



October 14, 2016
G-Logics File 01-0410-K

Washington State Department of Ecology, NW Region
Mr. Dale Myers
3190 160th Avenue SE
Bellevue, WA 98008

Subject: Progress Report, September to October 2016
Boeing Field Chevron
Ecology Facility-Site ID: 2551
Agreed Order: DE-10947
10805 East Marginal Way South
Tukwila, WA

Dear Mr. Myers:

This progress memo has been prepared to document the activities that have occurred at the above referenced Site, in regards to the Remedial Investigation (RI) currently underway. This Progress Report also is intended to fulfill the requirements established in the Agreed Order (No. DE 10947). Below is a summary of Tasks completed, underway, or scheduled to occur shortly.

Actions Taken at the Property to Comply with Agreed Order No. DE 8072

The following actions were recently completed as part of the on-going remedial investigation.

Video Inspection of Utilities

G-Logics has completed the utility and monitoring-well inspections associated with the Site on September 28, 29, 30, and October 3, 2016. Specifically, G-Logics contracted with Bravo Environmental (Bravo) to perform utility locating and video-scoping services. All accessible sanitary sewer and storm-drain lines on the Boeing Field Chevron (BFC)

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property and adjacent right-of-ways were video-scoped using closed-circuit video-recording equipment. The results of the video-scope did not identify any broken or cracked pipes in the videoed piping (on or off the BFC property). Screen-captured images of these video inspections will be included with the draft Remedial Investigation report.

In addition to the video-scoping, Bravo also attempted to locate on-property sanitary sewer and storm-drain lines in order to mark inferred locations on the surface. G-Logics was able to document the general direction and length of subsurface piping. However, due to reinforced concrete and multiple subsurface obstructions, efforts to precisely locate these features were unsuccessful. Additionally, G-Logics and Bravo attempted to identify/locate the carwash drainage system and its connections to sanitary sewer. G-Logics did not discover a connection of the carwash-drainage system to a sanitary-sewer line. Figure 1 shows the approximate locations of inspected storm and sewer lines.

Monitoring Well Inspection and Redevelopment

G-Logics inspected (video and visually) and redeveloped 28 existing monitoring wells at the Site. A Licensed Driller noted the construction and condition of each well, including well-screen depth, sediment accumulation, blockages, and the condition of monuments and other well equipment. Wells found with sediment accumulation were redeveloped with the use of a submersible pump. The results of this work are summarized in Table 1.

Catch Basin-Sediment Sampling

On Monday, October 3rd, G-Logics attempted to sample catch-basin sediments along the eastern curb of Pacific Highway South (western boundary of the subject property). The basins were found to contain approximately 1 foot of standing water with abundant leaf and garbage debris. Sediment was not encountered in sufficient quantities to sample. G-Logics will return for a second attempt to sample catch basin sediments and stormwater after subsequent storm events.

Remedial Investigation Report Preparations

G-Logics continues to compile and update analytical data tables and cross-section diagrams that will be used in the RI report and assist in planning and decision making during the field activities of the RI. Included in this memo is a draft figure (Figure 2) depicting a north-

south cross-section through the western portion of the property. The cross-section presents an interpretation of available subsurface data.

In order to have an up-to-date understanding of site conditions, G-Logics also has requested (via Foster Pepper) the electronic files from Terracon that were used to produce the RI workplan.

Summary of Sampling and Testing Reports

Sampling and analysis has not occurred during this reporting period.

Summary of Deviations from the Approved Workplans

There is a significant schedule impact due the inactivity of field work since the RI workplan was approved (prior to G-Logics authorization). Currently, G-Logics is scheduling to complete subsurface exploration and possible monitoring-well installations before conducting a site-wide groundwater sampling event. This alteration is intended to provide a broader picture of site characterization.

Summary of Contacts with Representatives from Local Community, Public Interest Groups, Press, and Federal, State, and Tribal Governments

G-Logics met with the Ecology project manager (Mr. Dale Myers) and with Ecology's consultant (Kennedy/Jenks, Ms. Julia Schwarz) on October 3, 2016 to discuss the project and gain a better understanding of the planned objectives and how they were created. Other attendees at the meeting included technical representative for Chevron (Leidos, Inc., Mr. Russell Shropshire) and legal representative for Rajbir Sandhu (Foster Pepper PLLC, Mr. Kurt Peterson).

Summary of Problems or Anticipated Problems in Meeting the Schedule or Objectives

Currently, it is questionable if the RI field activities can be completed in the required 180-day time-frame from the date the Ecology approved RI workplan. G-Logics understands the effective date of the workplan was May 24, 2016 and that the 180-day time frame to complete the field activities is November 20, 2016 (calculated using calendar-days, not work-days).

Summary of Solutions Developed and Implemented or Planned to Address Problems

G-Logics continues to schedule and perform work at the site. Specifically, G-Logics has created the attached Activity Schedule in an attempt to map out dates and durations of activities. Please note, the attached (Appendix A) activity schedule is a very aggressive/best-case-scenario plan. Unknown problems are anticipated to occur with the schedule and will be addressed as they arise.

Changes in Key Personnel

There are no changes in key personnel at this time.

Description of Work Planned for Next Reporting Period

Before the November 15th report submittal, G-Logics anticipates completing:

- A characterization of tidal influence on the existing monitoring well network.
- The 1st round of subsurface explorations (soil sampling).
- Additional monitoring well installations.
- A site-wide groundwater sampling event (after additional monitoring wells are installed).
- The installation of three permanent soil-vapor monitoring points on the south side of the property.
- The collection of soil-vapor samples from each of the three monitoring points.
- Depending on weather conditions, stormwater and catch-basin sediment sampling also may occur.

Closing

Please contact us at your convenience with any questions regarding our work or findings.

Sincerely,
G-Logics, Inc.



Rory L. Galloway, LG, LHG
Principal



Dan Hatch, PMP
Remediation Manager



Zackary S. Wall, M.Sc.
Staff Geologist

FIGURES

- Figure 1: On-Site Stormwater and Sewer Drain Systems
Figure 2: Site Diagram: Cross-section A-A'

TABLES

- Table 1 Well Inspection September 2016















APPENDICES

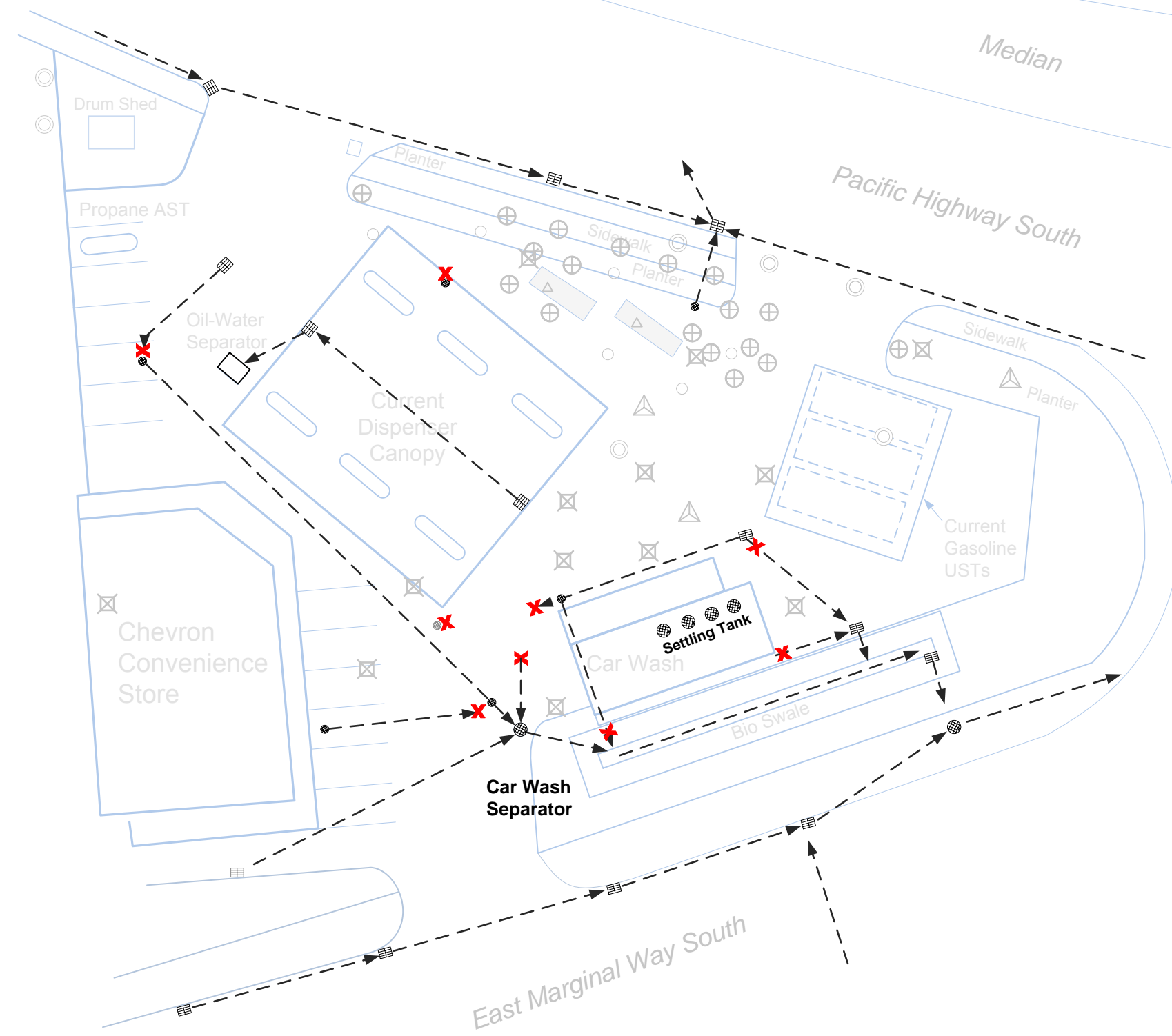
- Appendix A: RI Field-Activity Schedule

FIGURES



Legend

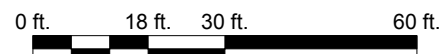
-  B-8 RZA 1990b
-  B-3 Hart Crowser 1993b
-  MW-8A Hart Crowser 1993c
-  MW-12 PEG 1997b
-  MW-13 ERI 2004b
-  EX-S Extraction Well 2004
-  MW-17 ERI 2005c
-  IP-3 G-Logics Injection Point/ Monitoring Well 2006
-  P-6 G-Logics Probe 2008c
-  EW-3 G-Logics Extraction Well/ Monitoring Well (2008)
-  Storm Drain Catch Basin Grate
-  Storm/Sewer Clean Out
-  Approximate direction and distance of video-inspected utility pipe
-  Approximate location of blockage in utility pipe



Project File: 01-0410-K-Storm and Sewer 30.vsd



Approximate Drawing Scale: 1" = 30'



Important Note: This figure contains information in color. Black & white photocopies may not be suitable for review.

DRAFT

On-Site Stormwater and Sewer Drainage Systems
Boeing Field Chevron
10805 East Marginal Way South
Seattle, Washington

Figure
1

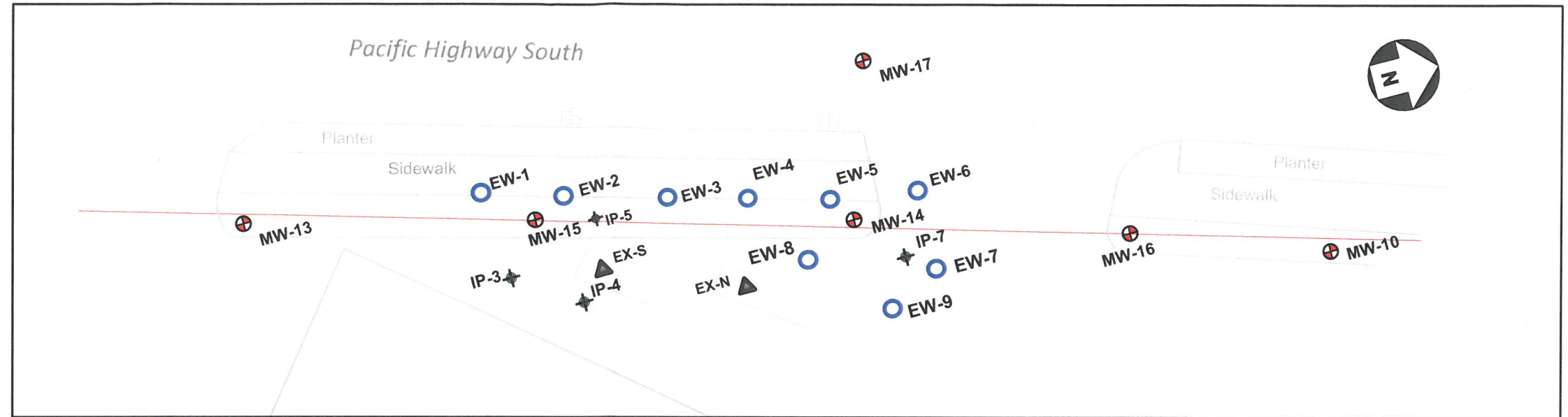
Project File: 01-0410-K A-A' from 1003.vsd



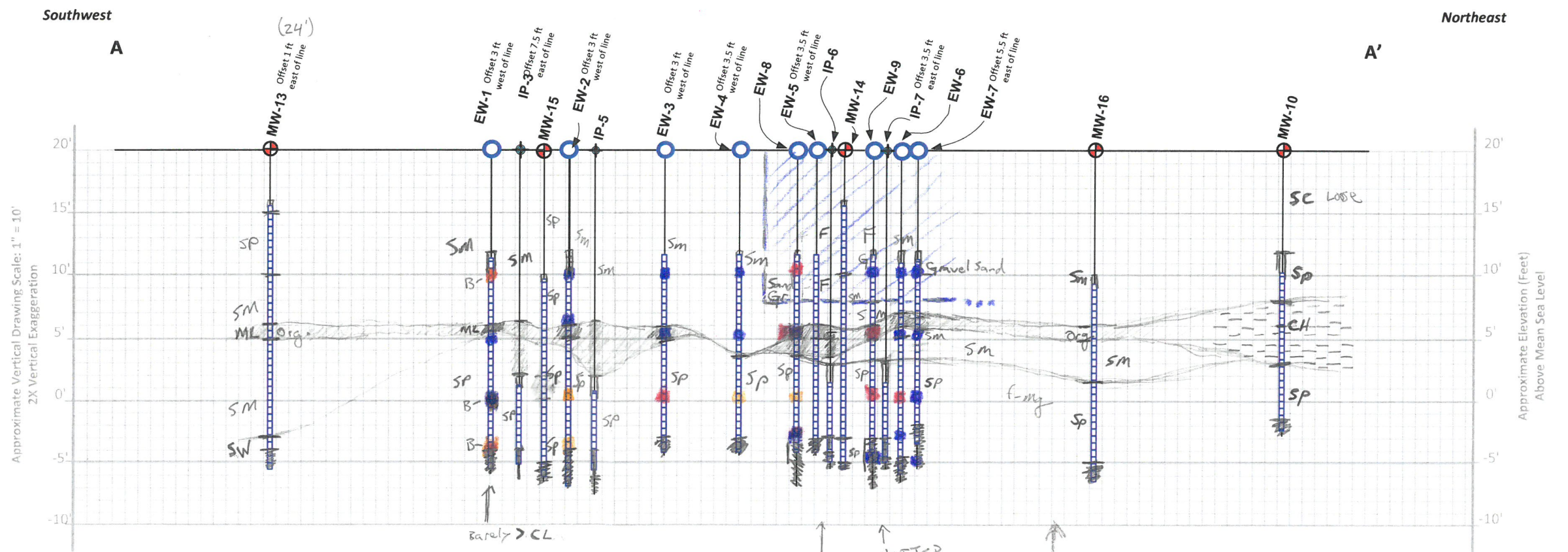
Legend

- EW-1 2008 G-Logics Extraction Well
- IP-3 Injection/Monitoring Well
- MW-13 1997-2005 Existing Monitoring Well

- Soil Sample, no petroleum contaminants detected
- Soil Sample, petroleum concentrations present but less than MTCA cleanup levels
- Soil Sample, petroleum concentrations above MTCA cleanup levels
- Groundwater Sample, no petroleum contaminants detected
- Groundwater Sample, petroleum concentrations present but less than MTCA cleanup levels
- Groundwater Sample, contaminant concentrations above MTCA cleanup levels
- Well Screen Interval



IP - J. Funderbark
EW - R. Roberts



- GAS > CL
- GAS < CL
- GAS ND

Note: This figure contains information in color. Black & white photocopies may not be suitable for review.

Approximate Horizontal Drawing Scale: 1" = 20'
Approximate Vertical Drawing Scale: 1" = 10'
0 ft. 12 ft. 20 ft. 40 ft.

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Site Diagram: Cross-section A-A'
Boeing Field Chevron
10805 East Marginal Way South
Tukwila, Washington

Figure 2

TABLES

Table 1

Well Inspection September 2016
Boeing Field Chevron
10805 East Marginal Way South
Seattle, Washington

Well Identification	Installation Date	Monument Diameter	Casing Diameter	Well Screen Depth*	Parts Needed			Well Tag Present	Ecology Well Log	Comments	Recommendations	Blockage/Sediment
					Expansion Cap	Bolts	Gasket					
MW-10	9/3/97	8"	2" PVC	8.5'-18.5' 20'	--	3	1	No	Yes R036366	Well depth does not match log		3' **
MW-11	9/3/97	8"	2" PVC	8'-20'	--	3	1	No	Yes R036366	Monument bolt wings missing	Replace monument	No
MW-12	9/3/97	8"	2" PVC	8'-18' 20'	--	N/A	N/A	No	Yes R036366	Monument bolt wings missing Well depth does not match log	Replace monument	4.5' **
MW-13	7/16/04	8"	2" PVC	4'-24'	2"	3	1	AKN-782	Yes R066307			1.5' **
MW-14	7/16/04	8"	2" PVC	4'-24'	2"	3	1	Missing AKN-783	Yes R066307	Concrete broken around monument	Replace monument	0.5'
MW-15	8/26/05	8"	2" PVC	10'-25'	2"	3	1	Missing APM-449	Yes R066693			1' **
MW-16	8/26/05	8"	2" PVC	9.5'-24.5' 25'	--	2	--	APM-450	Yes R066693			7' **
MW-17	8/26/05	8"	2" PVC	9.5'-24.5' 25'	--	3	1	AKT-104	Yes R067255			No
MW-18	4/16/08	5"	1" PVC	11'-16' ?	--	--	--	AJP-300	Yes RE02237	No camera verification, well diameter too small		No
MW-19	4/16/08	5"	1" PVC	15'-20' ?	--	--	1	AJP-299	Yes RE02237	No camera verification, well diameter too small		0.2'
MW-20	4/16/08	5"	1" PVC	15'-20' ?	--	--	--	AJP-297	Yes RE02237	No camera verification, well diameter too small		0.5'
MW-21	4/16/08	5"	1" PVC	17'-22' ?	--	--	--	AJP-298	Yes RE02237	No camera verification, well diameter too small		0.3'

Table 1

**Well Inspection September 2016
Boeing Field Chevron
10805 East Marginal Way South
Seattle, Washington**

Well Identification	Installation Date	Monument Diameter	Casing Diameter	Well Screen Depth*	Parts Needed			Well Tag Present	Ecology Well Log	Comments	Recommendations	Blockage/Sediment
					Expansion Cap	Bolts	Gasket					
IP-3	4/19/06	8"	2" Stainless Steel	18'-24'	2"	3	1	APK-234	No			No
IP-4	4/19/06	8"	3" Stainless Steel	8'-16' 14'	2"	3	1	APK-219	No	Well depth does not match log		No
IP-5	4/26/06	8"	2" Stainless Steel	18'-24'	--	--	--	Yes	No	Can not read tag number		No
IP-6	8/4/06	12"	2" Stainless Steel	18'-24' ?	2"	--	1	APL-600	Yes R069371	Obstruction @ 5.2' Product pump stuck in well	Remove Obstruction or Decommission	5'
IP-7	8/4/06	12"	2" Stainless Steel	17'-23' ?		3	1	APL-599	Yes R069371	Monument bolt wings missing Approximately two feet of product	Replace monument	No
EW-1	3/17/08	Plastic Vault	2" PVC	8.5'-23.5' 23'	--	N/A	N/A	Missing BAK-423	Yes R073548	Utility vault: Plastic, no seal	Replace monument or Obtain a variance	2' **
EW-2	3/17/08	Plastic Vault	2" PVC	8.5'-23.5' 23'	2"	N/A	N/A	Missing BAK-424	Yes R073548	Utility vault: Plastic, no seal	Replace monument or Obtain a variance	1.5' **
EW-3	3/17/08	Plastic Vault	2" PVC	8'-23'	2"	N/A	N/A	Missing BAK-425	Yes R073548	Utility vault: Plastic, no seal	Replace monument or Obtain a variance	7.5' **
EW-4	3/17/08	Plastic Vault	2" PVC	8'-23'	2"	N/A	N/A	Missing BAK-426	Yes R073548	Utility vault: Plastic, no seal	Replace monument or Obtain a variance	10.5' **
EW-5	3/17/08	Plastic Vault	2" PVC	7.5'-22.5' 23'	2"	N/A	N/A	Missing BAK-427	Yes R073548	Utility vault: Plastic, no seal	Replace monument or Obtain a variance	1' **

Table 1

**Well Inspection September 2016
Boeing Field Chevron
10805 East Marginal Way South
Seattle, Washington**

Well Identification	Installation Date	Monument Diameter	Casing Diameter	Well Screen Depth*	Parts Needed			Well Tag Present	Ecology Well Log	Comments	Recommendations	Blockage/Sediment
					Expansion Cap	Bolts	Gasket					
EW-6	3/18/08	Steel Vault	2" PVC	8'-23'	2"	N/A	N/A	Missing BAK-428	Yes R073548	Utility vault: Metal, no seal	Replace monument or Obtain a variance	5' **
EW-7	3/18/08	Steel Vault	2" PVC	8'-23'	2"	N/A	N/A	Missing BAK-429	Yes R073548	Utility vault: Metal, no seal Approximately two feet of product	Replace monument or Obtain a variance	1' **
EW-8	3/18/08	Steel Vault	2" PVC	8.5'-23.5' 23'	--	N/A	N/A	Missing BAK-430	Yes R073548	Utility vault: Metal, no seal	Replace monument or Obtain a variance	0.5'
EW-9	3/18/08	Steel Vault	2" PVC	8.5'-23.5' 23'	2"	N/A	N/A	Missing BAK-434	Yes R073548	Non boltable utility monument	Replace monument or Obtain a variance	1' **
EX-N	Unknown	12"	6" PVC	3.5'-14'	--	--	--	No	No	No record of construction found	Decommission Drill out	No
EX-S	Unknown	12"	4" PVC	0'-15'	--	--	--	No	No	No record of construction found	Decommission Pressure grout	No

Notes:

- * Used camera to verify screen interval on all wells greater than 1" diameter, with the exception of IP-7, product level was above the screen interval.
- ** Blockage or sediment removed during well redevelopment 9/29 -10/3, 2016
- N/A Not Applicable
- ? Unable to verify due to blockage, product level, or casing diameter
- No Parts Needed
- 20' Total well depth recorded on well log

APPENDIX A

Schedule Subject to Change

Boeing Field Chevron

RI Field-Activity Schedule

Schedule Revision Date: 10/14/16

Ecology Site ID# 2551

Activity List	Duration	Activity Dates		Key Person(s)	Task Status: S=Scheduled NS=Not Scheduled On=On Going C= Completed	Bills to Task #:	Notes
		Start	Finish				
Utility Survey/Inspection (Task 1)							
Utility Locates and Video Scoping	2	9/29/16	9/30/16	Zak	C	1	Need to Schedule with Bravo, City of Tukwila, Traffic Signage
Site Survey	1	10/3/16	10/3/16	Zak	On	1	
MW Inspect/Repairs (Tasks 2, 3, & 4)							
Well Inspections	3	9/29/16	10/3/16	Zak/Karis	C	2, 3, 4	
Rehab Wells & Schedule Driller for Decommissioning Work	5	9/29/16	10/5/16	Zak/Karis	C	2, 3, 4	
Well Decommissioning	5	10/31/16	11/4/16	Zak/Karis	NS	2, 3, 4	
IDW (Task 18)				Zak	On	2, 3, 4	Waiting for analytical
Tidal Influence Study (Task 5)							
Install Transducers	6	10/11/16	10/18/16	Zak/Dan	C	5	
Collect Data	1	10/19/16	10/19/16	Zak/Dan	On	5	
Plot Data / Generate Inspection/Decommissioning Memo	7	10/19/16	10/27/16	Zak/Dan	S	5	
Catch-Basin, Sediment & SW Sampling (Task 8)							
Catch-Basin Sampling	1	TBD	TBD	Zak	On	8	Need to schedule with Lab for ASAP Results
Stormwater Sampling	1	TBD	TBD	Zak	On	8	Need to schedule with Lab for ASAP Results

Schedule Subject to Change

Boeing Field Chevron

RI Field-Activity Schedule

Schedule Revision Date: 10/14/16

Ecology Site ID# 2551

Activity List	Duration	Activity Dates		Key Person(s)	Task Status: S=Scheduled NS=Not Scheduled On=On Going C= Completed	Bills to Task #:	Notes
		Start	Finish				
Exploration Borings, Soil & GW (Task 7)							
Schedule Traffic Control, Driller, Bottle Order	1	10/10/16	10/10/16	Zak/Dan	S	7	
Drilling Day 1	1	10/24/16	10/24/16	Zak/Karis	S	7	
Drilling Day 2	1	10/25/16	10/25/16	Zak/Karis	S	7	
Drilling Day 3	1	10/26/16	10/26/16	Zak/Karis	S	7	
Drilling Day 4	1	10/27/16	10/27/16	Zak/Karis	S	7	
Drilling Day 5	1	10/28/16	10/28/16	Zak/Karis	S	7	
Submit Samples for Analysis	10	10/26/16	11/8/16	Zak/Karis	S	7	
VI Assessment (Task 16)							
Order parts for Monitoring Points	1	10/13/16	10/13/16	Zak/Dan/Stu	S	16	
Install Monitoring Points (3 in South end)	1	1/2/00	1/2/00	Zak/Karis	S	16	
Sample and Submit for Analysis	10	1/3/00	1/16/00	Zak/Karis	S	16	
Additional Exploration Work (Task 9, "Step out borings")							
Schedule Driller	1	10/28/16	10/28/16	Zak/Karis	S	9	
Drilling Day 1	1	11/7/16	11/7/16	Zak/Karis	S	9	This Requires work to be performed without Ecology's review comments on the exploration memo
Drilling Day 2	1	11/8/16	11/8/16	Zak/Karis	S	9	
Drilling Day 3	1	11/9/16	11/9/16	Zak/Karis	S	9	
Sample and Submit for Analysis	8	11/8/16	11/17/16	Zak/Karis	S	9	

Schedule Subject to Change

Boeing Field Chevron

RI Field-Activity Schedule

Schedule Revision Date: 10/14/16

Ecology Site ID# 2551

Activity List	Duration	Activity Dates		Key Person(s)	Task Status: S=Scheduled NS=Not Scheduled On=On Going C= Completed	Bills to Task #:	Notes
		Start	Finish				
GW Sampling (Task 6)							
Schedule Traffic Control & Bottle Order	1	10/18/16	10/18/16	Zak/Dan	S	6	
Sampling Event 1	1	11/9/16	11/9/16	Zak/Karis	S	6	
Sampling Event 2	1	11/10/16	11/10/16	Zak/Karis	S	6	
Sampling Event 3	1	11/11/16	11/11/16	Zak/Karis	S	6	
Sampling Event 4	1	11/14/16	11/14/16	Zak/Karis	S	6	
Sampling Event 5	1	11/15/16	11/15/16	Zak/Karis	S	6	
Sampling Event 6	1	11/16/16	11/16/16	Zak/Karis	S	6	
Sampling Event 7	1	11/17/16	11/17/16	Zak/Karis	S	6	
Submit Samples for Analysis	10	11/11/16	11/28/16	Zak/Karis	S	6	
Generate <u>Memo</u> for soil, groundwater, soil-vapor Exploration Results (Summary Text ONLY)	10	11/29/16	12/12/16	Zak/Dan/Stu	S	16	
Submit Memo to FP/Chevron	6	12/13/16	12/20/16	Dan	S	16	
Submit Memo to Ecology	15	12/21/16	1/10/17	Dan	S	16	
<i>With this schedule, completion of the 1st round of drilling, groundwater, and soil-vapor exploration/field activities will have been completed in 57 days since G-Logics project authorization on 9/21/16.</i>							
Well Decommissioning							
Submit Well Inspection and Tidal Study Memo to Foster Pepper & Chevron	5	10/27/16	11/2/16	Zak/Dan	S	2, 3, 4	
Submit Well Inspection and Tidal Study Memo to Ecology	15	11/3/16	11/23/16	Zak/Dan		2, 3, 4	Ask Ecology to rush response.
Receive Ecology Comments and Schedule Driller	2	11/28/16	11/29/16	Zak/Karis	S	2, 3, 4	
Decommission Wells	4	12/13/16	12/16/16	Zak/Karis	S	2, 3, 4	

Schedule Subject to Change

Boeing Field Chevron

RI Field-Activity Schedule

Schedule Revision Date: 10/14/16

Ecology Site ID# 2551

Activity List	Duration	Activity Dates		Key Person(s)	Task Status: S=Scheduled NS=Not Scheduled On=On Going C= Completed	Bills to Task #:	Notes
		Start	Finish				
TEE (Task 14)							
TEE Preparation	20	11/21/16	12/20/16	Zak/Dan	On	14	
EIM (Task 15)							
EIM Data Entry	45	10/24/16	12/27/16	Halli	On	15	
RI Report Preparations (Task 12)							
RI Report Prep Table and Figure Generation	45	9/26/16	11/29/16	Zak/Jon/Dan		12	
RI Report Prep, Sections 1 and 2 (<i>Introductions</i>)	25	9/26/16	10/28/16	Dan		12	
Submit Sections 1 and 2 to FP/Chevron	6	10/31/16	11/7/16	Dan		12	
Submit Sections 1 and 2 to Ecology	15	11/8/16	11/30/16	Dan		12	Ask Ecology to rush response.
RI Report Prep, Section 5 (<i>Proposed Cleanup Standards</i>)	15	10/28/16	11/17/16	Dan/Rory/ Zak		12	
Submit Section 5 to FP/Chevron	9	11/18/16	12/2/16	Dan		12	
Submit Section 5 to Ecology	15	12/5/16	12/23/16	Dan		12	Ask Ecology to rush response.
RI Report Prep, Sections 3 and 4 (<i>Investigation Results and CSM</i>)	20	12/12/16	1/6/17	Dan		12	
Submit Sections 3 and 4 to FP/Chevron	9	1/9/17	1/19/17	Dan		12	
Submit Sections 3 and 4 to Ecology	15	1/20/17	2/9/17	Dan		12	Ask Ecology to rush response.
RI Report Prep, Section 6 (<i>Summary/Conclusions/Rec's</i>) and Final Draft Report	20	2/9/17	3/9/17	Dan		12	
Submit Section 6 and Final Draft Report to FP/Chevron	9	3/10/17	3/22/17	Dan		12	
Submit Section 6 and Final Draft Report to Ecology	90	3/23/17	7/28/17	Dan		12	
		With this schedule, completion of the draft RI report will have been submitted to Ecology in 183 days since G-Logics project authorization on 9/21/16.					