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DEPARTMENT OF ECOLOGY
NORTHWEST REGION

SEA24054.A0

January 26, 1990

Mr. D. N. Mendenhall
Water Quality Engineer
Longview Fibre Company
P. O. Box 639
Longview, Washington 98632

Subject: Summary Report of Recent Field Investigation
Results Seattle Plant

Dear Dave:

This letter report summarizes the results of field investigations conducted at the Longview Fibre Company (LFC) Seattle plant in 1989. These investigations were undertaken by Longview Fibre pursuant to correspondence and meetings with the Washington Department of Ecology (Ecology).

FIELD INVESTIGATION SUMMARY

GROUNDWATER SAMPLING

The three monitoring wells (Figure 1) at the LFC Seattle plant were sampled on August 8, 1989 to determine total petroleum hydrocarbon (TPH) concentrations in groundwater. Analytical results for TPH are presented in Table 1. No TPH was detected in MW-2, a trace in MW-1, and a very high concentration in MW-3. It should be noted that floating oil was present in MW-3, and that the TPH result represents hydrocarbons dissolved and suspended in water from this well.

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The August 8, 1989 results agree with prior sampling rounds (completed December 7, 1987 and February 26, 1988) in that little or no TPH was found at the MW-1 and MW-2 locations, and floating oil and a correspondingly large TPH concentration was detected at MW-3. TPH concentrations for wells MW-1 and MW-2 have always been below the 15 mg/L water cleanup level presented in the August 1, 1988 Ecology "Policies and Procedures for Underground Storage Tank Removal."

Field procedures and field parameter measurements for the August 1989 sampling event are provided in Attachment A. Laboratory reports and chain of custody forms are included in Attachment B.

TEST PIT INVESTIGATION IN VICINITY OF WELL MW-3

Additional investigation in the vicinity of monitoring well MW-3 was undertaken to assess the extent of oil floating on groundwater in the vicinity of this well. A work plan to carry out this investigation by means of test pits was completed on October 6, 1989 and reviewed by Ecology. The test pit excavations were completed between October 20 and 23, 1989, with a rubber-tire backhoe operated by a subcontractor, Church Construction. Geologic logs of these test pits are given in Attachment C to this report.

Initially, three pits were dug at distances of 10 feet to the north, west, and south of MW-3. Observation of a thin layer of floating oil in these first three pits resulted in excavation of four additional pits at further distances from well MW-3. Soil removed from the test pits was segregated into contaminated and uncontaminated piles on the basis of field organic vapor (HNU) readings. Selected soil samples were retained for laboratory analysis of TPH.

The pits were left open to facilitate visual monitoring for floating oil. Perforated 4-inch diameter plastic pipes were placed in each pit to allow access in the event that the pit wall collapsed. Initial observations indicated that floating oil was restricted to within 10 feet to the north and south of well MW-3, and within 20 feet to the west of MW-3.

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A meeting was held between LFC and Ecology on October 20, 1989, to discuss the preliminary results of the test pit investigation. As agreed by consensus at the meeting, three of the seven test pits (in which floating oil was not observed during monitoring) were closed. Continued monitoring of the four remaining test pits for floating oil and recovery of detected oil was conducted through November 30, 1989. The results of these activities are described in a letter from LFC to Ecology dated December 5, 1989 (included as Attachment D).

In the December 5, 1989 letter to Ecology, LFC stated plans to close the remaining test pits on December 15, 1989, on the basis of the prior test pit monitoring and oil recovery results, and in consideration of the imminent expiration of the LFC lease of the property. As per the letter, the four remaining test pits were closed on December 15, 1989.

TEST PUMPING TO ASSESS PRESENCE OF OIL IN VICINITY OF WELL MW-2

The Ecology letter to LFC dated May 18, 1989, stated concern that the presence or absence of floating oil at the MW-2 location could not be accurately established because the prevailing groundwater level at this well location has been very close to or above the top of the well screen. This situation would not allow floating oil to enter the well, if product was present in the formation surrounding the well. Well MW-2 is screened from 4.7 to 14.7 feet below ground surface.

Pursuant to discussions with Ecology, a work plan was prepared on October 6, 1989 and reviewed by Ecology for test pumping well MW-2, to lower groundwater levels around the well and thus induce floating oil (if present) to enter the well. Two rounds of test pumping of well MW-2 were conducted, on September 6 and October 3, 1989. The results of these tests are summarized in Tables 2 and 3. As shown in the tables, no oil was observed in discharge from well MW-2, or in the well, at any time during the pumping or post-pumping periods.

CONCLUSIONS

Exploration, sampling, and oil recovery activities conducted at the LFC Seattle plant, pursuant to removal of three underground storage tanks in August 1987, indicate that:

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- * a) residual petroleum products related to the former tanks were detected in the subsurface only in the vicinity of monitoring well MW-3, on the west side of the plant;
- b) product (oil) in the vicinity of MW-3 is very limited in extent (within 20 feet of the well); and
- c) volumes of recoverable oil in the vicinity of MW-3 have and will continue to decrease over time to very small quantities (oil sheens or dispersed droplets of oil that were recovered with sorbent booms, as recorded by the most recent onsite data).

RECOMMENDATIONS

Future activities at the site should be directed at completing the subsurface product assessment and recovery, and consist of:

- a) measuring water levels and checking for the presence of floating oil in the three onsite monitoring wells (with a clear plastic bailer), bailing and collecting observable floating oil, and reporting data to Ecology on a monthly basis;
- b) continuing this monitoring program until no floating oil is observed for three successive monthly monitoring events, at which time LFC will notify Ecology that the monitoring will be discontinued;
- c) abandonment of the three onsite monitoring wells in accordance with WAC 173-160 and a well abandonment work plan approved by Ecology; and
- d) documentation of the well abandonment with a brief letter report submitted to Ecology that includes as-built well abandonment drawings.

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Please contact me if you have questions or comments regarding this report.

Sincerely,

CH2M HILL



Michael R. Warfel
Project Manager

lsk/lfclr.wp5
Attachments -

- A. Methods, Procedures, and Field Data for August 8, 1989 Groundwater Sampling
- B. Laboratory Reports and Chain of Custody Forms for August 8, 1989 Groundwater Sampling
- C. Geologic Logs of Test Pits Excavated in October 1989
- D. Letter From Longview Fibre to Ecology dated December 5, 1989, Regarding Results of the Test Pit Investigation in the Vicinity of Well MW-3

APPROX SHORE LINE

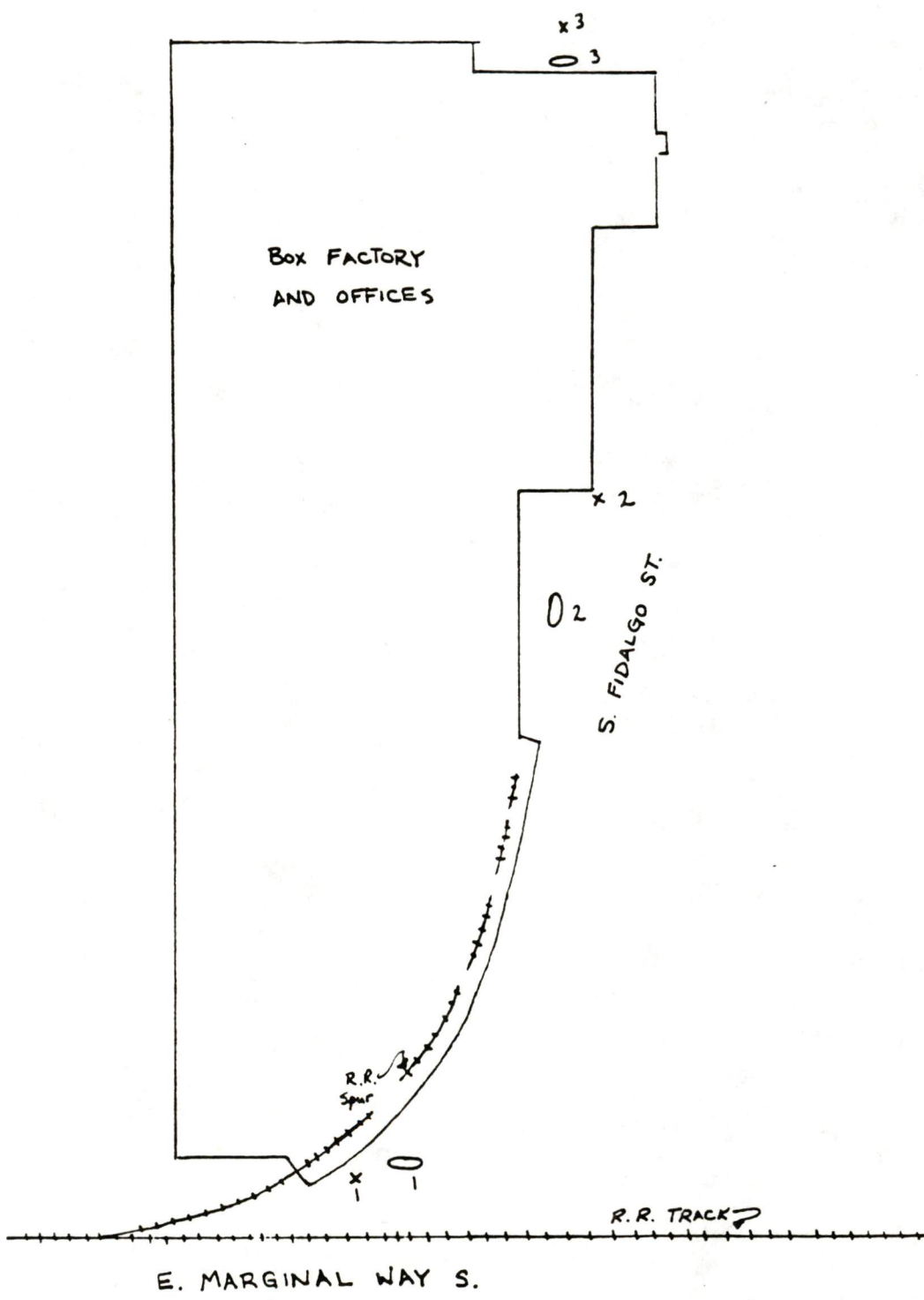


FIGURE 1
 LONGVIEW FIBRE COMPANY
 SEATTLE, WASHINGTON
SITE PLAN WITH APPROXIMATE
 TANK AND WELL LOCATIONS

KEY:
 O FORMER TANK LOCATION
 X WELL LOCATION

Table 1
TOTAL PETROLEUM HYDROCARBON DATA FOR
WATER SAMPLES COLLECTED ON AUGUST 8, 1989

<u>Well Number</u>	<u>Total Petroleum Hydrocarbons, mg/L^a</u>
MW-1	0.28
MW-2	<0.05
MW-3	7,590
MW-4 ^b	0.25

^aBy method 418.1.

^bEquipment blank; collected immediately after sampling MW-3.

Table 2
 DATA SUMMARY FOR FIRST PUMPING OF
 MONITORING WELL MW-2 (SEPTEMBER 6, 1989)^a

<u>Description of Activity</u>	<u>Water Level (feet)^b</u>
Pre-pumping groundwater level	4.9
Pumped well 5 minutes (removed approximately 6.3 gallons); no oil observed in discharge	
Water level immediately after pumping stops	9.2
Water level 10 minutes after pumping stops	5.1
Pumped well 10 minutes (removed 13.5 gallons); no oil observed in discharge	
Water level immediately after pumping stops	7.0
Water level 10 minutes after pumping stops	5.25
Pumped well 15 minutes (discharge volume not recorded); no oil observed in discharge	
Water level immediately after pumping stops	10.0
Water level 10 minutes after pumping stops (3:13 PM)	5.35
Water level at 7:35 AM on 9-7-89; no oil observed in clear bottom-filling bailer dipped into the well	5.35

^aData collected by Longview Fibre personnel.

^bFeet below top of casing; well screen interval is 4.5 to 14.5 feet below top of casing.

Table 3
 DATA SUMMARY FOR SECOND TEST PUMPING OF
 MONITORING WELL MW-2 (OCTOBER 3, 1989)^a

<u>Description of Activity</u>	<u>Water Level (feet)^b</u>
Pre-pumping groundwater level	5.07
Pumped well 150 minutes (removed 166.9 gallons); no oil observed in discharge	
Water level immediately after pumping stops	13.6
Adjusted pump to acheive water level drawdown of approximately 9 feet; pumped well 90 minutes (removed approximately 80 gallons); no oil observed in discharge	
Stopped pumping and allowed water level to stabilize; no oil observed in clear bottom-filling bailer dipped into the well	5.5

^aData collected by Longview Fibre personnel.

^bFeet below top of casing; well screen interval is 4.5 to 14.5 feet below top of casing.

ATTACHMENT A

**METHODS, PROCEDURES, AND FIELD DATA
FOR AUGUST 8, 1989 GROUNDWATER SAMPLING**

Groundwater samples were collected at Longview Fiber Company's Seattle plant on Tuesday August 8, 1989. The wells sampled were identified as MW-1, MW-2, and MW-3.

Water level measurements were taken from the three monitoring wells at varying times due to equipment parked over the surface completions. The following represents the depth to water below the top of the PVC casing:

<u>Well No.</u>	<u>Depth To Water (feet)</u>	<u>Oil Measured (feet)</u>	<u>Time</u>
MW-1	9.06	0.0	1056
MW-2	5.00	0.0	0950
MW-3	6.22	0.09	1015

The first well to be sampled was MW-3, where the floating oil was observed. The sample team attempted to remove the oil prior to sampling. Twenty-two gallons of water with traces of floating oil was removed before the well appeared free of oil. The water purged was placed into a 55-gallon drum for future disposal by Longview Fiber. The following data was obtained in the field during the sampling:

<u>Gallons Removed</u>	<u>pH</u>	<u>Specific Conductance</u>	<u>Temperature</u>
22	6.91	600 umhos/cm	21 °C
24	7.60	600 umhos/cm	20 °C
25	7.56	600 umhos/cm	20 °C

A clean stainless steel bailer was then used to collect the sample and place it into a 1-liter amber glass jar with a teflon lined lid, provided by the laboratory. The sample was collected, placed on ice, labeled, and placed under chain-of-custody procedures. The sample was identified as LFC-MW3-8/8/89.

The second sample collected was an equipment blank prepared by pouring store bought distilled water through the decontaminated stainless steel bailer directly into the sample container. The procedures used on MW-3 were then followed and the sampled was identified as LFC-MW4-8/8/89.

The third sample collected was MW-2. The following data was collected while purging this monitoring well:

<u>Gallons Removed</u>	<u>pH</u>	<u>Specific Conductance</u>	<u>Temperature</u>
1	7.66	360 umhos/cm	22 °C
2	7.46	490 umhos/cm	20 °C
4.5	7.50	500 umhos/cm	20 °C

The sample handling procedure identified for MW-3 were followed and the sample was labeled LFC-MW2-8/8/89.

Monitoring well MW-1 was the final sample collected and the following data was collected in the field:

<u>Gallons Removed</u>	<u>pH</u>	<u>Specific Conductance</u>	<u>Temperature</u>
0	7.11	340 umhos/cm	22 °C
2	7.15	350 umhos/cm	22 °C
3	7.16	345 umhos/cm	22 °C
4.5	7.15	360 umhos/cm	23 °C

The samples was collected following the procedures identified for MW-3 and the samples was labeled LFC-MW1-8/8/89.

All field monitoring equipment was calibrated prior to starting field work. The samples were shipped to CH2M HILL laboratory in Redding, California.

ATTACHMENT B

**LABORATORY REPORTS AND CHAIN OF
CUSTODY FORMS FOR AUGUST 8, 1989
GROUNDWATER SAMPLING**



REPORT OF ANALYTICAL RESULTS

Date: 09/01/89
Page: 1 of 4

Client: CH2M HILL/LRD
5090 CATERPILLAR ROAD
REDDING CA 96003


Project Number: SEA24054.A0
LONGVIEW
Laboratory Number: 14112
Date Received: 08/10/89

Atten: MS. BARBARA HURLEY

=====
Sample Description: MW-3 RDD24007-1 8/8/89 1245 GRAB
Laboratory Sample Number: 14112001 Date Collected: 08/08/89 Matrix: WATER
=====

Analytical Parameter	Method	Det Limit	Result	Units	Ana Date
Petroleum Hydrocarbons	EPA418.1	249	7590	mg/L	08/31/89

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INORGREP (v8908B)



Engineers
Planners
Economists
Scientists

REPORT OF ANALYTICAL RESULTS

Date: 09/01/89

Page: 2 of 4

Client: CH2M HILL/LRD
5090 CATERPILLAR ROAD
REDDING CA 96003

Project Number: SEA24054.A0
LONGVIEW

Laboratory Number: 14112

Date Received: 08/10/89

Atten: MS. BARBARA HURLEY

=====
Sample Description: MW-4 RDD24007-2 8/8/89 1300 GRAB

Laboratory Sample Number: 14112002 Date Collected: 08/08/89 Matrix: WATER

Analytical Parameter	Method	Det Limit	Result	Units	Ana Date
Petroleum Hydrocarbons	EPA418.1	0.05	0.25	mg/L	08/31/89

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INORGREP (v8908B)



REPORT OF ANALYTICAL RESULTS

Date: 09/01/89
Page: 3 of 4

Client: CH2M HILL/LRD
5090 CATERPILLAR ROAD
REDDING CA 96003


Project Number: SEA24054.A0
LONGVIEW
Laboratory Number: 14112
Date Received: 08/10/89

Atten: MS. BARBARA HURLEY

=====
Sample Description: MW-2 RDD24007-3 8/8/89 1315 GRAB
Laboratory Sample Number: 14112003 Date Collected: 08/08/89 Matrix: WATER
=====

Analytical Parameter	Method	Det Limit	Result	Units	Ana Date
Petroleum Hydrocarbons	EPA418.1	0.05	<0.05	mg/L	08/31/89

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INORGREP (v8908B)

Client: CH2M HILL/LRD
5090 CATERPILLAR ROAD
REDDING CA 96003


Project Number: SEA24054.A0
LONGVIEW
Laboratory Number: 14112
Date Received: 08/10/89

Atten: MS. BARBARA HURLEY

=====
Sample Description: MW-1 RDD24007-4 8/8/89 1338 GRAB
Laboratory Sample Number: 14112004 Date Collected: 08/08/89 Matrix: WATER
=====

Analytical Parameter	Method	Det Limit	Result	Units	Ana Date
Petroleum Hydrocarbons	EPA418.1	0.05	0.28	mg/L	08/31/89

Results for non-aqueous matrices are based on dry sample weight unless noted otherwise.

Reviewed by: 

INORGREP (v8908B)

CHAIN OF CUSTODY RECORD

PROJECT NUMBER SEA 24054.A9		PROJECT NAME Longview			ANALYSES REQUESTED							FOR LAB USE ONLY	
CLIENT NAME GARY SMITH					NUMBER OF CONTAINERS	TPH EPA 418.1	POL						LAB # 24007
REPORT TO: John Polk		COPY TO: Mike Waafel											PROJ # _____
REQUESTED COMPLETION DATE 8/30/89		LABORATORY CH2MHill Rdd											ACK _____ VERIFIED _____
SIA NO	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION							DATE INVOICED _____	
												NO. OF SAMPLES _____ pg _____ of _____	
MW-3	8/8/89	1245		X	LFC - MW3 - 8/8/89	1	X				1	DISPOSITION: D R _____ DATE _____	
MW-4	8/8/89	1300		X	LFC - MW4 - 8/8/89	1	X				2	REMARKS	
MW-2	8/8/89	1315		X	LFC - MW2 - 8/8/89	1	X				3		
MW-1	8/8/89	1338		X	LFC - MW1 - 8/8/89	1	X				4		
Coast Cold Seals													
SAMPLED BY AND TITLE (SIGNATURE) John Polk		DATE/TIME 8/8/89/1300	RELINQUISHED BY (SIGNATURE) John Polk		DATE/TIME 8/8/89/1600	RECEIVED BY: (SIGNATURE) Robert J. Smith		DATE/TIME 8/8/89/1600					
RELINQUISHED BY: (SIGNATURE) Robert J. Smith		DATE/TIME 8/8/89/1630	RECEIVED BY: (SIGNATURE) Mike Waafel		DATE/TIME 8/8/89/1630	RELINQUISHED BY: (SIGNATURE) Mike Waafel		DATE/TIME 8-9-80					
REMARKS _____			SAMPLING PROGRAM SDWA <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____ (SPECIFY)				SAMPLE SHIPPED VIA <input type="checkbox"/> UPS <input type="checkbox"/> BUS. <input checked="" type="checkbox"/> FED-EX <input type="checkbox"/> HAND OTHER _____			AIR BUS BILL NUMBER _____			

ATTACHMENT C

GEOLOGIC LOGS OF TEST PITS
EXCAVATED IN OCTOBER 1989
AT THE LONGVIEW FIBRE SEATTLE PLANTS

Test Pit S10 Depth	Description	HNu Measurement
0-3"	Asphalt	
3"-12"	Brown silty sandy gravel	0.3
12"-22"	Gray sandy gravel w/some silt and wood fragments	0.3
22"-36"	Grades to gray silty, sand	
36"-43"	Gray silty sand, slight diesel odor	1-2
43"-48"	Gray silty sand, slight diesel odor	2-3
48"-60"	Organic (tree bark) layer	10-12
	piece of plywood @ 60"	
60"-72"	Gray silty sand with wood fiber (wood fiber HNu=20)	10-12
72"-78"	Moist, silty sand w/some clay and wood fiber	5-10
78"-79"	One inch perched layer; water weeps slowly into trench	
79"-108"	Clayey silt (vertical wood piling in clay, with horizontal beams on top of piles)	

Test Pit W10 Depth	Description	HNu Measurement
0-3"	Asphalt	0.3
3"-12"	Brown silty sandy gravel	0.3
12"-22"	Gray sandy gravel w/some silt and wood fragments	0.3
22"-36"	Grades to gray silty sand	
36"-48"	Gray silty sand	42"=1-5
48"-60"	Organic (tree bark) layer	
60"-72"	Gray silty sand w/wood fiber	
66"	Water and oil gush from east side of trench (12" wood beam from 54"-66") 1/8" - 1/4" oil on water	
72"		30-40

GEOLOGIC LOGS OF TEST PITS
EXCAVATED IN OCTOBER 1989
AT THE LONGVIEW FIBRE SEATTLE PLANT
continued

Test Pit	Depth	Description	Measurement
N10	0-3"	Asphalt	<5
	3"-12"	Brown silty sandy gravel	<5
	12"-22"	Gray sandy gravel w/some silt and wood fragments	<5
	22"-36"	Grades to gray silty sand	<5
	36"-84"	Gray silty sand	<5
	84"	Wood beams	5-10
	84" - 102"	Silty clay; groundwater seepage on top of clay Vertical wood piles in clay with horizontal beam	
M20	0-3"	Asphalt	<5
	3"-12"	Brown silty sandy gravel	<5
	12"-22"	Gray sandy gravel w/some silt and wood fragments	<5
	22"-36"	Grades to gray silty sand	<5
	36"-84"	Gray silty sand	5-10
	84"-60"	Organic (tree bark) layer	5-10
	56"	12" beam on south side of trench	10-15
	60"-66"	Gray silty sand	20-25
	66"	Groundwater seep on west side of north end of trench	
	66"-72"	Gray silty sand	5
	72"-96"	Clay	

GEOLOGIC LOGS OF TEST PITS
EXCAVATED IN OCTOBER 1989
AT THE LONGVIEW FIBRE SEATTLE PLANT
Continued

Test Pit S20 Depth	Description	HNu Measurement
0-3"	Asphalt	0.3
3"-12"	Brown silty sand	0.3
12"-48"	Gray silty sand with boulders	0.3
48"-60"	Gray silty sand	2-3
60"-66"	Gray silty sand	5
66"-78"	Gray silty sand	
78"	Groundwater seepage on top of clay (1" zone)	3-4
78"-90	Clay	

Test Pit N20 Depth	Description	HNu Measurement
0-3"	Asphalt	0.3
3"-12"	Brown silty sand	0.3
12"-36"	Gray silty sand	0.3
36"-48"	Silty sand w/organic (tree bark, wood fiber) debris	4-5
48"-60"	Gray silty sand	4-5
60"-66"	Gray silty sand	4-10
66"-78"	Clay	5-7

Test Pit W30 Depth	Description	HNu Measurement
0-3"	Asphalt	
3"-30"	Gray silty sand w/some wood debris and gypsum	2
30"-42"	Gypsum layer (hydrogen sulfide odor)	4-5
42"-58"	Wood debris layer (tree bark)	5
58"	Water-no (12" wood beam)	
58"-66"	Gray silty sand	2

ATTACHMENT D

**LETTER FROM LONGVIEW FIBRE TO
ECOLOGY DATED DECEMBER 5, 1989
REGARDING RESULTS OF THE TEST
PIT INVESTIGATION IN THE VICINITY
OF WELL MW-3**

CONVERSATION RECORD

TIME

1040

DATE

1/4/90

TYPE

 VISIT CONFERENCE TELEPHONE INCOMING OUTGOING

ROUTING

NAME/SYMBOL INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

GARY SMITH

ORGANIZATION (Office, dept., bureau, etc.)

LONGVIEW FIBRE - SEATTLE 762-7170

TELEPHONE NO.

SUBJECT

Report of an oil line along south side of Longview Fibre's Building.

SUMMARY

Gary not available; left message for him to return call 1/5/90 (1010) - Gary Smith. I asked him if he knew about any fuel lines from their facility which ran along the south side of their building. Gary said they never had any fuel lines in that area.

The tank (former) at the northeast corner of the building had pipes which were under the building but did not extend to the south building wall. The ^{former} tank located on the north side of the building was ~~pump~~ plumbed to a gasoline pump located outside of the building and the former tank located on the west side of the building was plumbed under the west side of building.

Gary indicated that the source of petroleum could possibly be from J. H. Gypsum's maintenance shop

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

BARBARA TRED

SIGNATURE

Barbara J. Tred

DATE

1/5/90

ACTION TAKEN

SIGNATURE

TITLE

DATE

LONGVIEW FIBRE COMPANY

MAIN OFFICE AND MILLS, LONGVIEW, WASHINGTON 98632
1-206-425-1550



December 8, 1989

Ms. Barbara J. Trejo
Washington Department of Ecology
4350 150th Avenue NE
Redmond, WA 98052-5301

RECEIVED
DEC 12 1989

DEPARTMENT OF ECOLOGY
NORTH-EAST REGION

Dear Ms. Trejo:

Longview Fibre, Ecology, and CH₂M Hill met on October 30, 1989, to discuss the preliminary results of the most recent subsurface investigation at the Longview Fibre Seattle plant. At the close of this meeting it was agreed that the following additional data would be obtained:

1. Since test pits N20, S20, and S30 did not show floating oil, these pits would be back-filled with clean material.
2. The remaining four test pits would be left open for observation and recovery of additional oil, for a period of approximately two weeks.
3. The high total petroleum hydrocarbon values (analyzed by Method 418.1) for soil samples collected during the test pit work would be re-tested by an alternate procedure (Method 8015), to assess potential interference of biogenic hydrocarbon sources on the test.

Test pits N20, S20, and S30 (Figure 1) were back-filled on November 1, 1989, with clean soils removed during the test pit excavation (piles A and D on Figure 1), supplemented by imported clean fill. Oil observations and recovery, which were initiated immediately after the test pits were dug, continued through November 30, 1989. Soil samples from the initial test pit work that exhibited high TPH values were analyzed by the Method 8015 procedure. This letter summarizes the results of the additional data collection activities and recommendations for future site investigation activities.

Subsurface Oil Occurrence and Recovery

The sequence of test pit excavation and subsurface oil observations was described at the October 30 meeting, to illustrate the declining trend in oil thicknesses observed in monitoring well MW-3 and in the test pits. Oil observation and recovery from the dates of test pit excavation through the last date of data collection are summarized in Table 1. The locations of the test pits and MW-3 are shown on Figure 1.

Ms. Barbara Trejo
Page 2
December 8, 1989

The observations of thin oil layers and scattered oil globules in the test pits indicate that the extent of subsurface oil from the former heating oil tank is locally restricted to within about 20 feet of well MW-3, where measurable thicknesses of oil have been consistently measured in the past. The initial sudden appearance of oil in test pit W10 and the concurrent decline of oil thickness in well MW-3 are additional indications of the limited extent of subsurface oil in the vicinity of well MW-3.

Oil observations summarized in Table 1 show a general decreasing trend in the amount of oil present in well MW-3 and in the four remaining test pits. Measurable oil layers initially reported at the beginning of the test pit program declined over time to scattered globules of oil or oil sheens. This declining oil presence is also evident from the total oil volumes recovered from each of the four test pits (Table 1), which were accumulated by pumping from each test pit into dedicated 55-gallon drums and decanting off the oil-free water. Total additional oil recovered since the beginning of the test pit program is estimated at 3.0 gallons.

Additional TPH Testing of Soil Samples

Soil samples initially collected during the test pit program, and subsequently tested for TPH by Method 418.1, were retained in iced coolers by CH₂M Hill. In accordance with the results of the October 30 meeting with Ecology, selected soil samples were submitted for analysis of TPH by Method 8015, to determine if the initial high TPH values might be the result of interference from non-petroleum, biogenic hydrocarbons (such as natural wood components). The sample extraction and analysis process of Method 8015 eliminates interferences from biogenic hydrocarbons. The results of the TPH testing of soil samples by the two methods are summarized in Table 2. Laboratory reports for all samples appearing in Table 2 are included as an attachment to this letter.

As shown in Table 2, the Method 418.1 data exceed the Method 8015 data by significant factors (ranging from about 6 to 300). On the basis of these results, discussions with the laboratory, and observations of wood debris (timbers, logs, pilings, etc.) in the test pits, we have concluded that the original TPH tests were influenced by biogenic materials that resulted in erroneously high values. The TPH values from the Method 8105 testing are all less than the 200 ppm soil cleanup criteria of Ecology (August 1, 1988, Policies and Procedures for Underground Storage Tank Removal).

The Method 8015 data were also utilized to determine the disposal options for the contaminated soil piles from the test pit work at the site (piles B and C on Figure 1). On the basis of this data, the contaminated soil piles were transported by a contractor and disposed of at the Coal Creek Landfill on November 30, 1989.

Ms. Barbara Trejo
Page 3
December 8, 1989

Future Site Investigation Activities

On the basis of the project data presented in this letter, Longview Fibre plans to conduct the following activities to complete the Seattle plant site investigation:

1. The remaining four test pits (N10, S10, W10, and W20) will be back-filled with clean soil and the pavement will be replaced on December 15, 1989. As discussed with you during a recent telephone conversation, the Longview Fibre lease on the property on which the test pits are situated expires at the end of this month, and Longview Fibre will lose access at that time. The timely closure of the test pits is therefore critical.
2. Site investigation data collected since May 1989 (sampling of the three on-site monitoring wells, evaluation and testing of well MW-2, and the test pit program) will be summarized in a report by CH₂M Hill. This report will be submitted to Ecology in early January 1989.
3. Longview Fibre will meet with Ecology in late January 1990 to discuss the report and the final disposition of the Seattle plant site investigation.

Please call if you have questions.

Sincerely,



David N. Mendenhall
Water Quality Engineer

DNM:eh
Enclosures

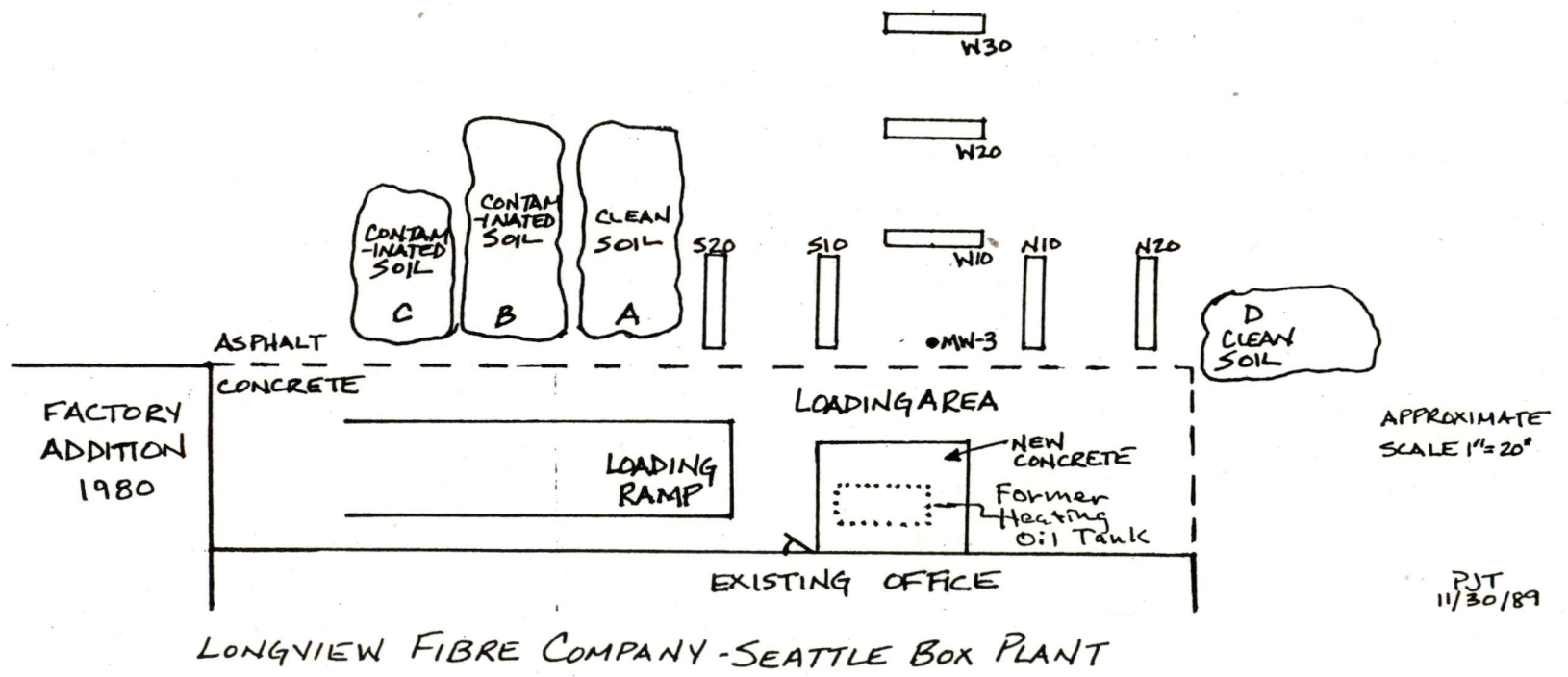
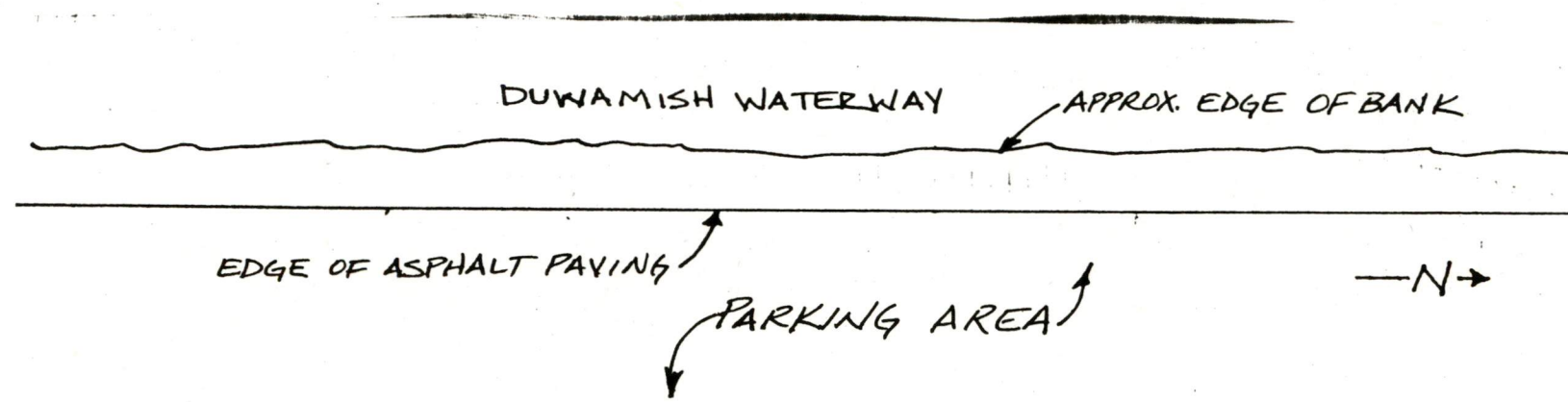


Figure 1

Table 1
SUMMARY OF OIL OBSERVATIONS AND RECOVERY IN
TEST PITS AND MONITORING WELL MW-3

<u>Date</u>	<u>Time</u>	<u>Well MW-3¹</u>	<u>Pit W10</u>	<u>Pit N10</u>	<u>Pit S10</u>	<u>Pit W20</u>
10/20/90	0945	OT = 1.8 ¹	--	--	--	--
10/20/89	--	--	Start pit @0955	Start pit @1045	Start pit @0740	Start pit @1240
10/20/89	1015	--	Oil "gush in pit; PT = 1/8- 1/4"	--	--	--
10/20/89	1345	OT = 0.7'	--	--	--	--
10/20/89	1420	OT = 0.6'	--	--	--	--
10/20/89	by end of day	--	thin oil layer; skim w/ pump	--	--	--
10/21/89	--	--	thin oil layer; skim w/ pump	thin oil layer; skim w/ pump	thin oil layer; skim w/ pump	--
10/23/89	1130	OT = 0.15'	--	--	--	--
10/23/89	--	--	thin oil layer; skim w/ pump	oil globules; skim w/ pump	oil globules; skim w/ pump	oil globules; skim w/ pump
10/25/89	--	--	oil globules; skim w /pump	oil globules; skim w/ pump	oil globules; skim w/ pump	oil globules; skim w/ pump
10/27/89	0933	OT - 0.02'	oil globules	oil globules	oil globules	oil sheen
11/07/89	--	--	oil globules skim w/ pump	oil globules skim w/ pump	oil globules skim w/ pump	trace oil globules; skim w/ pump

**Table 1
Continued**

<u>Date</u>	<u>Time</u>	<u>Well MW-3¹</u>	<u>Pit W10</u>	<u>Pit N10</u>	<u>Pit S10</u>	<u>Pit W20</u>
11/17/89	--	oil sheen in bailer	oil sheen; skim w/ pump	oil globules; skim w/ pump	oil globules; skim w/ pump	trace oil globules; skim w/ pump
11/27/89	--	OT = 1/8" in bailer	trace oil globules; skim w/ pads	oil sheen; skim w/ pads	trace oil globules; skim w/ pads	trace oil globules; skim w/ pads
11/30/89	--	oil sheen in bailer	trace oil globules; skim w/ pump	oil sheen; skim w/ pump	trace oil globules; skim w/ pump	trace oil globules; skim w/ pump
Total Oil Recovered		--	0.4 gal.	1.5 gal.	1.1 gal.	thin layer (not measurable)

¹OT = Oil thickness.

Table 2
SUMMARY OF TOTAL PETROLEUM
HYDROCARBON RESULTS FOR SOIL SAMPLES

<u>Sample Designation</u>	<u>Data Collected</u>	<u>Sample Origin¹</u>	<u>TPH², Method 418.1 (IR), mg/kg</u>	<u>TPH², Modified Method 8015 (GC), mg/kg</u>
Clean Composite #1	10/20/89	Clean soil pile A	8.0J	---
Clean Composite #2	10/20/89	Duplicate of above sample	5.0J	---
HNU Composite #1	10/20/89	Contaminated soil pile B	4,280	---
HNU Composite #2	10/20/89	Duplicate of above sample	5,970	90
N10	10/20/89	Test pit N10	283	50
S10	10/20/89	Test pit S10	1,810	100
W10	10/20/89	Test pit W10	216	10
W20 Above Clay	10/20/89	Test pit W20, soil above clay layer	6,920	160
W20 Clay	10/20/89	Test pit W20, sample of clay layer	5.8J	---
HNU >5 #2	10/23/89	Contaminated soil pile C	2,340	100
HNU <5 #2	10/23/89	Clean soil pile D	40.4	---
N20	10/23/89	Test pit N20	5,980	75
S20	10/23/89	Test pit S20	28,500	90
W30	10/23/89	Test pit W30	1,600	170

¹See site map with test pit and soil pile locations.

²Total Petroleum Hydrocarbons.