

February 13, 2012  
Project No. 2-915-17377-0

Longview Fibre, Inc.  
5901 E. Marginal Way S.  
Seattle, Washington 98134

Attention: David Miller

Subject: Groundwater Sampling Report  
Seattle, Washington

Dear Mr. Miller:

AMEC Environment & Infrastructure, Inc. (AMEC), is pleased to submit this *Groundwater Sampling Report* for the above-referenced property (Longview Fibre) located in Seattle, Washington. This report has been prepared for the exclusive use of Longview Fibre, Inc., in accordance with generally accepted environmental practices.

AMEC appreciates the opportunity to be of service to Longview Fibre on this project. If you have any questions or comments regarding this report, please feel free to contact our office at (425) 368-1000.

Sincerely,

**AMEC Environment & Infrastructure, Inc.**

A handwritten signature in black ink that reads "Cherie Howland".

Cherie Howland  
Environmental Scientist

A handwritten signature in black ink that reads "David Braungardt".

David Braungardt  
Project Manager

Attachments

Figure 1: Monitoring Well Locations

Attachment 1: Groundwater Sample Logs

Attachment 2: Laboratory Analytical Report and Chain-of-Custody

## 1.0 INTRODUCTION

AMEC Environment & Infrastructure, Inc. (AMEC), prepared this *Groundwater Sampling Report* to summarize groundwater sample collection activities performed at the Longview Fibre, Inc. (Longview Fibre) property located at 5901 E. Marginal Way S., Seattle, Washington (Site). AMEC's work was completed in accordance with AMEC's proposal 91P-21657, dated January 23, 2012. AMEC's scope of work is outlined below.

- Collect groundwater samples from two wells on Site;
- Analyze the groundwater samples for diesel (carbon range C12 to C24) and residual range organics (carbon range C24 to C38); and
- Prepare a summary report.

AMEC understands that the groundwater in the area of the monitoring wells to be sampled by AMEC has been impacted by a release of fuel from one or more former leaking underground storage tanks. Washington State Department of Ecology (Ecology) was previously notified of this release.

## 1.1 SITE DESCRIPTION

The Site is bounded on the north by Saint-Gobain Containers' operations; on the east by East Marginal Way S.; on the south by BPB Gypsum, Inc's, operations; and on the west by the Lower Duwamish Waterway. According to the King County Tax Assessor's records, the Site is owned by Longview Fibre Paper and Packaging, Inc.

The two wells sampled by AMEC are located on the north and west sides of the Site, as shown on Figure 1. The wells both have older flush mounted well monuments that appear to be corroding. AMEC observed that the well covers do not seal. The wells both have newer well caps however Well 01 is cut at a slant which makes getting a proper seal on the well impossible. The wells both had significant mud slough around the casing. In Well 01 mud slough appeared to have slid down the well. AMEC cleaned out the mud from the wells as best as possible prior to sampling. Well 01 (as named by AMEC) is located on the north side of the property near the northwest corner of the receiving docks. AMEC measured the depth of this well to be 14.17 feet below the top of casing (TOC). Groundwater was encountered at 4.56 feet below the TOC using a water level meter. Well 02 (as named by AMEC) is located on the west side of the property in the parking area west of the lunch room. AMEC measured the depth of this well to be 15.30 feet below TOC, and groundwater was encountered at a depth of 4.91 feet below TOC.

## **2.0 GROUNDWATER SAMPLE COLLECTION**

AMEC collected groundwater samples from Well 01 and Well 02 on February 1, 2012. Before collecting groundwater samples in each of the wells AMEC removed the well sock, stored it in a decontaminated area, and re-installed it following completion of sampling activities. AMEC noted that the well sock for Well 01 was in good condition and no free product was observed on it; however, AMEC also noted that the well sock was covered in mud slough and not in the water column. AMEC noted that the well sock for Well 02 was in good condition and no free product was observed on it; however, AMEC also noted that the well sock was not in the water column.

To collect groundwater samples representative of the shallow aquifer below the Site, groundwater was removed (purged) from the wells using a peristaltic pump with dedicated disposable tubing. Groundwater was removed from the wells at a flow rate not exceeding 500 milliliters per minute. During the purging of the wells, water quality parameters were attempted to be measured using a Horiba U-22 water quality meter. The water quality meter stopped working during well sampling. As a result, AMEC then determined that at least three well volumes would be removed from the wells before samples were collected. AMEC proceeded to remove three well volumes periodically checking the depth to water to ensure the purging was not drawing down the water level greater than low flow standards allow. The Groundwater Collection Logs are in Attachment 1.

One groundwater sample was collected from each well using the peristaltic pump. The samples were collected from approximately the middle of the water column in each of the wells. The groundwater was placed in laboratory-provided containers, labeled, sealed, and stored in a cooler. The cooler was securely stored under proper chain-and-custody procedures and was picked up Friedman & Bruya, Inc., within 2 hours of collection. Friedman & Bruya, Inc., immediately placed ice in the cooler with the samples and transported the samples to the laboratory located in Seattle, Washington.

## **3.0 GROUNDWATER SAMPLE RESULTS**

Two primary groundwater samples were analyzed for Diesel Range Organics (DRO) and Residual Range Organics (RRO) using Method NWTPH-Dx Extended. The groundwater analytical results are presented in Table 1 and are discussed in this section. Attachment 2 contains the groundwater sampling analytical report and the chain-of-custody. The results were screened against the Ecology's Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs). The laboratory detection limits are below the MTCA Method A CULs.

**Table 1 Groundwater Analytical Results**

Sample No.	mm/year	Well Location	Diesel Range Organics (µg/L)	Residual Range Organics (µg/L)
LF-111210-01	11/2010	Well 01	290	280
<b>LF-111210-02</b>	<b>11/2010</b>	<b>Well 02</b>	<b>820</b>	230
MW-01-020112	02/2012	Well 01	210	<250
<b>MW-02-020112</b>	<b>02/2012</b>	<b>Well 02</b>	<b>1,100</b>	<250
MTCA Method A Cleanup Levels			500	500

Notes:

Mg/L = milligrams per liter

BOLD = detection

Red font = detection greater than MTCA Method A CULs

MTCA Method A Cleanup Levels (CULs) from *Washington State Department of Ecology, Cleanup Levels and Risk Calculations (CLARC) database (February 6, 2012)*

A review of the analytical results indicates the following:

1. Detections of diesel range organics were below Ecology's MTCA Method A CULs in Well 01.
2. Residual range organics were not present at concentrations greater than the reporting limit in either well.
3. Detections of diesel range organics were above Ecology's MTCA Method A CULs in Well 02.

#### **4.0 SUMMARY AND RECOMMENDATIONS**

AMEC collected groundwater samples from Well 01 and Well 02 and analyzed the groundwater samples for diesel and residual range organic hydrocarbons. Diesel range organics are present in both wells. Although free product was not observed in Well 02, a review of the laboratory results indicates that the concentration of diesel range organics in this well is above Ecology's CUL for diesel range organics.

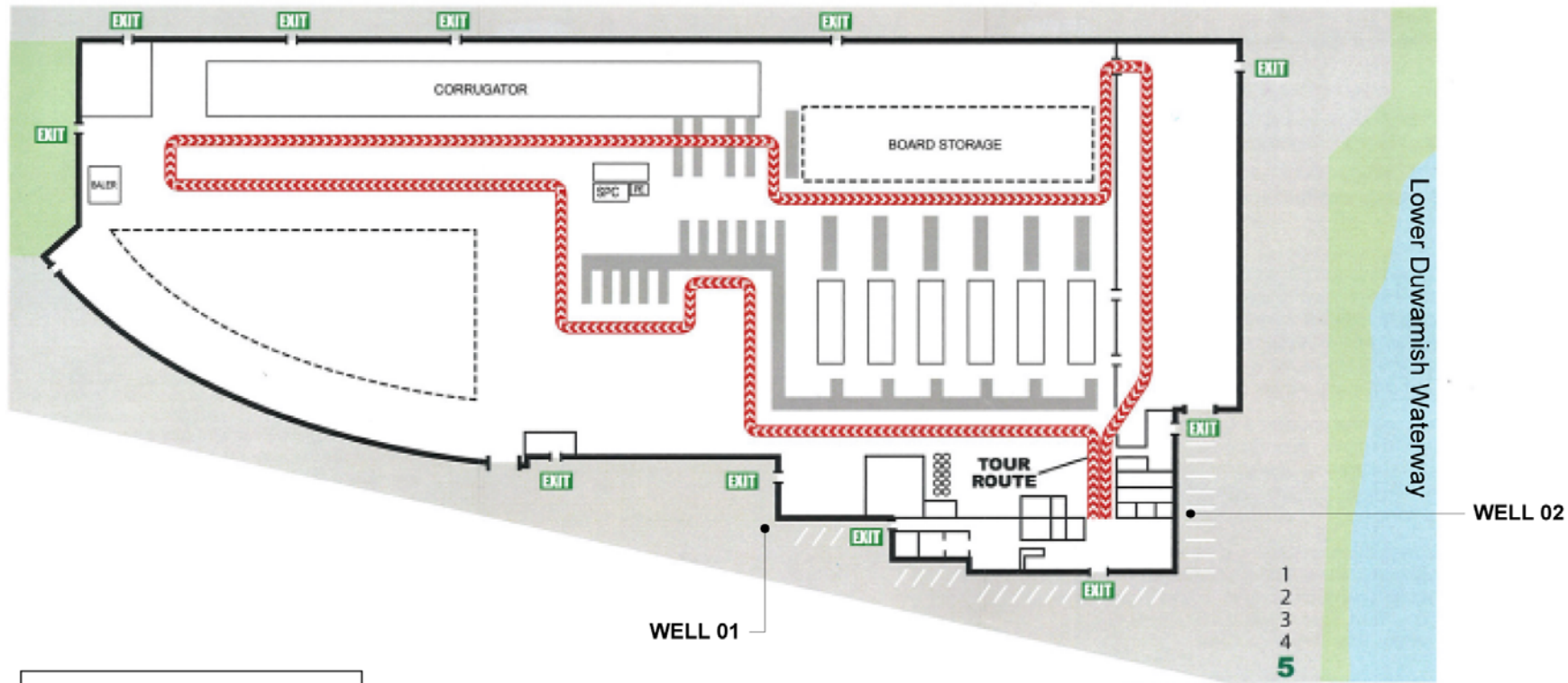
The current well monuments are out of compliance with state regulations. AMEC recommends that the wells either be decommissioned or refitted with well monuments that meet with the regulatory standards.

AMEC also recommends that the well socks be in the wells be lowered so that the water in the wells covers the well socks.

## LIMITATIONS

This report was prepared exclusively for Longview Fibre (Client) by AMEC. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in AMEC services and based on: (i) information available at the time of preparation; (ii) data supplied by outside sources; and (iii) the assumptions, conditions, and qualifications set forth in this report and the AMEC proposal. This report is intended to be used by the Client for the Site only, subject to the terms and conditions of the Client contract with AMEC. Any other use of, or reliance on, this report by any third party is at the sole risk of the party.

The findings contained herein are relevant to the date of the AMEC Site visit and should not be relied upon to represent conditions at later dates. Data presented herein are from discreet sampling points identified in our report, and cannot be construed to represent conditions at unsampled locations.



Drawing is a reproduction of drawing prepared by others. AMEC makes no warranty as to the accuracy of the drawing.



**130,000 SQUARE FOOT PLANT  
LOCATED ON 3.6 ACRES**

**EVACUATION MUSTERING POINT**  
VISITORS ARE TO STAND  
NEAR THE NUMBER "5"  
PAINTED ON ASPHALT



**amec**  
AMEC Environment & Infrastructure, Inc.  
221 S. 28<sup>th</sup> Street  
Suite 102  
Tacoma, WA 98402  
(253) 572-0516  
(425) 368-1003 fax

PROJECT TITLE: LONGVIEW FIBRE GROUNDWATER SAMPLING  
SHEET TITLE: MONITORING WELL LOCATIONS  
LOCATION: 5901 E. MARGINAL WAY S.  
SEATTLE, WASHINGTON  
DATE: FEBRUARY 2012

FIGURE NO.  
**1**



# GROUNDWATER SAMPLING LOG

WELL NO: MW-1 LOCATION: Loxaview Fibre PROJECT NO: 2915-173770  
 DATE: 2/1/12 TIME: 10:45 CLIMATIC CONDITIONS: Sunny  
 OVA/PID READING WHEN WELL OPENED: \_\_\_\_\_ DEPTH TO PRODUCT (TOC): \_\_\_\_\_  
 STATIC WATER LEVEL (TOC): 4.56 TOTAL DEPTH OF WELL (TOC): 14.17

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE: \_\_\_\_\_

14.17  
 - 4.92  
 -----  
 9.61  
 x .16  
 -----  
 1.54  
 x 3  
 -----  
 4.62g

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA									
			Horiba malfunction 3 well volumes will be removed.						
	4.92	10:53	1.25						
	5.36	10:59	2						
	5.34	11:04	2.75						
	5.32	11:09	3.5						
	5.32	11:15	4.25						
	5.32	11:20	4.75						

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CA & AS  
 SAMPLE NUMBER(S) AND TIME: MW-1-020/12 11:20

NOTES: sock is muddy sock sitting at 3.5ft bgs - not in water

LAB ANALYSIS PARAMETERS AND PRESERVATIVES: NWTPH-Dx

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 1-500ml Amber

DECON. PROCEDURES: A1conox, deionized water, new tubing

SAMPLES DELIVERED TO: Friedman & Banga TRANSPORTER: Mike Erdahl  
 DATE: 2/1/12 TIME: 11:50

CAPACITY OF CASING (GALLONS/LINEAR FOOT)  
 2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57



# GROUNDWATER SAMPLING LOG

WELL NO: MW-02 LOCATION: Longview Fibre PROJECT NO: 2915-17377-0  
 DATE: 9.55 2/1/12 TIME: 9:55 CLIMATIC CONDITIONS: Sunny 43°F  
 OVA/PID READING WHEN WELL OPENED: \_\_\_\_\_ DEPTH TO PRODUCT (TOC): 15  
 STATIC WATER LEVEL (TOC): 4.91 TOTAL DEPTH OF WELL (TOC): 15.30

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE: \_\_\_\_\_

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	<u>4.91</u>	<u>9:59</u>	<u>1.0</u>		<u>7.47</u>	<u>2.687</u>			
	<u>5.23</u>	<u>10:03</u>	<u>1.75</u>						
	<u>5.50</u>	<u>10:08</u>	<u>2.5</u>						
	<u>5.48</u>	<u>10:13</u>	<u>2.75</u>						
	<u>5.44</u>	<u>10:19</u>	<u>3.5</u>						
	<u>5.44</u>	<u>10:24</u>	<u>4.25</u>						
	<u>5.44</u>	<u>10:28</u>	<u>5</u>						

15.30  
 - 4.91  
 -----  
 10.39  
 x .16  
 -----  
 1.66  
 x 3  
 -----  
 4.98g

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CH:AS  
 SAMPLE NUMBER(S) AND TIME: MW-2-020112 10:30

NOTES: sock sitting at 3 ft bgs - not in water

LAB ANALYSIS PARAMETERS AND PRESERVATIVES: NWTPH-Dx

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 1- 500ml Amber

DECON. PROCEDURES: Alconox, Deionized water, new tubing

SAMPLES DELIVERED TO: Friedman: Braya TRANSPORTER: Mike Erdahl  
 DATE: 2/1/12 TIME: 11:40

CAPACITY OF CASING (GALLONS/LINEAR FOOT)  
 2" - 0.19 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Bradley T. Benson, B.S.  
Kurt Johnson, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
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February 3, 2012

Cherie Howland, Project Manager  
AMEC Environment & Infrastructure, Inc.  
221 S 28<sup>th</sup> Street, Suite 102  
Tacoma, WA 98402

Dear Ms. Howland:

Included are the results from the testing of material submitted on February 1, 2012 from the Longview Fibre 2915-173770, F&BI 202003 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Anna Sonoqui  
AMC0203R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 1, 2012 by Friedman & Bruya, Inc. from the AMEC Environment & Infrastructure Longview Fibre 2915-173770, F&BI 202003 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>AMEC Environment &amp; Infrastructure</u>
202003-01	MW-2-020112
202003-02	MW-1-020112

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/03/12

Date Received: 02/01/12

Project: Longview Fibre 2915-173770, F&BI 202003

Date Extracted: 02/01/12

Date Analyzed: 02/02/12

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

<u>Sample ID</u>	<u>Diesel Range</u>	<u>Motor Oil Range</u>	<u>Surrogate</u>
Laboratory ID	(C <sub>10</sub> -C <sub>25</sub> )	(C <sub>25</sub> -C <sub>36</sub> )	(% Recovery)
			(Limit 50-150)
MW-2-020112 202003-01	1,100	<250	103
MW-1-020112 202003-02	210	<250	103
Method Blank 02-150 MB2	<50	<250	99

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/03/12

Date Received: 02/01/12

Project: Longview Fibre 2915-173770, F&BI 202003

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	90	63-142	2

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

