City of Everett
Work Plan
PSO 4 Abandonment (Revised February 19, 2020)

The City of Everett plans to abandon the current combined sewer overflow (CSO) discharge pipeline, Puget Sound Outfall No. 4 (PSO 4) that runs through the Kimberly Clark Upland property. The pipe is currently functioning to carry overflows from the City's Lift Station No. 5, and storm water from the KC site; historically the pipeline also carried industrial and stormwater discharges originating from the KC site as well. Figure 1 displays the pipeline, manhole structures, and PSO 4's location within the cleanup site.

The PSO 4 outfall is permitted to discharge CSO and stormwater through the city's existing permits. The City of Everett's NPDES wastewater collection and treatment permit, Permit No. WA0024490 (expires October 30, 2020), lists PSO 4 as a permitted point of discharge for combined sewer (Section S.8); stormwater discharges from PSO 4 from the city's stormwater collection are covered under the Western Washington Phase II Stormwater General Permit (effective date August 1, 2019).

The abandonment of PSO 4 will result in no further stormwater or combined sewer overflows being discharged from outfall PSO 4. The city has made plans to temporarily route stormwater and combined sewer flows to the city's PSO 5 outfall, located at Lift Station No. 3. The city's July 19, 2018 letter to its permit manager details the revisions (Attachment 1), which has been approved by Ecology Water Quality.

The PSO 4 pipeline initiates at the city's Lift Station No. 5. The initial combined sewer overflow pipe is a 10-inch diameter pipe as it crosses under the railroad tracks to enter the KC site. As the pipeline travels west across the site, multiple revisions, pipe types, and pipe upsizing occurred during the years to accommodate the site's historical industrial use, and multiple connections to the City's pipeline from the KC industrial facilities. By the time reaches the point of discharge, the outfall is 30-inches in diameter, an increase of nine times the flow capacity. Pipe types used include clay tiles, ductile, and concrete. The nine structures across the site to be abandoned vary between brick and concrete.

Guidance on the acceptable methods to abandon the pipeline and manholes are from documents provided to the Ecology Toxics Cleanup Program for this site (Aspect Consulting memorandum to Andy Kallus, *Approach for Plugging Open Pipes at Shoreline,* June 27, 2018). The City's efforts to abandon the line will follow the methods prescribed in the memo.

Each manhole and pipe access location along the pipeline alignment will be filled with a control density fill mix (CDF) for a distance of five times the pipe diameter at that location. The CDF mix is a lean cement mix, that once sets is only a few hundred psi compressive strength. The specifications and supplier mix information is attached, including the aggregate source and

analytical data (Attachment 2). Results of metal analyses of the aggregate materials, indicate levels are well below MTCA Method A for soils.

Concrete trucks will be brought on site and deliver CDF at a consistency and viscosity that allows the CDF to fill the entire pipe at least to the five times the pipe diameter distance defined in the Aspect Consulting memo. The city will work with the CDF supplier to get a mix suitable to fill the pipes (a viscosity specification is not normal for concrete mixes). The fill quantity requirements will be used to determine if the mix filled the pipe up per the Ecology 5 times the diameter length (this is easily calculated and field verified).

Due to the CDF needing to be in a viscous state a two part installation will be done. The first pour filling the pipe as much as possible and then stopping to allow it to set and not continue to be pushed down the line due to the head pressure of the fill in the manhole. Once it has set the remainder of the fill will be installed to fill the entire pipe circumference. This will be inspected and verified by either a manhole entry or with a camera. Structures (manholes) will be filled to the surface with CDF. Manhole covers and frames will be removed once the CDF has set.

If the CDF flow into the pipes is problematic or if questionable to meet the distance of five times the pipe diameter, there is an alternative method that the city has used to abandon pipes. Crews perform a confined space entry, with a safe atmosphere and safe working conditions inside the structure. The manhole inlets and outlets are then 'bricked' closed by mortaring two vertical layers of bricks within the structure, then mortaring the opening completely closed. With this contingency method, manholes would still be filled completely to the surface with CDF after the brick grouting is done.

The specific details for each structure follows, and are listed per the city asset number, as labeled in the attached Figure 1.

Manhole #SMH Q01

This manhole has a 10-inch pipe entering and exiting the structure. The structure is five feet deep and four feet in dimeter. The Pipe distance to be filled with CDF is 50 inches in both directions. The estimated total CDF volume to fill the pipes and the manholes is three cubic yards.

Manhole # SMHQ14

This manhole has a 10-inch pipe entering and a 16-inch pipe exiting the structure. The structure is six feet deep and four feet in diameter. Pipe distance to be filled is 50 inches on the inlet pipe entering and 80 inches on the outlet pipe. At least 4.5 cubic yards of CDF is needed to fill the pipes and manhole.

Manhole #SMHQ16

This manhole has a 16-inch pipe entering and a 16-inch pipe exiting the structure. The structure is six feet deep and four feet in diameter. Pipe distance to be filled is 80 inches on both the inlet and outlet pipes, and about six cubic yards of CDF required to fill the pipes and manhole.

Manhole #SMHPO4

This manhole has a 16-inch pipe entering and a 16-inch pipe exiting the structure. The structure is six feet deep and four feet in diameter. Pipe distance to be filled is 80 inches on both the inlet and outlet pipes, and about six cubic yards of CDF required to fill the pipes and manhole.

Manhole #SMHPO3

This manhole has a 16-inch pipe entering and an 18-inch pipe exiting the structure. The structure is 8.5 feet deep and 4.5 feet in diameter. Pipe distance to be filled is 80 inches on the inlet pipe and 90 inches on the outlet pipe, or about nine cubic yards of CDF required to fill the pipes and manhole.

Manhole #SMHP3A

This manhole has an 18-inch pipe entering and an 18-inch pipe exiting the structure. The structure is nine feet deep and 4.5 feet in diameter. Pipe distance to be filled is 90 inches on the inlet pipe and 90 inches on the outlet pipe, or just over nine cubic yards of CDF required to fill the pipes and manhole.

Manhole #SMHPO2

This manhole has an 18-inch pipe entering and an 18-inch pipe exiting the structure. The structure is 13.5 feet deep and 4.5 feet in diameter. Pipe distance to be filled is 90 inches on the inlet pipe and 90 inches on the outlet pipe, or about 12 cubic yards of CDF required to fill the pipes and manhole.

Manhole #SMHPO1

This manhole has an 18-inch pipe entering and a 30-inch pipe exiting the structure. The structure is 14 feet deep and 6 feet in diameter. Pipe distance to be filled is 90 inches on the inlet pipe and 150 inches on the outlet pipe, or almost 20 cubic yards of CDF required to fill the pipes and manhole.

Vault (no city ID, as vault was installed by others) – ID on map as "Abandonment Point"

This structure is a vault rather than a manhole. The structure has a 30-inch pipe entering and a 30-inch exiting the structure. The vault appears to be concrete and is 14 feet deep and approximately 10 feet square. Pipe distance to be filled is 90 inches on the inlet pipe and the

outlet pipe will be bricked as described above. Bricking the outlet is planned prior to filling with CDF. However both inlets and outlets will be capped at the structure completely filled, thus completely blocked and prevent water from entering or exiting. The total volume of CDF to abandon this vault and piping is about 60 cubic yards. At the point of discharge the pipe will be plugged via bricks and mortar if possible.

End of Pipe for PS 04

The pipe west of the last vault (per above) is attached underneath the wharf, and is a 30-inch diameter clay tile pipe. City crews plan to plug the end of pipe that is accessible during low tides in July with a mechanical plug.

Other Abandonment – Outfall No. 008

Outfall No. 008 from the west clarifier at the former wastewater treatment plant owned by Kimberly-Clark (now owned by the City of Everett) also will be abandoned. The outfall was permitted in the now retired NPDES Industrial Discharge permit held by KC. The city's reuse plans for the clarifiers and the former treatment plant do not include any further discharges from this outfall. The outfall was an emergency overflow for the clarifiers and originated at the vault west of the clarifier and then exits into the waterway via a 54-inch pipe.

The outfall will be evaluated prior to abandonment, which will include the operational needs for the overflow and that it can be abandoned, and what measures are to be taken at the outfall from the vault to the East Waterway to plug the outfall to prevent discharge from the outfall during the injection of CDF. Once these two items are resolved, both the vault and pipe will be filled with CDF as per the other abandonments; the volume of CDF is expected to be about 50 cubic yards.

Schedule

The city's first action is to complete the installation of the temporary connection for storm and any CSO flows; and to make the line operable and in service. This was completed during October 2019. The abandonment work of PSO 4 will occur once the temporary pipeline is installed and Ecology approves this abandonment plan. The abandonment is anticipated to be completed by the first quarter of 2020 and coordinated with other site activity.

The work to abandon and plug portions of the PS 04 pipe will take place prior to the Interim Action for soil and construction material removal done by KC. The Interim Action will start by mid-March 2020; the PS 04 abandonment is planned to be completed by March 13, 2020.

Attachments: CDF aggregate specification sheet from Cadman
Aggregate metal analyses from Sechelt sand (Cadman aggregate supplier)

Figure 1


Outfall #008
Vault
Outfall #008
City of Everett
Kimberly Clark
Abandonment Point
(Existing Vault)
10 Foot Access
Either Side of Pipe
for Pipe Abandonment
Existing
PSO 4
Abandonment Point
(If Manhole Can
Be Located)
DOF1995Q19
OUTFALL #008
SMH Q02
25th St
30" CLAY TILE
SMH P02
SMH P3A
SMH P03
16" DI
SMHQ14
10" UNK
10" UNK
SMH Q01
OUTFALL
PS04
SMH P01
18" CONC
SMH P04
SMHQ16
MF 03010
LS05
Abandonment Points
(Existing Manholes)
26th St
W Marine View Dr
Entry to Site
OUTFALL
PS05
SML1995U02 30" CMP
SML U03
30" PVC
Federal Ave
SML1995T0A 30" PVC
Terminal Ave
Everett Ave
LS03
FIGURE 1
Proposed Re-Route of PSO4
Abandonment Point
Existing Manhole
EVERETT
0
75
150
Feet
N
W
E
S

Attachment 1

City of Everett July 19, 2018 Letter

PSO4 Combined Sewer Outfall Temporary Relocation

CITY OF EVERETT
Public Works Department

July 19, 2018

Mr. Lazaro Eleuterio, PE, PhD
Municipal Facility Manager
Washington State Department of Ecology – Water Quality Program
3190 160th Ave. SE.
Bellevue, WA 98008-5452

Re: City of Everett, PSO4 Combined Sewer Outfall Temporary Relocation

Dear Laz:

The City proposes to abandon the piping to the existing Combined Sewer Overflow (CSO) Puget Sound Outfall No. 4 (PSO4) pipe within the current Kimberly-Clark (KC) property and install a temporary pipeline to re-route flows to the existing Puget Sound Outfall No. 5 (PSO5). The background for this request along with the reasons plan of action, schedule, and our interim CSO monitoring plan for PSO4 and PSO5 are presented herein.

The attached Figure 1 shows the PS04 pipeline and surrounding area. The PSO4 pipeline carries the infrequent combined sewer overflow from the city's Lift Station No. 5 and stormwater from the local collection basin. Approximately seven acres of storm water from two private parking lots and a small area of West Marine View Drive flow through the line and out PS04 whenever it rains. All flow from the east side of the railroad tracks, storm water or combined sewage, must enter a manhole then through a 10-inch pipe under the railroad.

Earlier this year standing water was routinely observed in the manhole east of the railroad tracks indicating blockage in the pipe under tracks. The PSO4 pipe was subsequently inspected (CCTV) as best possible and found the line in poor condition and in need of replacement under the tracks and through the KC Site to the PSO4 outfall.

Several actions are being planned within the KC property that will affect and impact the existing or a replacement PS04 pipe. The KC upland property is a listed MTCA site, with Andy Kallus of Ecology's Port Gardner Bay, Puget Sound Initiative Work Group as Ecology's Site's Manager. This group has concerns that the PSO4 pipe through the KC property is in poor condition and that contaminated groundwater infiltrates into the pipe and discharges to Port Gardner Bay. KC is planning two separate construction activities onsite, one to remove the demolition rubble and the second is to remove select pockets of contaminated soils under an Interim Action. Both projects will cause work within the PSO4 outfall pipeline alignment. The Site also has a new warehouse building being planned directly over the western part of the PSO4 pipeline. Additionally, the City is still interested in acquiring KC's former wastewater treatment works (see Figure 1, which would also cause changes to pipelines and their alignments.

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everettpw@everettwa.gov
everettwa.gov

The PSO4 pipeline needs to be replaced, however due to many pending actions at the site and uncertainty of site development and ownership, the City has decided not to replace the line at this time. A better use of city resources and funds is to temporarily re-route the pipeline until some site development certainty exists.

The City has identified an above ground pipe route to connect flows from PSO4 pipeline to the existing PSO5 stormwater and CSO outfall. This option minimizes excavation within the property, avoids impacts from the pending construction for the rubble removal and interim actions, allows the proposed building to be planned and located, and accommodates future permanent piping with the hopeful City acquisition of the KC treatment works.

Figure 1 also presents the proposed route. The existing stormwater system and CSO regulator structure for PSO4 would connect to a new manhole on an existing abandoned 24-inch steel water main (previously the industrial water feed line for the KC Mill), just north of the existing PSO4 regulator. This 24-inch line will convey flows from the east side to the west side of the BNSF railroad tracks. A new manhole will be installed on the west side of the tracks on the same line. From the manhole a 12-inch HDPE above ground pipe would be laid on the east edge of the site, out of the way of any construction. The HDPE pipe will run south along the east side of the KC site, behind the existing warehouse building and into a manhole downstream of the PSO5 CSO regulator structure, near LS No. 3.

In 2018 modifications were completed on Lift Station No. 5 to increase pumping capacity and to extend its force main to the 17th Street interceptor, where flow now gravity discharges to the WWTP. Prior to the improvements LS 5 discharged to Lift Station No. 4. Flows that exceed the capacity of Lift Station No. 4 overflow back toward Lift Station No. 3 and could contribute to CSOs to PSO5. These changes resulted in approximate 1000 gal per minute flow being reduced at LS 4, and thus added the same capacity to the pipeline to PSO5.

Once all the connections to the existing PSO4 pipe are redirected to this temporary line, the existing PSO4 pipe on KC property will be abandoned by filling all the existing manholes within the site with controlled density fill, a weak concrete mix.

While this temporary CSO connection is in place the City will continue monitoring CSOs at PSO4 and PSO5 as is currently done. The frequency of overflows to PSO4 will be indicated by levels monitored in Lift Station No. 5 wetwell and overflow weir. Overflow levels and discharge volume calculation methods will be modified as necessary based on the installed height and geometry of the new overflow pipe to the 24-inch pipe under the tracks. Overflows recorded at PSO4 in this manor will be reported in the CSO Annual Report as overflows to PSO4 despite discharging through the PSO5 outfall. CSO monitoring at PSO5 will not be impacted by the temporary connection. Overflow levels will continue to be monitored in the PSO5 regulator structure which will be separated from the PSO4 connection by a tide gate. Overflows recorded at PSO5 will continue to be reported in the CSO Annual Report as PSO5 overflows.

It is expected that this temporary PSO4 connection will remain in place until the City acquires the existing treatment works on the KC site for the proposed Port Gardner Wet Weather Facility or other site actions allow a permanent pipeline. The City will provide a status update in our annual CSO reports, as anything changes on site, and also as required to Ecology in March of 2020.

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Thank you for your review and please let us know any comments as we would like to begin the work by late summer. If you have any questions, please contact me or Grant Moen at 425-257-8800.

Sincerely,

Mark Sadler, PE
Interim Operations Superintendent

Re:
Grant Moen
Souheil Nasr
Jim Miller
Halley Kimball
Andy Kallus, Dept. of Ecology
Bryan Lust, Kimberly Clark Corporation

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Figure 1: Proposed PSO4 Pipeline Realignment Plan

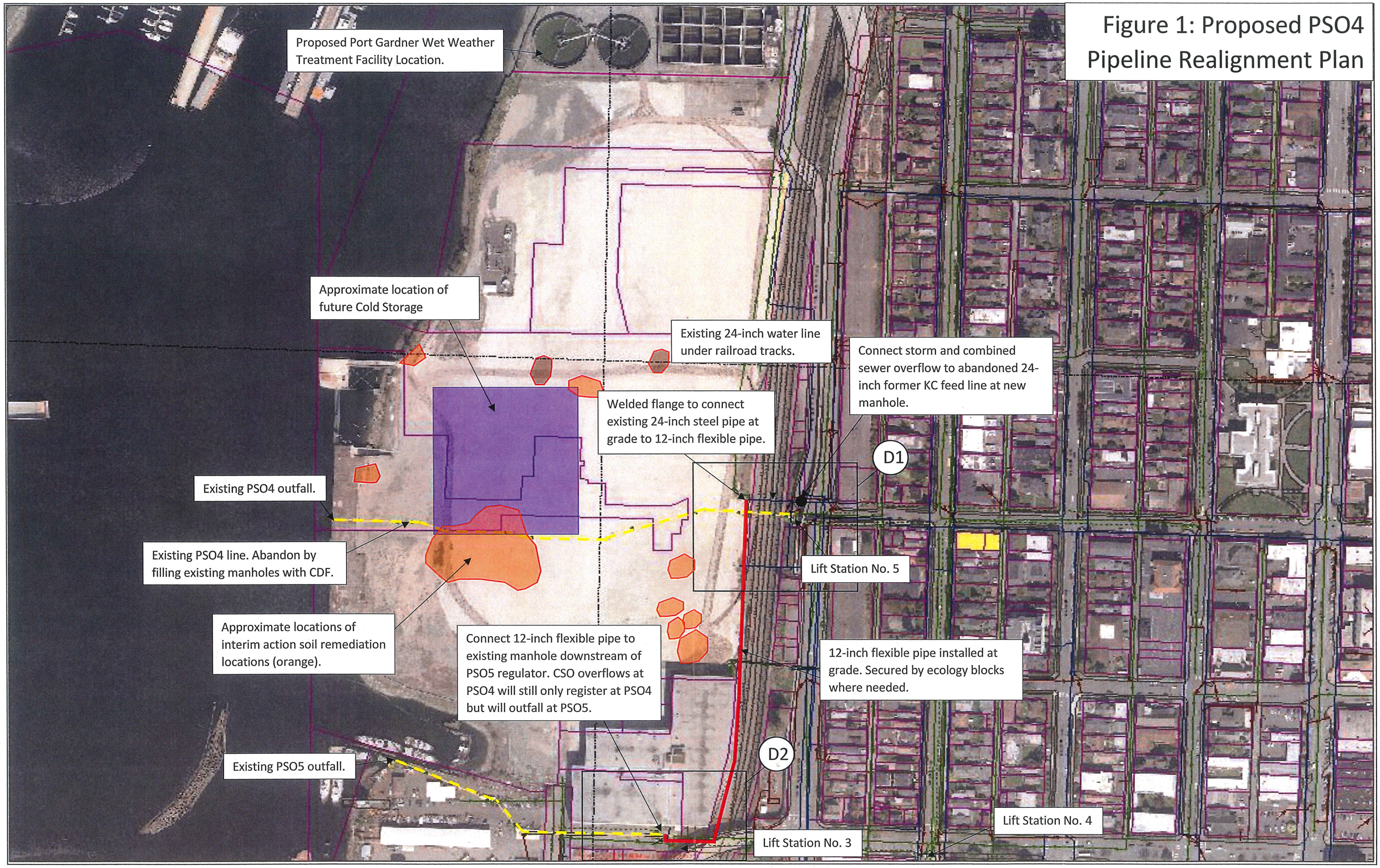
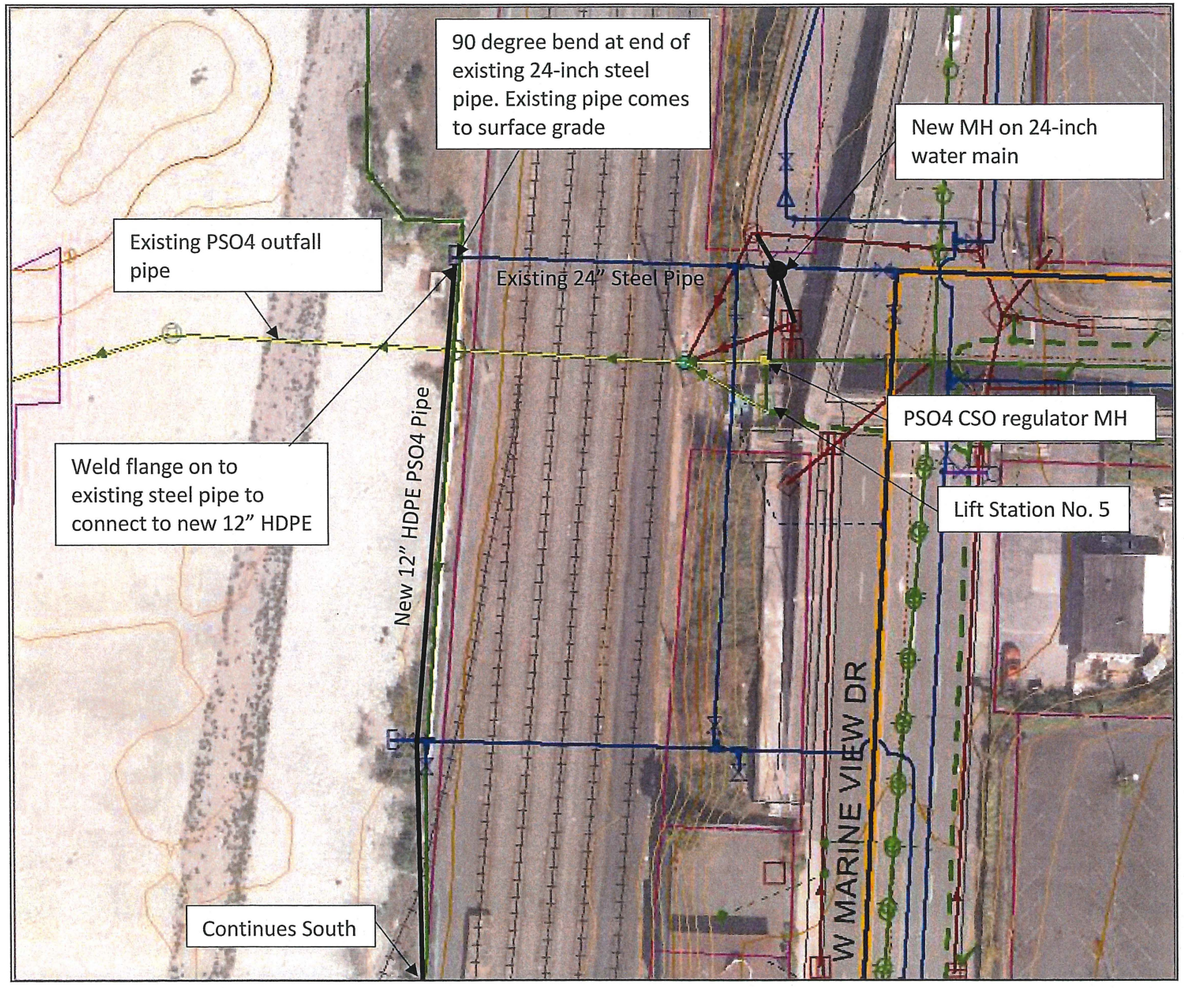
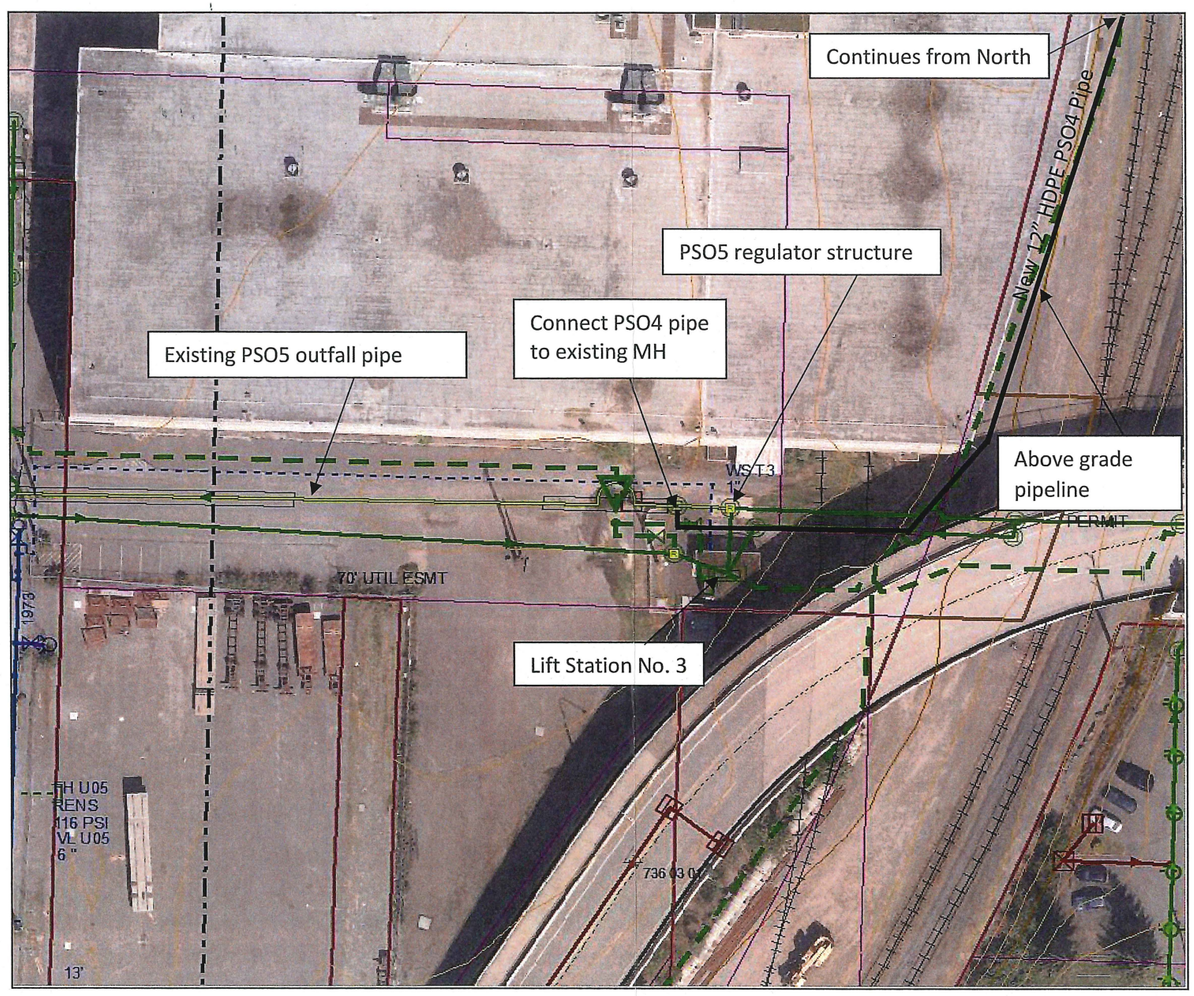


Figure 2: PSO4/PSO5 Connection Details



DETAIL 1 – CONNECTION OF PSO4 STORMWATER AND CSO PIPES TO 24" STEEL WATER MAIN



DETAIL 2 – CONNECTION OF TEMPORARY PSO4 PIPE TO PSO5 OUTFALL

Attachment 2

CDF Aggregate Specification Sheet from Cadman/Aggregate Metal Analyses from Sechelt Sand

CADMAN - Cadman, Inc.
7554 185th Avenue NE,Suite 100 PO Box 97038
Redmond, WA 98073-9738
Tel : 425.867.1234

Date : **1/9/2020**

Mix Code : **CDF4** Description : **LEAN MIX**

Revision Number : 60 Creation Date : 28 Mar 2019 Customer :

Plant : EVERETT - SMITH ISLA Created By : LKetterlin Project :

Specifications

Consistence Class : 6 Max W/C : 2.66 Max Agg Size : FI

Strength Class : 100 PSI Min Cement : lb Air Class : 10.00

Grading Specification :

Material Type	Description	Supplier Source	Design Quantity	Specific Gravity	Volume ft3
Fine Aggregate	BUILDING SAND - RM	SECHELT-CA7	2906 lb	2.65	17.57
Cement	CEMENT - TYPE I/II	LEHIGH-DELTA BC	141 lb	3.15	0.72
Admixture	AEA (OZ)	BASF-ADMIXTURES	3 lq oz	-	-
Water	WATER (LBS)	WATER-FRESH	375 lb	1.00	6.01
		Air Content	**10.00 %**	--	**2.70**
		Yield	**3422lb**	--	**27.00**

AEA (OZ): 0 To 10 lq oz Per CY

Prepared By :

CADMAN - Cadman, Inc.
7554 185th Avenue NE,Suite 100 PO Box 97038
Redmond, WA 98073-9738
Tel : 425.867.1234

Date : **1/9/2020**
Mix Code : **CDF6** Description : **2 SACK 3/4" LEAN MIX**

Revision Number : 59 Creation Date : 02 Apr 2019 Customer :
Plant : EVERETT - SMITH ISLA Created By : ermadis Project :

Specifications

Consistence Class : 1 Max W/C : 1.42 Max Agg Size : 3/
Strength Class : Min Cement : Air Class : 2.00
Grading Specification :

Material Type	Description	Supplier Source	Design Quantity	Specific Gravity	Volume ft3
Fine Aggregate	BUILDING SAND - RM	SECHELT-CA7	1439 lb	2.65	8.70
Coarse Aggregate	3/4" GRAVEL - RM	DUPONT AGGREGATES-DUPONT AGGREGA	1466 lb	2.70	8.70
Coarse Aggregate	3/8" GRAVEL - RM	DUPONT AGGREGATES-DUPONT AGGREGA	641 lb	2.69	3.82
Cement	CEMENT - TYPE I/II	LEHIGH-DELTA BC	188 lb	3.15	0.96
Water	WATER (LBS)	WATER-FRESH	267 lb	1.00	4.28
		Air Content	**2.00 %**	**--**	**0.54**
		Yield	**4001lb**	**--**	**27.00**

Prepared By :

Lehigh Hanson
HEIDELBERGCEMENT Group

Lehigh Hanson Materials Limited
8955 Shaughnessy Street
Vancouver, British Columbia
V6P 3Y7

LEHIGH HANSON MATERIALS LIMITED
Analytical Results for "Sechelt Sand" and "Sechelt 25mm Base" Materials Produced at Lehigh Hanson Materials Limited Sechelt Mine

Dear Sir/Madam,

Samples of "Sechelt Sand" and "Sechelt 25mm Base" were collected and analyzed by ALS Environmental for total metals and pH on January 9, 2019. The results were compared to the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines (SQG) for the Protection of Environmental and Human Health. Both samples met the lowest possible criteria of all considered land uses in the guidelines and are therefore acceptable to be placed on agricultural, residential/parkland, commercial, and industrial lands.

Please don't hesitate to contact me at 604-312-0848 or mat.kavanagh@lehighhanson.com if there are any additional questions regarding the environmental compliance of our materials.

Thank you,

Mat Kavanagh, MSc, P.Ag
Environment Manager – British Columbia
Lehigh Hanson Materials Limited

18/01/19

ALS		ALS ID		L2218443-1	L2218443-2
1/17/2019		Sample ID		SECHELT SAND	SECHELT 25MM BASE
L2218443		Date Sampled		1/9/2019 12:45:00 PM	1/9/2019 12:45:00 PM
Analyte	Units	LOR	CCME-CEQG-SQG	Soil	Soil
pH (1:2 soil:water)	pH	0.1	-	7.73	8.27
Aluminum (Al)	mg/kg	50	-	6520	8280
Antimony (Sb)	mg/kg	0.1	20	<0.10	<0.10
Arsenic (As)	mg/kg	0.1	12	1.04	1.07
Barium (Ba)	mg/kg	0.5	500	31.7	71.3
Beryllium (Be)	mg/kg	0.1	4	<0.10	<0.10
Bismuth (Bi)	mg/kg	0.2	-	<0.20	<0.20
Boron (B)	mg/kg	5	2	<MDL	<MDL
Cadmium (Cd)	mg/kg	0.02	1.4	0.037	0.034
Calcium (Ca)	mg/kg	50	-	3190	3960
Chromium (Cr)	mg/kg	0.5	64	9.62	9.09
Cobalt (Co)	mg/kg	0.1	40	3.44	5.58
Copper (Cu)	mg/kg	0.5	63	8.49	19.5
Iron (Fe)	mg/kg	50	-	12400	16100
Lead (Pb)	mg/kg	0.5	70	1.32	1.71
Lithium (Li)	mg/kg	2	-	7.1	9.9
Magnesium (Mg)	mg/kg	20	-	3230	4510
Manganese (Mn)	mg/kg	1	-	179	283
Mercury (Hg)	mg/kg	0.05	6.6	<0.050	<0.050
Molybdenum (Mo)	mg/kg	0.1	5	0.11	0.74
Nickel (Ni)	mg/kg	0.5	45	4.79	4.87
Phosphorus (P)	mg/kg	50	-	309	451
Potassium (K)	mg/kg	100	-	850	1890
Selenium (Se)	mg/kg	0.2	1	<0.20	<0.20
Silver (Ag)	mg/kg	0.1	20	<0.10	<0.10
Sodium (Na)	mg/kg	50	-	250	370
Strontium (Sr)	mg/kg	0.5	-	20.1	27.1
Sulfur (S)	mg/kg	1000	-	<1000	<1000
Thallium (Tl)	mg/kg	0.05	1	<0.050	0.054
Tin (Sn)	mg/kg	2	5	<2.0	<2.0
Titanium (Ti)	mg/kg	1	-	482	823
Tungsten (W)	mg/kg	0.5	-	<0.50	<0.50
Uranium (U)	mg/kg	0.05	23	0.241	0.404
Vanadium (V)	mg/kg	0.2	130	31.6	39.2
Zinc (Zn)	mg/kg	2	250	20.5	30.4
Zirconium (Zr)	mg/kg	1	-	1.1	1.1
Applied Guideline:	CCME Canadian Environmental Quality Guidelines - Soil Quality Guidelines for the Protection of Environmental and Human Health - Lowest Applicable Criteria (*de minimus*)				
Color Key:	Within Guideline	Exceeds Guideline	MDL = Method Detection Limit		