chlorophenylphenylether	<1	ug/L	1.0		
4-Nitroaniline	<5	ug/L	5.0		
4-Nitrophenol	<20	ug/L	20		
Acenaphthene	<1	ug/L	1.0		
Acenaphthylene	<1	ug/L	1.0		
Aniline	<1	ug/L	1.0		
Anthracene	<1	ug/L	1.0		
Azobenzene	<1	ug/L	1.0		
Benzidine	<10	ug/L	10		
Benzo(a)anthracene	<1	ug/L	1.0		
Benzo(a)pyrene	<1	ug/L	1.0		
Benzo(b)fluoranthene	<1	ug/L	1.0		
Benzo(g,h,i)perylene	<5	ug/L	5.0		

Continued from Previous Page HETL Sample Number: **C024082004**

Benzo(k)fluoranthene	<1	ug/L	1.0
Benzoic acid	21	ug/L	20
Benzyl alcohol	<5	ug/L	5.0
Butyl benzyl phthalate	<2	ug/L	2.0
Chrysene	<1	ug/L	1.0
Dibenzo(a,h)anthracene	<5	ug/L	5.0
Dibenzofuran	<1	ug/L	1.0
Diethyl phthalate	<2	ug/L	2.0
Dimethyl phthalate	<2	ug/L	2.0
Di-n-butyl phthalate	<2	ug/L	2.0
Di-n-octyl phthalate	<2	ug/L	2.0
Fluoranthene	<1	ug/L	1.0
Fluorene	<1	ug/L	1.0
Hexachlorobenzene	<1	ug/L	1.0
Hexachlorobutadiene	<1	ug/L	1.0
Hexachloroethane	<1	ug/L	1.0
Hexachlorocyclopentadiene	<10	ug/L	10
Isophorone	<1	ug/L	1.0
m-Dichlorobenzene	<1	ug/L	1.0
Naphthalene	<1	ug/L	1.0
Nitrobenzene	<1	ug/L	1.0
o-Dichlorobenzene	<1	ug/L	1.0
p-Dichlorobenzene	<1	ug/L	1.0
Pentachlorophenol	<20	ug/L	20
Phenanthrene	<1	ug/L	1.0
Phenol	<1	ug/L	1.0
Pyrene	<1	ug/L	1.0
2,4-Dinitrophenol	<50	ug/L	50
4-Chloro-3-methylphenol	<1	ug/L	1.0
2-Methyl-4,6-dinitrophenol	<20	ug/L	20
N-Nitroso-di-n-propylamine	<10	ug/L	10
2,4-Dimethylphenol	<1		1.0
4-Methylphenol	<1		1.0
N-Nitroso-dimethylamine	<5		5.0
N-Nitroso-diphenylamine	<1		1.0
bis(2-ethylhexyl)phthalate	<2		2.0
bis(2-chloroethoxy)methane	<1		1.0
bis(2-chloroethyl)ether	<1		1.0
bis(2-chloroisopropyl)ether	<1		1.0

Continued from Previous Page HETL Sample Number: **C024082004**

Indeno(1,2,3-cd)pyrene	<5			5.0		

Surrogate Analytes (added as part of testing to verify performance)	**Result**	**Amount**	**% Rec**	**Low % Rec**	**High % Rec**	**Qualifiers**
Nitrobenzene-d5	101			35	114	LoRec
2-Fluorobiphenyl	88.0			43	116	LoRec
2-Fluorophenol	40.0			21	100	LoRec
Phenol-d5	27.0			10	94	LoRec
2,4,6-Tribromophenol	84.0			10	123	LoRec
2-Fluoroaniline	35.0			0	100	
Terphenyl-d14	112			33	141	LoRec

Continued from Previous Page HETL Sample Number: **C024082004**

Units & Measurement

"**mg/L**" = Milligrams per liter; "**ug/L**" = Micrograms per Liter; "**mg/Kg**" = Milligrams per Kilogram;
"**ug/Kg**" = Micrograms per Kilogram; "**PPM**" = Parts per Million; "**NTU**" = Nephelometric Turbidity Units;

The MCL, Maximum Contaminant Level is listed for comparing your results with recommended levels.
In the "**Qualifier**" column, **an " * "** is placed to indicate any results that **exceed** this MCL.

If there are no " * " in the "Qualifier" column, your water is considered satisfactory for those tests.

All solid results on a "**Dry Weight**" basis

NC = Not confirmed **NQ** = Not Quantitated **NA** = Not Analyzed **J** = Approximately **U** = Undetected **R** = Rejected

RL-Reporting Limit, the lowest concentration which can be reliably reported on a routine basis
"<" = Less than ">" = Greater than

Note: Results below the advisory limit, including < and K are considered satisfactory for that parameter.

Disclaimer

bag

State of Maine
Health and Environmental Testing Lab
221 State Street Station #12 Augusta, ME 04333-0012
Phone (207) 287 – 2727 Fax (207) 287-4525

Chain - of - Custody

C024082

Sample Date: 6/11/07
Town/County: Winthrop/Kennebec
Project Name: Winthrop

Company: Maine DEP	Appropriation/PO# 014 06A 1517 442	Compliance sample Y / (N)
Contact: John E. Beane	Bill To:	Copy To:
Address: #17 SHS	Address:	Address
Augusta 04333		
Phone: Fax:	Phone: Fax:	Phone: Fax:
e-Mail address:	e-Mail address:	e-Mail address

Sample ID	Sample time	Preservation	Container vol	Container type	Quantity	Grab or Composite	Matrix: Ground Water / Waste Water / Drinking Water / Solids / Other	Analyses Required	HETL Number
SP3B	12:00				1	G	S	DRO	C024082-001
SP4B	12:20				1	G	S	DRO	002
SP16	13:10				1	G	S	DRO	003
Waypoint 17	13:45		1L	✓	1	G	W	SVOGW	004

Notes: Please include DRO chromatogram with result

Sampled By John E. Beane Date/Time 6/11/07 Received By [signature] Date/Time JUN11'07 PM 4:11:36 RC

Relinquished By Date/Time Received By Date/Time

Relinquished By Date/Time Received By Date/Time

Rush (Yes or No)	Fax Results (Yes or No)	Custody seal intact (Yes or No)	Temperature on Arrival // °C

If the sample is deemed hazardous it may be returned to the client at your expense for proper disposal rev 5/17/05
By signing this Chain-of-Custody you agree that the limit of The HETL's liability to be the cost of the analytical fees in question

MAINE HEALTH AND ENVIRONMENTAL
TESTING LABORATORY
221 State Street, Station #12
Department of Health and Human Services
Augusta, Maine 04333
Tel. No. 207-287-1716
Fax. No. 207-287-6832

PUBLIC HETL

Logged: 6/11/2007 4:15:00PM
Folder/ Invoice # C024082

JOHN BEANE
DEPT OF ENVIRONMENTAL PROTECTION
17 SHS
AUGUSTA ME 04333 Fax#:

Office Use Only:
Summary
DEPP

Released: 7/16/2007
Case #:

Project Name: WINTHROP
No. of Samples in Folder 4
C024082001, C024082002, C024082003
C024082004

COPY

CERTIFICATION

The HETL hereby certifies that all test results for this sample were analyzed by the method listed, including preservation, preparation , and holding times, unless otherwise indicated.

John A. Krueger, Director Richard French, Quality Assurance Officer

If we can be of further assistance to you, Please Call us at 287-1716

Approved by:

CC:

7/16/2007 9:41:55AM

Continued from Previous Page HETL Sample Number: **C024082003**

HETL Sample Number: C024082003 Default Description: **SP16**

Matrix: **SOLID** Sample Point:

Sampler: JOHN BEANE Sample Date: **6/11/2007** Time: **13:10:00**

Method: **ME 4.1.25** Analyst **JOHN MARTHA** Analysis Datetime: **06/23/2007**

Preparation Method: DRO Soxhlet **Prepared by:** JOHN MARTHA

Date Prepared	Time Prepared	Amount Extracted	Extraction pH	Final Amount of Extract
06/20/2007	12:00	3.55 g	NA	1.0 ml

Analyte	Result	Units	RL	MCL	Qualifiers
DRO	410000	ug/kg	5000	5000	*Ach

Surrogate Analytes (added as part of testing to verify performance)	Result	Amount	% Rec	Low % Rec	High % Rec	Qualifiers
o-terphenyl	17.1	20.0	85.5	50	150	

Attached By JOHN MARTHA **Date** 6/28/2007 12:00:00AM **Time** 08:10

Comment : The chromatogram of the extract contains an envelope with peaks extending from the fuel oil region to the mineral grease region that can not be identified by GC/FID.

Continued from Previous Page HETL Sample Number: **C024082003**

HYDROCARBON HEALTH ADVISORY

The effects of long-term exposure to petroleum mixtures have not been thoroughly assessed and a chronic (long-term) exposure guideline has yet to be developed for petroleum-contaminated water supplies. However,exposure to petroleum concentrations greater than 50 parts per billion through skin contact,drinking contaminated water,and from inhalation of vapors,such as when showering,can create immediate health effects including irritation of the eyes,skin and mucous membranes,headache,fatigue,central nervous system depression and dizziness. It is suspected long-term exposure may increase the risk of developing cancer.

Because there is no level of exposure to gasoline which can be considered "safe" every effort should be made to completely prevent the intrusion of petroleum and petroleum vapors into affected households by discontinuing the use of contaminated water and by creating vapor barriers in the basement. A water supply containing greater than 50 parts per billion (ug/L) gasoline or fuel oil should not be used for drinking,showering or bathing. (Above 50 parts per billion an odor can be detected and irritant effects can occur). If contamination levels are less than 50 parts per billion (ug/L) the following recommendations should be implemented to minimize exposure to these contaminants:

Minimize bathing/showering time. Use warm rather than hot water while bathing/showering.
Use rubber gloves while washing dishes.
Use a Laundromat for washing clothes or close off the laundry room from living areas during and after use.
Ventilate the areas in which water is being used,or has just been used for any significant period of time.
Use alternative water supplies to the maximum extent possible.

If you receive test results above 50 parts per billion (ug/L) for petroleum (gasoline,kerosene or fuel oil) it is recommended that you discontinue using your tap water for any purpose until a water treatment system is installed. For assistance in obtaining water treatment systems contact:

Bureau of Oil and Hazardous Materials Control
Department of Environmental Protection
Statehouse Station 17
Augusta,Maine 04333
(207)-287-2651

Continued from Previous Page HETL Sample Number: **C024082003**

Units & Measurement

"**mg/L**" = Milligrams per liter; "**ug/L**" = Micrograms per Liter; "**mg/Kg**" = Milligrams per Kilogram;
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The MCL, Maximum Contaminant Level is listed for comparing your results with recommended levels.
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If there are no " * " in the "Qualifier" column, your water is considered satisfactory for those tests.

All solid results on a "**Dry Weight**" basis

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"**<**" = Less than ">" = Greater than

Note: Results below the advisory limit, including < and K are considered satisfactory for that parameter.

Disclaimer

MAINE HEALTH AND ENVIRONMENTAL
TESTING LABORATORY
221 State Street, Station #12
Department of Health and Human Services
Augusta, Maine 04333
Tel. No. 207-287-1716
Fax. No. 207-287-6832

PUBLIC HETL

Logged: 6/11/2007 4:15:00PM
Folder/ Invoice # C024082

Office Use Only:
Summary
DEPP

Released: 7/16/2007
Case #:

JOHN BEANE
DEPT OF ENVIRONMENTAL PROTECTION
17 SHS
AUGUSTA ME 04333 **Fax#:**

Project Name: WINTHROP
No. of Samples in Folder 4
C024082001, C024082002, C024082003
C024082004

COPY

CERTIFICATION

The HETL hereby certifies that all test results for this sample were analyzed by the method listed, including preservation, preparation , and holding times, unless otherwise indicated.

John A. Krueger, Director Richard French, Quality Assurance Officer

If we can be of further assistance to you, Please Call us at 287-1716

Approved by:

CC:

7/16/2007 9:41:55AM

Continued from Previous Page HETL Sample Number: **C024082002**

HETL Sample Number: C024082002 Default Description: **SP4B**

Matrix: **SOLID** Sample Point:

Sampler: JOHN BEANE Sample Date: **6/11/2007** Time: **12:20:00**

Method: **ME 4.1.25** Analyst **JOHN MARTHA** Analysis Datetime: **06/23/2007**

Preparation Method: DRO Soxhlet **Prepared by:** JOHN MARTHA

Date Prepared	Time Prepared	Amount Extracted	Extraction pH	Final Amount of Extract
06/20/2007	12:00	8.33 g	NA	1.0 ml

Analyte	Result	Units	RL	MCL	Qualifiers
DRO	94000	ug/kg	5000	5000	*Ach

Surrogate Analytes (added as part of testing to verify performance)	Result	Amount	% Rec	Low % Rec	High % Rec	Qualifiers
o-terphenyl	26.3	20.0	131.5	50	150	

Attached By JOHN MARTHA **Date** 6/28/2007 12:00:00AM **Time** 08:09

Comment : The chromatogram of the extract contains an envelope with peaks extending from the fuel oil region to the mineral grease region that can not be identified by GC/FID.

Continued from Previous Page HETL Sample Number: **C024082002**

HYDROCARBON HEALTH ADVISORY

The effects of long-term exposure to petroleum mixtures have not been thoroughly assessed and a chronic (long-term) exposure guideline has yet to be developed for petroleum-contaminated water supplies. However,exposure to petroleum concentrations greater than 50 parts per billion through skin contact,drinking contaminated water,and from inhalation of vapors,such as when showering,can create immediate health effects including irritation of the eyes,skin and mucous membranes,headache,fatigue,central nervous system depression and dizziness. It is suspected long-term exposure may increase the risk of developing cancer.

Because there is no level of exposure to gasoline which can be considered "safe" every effort should be made to completely prevent the intrusion of petroleum and petroleum vapors into affected households by discontinuing the use of contaminated water and by creating vapor barriers in the basement. A water supply containing greater than 50 parts per billion (ug/L) gasoline or fuel oil should not be used for drinking,showering or bathing. (Above 50 parts per billion an odor can be detected and irritant effects can occur). If contamination levels are less than 50 parts per billion (ug/L) the following recommendations should be implemented to minimize exposure to these contaminants:

Minimize bathing/showering time. Use warm rather than hot water while bathing/showering.
Use rubber gloves while washing dishes.
Use a Laundromat for washing clothes or close off the laundry room from living areas during and after use.
Ventilate the areas in which water is being used,or has just been used for any significant period of time.
Use alternative water supplies to the maximum extent possible.

If you receive test results above 50 parts per billion (ug/L) for petroleum (gasoline,kerosene or fuel oil) it is recommended that you discontinue using your tap water for any purpose until a water treatment system is installed. For assistance in obtaining water treatment systems contact:

Bureau of Oil and Hazardous Materials Control
Department of Environmental Protection
Statehouse Station 17
Augusta,Maine 04333
(207)-287-2651

Continued from Previous Page HETL Sample Number: **C024082002**

Units & Measurement

"**mg/L**" = Milligrams per liter; "**ug/L**" = Micrograms per Liter; "**mg/Kg**" = Milligrams per Kilogram;
"**ug/Kg**" = Micrograms per Kilogram; "**PPM**" = Parts per Million; "**NTU**" = Nephelometric Turbidity Units;

The MCL, Maximum Contaminant Level is listed for comparing your results with recommended levels.
In the "**Qualifier**" column, **an " * "** is placed to indicate any results that **exceed** this MCL.

If there are no " * " in the "Qualifier" column, your water is considered satisfactory for those tests.

All solid results on a "**Dry Weight**" basis

NC = Not confirmed **NQ** = Not Quantitated **NA** = Not Analyzed **J** = Approximately **U** = Undetected **R** = Rejected

RL-Reporting Limit, the lowest concentration which can be reliably reported on a routine basis
"**<**" = Less than "**>**" = Greater than

Note: Results below the advisory limit, including < and K are considered satisfactory for that parameter.

Disclaimer

MAINE HEALTH AND ENVIRONMENTAL
TESTING LABORATORY
221 State Street, Station #12
Department of Health and Human Services
Augusta, Maine 04333
Tel. No. 207-287-1716
Fax. No. 207-287-6832

PUBLIC HETL

Logged: 6/11/2007 4:15:00PM
Folder/ Invoice # C024082

JOHN BEANE
DEPT OF ENVIRONMENTAL PROTECTION
17 SHS
AUGUSTA ME 04333 **Fax#:**

Office Use Only:
Summary
DEPP

Project Name: WINTHROP

No. of Samples in Folder 4

C024082001, C024082002, C024082003
C024082004

Released: 7/16/2007

Case #

COPY

CERTIFICATION

The HETL hereby certifies that all test results for this sample were analyzed by the method listed, including preservation, preparation , and holding times, unless otherwise indicated.

John A. Krueger, Director Richard French, Quality Assurance Officer

If we can be of further assistance to you, Please Call us at 287-1716

Approved by:

CC:

7/16/2007 9:41:55AM

Continued from Previous Page HETL Sample Number: **C024082001**

HETL Sample Number: C024082001 Default Description: **SP3B**

Matrix: **SOLID** Sample Point:

Sampler: JOHN BEANE Sample Date: **6/11/2007** Time: **12:00:00**

Method: **ME 4.1.25** Analyst **JOHN MARTHA** Analysis Datetime: **06/23/2007**

Preparation Method: DRO Soxhlet **Prepared by:** JOHN MARTHA

Date Prepared	Time Prepared	Amount Extracted	Extraction pH	Final Amount of Extract
06/20/2007	12:00	5.66 g	NA	1.0 ml

Analyte	Result	Units	RL	MCL	Qualifiers
DRO	110000	ug/kg	5000	5000	*Ach

Surrogate Analytes (added as part of testing to verify performance)	Result	Amount	% Rec	Low % Rec	High % Rec	Qualifiers
o-terphenyl	15.9	20.0	79.5	50	150	

Attached By JOHN MARTHA **Date** 6/28/2007 12:00:00AM **Time** 08:07

Comment : The chromatogram of the extract contains an envelope with peaks extending from the fuel oil region to the mineral grease region that can not be identified by GC/FID.

Continued from Previous Page HETL Sample Number: **C024082001**

HYDROCARBON HEALTH ADVISORY

The effects of long-term exposure to petroleum mixtures have not been thoroughly assessed and a chronic (long-term) exposure guideline has yet to be developed for petroleum-contaminated water supplies. However,exposure to petroleum concentrations greater than 50 parts per billion through skin contact,drinking contaminated water,and from inhalation of vapors,such as when showering,can create immediate health effects including irritation of the eyes,skin and mucous membranes,headache,fatigue,central nervous system depression and dizziness. It is suspected long-term exposure may increase the risk of developing cancer.

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Bureau of Oil and Hazardous Materials Control
Department of Environmental Protection
Statehouse Station 17
Augusta,Maine 04333
(207)-287-2651

Continued from Previous Page HETL Sample Number: **C024082001**

Units & Measurement

"**mg/L**" = Milligrams per liter; "**ug/L**" = Micrograms per Liter; "**mg/Kg**" = Milligrams per Kilogram;
"**ug/Kg**" = Micrograms per Kilogram; "**PPM**" = Parts per Million; "**NTU**" = Nephelometric Turbidity Units;

The MCL, Maximum Contaminant Level is listed for comparing your results with recommended levels.
In the "**Qualifier**" column, **an " * "** is placed to indicate any results that **exceed** this MCL.

If there are no " * " in the "Qualifier" column, your water is considered satisfactory for those tests.

All solid results on a "**Dry Weight**" basis

NC = Not confirmed **NQ** = Not Quantitated **NA** = Not Analyzed **J** = Approximately **U** = Undetected **R** = Rejected

RL-Reporting Limit, the lowest concentration which can be reliably reported on a routine basis
"<" = Less than ">" = Greater than

Note: Results below the advisory limit, including < and K are considered satisfactory for that parameter.

Disclaimer

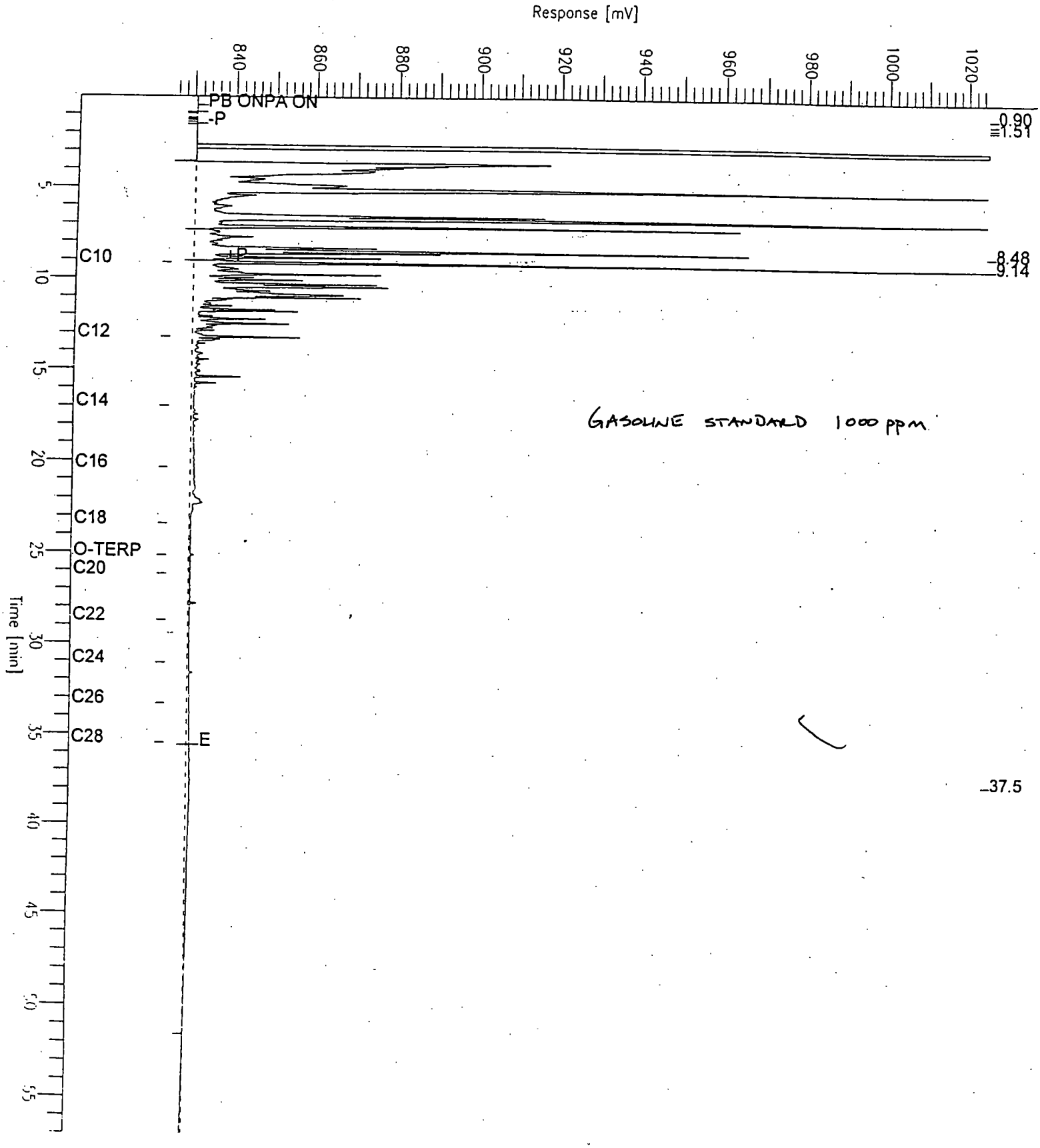
Chromatogram

Sample Name : GASOLINE 1000PPM H0086
FileName : E:\GC12\CAU4077A.RAW
Method :
t Time : 0.01 min
e Factor: 0.0

End Time : 59.37 min
Plot Offset: 825 mV

Sample #:
Date : 9/10/96 09:19 AM
Time of Injection: 9/9/96 05:29 AM
Low Point : 825.00 mV
Plot Scale: 200.0 mV

High Point : 1025.00 mV



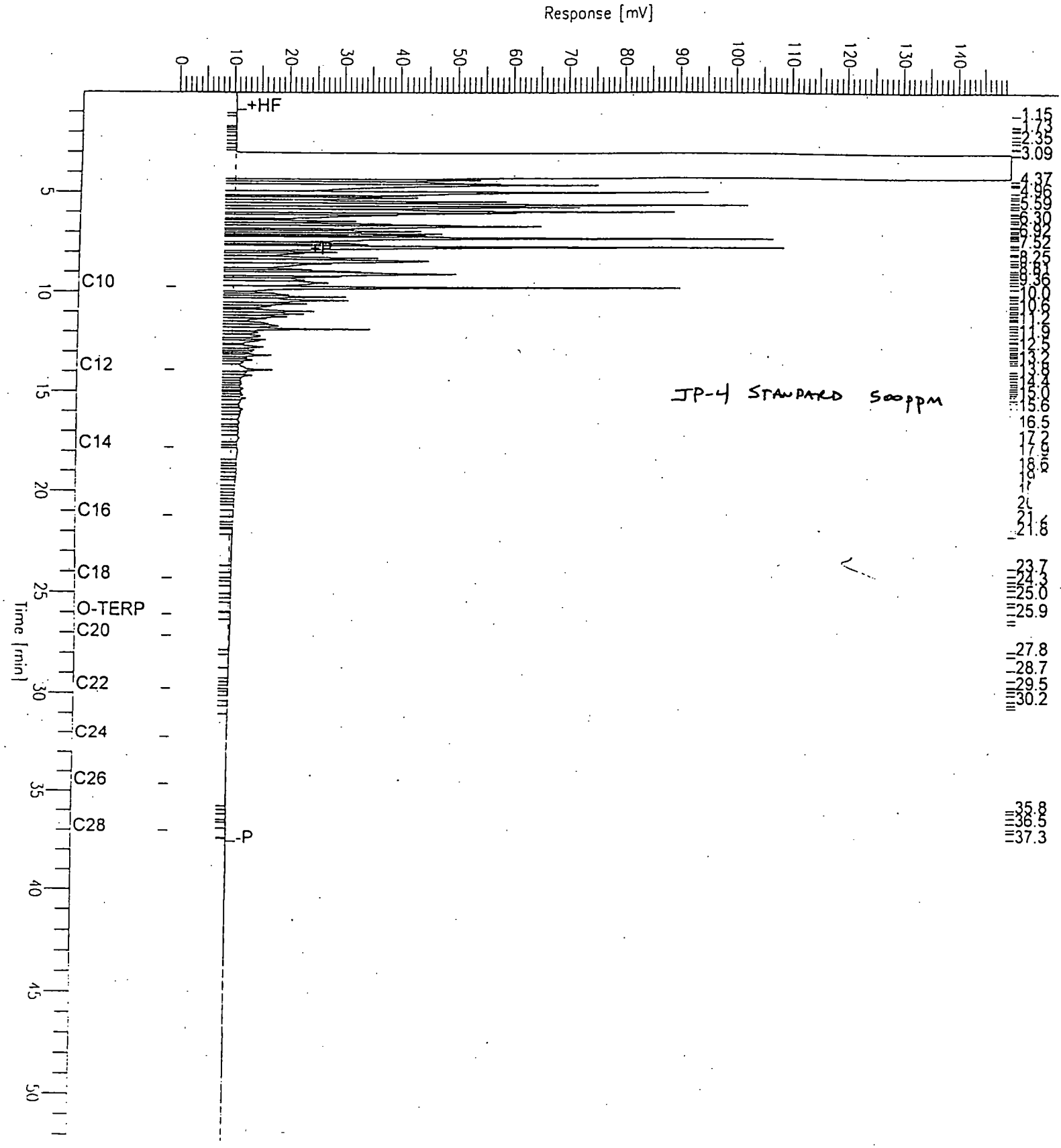
GASOLINE STANDARD 1000 ppm

6000283

Chromatogram

Sample Name : JP-4 500PPM H0072
FileName : E:\GC10\AAU2060.RAW
Method :
Start Time : 0.02 min End Time : 55.00 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #: Page 1 of 1
Date : 8/20/96 02:08 PM
Time of Injection: 8/14/96 11:57 AM
Low Point : 0.00 mV High Point : 150.00 mV
Plot Scale: 150.0 mV

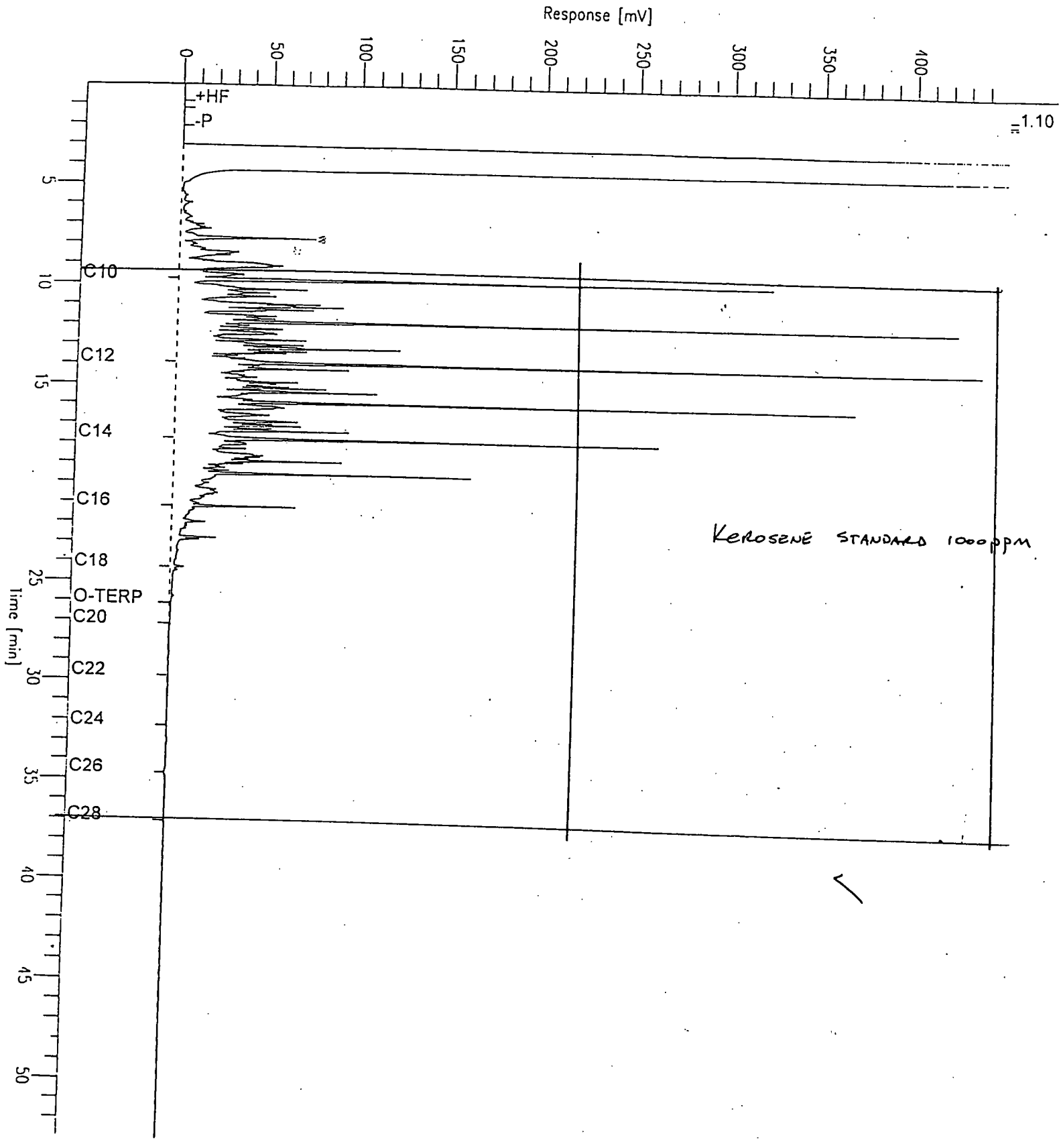


6000197

Chromatogram

Sample Name : Kerosene 1000PPM H0087
FileName : E:\GC10\ASP2018A.RAW
Method :
Time : 0.02 min End Time : 55.00 min
Factor: 0.0 Plot Offset: 0 mV

Sample #:
Date : 9/4/96 09:51 AM
Time of Injection: 9/3/96 12:20 PM
Low Point : 0.00 mV High Point : 450.00 mV
Plot Scale: 450.0 mV



KEROSENE STANDARD 1000 ppm

6000202

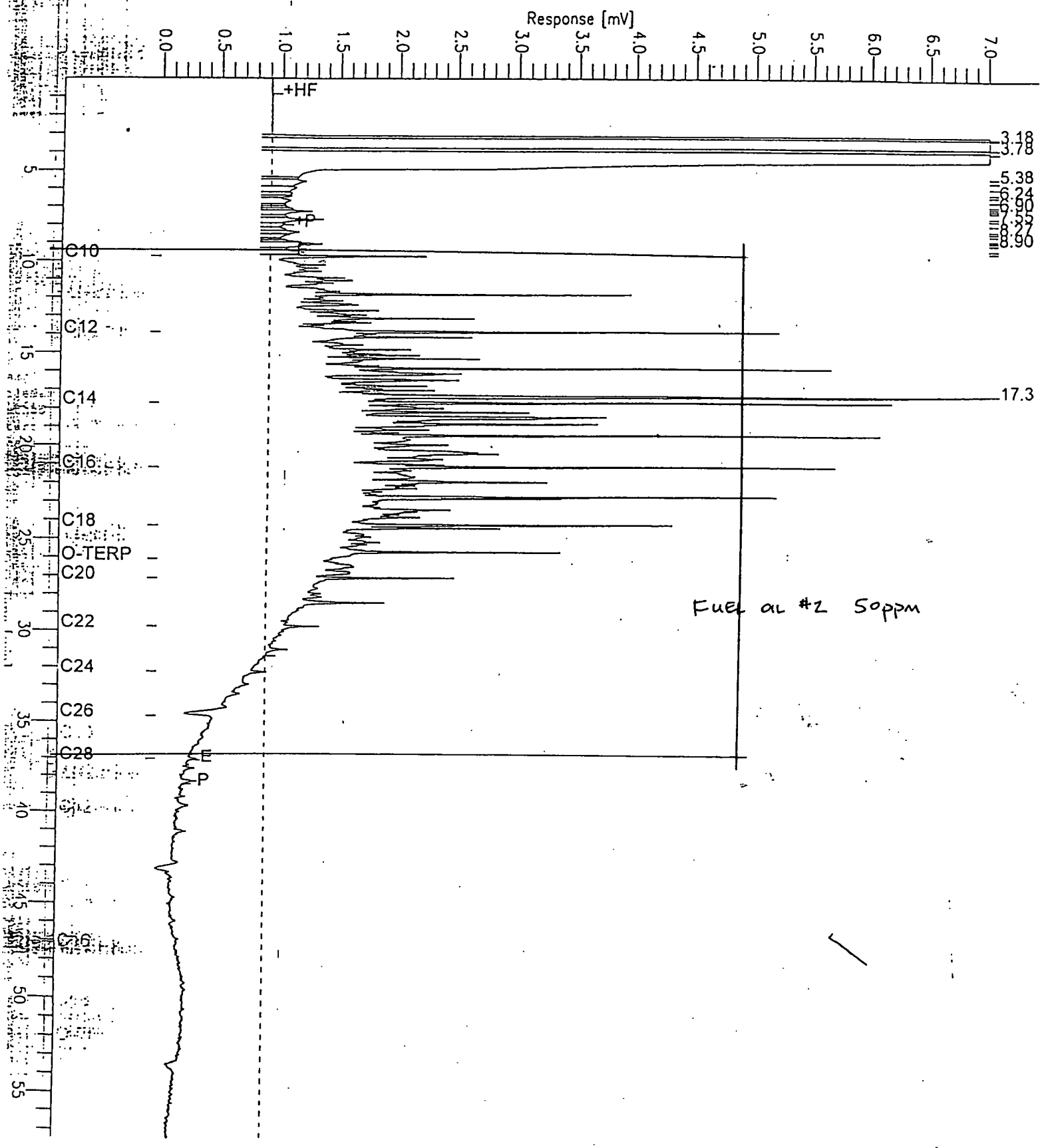
Chromatogram

Sample Name : FO#2 50 PPM
FileName : E:\GC10\ASP2122A.RAW
Method :
Start Time : 0.02 min
Scale Factor: 0.0

End Time : 60.00 min
Plot Offset: 0 mV

Sample #:
Date : 9/18/96 03:54 PM
Time of Injection: 9/17/96 06:57 AM
Low Point : 0.00 mV
Plot Scale: 7.0 mV

High Point : 7.00 mV

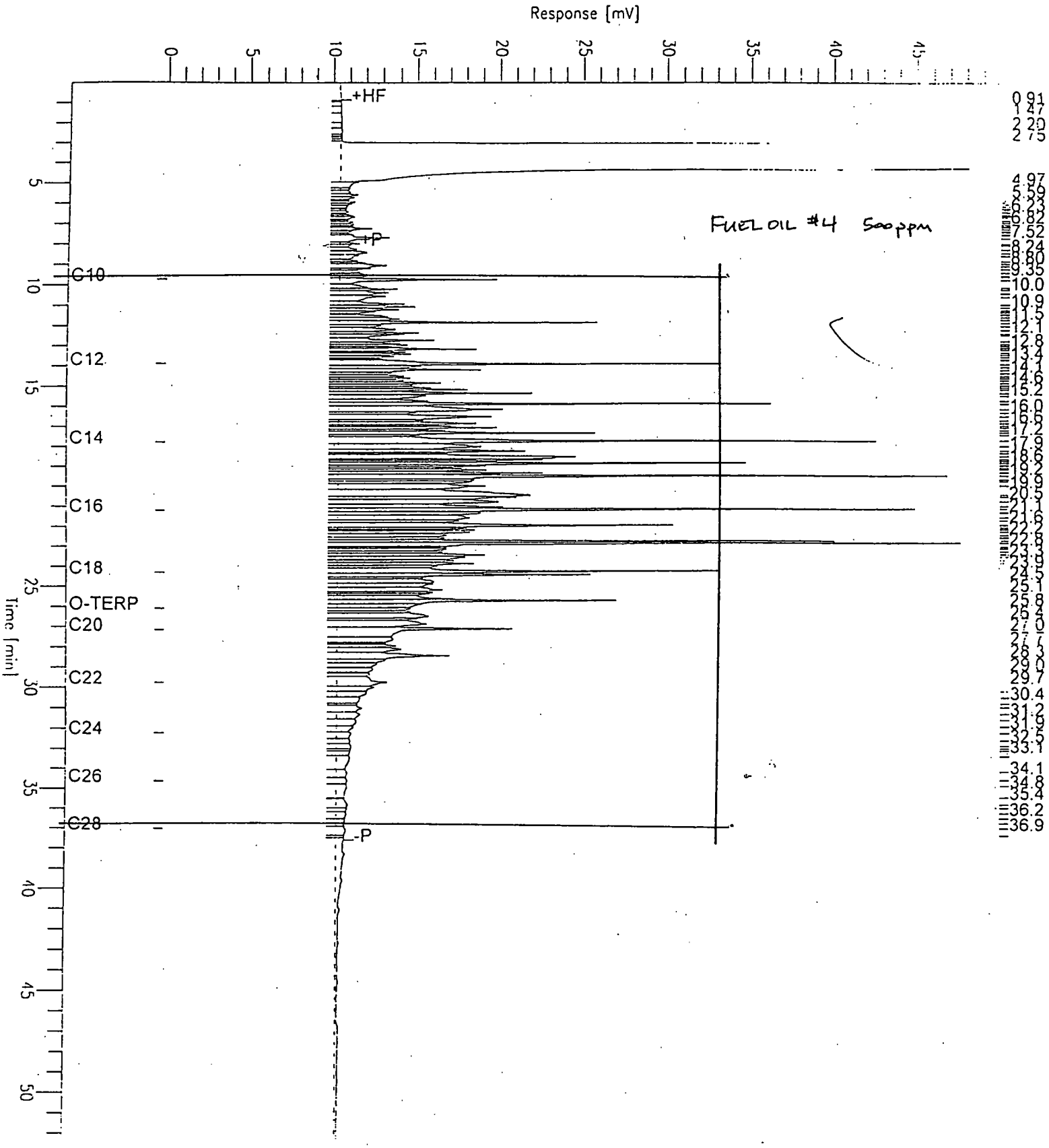


6000231

Chromatogram

Sample Name : FO#4 500PPM H0077
FileName : E:\GC10\AAU2063.RAW
Method :
Start Time : 0.02 min End Time : 55.00 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #:
Date : 8/20/96 02:09 PM
Time of Injection: 8/14/96 03:18 PM
Low Point : 0.00 mV High Point : 50.00 mV
Plot Scale: 50.0 mV

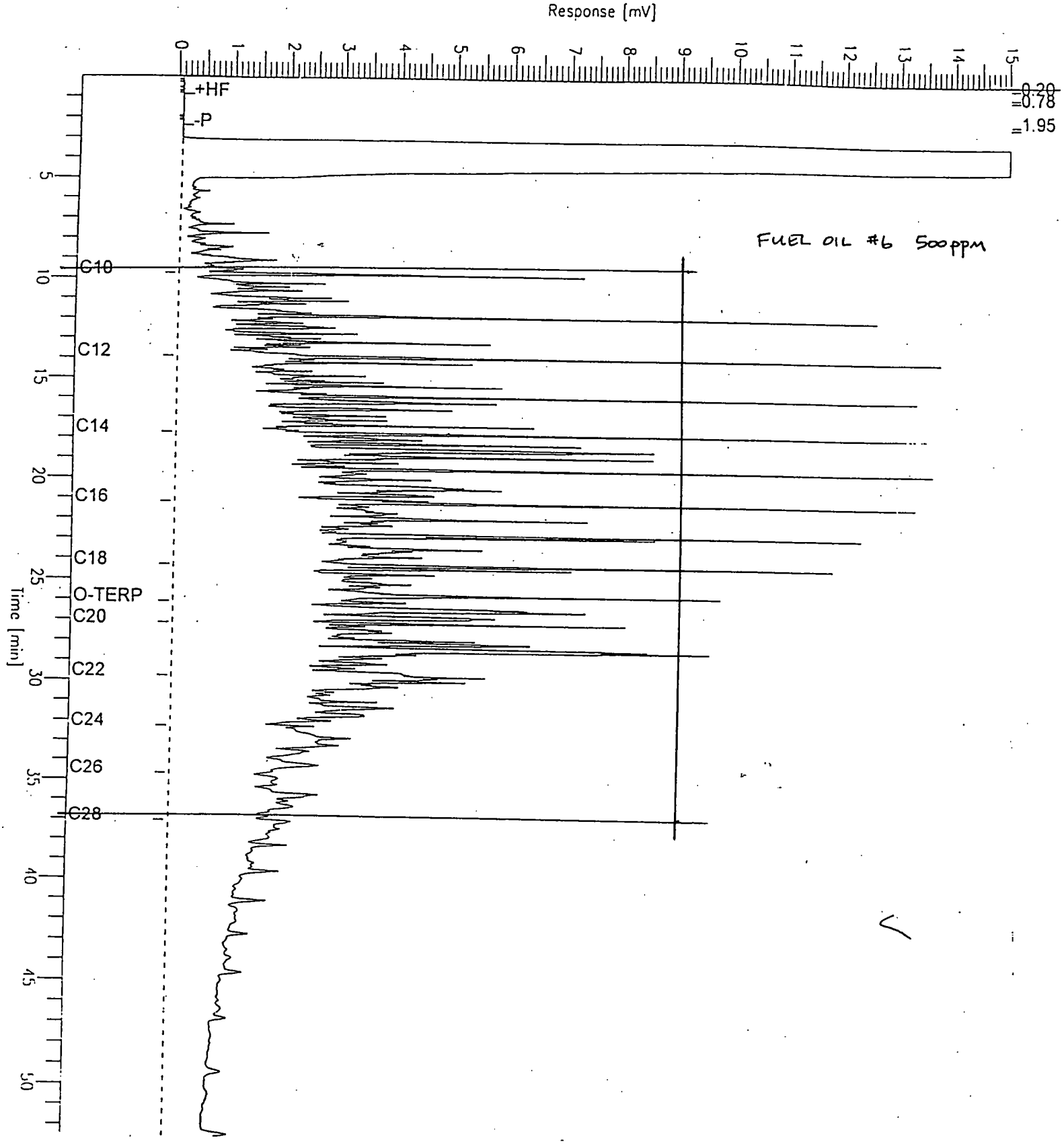


6000203

Chromatogram

Sample Name : FO#6 500PPM H0045
FileName : E:\GC10\ASP2021A.RAW
Method :
Start Time : 0.02 min
End Time : 55.00 min
Scale Factor: 0.0
Plot Offset: 0 mV

Sample #:
Date : 9/4/96 09:54 AM
Time of Injection: 9/3/96 03:42 PM
Low Point : 0.00 mV
High Point : 15.00 mV
Plot Scale: 15.0 mV

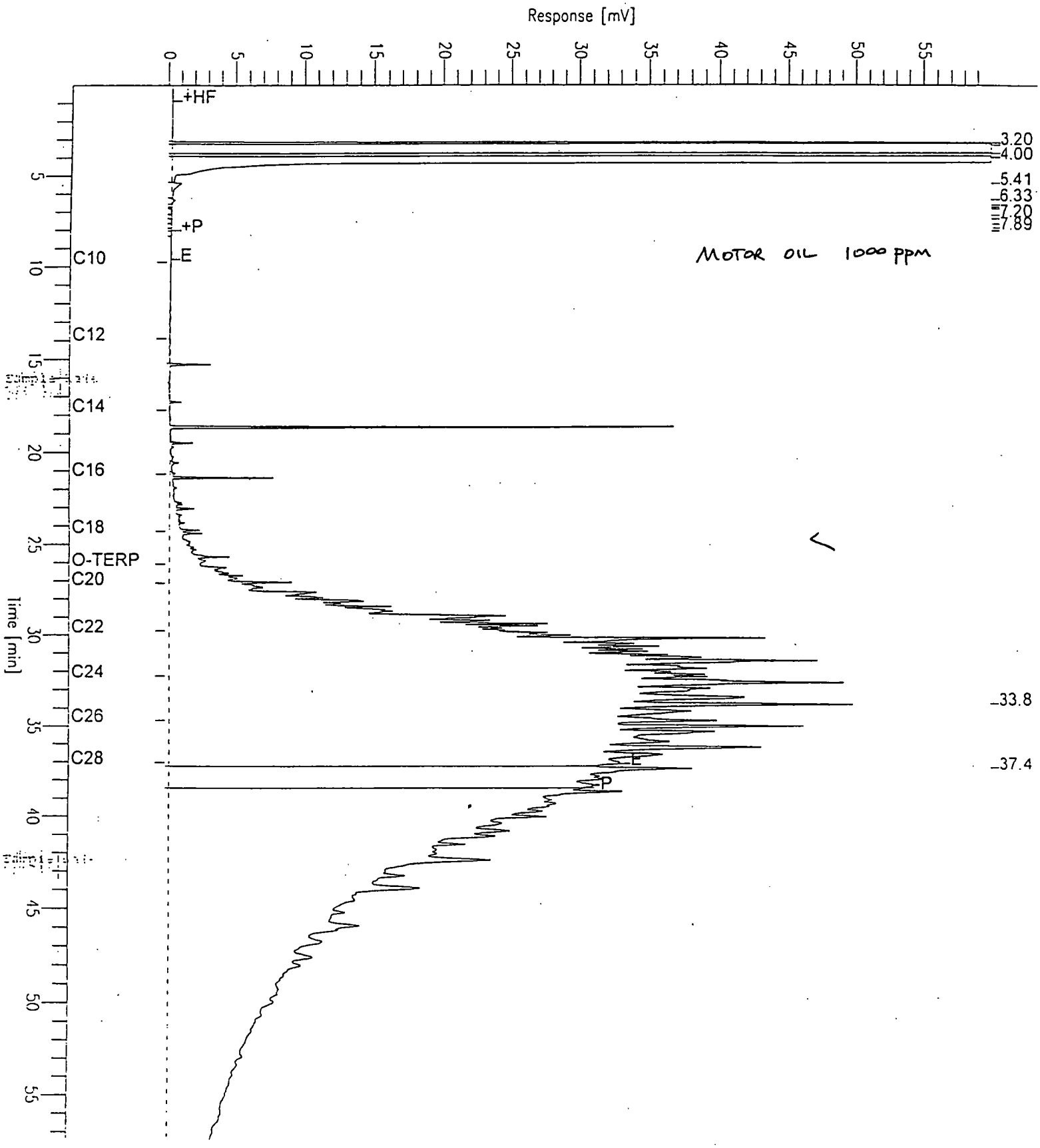


6000208

Chromatogram

Sample Name : Motor Oil 1000 PPM H0044
FileName : E:\GC10\ASP2130A.RAW
d :
Time : 0.02 min End Time : 60.00 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #: Page 1 of 1
Date : 9/18/96 04:15 PM
Time of Injection: 9/17/96 04:38 PM
Low Point : 0.00 mV High Point : 60.00 mV
Plot Scale: 60.0 mV

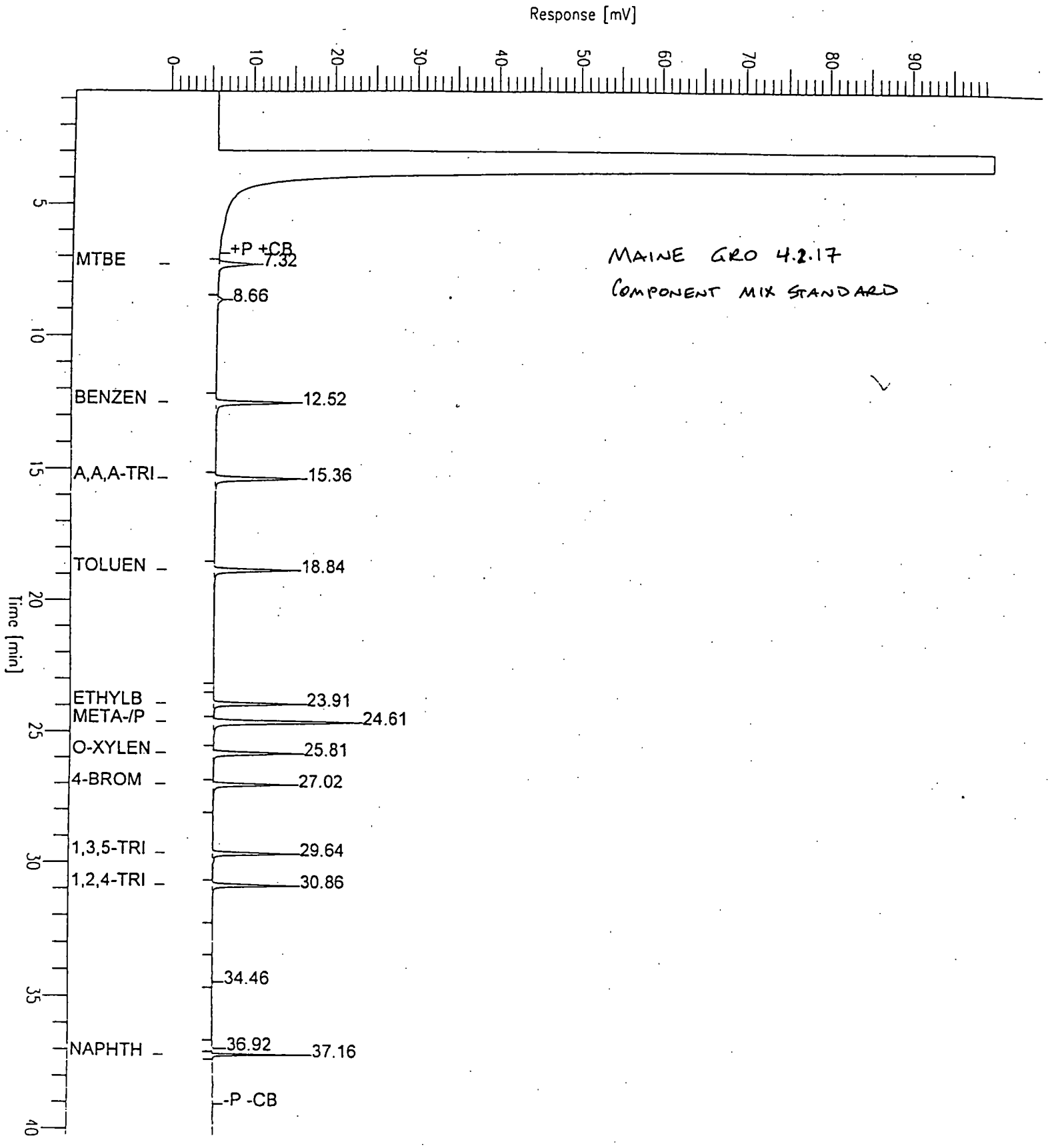


5000251

Chromatogram

Sample Name : 100UG/L
FileName : D:\GC04\JL1B004.raw
Method : VPHC
: Time : 0.70 min End Time : 42.00 min
: Factor: 0.0 Plot Offset: 0 mV

Sample #: 2UL H0107 Page 1 of 1
Date : 7/12/96 03:06 PM
Time of Injection: 7/9/96 10:37 AM
Low Point : 0.00 mV High Point : 100.00 mV
Plot Scale: 100.0 mV

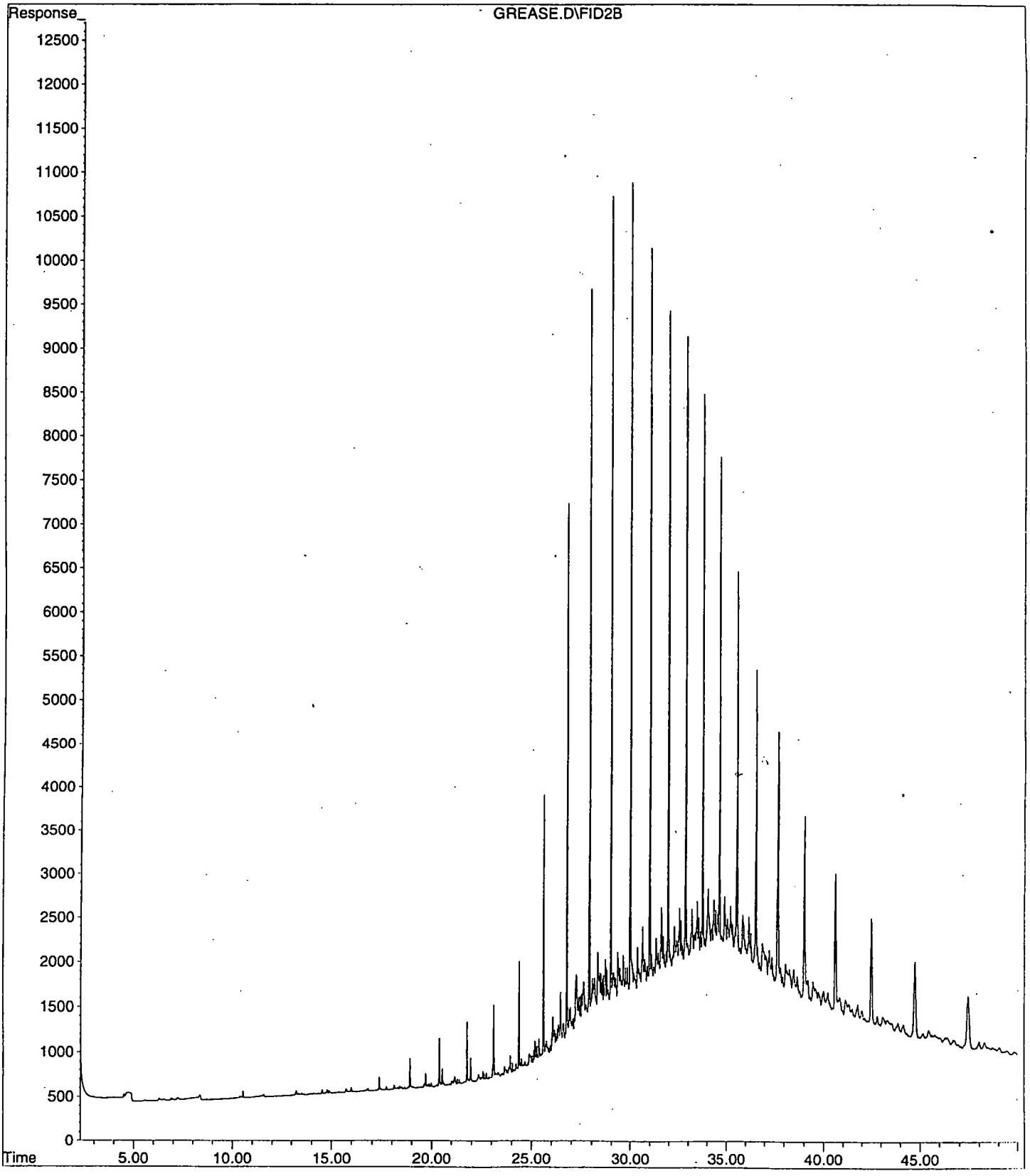


MAINE GRO 4.2.17
COMPONENT MIX STANDARD

6000310

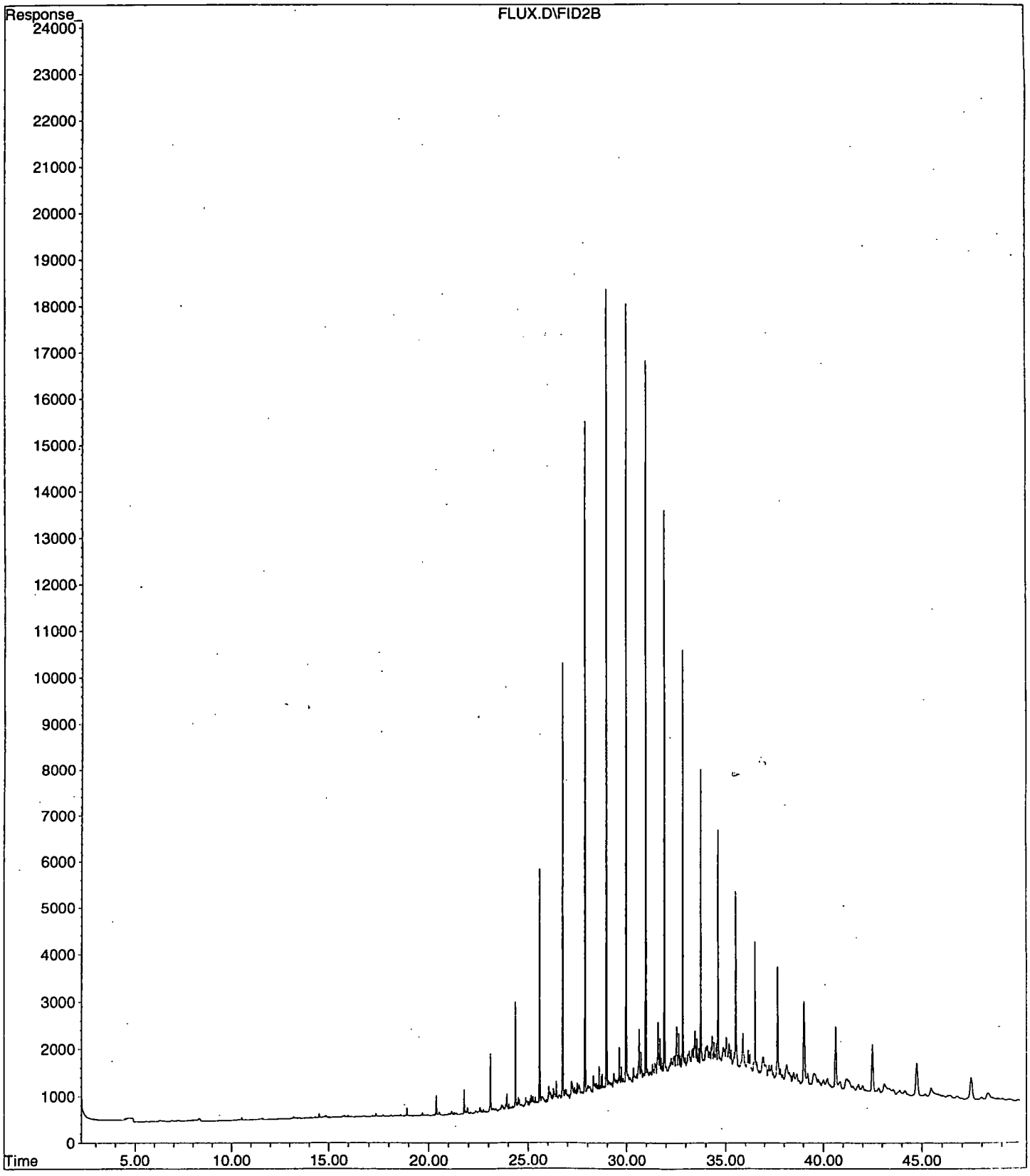
File : D:\GC\GREASE.D
Operator : C. HOPKINS
Acquired : 1 Mar 99 2:06 am using AcqMethod REAR.M
Instrument : GC FOW
Sample Name: MINERAL GREASE
Misc Info :
Vial Number: 51

HETL



File : D:\GC\FLUX.D
Operator : C. HOPKINS
Acquired : 1 Mar 99 4:15 am using AcqMethod REAR.M
Instrument : GC FOW
Sample Name: SOLDERING FLUX
Misc Info :
Vial Number: 53

HETL



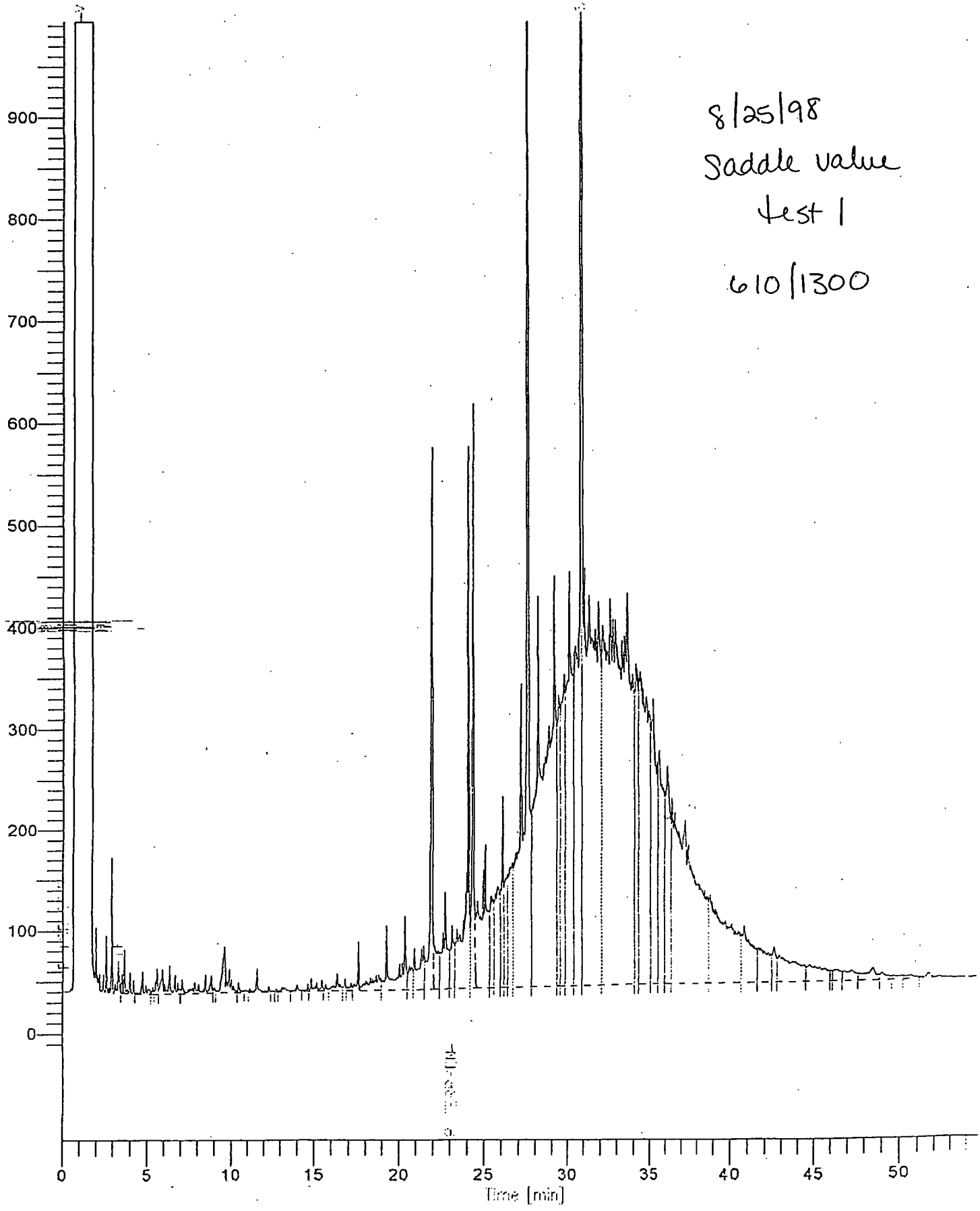
Tennant Harbor Chromatogram

NEL

Sample Name : W-9837964 U ME DEP SV TEST1
FileName : C:\TC4\DATA\QTPH421.RAW
Method : EXTDRO.MTH
Start Time : 0.00 min End Time : 54.86 min
Scale Factor: 1.0 Plot Offset: -10 mV

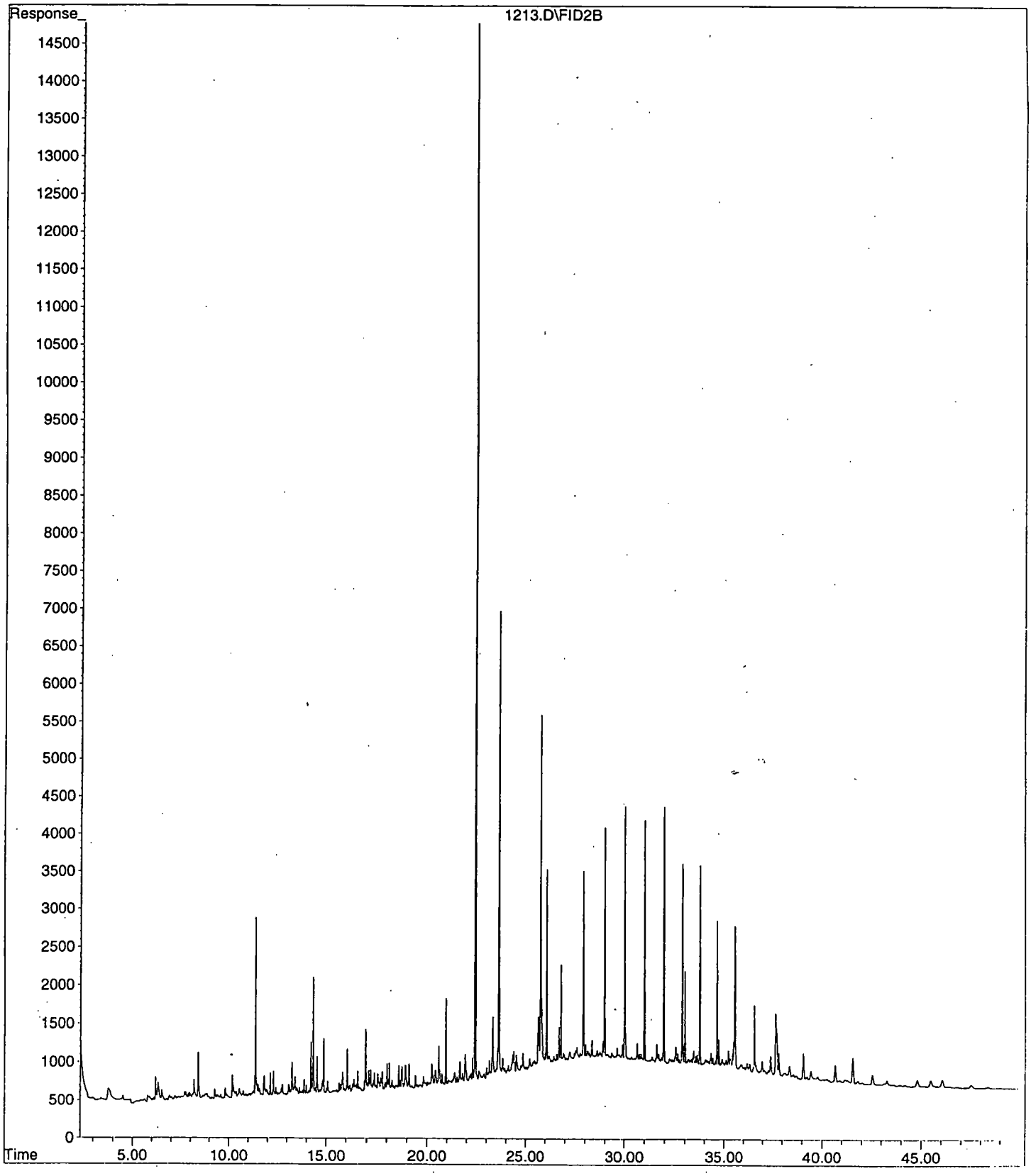
Sample #: 13 Page 1 of 1
Date : 9/1/98 09:09 AM
Time of Injection: 9/1/98 04:14 AM
Low Point : -10.40 mV High Point : 993.88 mV
Plot Scale: 1004.3 mV

8/25/98
Saddle value
test 1
610/1300

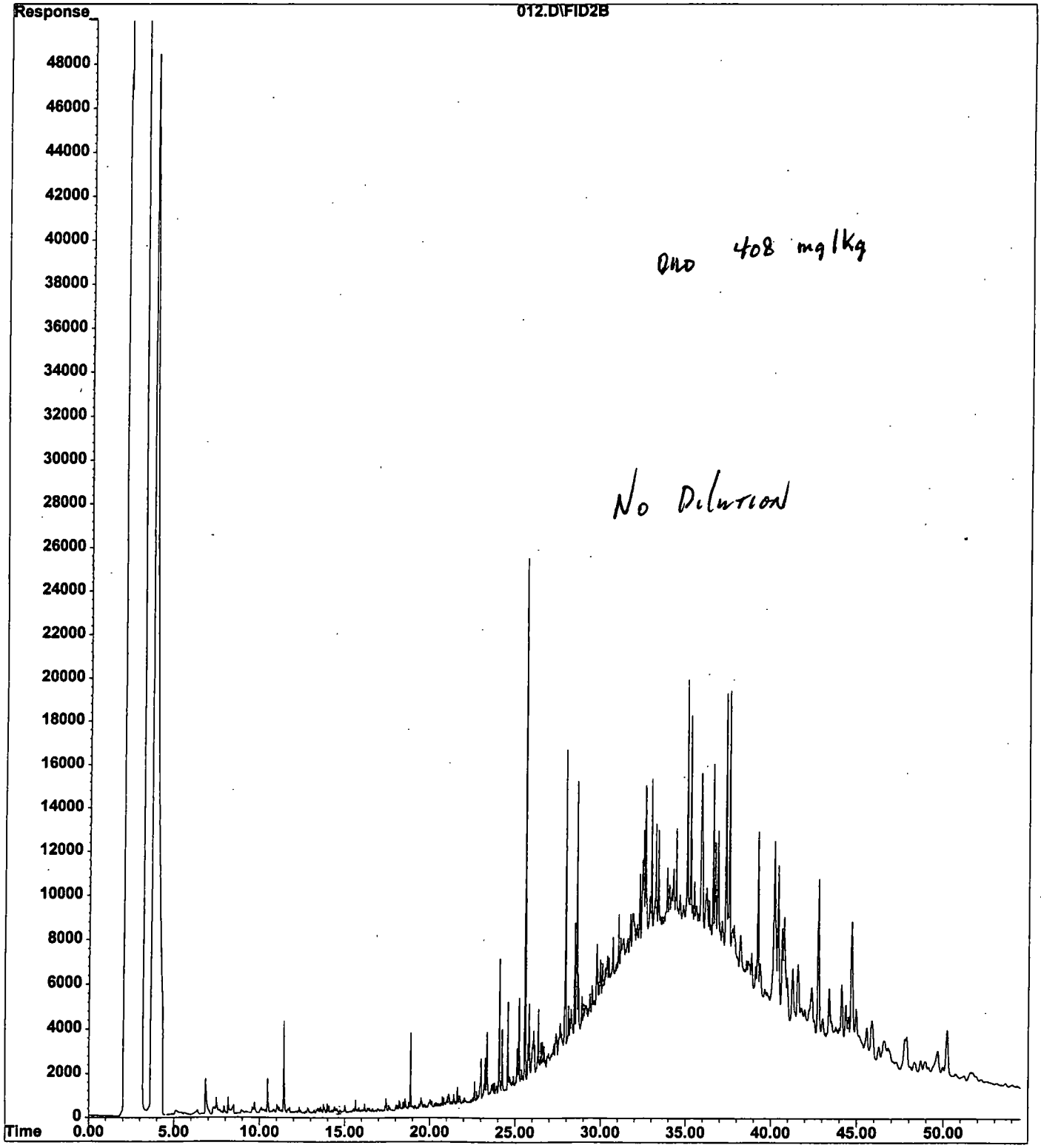


HETL

File : D:\GC_MS\1213.D
Operator : C. HOPKINS
Acquired : 6 Feb 99 5:18 pm using AcqMethod REAR.M
Instrument : GC FOW
Sample Name: 1213 Boiler Valve
Misc Info : LOWELL COVE/MDEP
Vial Number: 21



File : C:\HPCHEM\1\DATA\061907R\012.D
Operator : JDM
Acquired : 20 Jun 20107 4:37 am using AcqMethod DROREAR.M
Instrument : DRO-GC1
Sample Name: C024082-003
Misc Info : WINTHROP
Vial Number: 12

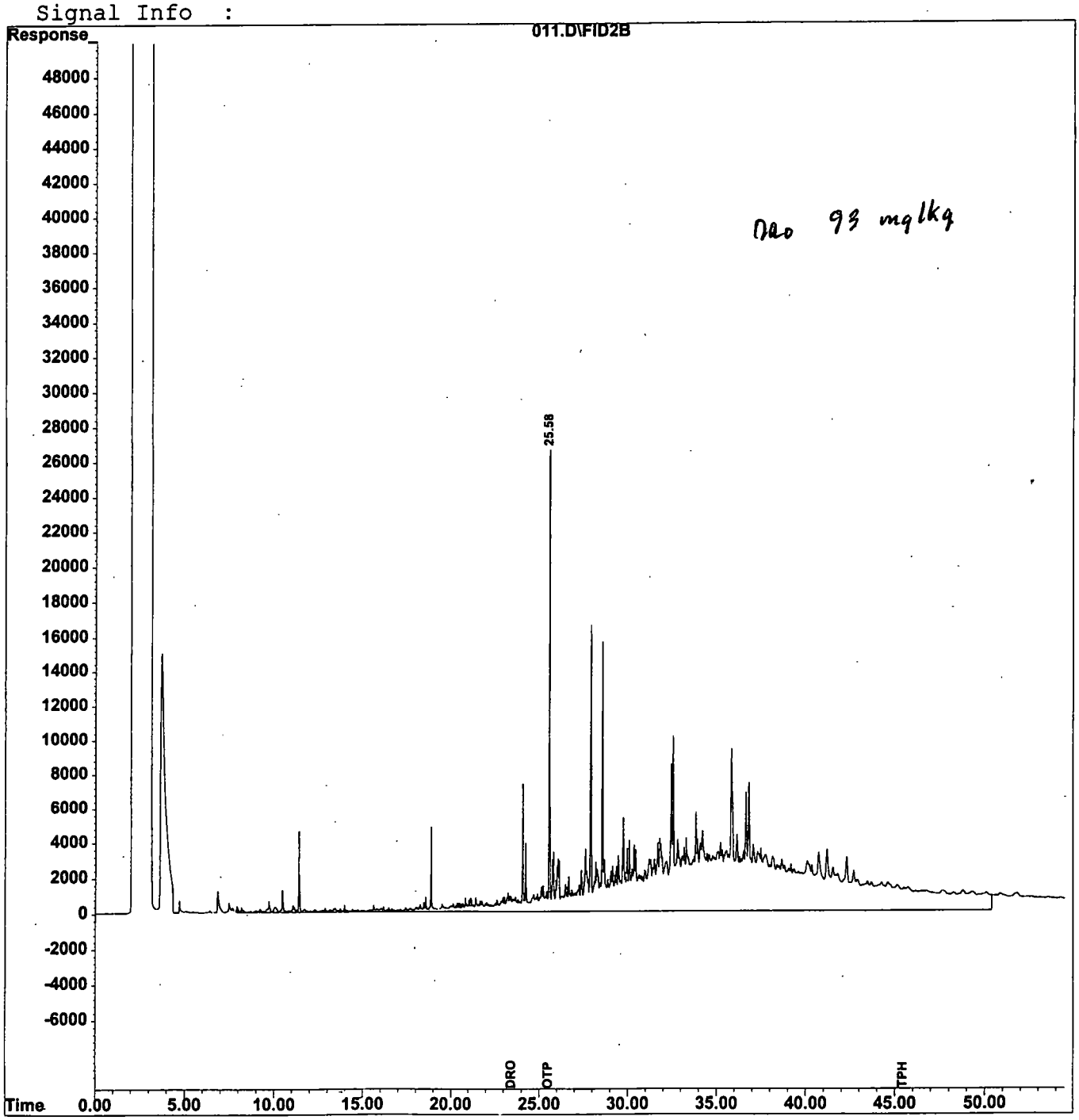


Data File : C:\HPCHEM\1\DATA\062207R\011.D
Acq On : 23 Jun 20107 1:34 am
Sample : C024082-002
Misc : WINTHROP
IntFile : EVENTS.E
Quant Time: Jun 26 12:53 19107 Quant Results File: 022707R.RES

Vial: 11
Operator: JDM
Inst : DRO-GC1
Multiplr: 1.00

Quant Method : C:\HPCHEM\1\METHODS\022707R.M (Chemstation Integrator)
Title : DRO F
Last Update : Sun Jun 17 11:41:27 2007
Response via : Multiple Level Calibration
DataAcq Meth : DROREAR.M

Volume Inj. :
Signal Phase :
Signal Info :

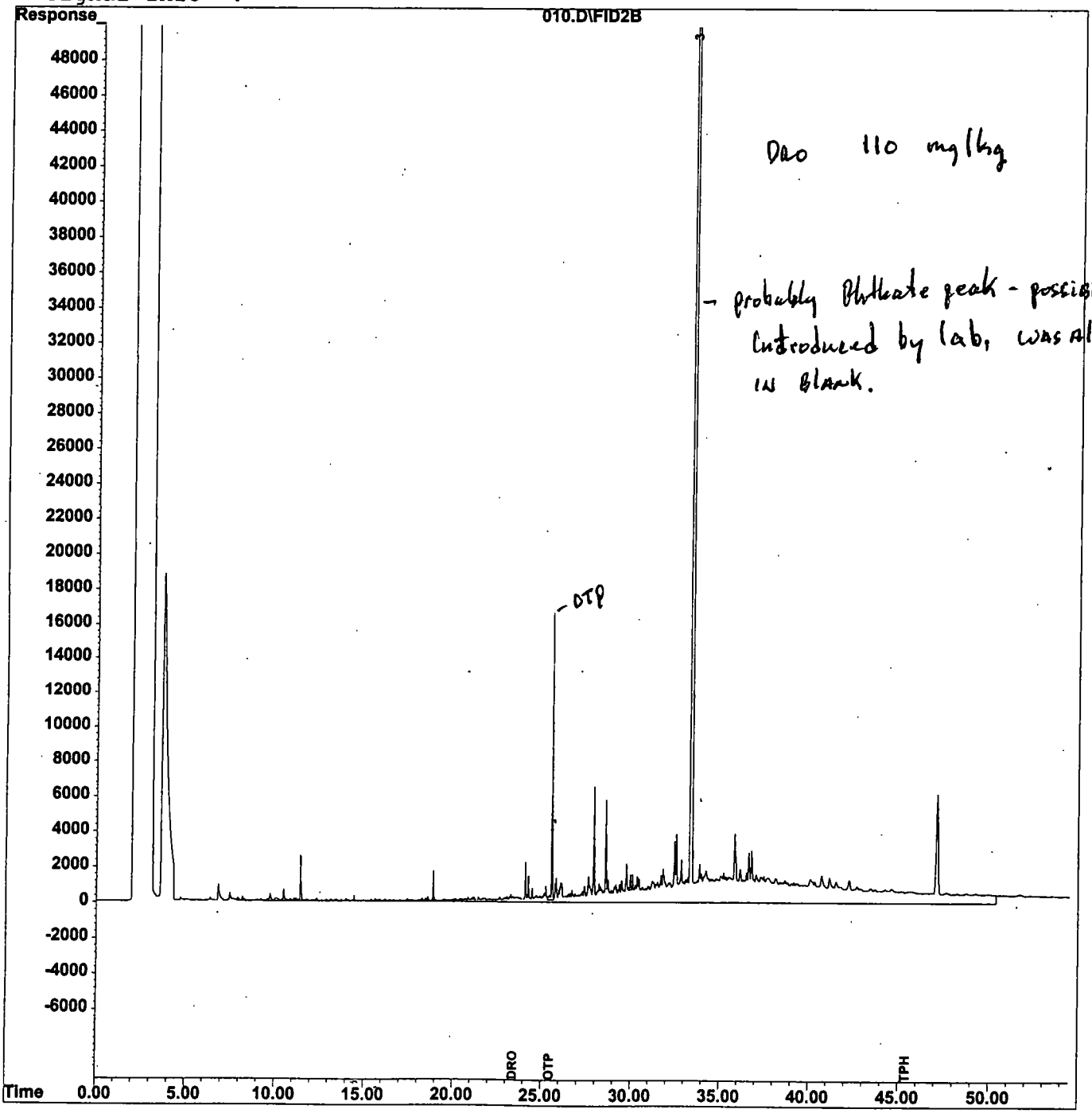


DRO 93 mg/kg

Data File : C:\HPCHEM\1\DATA\062207R\010.D Vial: 10
Acq On : 23 Jun 20107 12:28 am Operator: JDM
Sample : C024082-001 Inst : DRO-GC1
Misc : WINTHROP Multiplr: 1.00
IntFile : EVENTS.E
Quant Time: Jun 26 12:52 19107 Quant Results File: 022707R.RES

Quant Method : C:\HPCHEM\1\METHODS\022707R.M (Chemstation Integrator)
Title : DRO F
Last Update : Sun Jun 17 11:41:27 2007
Response via : Multiple Level Calibration
DataAcq Meth : DROREAR.M

Volume Inj. :
Signal Phase :
Signal Info :



DRO 110 mg/kg

- probably Phthalate peak - possibly introduced by lab, was also in blank.

Photograph showing oil stains on bowl, oil blebs in sediment and sheen on wet surface of sediment.

Photograph of weedy silty sediment showing swirl of black oil on water surface.

Annabessacook Lake – Oil Spill
Wildlife Report

IFW-Nicole Munkwitz

The late April 2007 oil spill at the north end of Annabessacook Lake, Winthrop (Kennebec Co.) took place in an IFW designated Inland Waterfowl and Wading bird habitat. This is an area heavily used by waterfowl in early spring, as it is one of the first 'ice-off' areas suitable for foraging. While the spill took place at a time when most of the lake was still covered by ice, the ice was melted off several days following the spill. It is suspected that a combination of the high waters (creating less suitable habitat), the opening up of other suitable habitat as ice cover disappeared on Annabessacook Lake and nearby lakes, and presence of clean-up crew deterred the normally high waterfowl use of the oiled area. While groups of waterfowl were observed visiting the northern bay of the lake seldom did they stay long nor were they the large groups expected. Thus the oil spill appeared to have little or no impact on migratory birds using the lake.

IFW responded to several reports of oiled wildlife. Wildlife surveys specific to observing the loon population on the lake were made following a report of unusual behavior of a common loon (coming onto land) early after the spill and again (excessive preening) during the second week following the spill. During these surveys two or three pairs of loons were found but no oil was observed on a loon nor was there unusual loon behavior observed. It is inconclusive whether these behaviors were linked to the oiling of a loon. A dead, possibly oiled, porcupine was checked out and no cause of death could be determined nor was oil found on it quills or fur. An oiled muskrat was reported immediately following the spill. On April 25th, a lethargic and possibly oiled muskrat was observed near the outlet of Mill Stream but we were unable to catch it. On April 26th clean-up crew collected one dead muskrat while removing oiled vegetation. In the weeks following, all observed muskrat activities appeared to be normal. The clean-up crew also collected one dead musk turtle, while IFW staff collected one dead painted turtle and one dead bullfrog. The cause of death for each was not undetermined. A possibly oiled female hooded merganser was observed on April 25th. An attempt to capture the bird was unsuccessful and the bird was never observed again.

Finally, turtles were observed in the oiled vegetation and many were successfully hand captured during each visit to the lake. Turtle traps were set on April 28th outside of the oiled areas although no turtles were captured here. On May 1st traps were re-set inside the boomed area, where turtles were successfully trapped and checked for oil. Oiled turtles were brought to the Bangor IFW office where they were washed clean of all oil. The turtles were then taken to Avian Haven, a wildlife rehabilitation center, were their health was checked and they remained under observation until the time of their release back into Annabessacook Lake. A total of 84 oiled painted turtles and one snapping turtle were captured and cleaned. One painted turtle died in captivity while 83 painted turtles and the snapping turtle were successfully released back into Annabessacook Lake. Two musk turtles and were captured but no oil was found on them and they were released. On May 7th and 9th oiled turtles were captured and brought in for rehabilitation but also a painted turtle with no oil was captured and immediately released.

A group of 49 turtles was released on May 9th. Before turtles were released, morphological measurements were taken and each was marked with a notch from the same marginal scute in the rear of the caparace for future identification. Twenty-six turtles were

captured in the traps when checked on May 11th, 7 new turtles, 3 of which were lightly to moderately oiled, and 18 previously released turtles, none of which were re-oiled. The final turtle to be captured in the trap was a large female red-eared slider. This was a surprising capture as red-eared sliders are not native to the state of Maine and it was unclear if they would survive the Maine winters. This turtle most likely was a released pet turtle that not only survived in Annabessacook Lake over winter but could potentially be a founding turtle for a population that would compete with native species. She was removed from the wild for a home in captivity.

Traps were removed on May 11th but will be periodically reset to monitor that previously washed turtles are staying clean and check for any oiled turtles that were not previously captured. It is also hoped that trapping efforts will capture any other red-eared sliders in the lake. Traps were most recently set on May 29th and checked on May 31st. No previously captured and marked turtles where recaptured within the three traps set. In the traps were three new painted turtles with no oil along with five snapping turtles of which only two showed a possible trace of oil on their plastron. All turtles were immediately released and the traps were removed.

While our focus is on preventing wildlife from becoming oiled, the main activities of the wildlife response include surveys and assessments of wildlife use within oiled areas and capture, washing and rehabilitation of oiled animals, in this case all turtles.

Since IFW was first notified of the spill at Annabessacook Lake, the help of several IFW staff, DEP response staff, several volunteers, local observers, and Avian Haven were instrumental in carrying out the spill wildlife response. What follows is a brief list of wildlife response activities:

-An initial assessment of potential for wildlife oiling & prevention (4/24/07)
-Dusk survey of waterfowl (foraging and roosting) use of the northern bay of Annabessacook Lake (4/24/07)
-Boat lead shoreline assessment of entire spill area & turtle captures; oiled turtle washing (4/25/07)
-Canoe based survey of oiled areas and search for oiled wildlife; oiled turtle washing (4/26/07)
- Oiled turtle washing (4/27/07)
-Canoe based survey of oiled areas and search for oiled wildlife; oiled turtle washing (4/28/07)
-Oiled turtle washing (4/29/07)
-Trap check (4/30/07)
-Canoe based surveys of oiled areas and search for oiled wildlife; trap check and oiled turtle washing (5/1/07)
-A.M. survey of loon pairs on the Lake (5/2/07)
-P.M. survey of loon pairs on the Lake (5/2/07)
-Canoe based survey of oiled areas and search for oiled wildlife; trap check and oiled turtle washing (5/3/07)
- Search for oiled wildlife in near oiled areas; trap check and oiled turtle washing (5/5/07)
-Oiled turtle washing (5/6/07)
-Trap check (5/7/07)
-Oiled turtle washing (5/8/07)
-Morphological measurements & marking of turtles at Avian Haven, trap check and release of turtles (5/9/07)

-Oiled turtle washing (5/10/07)
-Oiled turtle washing, morphological measurements & marking of turtles at Avian Haven, trap check and release of turtles (5/11/07)
-Oiled turtle washing (5/12/07)
-Release of turtles (5/14/07)
-Release of turtles (5/27/07)
-Traps set (5/29/07)
-Traps check (5/31/07)

Winthrop Commerce Center
2007 Remediation Workplan

1. Install bedrock flushing wells. Drill 3'- 5' into bedrock at two locations in area of highest contamination. Install PVC pipe in boreholes and backfill with cuttings. *(NOTE: This task was completed by Northeast Test Borings during the week of 6/25)*

2. Install new run of boom. Install additional run of boom across Mill Stream in quiet area just downstream of WCC property. *(NOTE: This task was completed by DEP Response personnel during the weeks of 6/25).*

3. Extend cofferdam. Lengthen cofferdam in downstream direction to enclose "island" of streambed soils and convert to underflow dam. Line inside of sandbags, streambed floor, and retaining wall with poly to make coffer watertight. Install 6" PVC pipe at upstream end, to bring Mill Stream flow into cofferdam, creating pond to trap/remove flushed product.

4a. Cut brush on streambed soil "island." Remove trees, brush, poison ivy, etc. to bare soil, to permit exploration for product.

4b. Explore streambed soils for free product. Using shovels, soil augers, and hand tools, survey shallow soils within cofferdam to define extent of free product.

4c. Remove contaminated streambed soils at upstream end of "island." Remove soils at known free product discharge point to facilitate flushing. Excavate with hand tools into bucket of excavator in parking lot above. Vactor soils if appropriate.

4d. Remove rubble at foot of poured wall. Remove stone and rubble to bedrock surface where free product discharge has been observed. Return clean materials to streambed outside cofferdam. Remove contaminated materials to disposal, as in Item 4c.

5. Flush shallow bedrock. Pump hot water into shallow bedrock fractures through boreholes installed in Item 1, above. Hot water to be produced by heating tote tank with steam heater. Collect freed product within cofferdam and remove with sorbent pads or vactor, depending on volume. Inspect adjacent boreholes for product and bail off any collected. Flush until little or no product is being liberated. Care will be taken to ensure that flushing does not liberate oil into the Mill Stream/Lake environment. If the coffer dam containment structure is not effective at containing oil, the flushing will be stopped. The design of the containment will be re-evaluated. Downstream boom will be monitored and cleaned to collect any oil that escaped the coffer dam.

6. Excavate parking lot. Remove soil and buried structures to bedrock surface. Reduce massive concrete as needed to access contaminated soil. It is expected that abandoned, concrete-encased utility lines will be encountered and these will be removed as needed. Stockpile clean shallow soils onsite for backfill. Load and dispose of contaminated soils offsite at approved facility. A soil sample(s) will be taken to characterize for disposal per receiving facility requirement.. Evaluate breaking up bedrock mechanically to shallowest bedding plane fracture, to better access free product.

7. Flood bedrock surface. Fill excavation with hot water to a depth of 2', if possible, to flush product from fractures. Collect freed product in cofferdam and remove using sorbent pads or vactor, depending on volume. Repeat flushing until no more product is liberated. Monitor and clean downstream boom as necessary following this procedure.

8. Remove streambed soils contaminated by flushing. Examine soil within cofferdam and remove soil contaminated by flushed product.

9a. Install stone, well in excavation for future flushing. Place +/- 1' blanket of 3/4" stone over floor of excavation. Install 8" PVC pipe, bottom 2' with sawcut slots, vertically at low point of bedrock surface.. Place geotextile over stone blanket to separate stone from backfill fines.

9b. Backfill excavation. Place and compact stockpiled soil in excavation in 8" lifts, wetting as needed for good compaction with vibratory equipment. Use material with gradation recommended by paving contractor for pavement subgrade.

10. Repave parking lot. Allow backfill to settle 3-4 weeks. Replace pavement removed or damaged by remedial activities with equal. Complete flushing well with flush-mount roadbox.

11. Drill bedrock sump in flushing well. Drill 6" diameter pocket +/- 3' into bedrock at bottom of flushing well, to serve as catchment sump for product freed in future.

12. Remove cofferdam/demobilize. Remove all floating and sunken product, sorbents, and contaminated media from within cofferdam. Dismantle cofferdam.

Redistribute in streambed any material used to armor exterior. Assess removal of boom downstream and in lake.

13. Install riprap protection at foot of concrete wall. Place stone against base of concrete wall (where rubble was removed per Item #4b) to prevent current undercutting wall. Use stone sized for spring runoff stream stages and velocities.

Free Product Exploration Plan
Annabessacook Inlet Delta
Winthrop Commerce Center LUST Site (A-157-05)
May 10, 2007
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Introduction and Background

In April 2005, #6 fuel oil that had been trapped in the ground at the former Carlton Woolen Mill on Main Street in Winthrop seeped into Mill Stream in substantial quantities during the spring freshet. The oil was washed quickly down stream to Annabessacook Lake. The lake was partially covered with ice, so the oil only had access to the northern end of the lake that was ice-free. The shoreline of that northern portion of the lake was exposed to the floating heavy oil before cleanup workers were able to further restrict the oil through the effective use of booms.

During 2005 and 2006 the former boiler room at the mill was identified as the source and a major soil removal was completed that included demolition of the boiler room and excavation of soils to the bedrock surface.

Discharge of # 6 oil resumed in mid-April of 2007, again during spring high water. The source again appears to be the location of the former boiler room. The quantity discharged appears to have been substantial (perhaps 100 gallons or more?) and the oil appeared in the stream over a period of a week or so. It appears that rather abundant oil in the ground is being released to the surface water environment in prolonged episodes that follow high water events. Booming and cleanup activities have removed floating oil that resulted from these discharges. This work plan outlines an reconnaissance investigation to evaluate the occurrence of sunken heavy oil on the surface of the Annabessacook Lake inlet delta.

Objectives

This sampling program is intended to determine whether sunken separate phase #6 fuel oil from either the 2007 or 2005 discharges can be found easily in and surrounding the distributary channels at the inlet of Annabessacook Lake.

Field Methods

Twenty sample locations have been selected using air photos that show the locations of distributary channels of the inlet delta. A Global Positioning Unit will be used to navigate a small boat to the pre-selected sample locations. The boat will be anchored at each location and two samples of the bottom sediments will be collected using a petit ponar grab sampler. The samples will be emptied into a large stainless steel bowl and

will be visually inspected for the presence of separate phase oil, tar balls, oil-stained detritus and oil sheen. Petroleum odors will be noted. The samples will be bagged for disposal, rather than being returned to the lake to minimize redistribution of potentially contaminated sediments.

Notes of observations will be recorded and photographs will be taken. The actual sample locations will be determined using high-precision GPS (± 1 meter). Samples of selected neat samples will be submitted for laboratory characterization (DRO chromatogram) if free product is encountered.

Two water samples from the water column in the channel where the stream discharges into the lake will be collected within six feet of the bottom using a Kemmerer water sample for DRO analysis.

Analytical Methods

Neat samples may be analyzed by HETL method 4.1.25 (Diesel Range Organics) for their chromatographic fingerprint.

Samples from the water column will be analyzed for DRO by HETL method 4.1.25 for concentration of diesel range organics and their chromatographic fingerprint.

Water samples will be analyzed for DRO and SVOCs by HETL method 4.1.25 and EPA 8270 respectively.

Reporting

A report will be written that will include a narrative describing the work that was done and the observations that were made, any analytical results, and site map showing the sample locations.