



Highway 91/17 Upgrade Project

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0	1 October 2020	Heather Taylor, P.Ag., R.P.Bio.	Patty Burt, RP Bio, AQP	
1	14 October 2020	Heather Taylor, P.Ag., R.P.Bio.	Patty Burt, RP Bio, AQP	Minor edits throughout. Addition of Appendix 3: Wildlife and fish salvage data from August and September 2020
2	15 October 2020	Patty Burt, RP Bio, AQP		Section 2.2: minor edits to the construction description at River Road
3	26 October 2020	Allegra Hollingbury, P.Eng.		Section 4.4: water quality information added Appendix 3: glossary added

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1.0 INTRODUCTION

This report covers all activities between 01 to 30 September 2020. During this period works occurred at River Road East, Site I, L100 Area, the E01 Detour, E02 Detour, Site F, Site G, C01 (F1), 96th Street Ditch, Area H, Site E. For the purposes of this report, the following areas shall be defined as:

- River Road East = Portion of River Road East of Highway 17 (Includes L450, L475, part of L375).
- River Road West = Portion of River Road West of Highway 17 (Includes L250, L275, L325, L350, part of L375)
- Site I = Truck stop area and Nordel Interchange
- L100 Area = Highway 17
- E01 Detour = Portion of L910
- E02 Detour = Highway 91
- Site G = Delta Nature Reserve
- C01 Detour = North edge of Site F along Hwy 91C
- 96th Street Ditch
- Site H = L1150, L1200, and L1400
- Site E = L500, L1170, and L1300
- W01 Detour = Hwy 17 Onramp at L475
- Site F = MKDelta



A Key Plan has been included showing the project alignments (See Appendix 1).

2.0 CONSTRUCTION ACTIVITIES

2.1 Activities for this Period

The following works took place within Section 1 in September 2020:

River Road East

- Embankment and pre-load material placement were complete for alignments L450, L475, and the east portion of the L375 (outside the lock block wall).
- W01 detour work included the placement and compaction of fill and gravel, installation of temporary drainage, installation of electrical conduits, and installation of a lock block wall to delineate the site.
- Surveying activities are ongoing.

River Road West

- Work continued on the watermain construction.

The following works took place in Section 2 in September 2020:

L100

- Commenced wildlife salvages at staging area near L100 (Hwy 17 west). This staging area is to provide an offloading and preparation area for the installation of a concrete box culvert in 96 St Ditch.
- Wildlife salvage completed on 09 Sept 2020.
- Commencement of topsoil stripping at the staging area.

96th Street Ditch

- Installation of isolation plates for fish salvage.
- Fish salvage completed on 10 September 2020.
- Following the dewatering of the ditch, channel excavation commenced North of Hwy 17.
- Sand, geotextile fabric, and crushed rock were placed in the channel. Following this, a concrete box culvert extension was placed in the prepared channel. Sand was placed and compacted around the culvert and rip rap was placed at the outlet to complete the installation.
- A wildlife sweep was performed on the South side of Hwy 17, east of 96th St. to enable the installation of 30m of CSP culverts.

The following works took place in Section 3 in September 2020:

C01 (Burns Bog/F1)

- Commenced wildlife salvages.
- Wildlife salvage completed on 11 Sept 2020.
- Isolation plates were installed in Burns Bog East West Perimeter ditch and a fish salvage was performed.
- The salvaged section of the ditch was dewatered and backfilled.
- C01 Detour works commenced for the widening of the south side of the 91 Connector. This work included the installation of temporary drainage, streetlights, sand and gravel placement, paving, installation of concrete barriers and road signage, and line painting.

Site E

- Wildlife isolation fence was installed east of 91C in Section 2 in preparation for wildlife salvages.
- The works at the L500/L550E/L575 alignments were paused. Preload and embankment fill is nearly complete in this area.

The following works took place in Section 4 in September 2020:**Truck Parking Area**

- Removal of material that was stockpiled in the truck parking area continued.
- Watermain installation was paused awaiting the delivery of a part. The final tie in will be made in October.

Site G

- Wildlife isolation fence installation for the DNR and boardwalk was completed.
- Hemmera was onsite conducting water sampling for the Province at various stations in the bog.
- Wildlife salvage was complete for a portion of Site G on 11 Sept 2020. This area is a geotechnical test section for the sub excavation of peat and replacement with sand. Clearing and grubbing was complete in this area and the sub excavation of peat commenced at the end of September.

E01

- Topsoil stripping commenced after an assessment was completed by Brybil. Upon completion of stripping, gravel placement commenced.
- Grade placed and compacted in those detour areas with the stockpiles of asphalt and gravel removed.
- Temporary stockpile placement for later preload.

Site I

- Commenced wildlife salvages at Site I around west ditch
- Wildlife salvage completed on 11 Sept 2020.

E02

- On Hwy 91, existing line paint was removed (hydro blasted) and new paint lines were applied along with road reflectors and white barrier reflectors.

2.2 Upcoming Activities

Section 1: At River Road West, once the watermain installation is complete, the following work will take place: protect/relocate gas line; place balance of embankment and pre-load fill; and construction of truck turnaround lane. Stripping will commence at the L250 and partial of the roundabout in late October. At River Rd East, W01 detour works will continue. After the detour is implemented, the following works will take place: utility relocations including ITS and existing storm line; and demo of the existing Highway 17 in preparation for ground improvement activities (stone column and bridge foundation).

Section 2: At the L575/L500, embankment and pre-load fill placement is scheduled to re-commence in mid-October.

Section 3: C01 detour phase 2 will continue and will include removing the existing median curb, paving, sign installation and drainage. The completed detour is scheduled to open in mid-late October. After the opening of the detour the following works are planned to start: removal of existing Hwy 91C pavement, stripping and excavation; construction RFS and temporary wall; and placing embankment fill and light weight fill over the Fortis gas line. At site F (L1400/L1170/L1150/L1160), embankment and preload fill placement is scheduled to commence in mid-October. After the completion of the wildlife salvage at Site E, a Fortis crossing (polymer coated CSP culvert) will be installed in late October.

Section 4: Once the wildlife salvage for the peat sub excavation and backfill at Site G is complete, this work will commence in mid-September. Isolation fencing for the remainder of Site G will be completed with wildlife salvage scheduled to commence on 23 September.

The peat sub-excavation for the test section in Site G will continue. The wildlife salvage for the remainder of Site G and the Boardwalk will commence in early October. Following the completion of the salvage clearing, stripping and sand placement will commence. Civil works at the E02 detour will commence.

3.0 ENVIRONMENTAL ISSUES

3.1 Environmental Incidents

On 17 September 2020, an oil sheen was observed on the surface of the East West Burns Bog Perimeter Ditch. The source of the contamination was a water pump which was situated on the top of bank. A fitting on the pump had developed a leak which caused engine oil to leak into the secondary containment. The secondary containment had filled with water and as a result overflowed allowing water to be released which entered the ditch. The total volume of the spill is estimated to have been 100 mL of engine oil. Clean up efforts were conducted immediately, and no further impact was noted. A file was opened with Emergency Management BC and DFO Violations and Reporting were contacted.

On 22 September 2020, a spill was caused by one of the Nordel Trucking Inc. trucks while delivering gravel to the C01 site. Oil was tracked out onto Highway 91. The truck was taken out of service and immediate action was taken by deploying kitty litter sand and spill pads to absorb excess liquid from the road surface. The road sweeper was used to remove all the contaminated kitty litter sand.

On 29 September 2020, a hydraulic line broke on the pipe fusing machine which sprayed hydraulic oil. The oil contaminated the preload sand but did not contact any surface water. The total spill volume was approximately 2 L. The machine was immediately shut off and spill pads were placed on the ground. Contaminated soils were shoveled and placed into hazmat bags. Full clean-up was completed the following day once the machine could be safely removed from the area. All contaminated material was placed in the hazardous waste storage area in the PGC laydown for proper removal from site.

3.2 Non-Compliance

No Environmental Non-Compliance Reports were issued or received during the reporting period.

Table 1: Non-Compliance Tracking

NCR #	Date Issued	Location	Description	Status

3.3 Non-Conformance

Nothing to report this period.

3.4 Opportunities for Improvement

Nothing to report this period.

3.5 Outstanding Environmental Issues

The following ongoing monitoring is being conducted (Table 2):

Table 2: Environmental Issues Tracking Table

Item No	Date	Environmental Issue or Required Action	Corrective Action	Projected Closure Date	Open/ Closed	Comments
1	25 June	Sediment fence with accumulated material at River Road West	Remove material and repair fence	29 June	Closed 30 June	Discussed with Supervisor. Accumulated material has been removed.
2	25 June	Minor dust at E01 Detour	Area watered to suppress dust	25 June	Closed	Dust suppression ongoing.
3	25 June	Potential track out at River Road East and West	Install gravel access pad	14 August	Closed	Ongoing monitoring performed. Pads will be installed if required.
4	10 July	Japanese knotweed growth in topsoil stockpile at River Road West	Treat with foliar application	10 August	Closed	Ongoing treatment efforts.
5	10 July	Construction personnel smoking throughout site as opposed to designated areas	Reiterate policies regarding smoking	13 July	Closed	Policies have been reiterated. An environmental advisory will be issued.
6	10 July	Trash can at River Road West was left full on site	Trash was removed. Crews reminded that trash is to be removed daily	10 July	Closed	
7	13 July	Approximately 3 L of diesel spilt from light station onto pavement	Spill volumes collected with absorbent materials	13 July	Closed	Refueling procedures to be reviewed with construction crews to prevent over filling.
8	16 July	Damaged sediment fence at River Road West and E01	Fence needs to be repaired	20 July	Closed	Fence repaired, and areas swept for wildlife.
9	23 July	Concern noted with noise levels at E01	Noise monitoring will be carried out	19 August	Closed	Monitoring will commence once works are happening in that area
10	28 July	Less than 1 L of oil leaked from the track of a CAT D6K Dozer	Contained with drip trays and absorbent pads	28 July	Closed	Normal wear and tear of equipment.
11	29 July	Sediment fence needs attention at L575	Repair fence	14 August	Closed	Spoke with Superintendent, Foremen fixed
12	10 August	Monitor for new instances of Japanese knotweed growth-project wide	Treat with foliar application	30 August	Closed	Ongoing treatment efforts and monitoring.
13	02 September	Excavated soils with potential contamination not fully covered with plastic	PGC Environmental Representative spoke to the Site Superintendent who indicated that stockpiles will be covered the following day	03 September	Closed	Low risk of contamination. Soils placed on an impermeable paved surface and has suspected high NaCl concentrations; however, piles have since been covered
14	10 September	Overflowing general waste bin at the office laydown yard	Responsible party for scheduling was on days off, reminded to have a back up plan	11 September	Closed	Werner Beukes was already actioning a refuse pickup

15	17 September	Approximately 100 mL of engine oil spilled into the Burns Bog perimeter ditch due to a faulty fitting and the accumulation of water within a secondary containment structure	Spill response protocols were initiated immediately and the was reported to the appropriate agencies	17 September	Closed	Spill clean up initiated and reported to appropriate agencies
16	22 September	Gravel truck tracking out a hydrocarbon spill onto Hwy 91.	Truck was immediately taken out of service and spill volumes collected with kitty litter & absorbent materials	22 September	Closed	Spill clean up which included the use of a sweeper.
17	23 September	Swamped and compromised sediment fence as a result of the heavy precipitation	Inspection of all silt fence onsite and repair as required.	28 September	Closed	
18	29 September	Hydrocarbon spill while splicing plastic pipe	Spill was contained to a small area and immediately cleaned up	29 September	Closed	Spill absorbent materials were bagged and stored properly at the office laydown.

4.0 ENVIRONMENTAL MONITORING AND INSPECTION RESULTS

The PGC Environmental Representative was present between 01 and 30 September 2020 to monitor and inspect Project activities during construction. Construction activities are guided by the environmental requirements outlined in the Construction Environmental Management Plan (CEMP) and Environmental Work Plans (EWPs) developed in accordance with the Environmental Assessment Certificate (EAC) and applicable permits, approvals and/or authorizations. In addition to daily monitoring performed by PGC, weekly monitoring was conducted by McElhanney's Environmental Monitor (EM).

McElhanney's EM visited the site on 02, 10, 17, 21 and 30 September 2020 to measure compliance with the CEMP. McElhanney's EM met with environmental representatives from PGC after each audit to discuss observations which had been recorded.

4.1 Air Quality and Dust Control

During removal of stockpiles at Area H, some fugitive dust was being generated. To mitigate this, stockpiles will be monitored and watered, as required.

4.2 Noise and Vibration Management

Nothing to report this period.

4.3 Erosion and Sediment Control

Daily monitoring is done by PGC Environmental Representatives, Site Supervisors, and Foreman to ensure the installed sediment fences are fully functional in affected areas and repaired as needed. Sediment control fences had been installed at River Road West, River Road East, E01 Detour, L575, and the L100 to prevent sediment run-off from clearing and grubbing activities in addition to containment of preload and isolation of wildlife. MESL inspected the silt fencing which appeared to be in overall good condition. Most areas were covered with sand pre-load which were well contained and generally less erodible.

The remaining open ditches at River Road West had been lined with filter fabric and polyethylene sheeting and equipped with evenly spaced check dams and sediment fencing along the banks.

Roads are routinely swept on the project site and are clean condition. There are no current issues with track out of material onto roadways. Approved inlet protection had been installed in catch basins along the Highway 91 Connector adjacent to the L575 and appeared to be in good condition.

First major rain of season revealed some minor ESC issues. Area C, River Road Ditch, experienced a large input of water, but still remained functional. Area E culvert extension stockpile was observed to be visibly contributing sediment to the culvert immediately to the south of the culvert extension and this area was being actively dewatered. To mitigate this, the stockpile was pulled back away from the culvert and covered with poly sheeting. Two damaged spots were observed in the L575 fences and were repaired.

Contingency supplies such as silt fencing were readily available on pallets near the site trailers.

4.4 Water Quality Management

The ditch segments along River Road West had been salvaged and infilled. Residual water was still contained in remaining segments which fluctuates with the prevailing tide. Hemmera was onsite 21/22 September 2020 to conduct water sampling in the bog areas on behalf of the Province.

PGC has continued to collect water quality samples from 96 Street Ditch and Silda Ditch to the Fraser River. The results of this data collection are presented in Table 4 (Figure 1).

Most of the wetland to the east of the existing highway closure in E02 is under a layer of deep water. The excavation strategy is to create square sections that are excavated sequentially while maintaining a berm of native material to isolate the section. The isolated section has water removed using the excavator, then material can be loaded into trucks with better visibility and minimal disturbance (reduce turbidity) to the larger area of pooling water formed in Area G.

The weather conditions in September significantly influenced turbidity readings, particularly at Silda Ditch Upstream (WQ-1). Ditches were running low at the end of summer. The fine sediment resting at the bottom of ditches was easily disturbed when collecting water due to the low water levels. Additionally, significant rainfall after a long dry period correlated with a spike in watercourse turbidity. Note that turbidity readings taken downstream of 96th St ditch show elevated turbidity levels. These results are likely a result of the elevated turbidity in the Fraser River (see Fraser River turbidity readings and similarities in water pH). The downstream water quality monitoring location in 96th ditch is being relocated to reflect the water quality more accurately.

Table 4: Background Water Quality

Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-1	Silda Ditch US	04/09/2020	14:15	15.8	3.89	1.12	7.57	0.39	25	-
WQ-2	Silda Ditch MS	04/09/2020	14:30	14.9	7.64	0.79	7.8	0.48	22.2	-
WQ-3	Silda Ditch DS	04/09/2020	14:45	14.8	5.99	0.68	7.34	0.33	17.3	-
WQ-4	Fraser Rr Inlet	04/09/2020	15:15	17.9	6.24	0.89	7.91	0.39	63.2	-

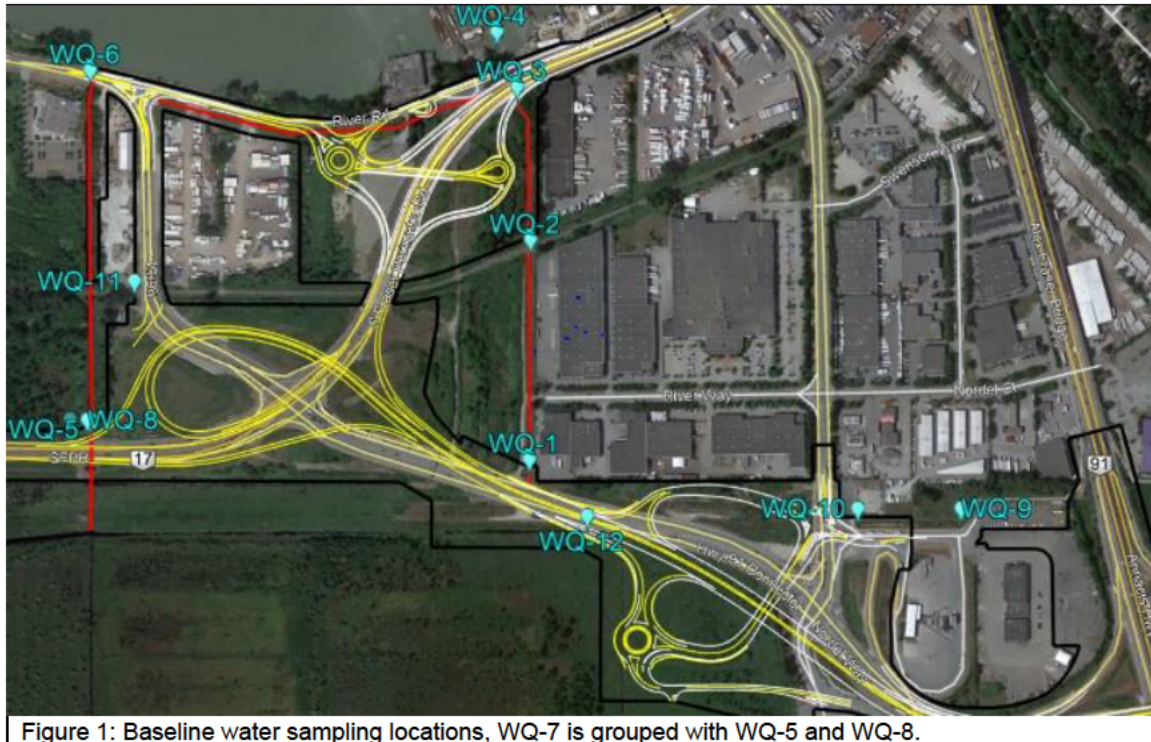
Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-5	96 Street Ditch US	08/09/2020	19:30	12.9	5.90	1.05	6.15	0.05	7.15	Prior to topsoil stripping and sand placement; High tide coming in.
WQ-5	96 Street Ditch US	09/09/2020	22:45	18.6	5.45	0.09	5.85	0.06	7.25	High tide moving out
WQ-6	96 Street Ditch DS	09/09/2020	23:30	18.4	6.27	0.15	7.21	0.07	27.1	High tide moving out
WQ-1	Silda Ditch US	10/09/2020	11:15	17.9	4.95	1.15	6.25	0.33	9.5	High tide moving in
WQ-2	Silda Ditch MS	10/09/2020	11:30	17.7	5.10	0.95	6.65	0.45	9.6	High tide moving in
WQ-3	Silda Ditch DS	10/09/2020	11:45	17.2	4.75	0.79	7.23	0.70	12.1	High tide moving in
WQ-4	Fraser Rr Inlet	10/09/2020	12:00	18.1	11.15	0.25	7.90	0.85	55.2	High tide moving in
WQ-5	96 Street Ditch US	10/09/2020	13:30	17.6	4.99	0.11	6.45	0.08	10.2	High tide moving in
WQ-6	96 Street Ditch DS	10/09/2020	14:00	17.4	6.31	0.18	7.12	0.15	17.8	High tide moving in
WQ-5	96 Street Ditch US	13/09/2020	0:11	17.6	4.56	0.77	5.45	0.38	5.2	High tide moving in
WQ-6	96 Street Ditch DS	13/09/2020	0:35	17.9	5.76	0.75	7.00	0.32	11.8	High tide moving in
WQ-5	96 Street Ditch US	14/09/2020	23:45	15.6	4.23	1.15	5.89	0.25	9.35	High tide moving in
WQ-6	96 Street Ditch DS	14/09/2020	0:15	15.7	4.59	0.86	7.23	0.28	12.57	High tide moving in
WQ-1	Silda Ditch US	15/09/2020	15:40	22.1	13.52	0.83	6.59	0.42	232	Mid tide moving in. Very shallow and still water with easily disturbed sediment.
WQ-2	Silda Ditch MS	15/09/2020	15:30	23.3	5.52	0.79	7.12	0.39	51.1	Mid tide moving in. Shallow water with easily disturbed sediment.
WQ-3	Silda Ditch DS	15/09/2020	15:15	22.9	5.96	0.23	7.55	0.12	11.7	Mid tide moving in
WQ-4	Fraser Rr Inlet	15/09/2020	14:30	20.1	5.65	0.73	7.07	0.36	20.5	Mid tide moving in
WQ-5	96 Street Ditch US	15/09/2020	15:00	22.8	4.12	0.29	6.34	0.14	8.16	Mid tide moving in

Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-6	96 Street Ditch DS	15/09/2020	14:45	21.1	4.11	0.27	6.94	0.13	12.6	Mid tide moving in
WQ-1	Silda Ditch US	16/09/2020	15:40	20.7	2.79	0.76	6.79	0.39	141	Low tide moving in. Very shallow and still water with easily disturbed sediment.
WQ-2	Silda Ditch MS	16/09/2020	15:30	21.5	2.18	0.74	7.04	0.37	48.6	Low tide moving in. Shallow water with easily disturbed sediment.
WQ-3	Silda Ditch DS	16/09/2020	15:15	20.7	5.84	0.33	7.58	0.17	11.3	Low tide moving in
WQ-4	Fraser Rr Inlet	16/09/2020	14:30	21.2	3.31	0.87	8.17	0.46	23.2	Low tide moving in
WQ-5	96 Street Ditch US	16/09/2020	15:00	19.2	3.41	0.25	6.51	0.12	5.22	Low tide moving in
WQ-6	96 Street Ditch DS	16/09/2020	14:45	20.0	4.48	0.43	7.29	0.21	18.1	Low tide moving in
WQ-1	Silda Ditch US	17/09/2020	15:40	20.8	1.90	0.91	6.75	0.46	207	Mid tide moving in. Very shallow and still water with easily disturbed sediment.
WQ-2	Silda Ditch MS	17/09/2020	15:30	19.8	2.51	1.07	7.24	0.59	9.3	Mid tide moving in
WQ-3	Silda Ditch DS	17/09/2020	15:15	20.3	4.21	0.34	7.68	0.16	15.2	Mid tide moving in
WQ-4	Fraser Rr Inlet	17/09/2020	14:30	19.3	4.21	0.69	8.49	0.35	8.6	Mid tide moving in
WQ-5	96 Street Ditch US	17/09/2020	15:00	18.4	3.86	0.31	6.58	0.15	6.1	Mid tide moving in
WQ-6	96 Street Ditch DS	17/09/2020	14:45	19.5	4.76	0.37	7.51	0.20	13.5	Mid tide moving in
WQ-1	Silda Ditch US	21/09/2020	02:30	13.2	3.23	0.75	5.95	0.31	14.6	Shallow standing water.
WQ-2	Silda Ditch MS	21/09/2020	01:45	13.4	4.05	0.48	7.15	0.49	15.4	Low tide, going out
WQ-3	Silda Ditch DS	21/09/2020	01:33	13.9	3.34	1.15	7.28	0.25	22.4	Low tide, going out
WQ-4	Fraser Rr Inlet	21/09/2020	01:08	14.5	4.25	0.35	8.05	0.49	56.12	Low tide, going out
WQ-5	96 Street Ditch US	20/09/2020	23:45	13.3	4.13	0.36	6.78	0.29	5.55	Low water due to dewatering for culvert extension.
WQ-6	96 Street Ditch DS	20/09/2020	23:15	13.8	6.00	0.34	7.09	0.20	8.73	Mid tide, going out

Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-1	Silda Ditch US	21/09/2020	12:00	17.6	4.55	0.77	6.94	0.37	198.0	High tide, going out. Very shallow and still water with easily disturbed sediment.
WQ-2	Silda Ditch MS	21/09/2020	11:40	18.0	5.62	1.18	8.90	0.62	10.2	High tide, going out
WQ-3	Silda Ditch DS	21/09/2020	11:50	17.3	7.21	0.23	8.51	0.13	16.0	High tide, going out
WQ-4	Fraser Rr Inlet	21/09/2020	12:10	17.7	7.36	0.21	8.25	0.12	14.8	High tide, going out
WQ-5	96 Street Ditch US	21/09/2020	12:30	18.4	3.95	0.42	6.71	0.18	11.4	High tide, going out
WQ-6	96 Street Ditch DS	21/09/2020	12:15	17.3	6.98	0.27	8.16	0.13	14.5	High tide, going out
WQ-1	Silda Ditch US	22/09/2020	10:40	17.4	4.50	0.82	6.84	0.41	191.0	Shallow standing water. Very shallow and still water with easily disturbed sediment.
WQ-2	Silda Ditch MS	22/09/2020	10:30	18.0	5.90	0.50	7.42	0.24	8.6	High tide
WQ-3	Silda Ditch DS	22/09/2020	10:00	17.4	5.95	0.32	7.90	0.15	28.8	High tide
WQ-4	Fraser Rr Inlet	22/09/2020	9:00	17.8	3.58	1.16	9.10	0.57	26.6	High tide
WQ-5	96 Street Ditch US	22/09/2020	9:40	16.4	3.41	0.34	6.69	0.17	8.4	Low water due to dewatering for culvert extension.
WQ-6	96 Street Ditch DS	22/09/2020	9:30	17.3	5.56	0.30	8.63	0.15	19.3	High tide
WQ-1	Silda Ditch US	23/09/2020	13:50	16.6	4.25	1.09	7.33	0.44	102.0	High tide, heavy rain during sampling. Shallow pool with easily disturbed sediment.
WQ-2	Silda Ditch MS	23/09/2020	13:45	16.9	5.38	1.67	8.06	0.69	22.8	High tide, heavy rain during sampling
WQ-3	Silda Ditch DS	23/09/2020	13:40	16.6	4.79	1.69	9.45	0.87	34.0	High tide, heavy rain during sampling
WQ-4	Fraser Rr Inlet	23/09/2020	13:10	17.1	4.21	1.72	9.38	0.91	37.1	High tide, heavy rain during sampling
WQ-5	96 Street Ditch US	23/09/2020	13:30	17.0	3.88	0.81	7.01	0.45	10.4	High tide, heavy rain during sampling
WQ-6	96 Street Ditch DS	23/09/2020	13:20	16.8	4.00	0.73	8.75	0.33	32.6	High tide, heavy rain during sampling. Poly sheets will now be placed over nearby stockpile to limit sedimentation.
WQ-1	Silda Ditch US	24/09/2020	11:45	16.7	3.85	0.19	6.78	0.08	6.8	High tide, coming in. Rain during sampling. High water from earlier rain.
WQ-2	Silda Ditch MS	24/09/2020	11:20	17.9	4.59	0.31	7.34	0.19	34.0	High tide, coming in. Rain during sampling. High

Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
										water from earlier rain. Natural area with no construction upstream – turbidity potentially caused by disturbing water with foot while sampling.
WQ-3	Silda Ditch DS	24/09/2020	11:25	16.3	4.59	0.10	6.90	0.05	10.6	High tide, coming in. Rain during sampling. High water from earlier rain.
WQ-4	Fraser Rr Inlet	24/09/2020	12:00	17.0	6.32	0.14	7.74	0.07	30.3	High tide, coming in. Rain during sampling
WQ-5	96 Street Ditch US	24/09/2020	12:20	16.3	5.03	0.67	7.18	0.32	8.0	High tide, coming in. Rain during sampling. High water from earlier rain.
WQ-6	96 Street Ditch DS	24/09/2020	12:10	16.8	6.29	0.20	7.96	0.09	30.1	High tide, coming in. Rain during sampling. High water from earlier rain. Rain has potential to cause turbid water in shallow sampling location.
WQ-1	Silda Ditch US	28/09/2020	13:20	19.7	4.19	0.28	6.68	0.14	5.0	Mid-tide, coming in
WQ-2	Silda Ditch MS	28/09/2020	13:10	18.9	4.29	0.27	6.81	0.13	4.9	Mid-tide, coming in
WQ-3	Silda Ditch DS	28/09/2020	13:00	17.8	4.03	0.25	6.85	0.13	5.6	Mid-tide, coming in
WQ-4	Fraser Rr Inlet	28/09/2020	12:20	17.8	4.11	0.79	7.58	0.39	5.8	Mid-tide, coming in
WQ-5	96 Street Ditch US	28/09/2020	12:45	18.0	5.46	0.23	6.44	0.12	2.5	Mid-tide, coming in
WQ-6	96 Street Ditch DS	28/09/2020	12:25	16.5	5.83	0.22	6.88	0.11	8.2	Mid-tide, coming in
WQ-1	Silda Ditch US	29/09/2020	12:15	19.1	4.17	0.33	6.56	0.16	5.3	Low tide
WQ-2	Silda Ditch MS	29/09/2020	12:00	17.4	3.48	0.31	6.68	0.16	5.5	Low tide
WQ-3	Silda Ditch DS	29/09/2020	11:45	16.4	4.77	0.33	6.72	0.16	6.1	Low tide
WQ-4	Fraser Rr Inlet	29/09/2020	10:00	16.4	5.64	0.27	6.98	0.14	7.6	Low tide
WQ-5	96 Street Ditch US	29/09/2020	10:30	16.8	4.55	0.15	6.18	0.08	1.7	Low tide
WQ-6	96 Street Ditch DS	29/09/2020	10:15	15.6	4.29	0.21	6.70	0.10	16.6	Low tide. Sampling location was shallow.
WQ-1	Silda Ditch US	30/09/2020	10:10	15.2	4.39	0.45	6.87	0.26	7.8	Low tide
WQ-2	Silda Ditch MS	30/09/2020	9:55	14.9	3.13	0.48	6.98	0.24	6.8	Low tide
WQ-3	Silda Ditch DS	30/09/2020	10:00	14.5	5.72	0.35	7.03	0.18	7.0	Low tide

Site Code	Site	Date	Time	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (mS/cm)	pH	TDS (ppt)	Turbidity (NTU)	Comments
WQ-4	Fraser Rr Inlet	30/09/2020	14:50	19.0	5.12	0.41	7.13	0.20	10.4	Mid-tide, coming in
WQ-5	96 Street Ditch US	30/09/2020	15:10	19.4	4.05	0.53	6.82	0.26	6.2	Mid-tide, coming in
WQ-6	96 Street Ditch DS	30/09/2020	15:00	18.1	4.94	0.14	6.54	0.07	4.2	Mid-tide, coming in



4.5 Wildlife and Habitat Management

Salvages

Brybil conducted wildlife salvages in Site F, Site G, Site I, and Site B and fish salvages were conducted in 96th St ditch and East-West Perimeter Ditch. During salvages wildlife traps are checked 4 times per day.

Due to weather events, wildlife salvages efforts were paused in late September for 5 days. Due to potential flooding of traps, traps were closed to mitigate the potential for accidental death to wildlife. However, a dead Pacific Water Shrew was found in a trap at Area F2 on 29 September 2020, despite following all Best Management Practices, terms and conditions of the Wildlife Permit, and biologists checking traps more often than required. The death was reporting to FLNRORD, as per permit conditions.

A beaver lodge was identified within the alignment in the Delta Nature Reserve. Although minimal activity (most sign was older) was observed in the field, it does appear that some individuals may still occupy the site. Oliver Busby from EBB Consulting was onsite 21 September 2020 to inspect the beaver lodge and provide services to the PGC for the capture and relocation on any inhabitants (23 September 2020).

Wildlife Observations

Several garter snakes had been trapped by the wildlife isolation fence at River Road East which were promptly relocated to the other side.

4.6 Vegetation Management

No new occurrences of Japanese Knotweed (*Fallopia japonica*) were detected during this reporting period. Known occurrences had been treated and appeared to be stressed.

4.7 Fisheries Habitat Management

A successful fish salvage was completed at the F1/C01 detour and no fish were caught, with accidental captures of amphibians and salamanders in the minnow traps, which were safely relocated outside of the isolation.

4.8 Construction and Hazardous Waste Management

A yellow wheelie bin is readily available at each active work location and mobile equipment are equipped with spill kits. PGC indicated that trash had been observed in one bin and personnel were subsequently reminded to keep these bins free of waste.

Hydrocarbon wastes are stored in labelled drums near the site office and are covered and protected from rain. These bins are collected by Tervita for disposal when they are about 75% full. All waste receptacles are labelled with appropriate signage and personnel have been reminded by PGC to sort wastes accordingly.

Zip tied hazardous waste bags containing used spill pads and contaminated soils are stored under the tent by office muster point to stop rain reaching and spreading beyond spill trays. The removal of contaminated soil disposal was scheduled with Tervita – 16 bags of contaminated soil, 1 bag of contaminated gravel, and 1 bag of spill pads. Soil and gravel bags are only ¼ full to manage weight.

Table 5: Hazardous Waste Storage and Disposal Tracking

Date (2020)	Location	Haz-Material Stored	Volume m ³	Comments	Date of Disposal
13 July	PGC Site Office Yard	Spent absorbents	N/A	Approximately 2-3 L of diesel was spilled on the pavement. Spent absorbents to be collected by Tervita.	TBD
28 July	L575 Preload Area	Spent absorbents	N/A	Less than 1L of oil to spill tray, absorbent pads used to mitigate spill to ground. Spent absorbent pads to be collected by Tervita.	TBD
17 Sept	Burns Bog perimeter ditch	Spent Absorbents	N/A	~100 mL of engine oil to water. Spent absorbent pads to be collected by Tervita.	TBD
21 Sept	Site office waste area	Spent Absorbents	N/A	Excess pads that were placed in spill trays. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels
24 Sept	Site office waste area	Spent Absorbents	N/A	Excess pads that were placed in spill trays. Spent absorbent pads to be collected by Tervita.	24 September 2020-3 barrels
24 Sept	Site office waste area	Used aerosols	N/A	Spray paint cans that had collected to date.	24 September 2020-3/4 of a bin

4.9 Spill Management and Emergency Response

All refueling of equipment is done on flat surfaces away from water bodies, with a drip tray in place and special care is taken to prevent spillages to the environment. All equipment and vehicles on site are inspected daily to ensure that there are no leaks or defects. No fuel is stored on site.

PGC has retained Tervita for hazardous waste management and emergency spills. No Emergency Responses were recorded during this reporting period.

To meet the conditions of the Approval, equipment working near watercourses are equipped with environmentally sensitive hydraulic fluid. Stickers are placed on equipment to indicate equipment the use of environmentally sensitive hydraulic fluid.

4.10 Contaminated Sites Management

The Approval in Principle (AiP) Application Package for Sections 1 and 2 was submitted to BC Ministry of Environment and Climate Change Strategy on 04 September 2020.

A Remediation Plan has been prepared by McElhanney for Section 3 and 4 to manage contamination that is anticipated to be encountered during construction activities and managed under a Notice of Independent Remediation with the Ministry of Environment. In addition, the Project Wide - Contaminated Sites Management Plan (CSMP) will be followed in Sections 3 and 4.

5.0 ENVIRONMENTAL PERMITS

5.1 Status Update

A Permit Tracker is provided in Appendix 4.



5.2 Permit Conditions Tracking

A Permit Conditions Tracker is included as Appendix 5 outlining all DFO and WSA permit terms and conditions.

5.3 Status of the Table of Commitments and Assurances

The status of completed and ongoing commitments in the Table of Commitments and Assurances is provided in Appendix 6.

6.0 SITE PHOTOS



Photo 1. Most working surfaces had been covered with sand preload such as River Road west (Area C).



Photo 2. Topsoil stripping was underway at River Road east (Area D). Erodeable soils were contained within a basin.



Photo 3. Silt fence containment during clearing and grubbing at the 96 Street Ditch (Area B).



Photo 4. Most working surfaces had been covered with sand preload River Road West. Erodeable soils were contained within a basin.



Photo 5. 96 Street Ditch (area B) isolation for the culvert extension.



Photo 6. General waste bin at office laydown yard beyond capacity.



Photo 7. 96 Street Ditch culvert extension installation and compaction, upstream view from Hwy 17.

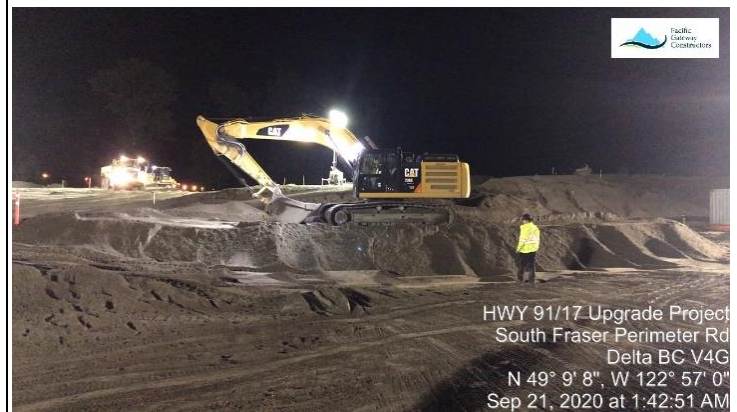


Photo 8. Area D River Road East Description: Importing and placement of preload sand at the detour.



Photo 9. Catch basins removed in preparation for the installation of new ones at C01 Detour.



Photo 10. Rescue mission of excavator sunk in the DNR.



Photo 11. Spill clean-up at C01.



Photo 12. Heavy rainfall caused River Road ditch water level to rise and swamp ECS fence but still intact.



Photo 13. Wildlife capture to be relocated safely outside of the construction footprint.



Photo 14. 96th Street Ditch culvert extension, poly covering stockpiles, view to the east.



Photo 15. Placement of culvert section in the 96 Street ditch channel, upstream view from Hwy 17.



Photo 16. Installation of fish isolation panels for fish salvages on sand staging area at the C01 detour.



Photo 17. A fitting on a water pump was leaking oil into the secondary containment which had filled with water and overflowed.



Photo 18. A crew cleaned the spill immediately in the perimeter ditch of Burns Bog.



Photo 19. Minnow trapping technique for the fish salvage at C01, trap circled in red (Brybil).



Photo 20. Amphibian caught in the minnow trapping efforts for fish salvage at C01 (Brybil).



Photo 21. A beaver lodge was identified in the Delta Nature Reserve which conflicted with the alignment.



Photo 22. Older beaver activity was detected in the Delta Nature Reserve.



Photo 23. Delivery of culvert sections on the south side of the 96 Street Ditch.



Photo 24. Poly sheeting covering exposed sand stockpiles at 96 Street Ditch.



Photo 25. River Road west (Site C), continuing watermain installations.



Photo 26. Stockpiling of sand at the Delta Nature Reserve for the preload.

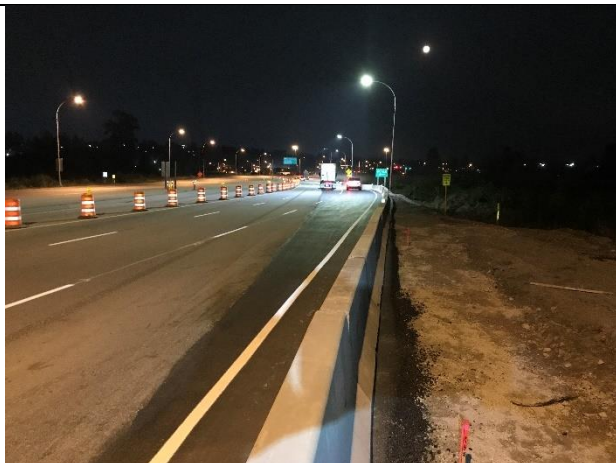


Photo 27. C01 paving results, view to the south.



Photo 28. C01 removal of the existing medium by way of milling.

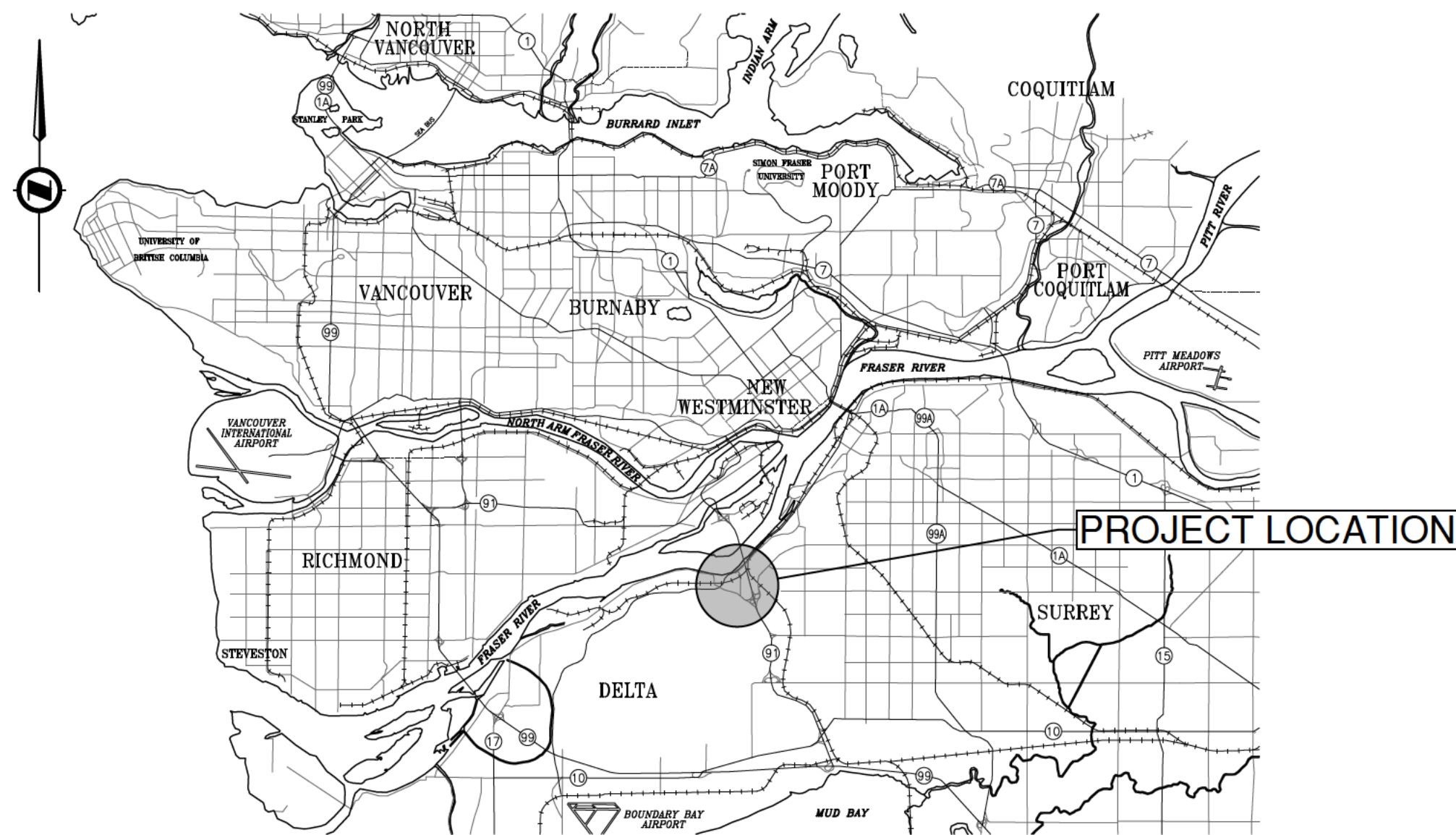


Photo 29. Oil spill from the pipe fuser machine at River Road west.

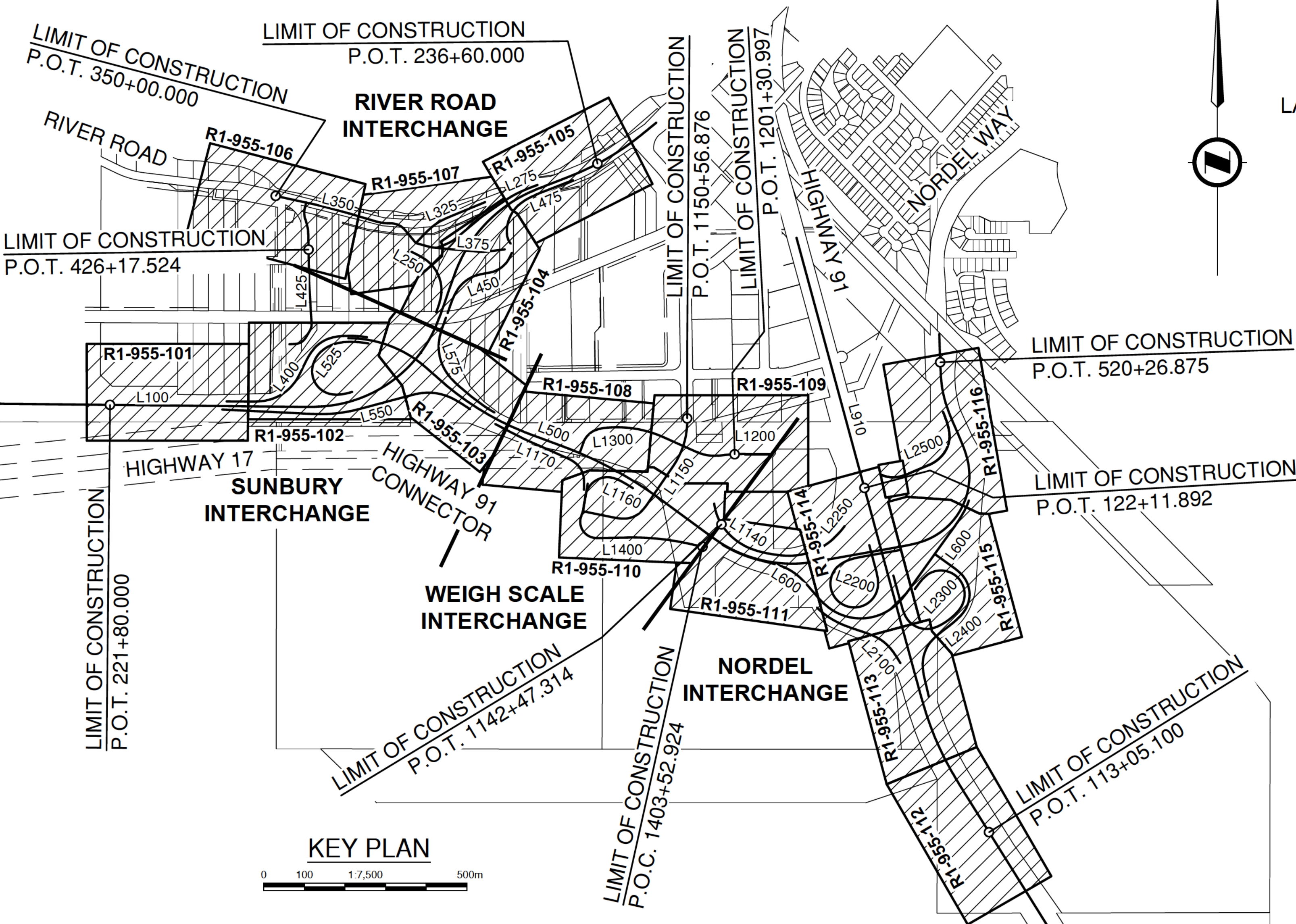


Photo 30. Wood waste properly sorted and ready for pick up.

APPENDIX 1: KEY PLAN DRAWING



LOCATION MAP
N.T.S.



KEY PLAN



Ministry of
Transportation
and Infrastructure

PROJECT NO. 08900

HIGHWAY 91/17 UPGRADE PROJECT DESIGN BUILD

HIGHWAY 17 - STA. P.O.T 221+80.000 - STA. P.O.C. 236+60.000

1.480 km

HIGHWAY 91 - STA. P.O.T 113+05.000 - STA. P.O.T. 122+11.892

0.907 km

LANDMARK KILOMETRE INVENTORY - SOUTH FRASER PERIMETER ROAD: HWY 99 - 136 ST

SEGMENT 3134 (EAST)

km 8.92 to km 10.23

SEGMENT 3135 (WEST)

km 9.67 to km 12.17

LANDMARK KILOMETRE INVENTORY - HWY 91 ANNACIS: RTE99 - NORDEL I/C

SEGMENT 3002 (NORTH)

km 7.10 to km 7.85

SEGMENT 3003 (SOUTH)

km 0.00 to km 0.75

LANDMARK KILOMETRE INVENTORY - HWY 91 ANNACIS: NORDEL I/C - JCT 91A

SEGMENT 3030 (NORTH)

km 0.00 to km 0.27

SEGMENT 3050 (SOUTH)

km 3.61 to km 3.88

ROADWAY DESIGN

PLOT DATE: 2020/02/14 N:\Proj\2111-40088-00 Hwy 91-17C-Detail Design\10.3 Engineering\MES\DrawingProduction\000_CoverKeyPlan.apex\R1-955-011.dwg

SCALE AS SHOWN		CAD FILENAME R1-955-011	
		PLOT DATE 2020-02-14	
REV	DATE	REVISIONS	NAME
A	2020-02-14	30% INTERIM DESIGN SUBMISSION	D. DULAY



MINISTRY OF TRANSPORTATION
AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS



HIGHWAY 91/17 UPGRADE PROJECT
KEY PLAN

DESIGNED V. MAK DATE 2020-02-14
QUALITY CONTROL T. SMILJANIC DATE 2020-02-14
QUALITY ASSURANCE D. DULAY DATE 2020-02-14
DRAWN E. YANG DATE 2020-02-14

CONTRACTOR FILE NUMBER 2111-40088-00
PROJECT NUMBER 08900
REG 1
DRAWING NUMBER R1-955-011
REV A

APPENDIX 2: SPILL AND INCIDENT TRACKER

HWY 94/17 SITE
Environmental Spill and Incident Tracking

Incident #	Date Of Event	Date Reported	Date Initial Notification Issued	Shift	Approx. Time	Contractor	Sub-Contractor	Silo	Classification	Description of Event	Location	Fluid Amount (L)	Fluid Type	Type of Equipment	Causal Factors	Action Taken	Corrective Actions Date Complete

SUMMARY		
Totals	Unit/Value	Total
Total Volume	L	4
Total Spills	#	6
Classification		Total
Minor Spill (<1L)	#	4
Spill (1.1L-5L)	#	2
Large Spill (5.1L-99.9L)	#	0
Significant Spill (To water or >100L)	#	0
Total	#	6
Fluid Type		Total
Hydraulic	#	2
Antifreeze	#	0
Diesel	#	1
Oil	#	3
Gasoline	#	0
Black Water	#	0
Glycol	#	0
Unknown	#	0
Total	#	6

APPENDIX 3: WILDLIFE SALVAGE RESULTS

Glossary of Terms

PEMA = North American Deer Mouse

Sorex sp = shrew family

MITO = Townsend vole

MIOR = Creeping vole

Area C1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Notes	Initials
30-Apr-20	6:35	P1	Common Shrew	60	100		relocated	PM, NS
30-Apr-20	7:13	P14	Common Shrew	45	80		relocated	PM, NS
30-Apr-20	7:31	P22	Common Shrew	50	100		Distinct next fringe and dark fringes along the thighs and back	PM, NS
3-May-20	6:30	S7	PEMA				relocated	JC
3-May-20	22:00	P13	Common Shrew	50	100		relocated	SB, JW
3-May-20	22:00	P13	Common Shrew	50	95		relocated	SB, JW
4-May-20	6:20	S3	PEMA				escaped	NS
4-May-20	6:35	S4	PEMA				escaped	NS
4-May-20	6:50	S7	PEMA				relocated	NS
4-May-20	7:20	M3	green frog (juv)				euthanized	NS
5-May-20	6:29	S3	PEMA				relocated	NS
5-May-20	6:45	S9	PEMA				relocated	NS
5-May-20	22:15	P8	PEMA				escaped	JC, JW
5-May-20	22:30	S9	PEMA				relocated	JC, JW
5-May-20	22:40	M2	green frog				escaped	JC, JW
5-May-20	22:45	S11	PEMA				relocated	JC, JW
6-May-20	6:36	S3	PEMA				relocated	NS, PM
6-May-20	14:50	P13	Common Shrew	40	70		white belly; relocated	JC
7-May-20	6:50	M3	green frog				euthanized	JC, PM
7-May-20	14:45	M6	green frog				escaped; traps closed	NS, JC

Area D1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
20-May-20	14:30	DS5	Creeping vole?					no red on back; relocated	NS
21-May-20	6:15	DS1	PEMA					relocated	NS
21-May-20	14:15	DS1	common shrew	45	90			white belly; relocated	JC
21-May-20	14:30	DP4	common shrew	50	90			white belly; relocated	JC
22-May-20	14:20	DS1	Townsend's vole	80	120			no red on back; relocated	NS
23-May-20	14:00	CLOSED							

Area E1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
19-May-20	22:00	ES40	PEMA						SB, PJM
21-May-20	7:17	ES4	PEMA				relocated		NS
21-May-20	7:48	ES13	PEMA				relocated		NS
21-May-20	8:03	ES22	PEMA				relocated		NS
21-May-20	8:08	ES28	PEMA				relocated		NS
21-May-20	8:34	ES40	PEMA				relocated		NS
21-May-20	23:15	ES30	PEMA				relocated		JC/PM
22-May-20	6:52	EP1	common shrew	40	80		relocated		NS
22-May-20	7:00	ES3	townsend's vole	100	140		no red on back; relocated		NS
22-May-20	7:04	ES4	PEMA				relocated		NS
22-May-20	7:37	ES33	PEMA				relocated		NS
23-May-20	6:45	EP1	common shrew	50	100		white belly		JC
23-May-20	7:00	ES9	house mouse?				grey, small ears		JC
23-May-20	7:15	EP5	common shrew	60	110		white belly		JC
23-May-20	7:15	EP5	common shrew	40	80		white belly		JC
23-May-20	7:45	ES33	house mouse?				escaped		JC
24-May-20	6:18	ES3	PEMA				relocated		NS
25-May-20	6:00	EP1	common shrew	40	80		relocated		NS/JC
25-May-20	6:00	EP1	common shrew	50	90		relocated		NS/JC
25-May-20	6:00	ES3	PEMA				relocated		NS/JC
25-May-20	6:15	EP5	common shrew	40	75		relocated		NS/JC
25-May-20	6:15	EP5	common shrew	50	85		relocated		NS/JC
25-May-20	6:15	EP5	common shrew	50	50		relocated		NS/JC
26-May-20	6:20	ES22	PEMA				relocated		NS

Area D2

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
11-Aug-20	15:15	P14	Sorex sp.	50	40			relocated	NS
11-Aug-20	15:15	P14	Sorex sp.	50	40			slightly darker w/ lighter belly	NS
11-Aug-20	22:33	P14	Sorex sp.	35	40				PM/SB **PEMA was
12-Aug-20	6:25	S4B	PEMA					relocated	NS frequently
12-Aug-20	7:10	S30	PEMA					relocated	NS misidentified as
12-Aug-20	14:30	P8	Sorex sp.	50	30				PM MUMU on data
12-Aug-20	22:54	S31	Sorex sp.	45	45				SB/KD sheets;
12-Aug-20	23:07	S36	PEMA						SB/KD corrected here
13-Aug-20	6:50	S21	PEMA					mortality	NS
13-Aug-20	7:15	P28	Sorex sp.	45	30			relocated	NS
13-Aug-20	7:28	S34	PEMA					relocated	NS
13-Aug-20	7:31	S36	Rat						NS
13-Aug-20	14:33	P17	Sorex sp.	45	30				PM
13-Aug-20	15:03	S22	Sorex sp.	50	45				PM
13-Aug-20	22:14	P11	Sorex sp.	45	50			mortality	SB
13-Aug-20	22:29	P17	Sorex sp.	50	50				SB
13-Aug-20	22:29	P17	Sorex sp.	45	50				SB
13-Aug-20	22:41	S21	PEMA?						SB
14-Aug-20	6:20	P2	Sorex sp.						PJM
14-Aug-20	7:20	S23	Sorex sp.					mortality	PJM
14-Aug-20	7:30	S30	PEMA						PJM
14-Aug-20	7:40	P24	Sorex sp.						PJM
14-Aug-20	7:55	S34	PEMA						PJM
14-Aug-20	8:00	S36	PEMA						PJM
14-Aug-20	14:31	P8	garter snake					escaped when lifted lid	PM
14-Aug-20	14:45	P14	Sorex sp.	45	35				PM
14-Aug-20	14:45	P14	Sorex sp.	45	30				PM
14-Aug-20	14:45	P14	PEMA					mortality; appears to have been predated by the shrews	PM
14-Aug-20	22:33	S36	PEMA						SB/KD
15-Aug-20	6:55	S21	PEMA					mortality	NS
15-Aug-20	7:35	P28	Sorex sp.	50	40			mortality	NS
15-Aug-20	7:50	S30	PEMA					mortality	NS
15-Aug-20	14:00	P11	Sorex sp.	45	45				SB
15-Aug-20	22:00	P14	Sorex sp.	45	45				SB/JW
15-Aug-20	22:00	P14	Sorex sp.	45	45				SB/JW
15-Aug-20	22:00	S23	bird sp.					little brown bird; flew away	SB/JW
16-Aug-20	8:00	S36	PEMA					relocated	NS
16-Aug-20	14:26	S9	Sorex sp.	50	45				PM
16-Aug-20	22:00	S4B	PEMA						SB/JW
16-Aug-20	22:00	P5	PEMA					baby?	SB/JW

16-Aug-20	22:00	P10	Pacific treefrog					SB/JW
16-Aug-20	22:00	S24	PEMA					SB/JW
16-Aug-20	22:00	S34	PEMA					SB/JW
16-Aug-20	22:00	S36	PEMA					SB/JW
17-Aug-20	7:25	S18	PEMA					NS
17-Aug-20	7:35	P21	Sorex sp.	60	50	relocated		NS
17-Aug-20	7:50	P24	Sorex sp.	50	50	darker; light underside; relocated		NS
17-Aug-20	7:50	P24	Sorex sp.	60	50	lighter brown; relocated		NS
17-Aug-20	8:25	S34	PEMA			relocated		NS
17-Aug-20	8:30	S36	PEMA			weird growth on right side of belly, near hing legs		NS
17-Aug-20	22:15	S4B	PEMA					PM/JC
17-Aug-20	22:25	S8	PEMA			escaped		PM/JC
17-Aug-20	22:30	S14	PEMA					PM/JC
17-Aug-20	22:45	S19	PEMA					PM/JC
17-Aug-20	22:45	S20	PEMA					PM/JC
17-Aug-20	22:55	S24	PEMA					PM/JC
17-Aug-20	23:10	P24	Sorex sp.	40	35			PM/JC
17-Aug-20	23:20	S37	PEMA					PM/JC
17-Aug-20	23:25	S34	PEMA					PM/JC
17-Aug-20	23:30	S29	Sorex sp.	35	35			PM/JC
17-Aug-20	23:30	S31	Sorex sp.	50	40	almost dead, attempted to revive but died		PM/JC
18-Aug-20	6:10	S1	PEMA					NS
18-Aug-20	6:25	S4B	PEMA					NS
18-Aug-20	6:40	P11	Creeping vole	70	40	relocated		NS
18-Aug-20	7:00	S13	PEMA			small; relocated		NS
18-Aug-20	7:10	S14	PEMA			relocated		NS
18-Aug-20	7:30	S23	PEMA			small; relocated		NS
18-Aug-20	7:45	S22	PEMA			relocated		NS
18-Aug-20	7:50	P24	Sorex sp.	60	40	relocated		NS
18-Aug-20	7:50	P24	Sorex sp.	60	50	relocated		NS
18-Aug-20	7:50	P24	Sorex sp.	60	50	relocated		NS
18-Aug-20	8:15	S32	PEMA			relocated		NS
18-Aug-20	14:20	S4	Sorex sp.	50	40	fed mealworm		JC
18-Aug-20	14:30	P6	Peromyscus sp.			grey; large hind legs; long tail; ears flat to head		JC
18-Aug-20	15:30	S22	Sorex sp.	45	40	mortality		JC
18-Aug-20	15:45	S24	Sorex sp.	50	35	mortality		JC
18-Aug-20	16:10	S33	Sorex sp.	45	35			JC
18-Aug-20	16:15	S36	Sorex sp.	40	40	fed mealworm		JC
18-Aug-20	22:09	S1	PEMA					JC/JG
18-Aug-20	22:19	S7	PEMA					JC/JG
18-Aug-20	22:28	S9	PEMA					JC/JG
18-Aug-20	23:02	S20	PEMA					JC/JG
18-Aug-20	23:04	P21	Sorex sp.	40	40			JC/JG
18-Aug-20	23:12	S22	Sorex sp.	50	40			JC/JG

18-Aug-20	23:23 S22B	Sorex sp.	45	40	mortality	JC/JG
18-Aug-20	23:29 S24	PEMA				JC/JG
18-Aug-20	23:30 P26	Sorex sp.	40	40		JC/JG
18-Aug-20	23:38 S25	PEMA				JC/JG
18-Aug-20	23:52 S32	Sorex sp.	40	40		JC/JG
18-Aug-20	23:54 S34	PEMA				JC/JG
19-Aug-20	0:04 S36	PEMA				JC/JG
19-Aug-20	0:07 S37	PEMA			growth on right side	JC/JG
19-Aug-20	0:15 S14	PEMA				JC/JG
19-Aug-20	6:15 S1	PEMA			relocated	NS
19-Aug-20	6:25 S3	PEMA			relocated	NS
19-Aug-20	7:30 S21	PEMA			relocated	NS
19-Aug-20	7:35 S22	PEMA			mortality	NS
19-Aug-20	7:45 S24	PEMA			relocated	NS
19-Aug-20	7:50 S25	PEMA			relocated	NS
19-Aug-20	7:55 S26	Sorex sp.	50	40	mortality	NS
19-Aug-20	8:05 P28	Sorex sp.	50	50	relocated	NS
19-Aug-20	8:30 S32	Sorex sp.	50	40	mortality	NS
19-Aug-20	8:38 P30	Sorex sp.	60	50	relocated	NS
19-Aug-20	8:45 S36	PEMA			relocated	NS
19-Aug-20	14:20 S3	Sorex sp.			mortality	PJM
19-Aug-20	14:30 P2	garter snake			relocated	PJM
19-Aug-20	15:50 P23	Sorex sp.			fed mealworm; relocated	PJM
19-Aug-20	16:20 S24	bird sp.			flew away	PJM
19-Aug-20	16:50 S37	Sorex sp.			mortality	PJM
19-Aug-20	22:09 S2	Sorex sp.	40	35		PM/JG
19-Aug-20	22:19 S7	PEMA				PM/JG
19-Aug-20	22:33 S13	Sorex sp.	40	40		PM/JG
19-Aug-20	22:56 P23	Sorex sp.	35	40		PM/JG
19-Aug-20	22:56 S22	Sorex sp.	40	40		PM/JG
19-Aug-20	23:08 S4	PEMA				PM/JG
19-Aug-20	23:23 S23	PEMA				PM/JG
19-Aug-20	23:18 S26	PEMA				PM/JG
19-Aug-20	23:35 P30	Sorex sp.	40	40		PM/JG
19-Aug-20	23:39 S34	PEMA				PM/JG
20-Aug-20	6:25 P1	Sorex sp.			escaped	NS
20-Aug-20	6:25 P1	Sorex sp.	60	50	relocated	NS
20-Aug-20	6:55 S7	PEMA			relocated	NS
20-Aug-20	7:10 S9	Sorex sp.	60	50	relocated	NS
20-Aug-20	7:20 P14	Sorex sp.	50	40	relocated	NS
20-Aug-20	7:35 P16	Sorex sp.	50	40	relocated	NS
20-Aug-20	8:05 P23	Sorex sp.	50	40	relocated	NS
20-Aug-20	8:05 P23	Sorex sp.	55	45	relocated	NS
20-Aug-20	8:05 P23	Sorex sp.	45	40	mortality; other 2 eating it	NS

20-Aug-20	8:25 P24	Sorex sp.	50	40	relocated	NS
20-Aug-20	8:40 P26	Sorex sp.	50	50	relocated	NS
20-Aug-20	8:40 P26	Sorex sp.	45	40	mortality; slug feeding on it	NS
20-Aug-20	8:50 S25	PEMA			relocated	NS
20-Aug-20	8:55 S26	Sorex sp.	60	50	relocated	NS
20-Aug-20	9:10 S28	Sorex sp.	50	50	relocated	NS
20-Aug-20	9:25 S32	Sorex sp.	60	50	relocated	NS
20-Aug-20	9:35 S34	PEMA			relocated	NS
20-Aug-20	14:30 S6	Sorex sp.			fed mealworm; relocated	PJM
20-Aug-20	15:00 S9	Sorex sp.			relocated	PJM
20-Aug-20	15:20 P16	Sorex sp.			relocated	PJM
20-Aug-20	15:50 S23	Sorex sp.			fed mealworm; relocated	PJM
20-Aug-20	22:10 S2	Sorex sp.	60	50		PM/JG
20-Aug-20	22:26 S9	Sorex sp.	40	40		PM/JG
20-Aug-20	22:29 S10	PEMA				PM/JG
20-Aug-20	22:33 S12	Sorex sp.	50	45		PM/JG
20-Aug-20	22:43 P16	Sorex sp.	60	40		PM/JG
20-Aug-20	22:50 S16	PEMA				PM/JG
20-Aug-20	22:57 P20	Sorex sp.	60	50		PM/JG
20-Aug-20	23:08 S23	PEMA				PM/JG
20-Aug-20	23:14 S22B	Sorex sp.	60	45	mortality	PM/JG
20-Aug-20	23:20 S26	PEMA				PM/JG
20-Aug-20	23:26 S34	Sorex sp.	60	45		PM/JG
20-Aug-20	23:40 P29	Sorex sp.	60	40		PM/JG
21-Aug-20	6:15 P1	Sorex sp.	45	40		JC
21-Aug-20	7:00 P11	Sorex sp.	50	40		JC
21-Aug-20	7:20 S15	Sorex sp.	45	35	mortality	JC
21-Aug-20	7:40 P20	Sorex sp.	40	40		JC
21-Aug-20	8:00 P23	Sorex sp.	50	40		JC
21-Aug-20	8:15 P22	Sorex sp.	50	45		JC
21-Aug-20	8:15 S21	PEMA				JC
21-Aug-20	8:45 S35	PEMA				JC
21-Aug-20	14:45 S3	Sorex sp.	45	45	relocated	NS
21-Aug-20	15:00 S5	Sorex sp.	50	45	mortality	NS
21-Aug-20	15:15 S8	Sorex sp.	50	50	relocated	NS
21-Aug-20	16:15 S27	Sorex sp.	45	45	mortality	NS
21-Aug-20	16:45 S31	Sorex sp.	45	45	mortality	NS
21-Aug-20	22:00 S2	Sorex sp.	40	40	relocated to east side of Silda	PJM/JG
21-Aug-20	22:10 S4	Sorex sp.	40	40	relocated to east side of Silda	PJM/JG
21-Aug-20	22:15 S7	PEMA			relocated	PJM/JG
21-Aug-20	22:20 S9	PEMA			relocated	PJM/JG
21-Aug-20	22:30 S13	PEMA			relocated south of site	PJM/JG
21-Aug-20	22:30 P14	Sorex sp.	40	35	relocated south of site	PJM/JG
21-Aug-20	22:45 S20	Sorex sp.	40	30	relocated	PJM/JG

21-Aug-20	23:00 S26	Sorex sp.	50	40	relocated	PJM/JG
21-Aug-20	23:10 P27	Sorex sp.			relocated	PJM/JG
22-Aug-20	6:20 S4	PEMA			relocated	NS
22-Aug-20	6:25 S4B	PEMA			relocated	NS
22-Aug-20	6:30 S5	PEMA			relocated	NS
22-Aug-20	6:35 S6	PEMA			relocated	NS
22-Aug-20	7:05 S13	Sorex sp.	45	40	mortality; trap had been thrown/moved	NS
22-Aug-20	7:10 S14	PEMA			relocated	NS
22-Aug-20	7:40 S18	PEMA			relocated	NS
22-Aug-20	7:50 S21	PEMA			relocated	NS
22-Aug-20	7:52 S23	PEMA			relocated	NS
22-Aug-20	7:55 S22B	Sorex sp.	45	40	mortality	NS
22-Aug-20	8:10 P24	Sorex sp.	45	40	relocated	NS
22-Aug-20	8:10 P24	Sorex sp.	50	50	relocated	NS
22-Aug-20	8:20 P26	Sorex sp.	50	50	relocated	NS
22-Aug-20	8:35 P28	Sorex sp.	50	50	relocated	NS
22-Aug-20	8:50 S32	PEMA			relocated	NS
22-Aug-20	14:30 P1	Sorex sp.	40	40		JC
22-Aug-20	14:35 S4	Sorex sp.	50	40		JC
22-Aug-20	14:40 P2	Sorex sp.	45	45		JC
22-Aug-20	22:00 S4	PEMA				KD/JC
22-Aug-20	22:03 S4B	PEMA				KD/JC
22-Aug-20	22:16 S12B	Sorex sp.	50	40		KD/JC
22-Aug-20	22:18 S13	PEMA				KD/JC
22-Aug-20	22:30 P23	Sorex sp.	45	45		KD/JC
22-Aug-20	23:08 S35	PEMA				KD/JC
22-Aug-20	23:10 S36	PEMA				KD/JC
22-Aug-20	23:15 S37	Sorex sp.	40	45		KD/JC
23-Aug-20	6:30 S13	PEMA			relocated to south side of railroad tracks	PJM
23-Aug-20	6:45 S14	PEMA			relocated to south side of railroad tracks	PJM
23-Aug-20	6:50 S12B	PEMA			relocated to south side of railroad tracks	PJM
23-Aug-20	7:20 S21	PEMA			mortality	PJM
23-Aug-20	7:40 P30	Sorex sp.	45	40	relocated to east side of Silda	PJM
23-Aug-20	7:45 P32	PEMA			escaped	PJM
23-Aug-20	8:00 P37	PEMA			escaped	PJM
23-Aug-20	14:50 S12B	Sorex sp.			mortality	PM
23-Aug-20	14:54 P14	Sorex sp.	50	50		PM
23-Aug-20	15:03 S15	PEMA				PM
23-Aug-20	15:08 S16	Sorex sp.	40	40		PM
23-Aug-20	22:00 S2	Sorex sp.	45	40		KD/PM
23-Aug-20	22:10 S10	Sorex sp.	45	40	signs of stress	KD/PM
23-Aug-20	22:15 S13	Sorex sp.	45	40		KD/PM
23-Aug-20	22:20 S14	Sorex sp.	45	40	mortality	KD/PM
23-Aug-20	22:22 S15	Sorex sp.	40	40		KD/PM

23-Aug-20	23:00 S21	PEMA					KD/PM
23-Aug-20	23:20 S35	PEMA					KD/PM
23-Aug-20	23:30 S37	PEMA					KD/PM
24-Aug-20	6:25 S2	Sorex sp.	50	50	relocated		NS/PJM
24-Aug-20	6:45 S12B	Sorex sp.	45	45	relocated		NS/PJM
24-Aug-20	7:10 S21	PEMA			relocated		NS/PJM
24-Aug-20	7:15 P23	Sorex sp.	50	50	relocated		NS/PJM

Area B1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
13-Aug-20	16:25	B1P3	MITO	70	30				PM
16-Aug-20	22:00	B1S3	PEMA						SB, JW
18-Aug-20	17:00	B1P3	garter snake						JC
18-Aug-20	0:45	B1S4	PEMA						JC, JG
18-Aug-20	0:50	B1S3	Sorex sp	50	45			mortality	JC, JG
18-Aug-20	0:55	B1S2	PEMA						JC, JG
19-Aug-20	9:25	B1S1	PEMA						NS
19-Aug-20	9:30	B1S2	PEMA						NS
19-Aug-20	9:40	B1S3	PEMA						NS
19-Aug-20	17:20	B1P1	garter snake						PJM
19-Aug-20	0:05	B1S4	PEMA						PM, JG
19-Aug-20	0:10	B1S3	PEMA						PM, JG
19-Aug-20	0:15	B1S1	PEMA						PM, JG
20-Aug-20	10:10	B1S1	PEMA						NS
20-Aug-20	0:05	B1S3	PEMA						PM, JG
20-Aug-20	0:10	B1S1	PEMA						PM, JG
21-Aug-20	9:00	B1S1	PEMA						JC
21-Aug-20	9:05	B1P1	Sorex sp	40	35				JC
21-Aug-20	23:45	B1S1	PEMA						PJM, JG
21-Aug-20	23:45	B1S3	PEMA						PJM, JG
22-Aug-20	9:30	B1S1	PEMA						NS
22-Aug-20	9:35	B1S3	PEMA						NS

Areas B2a

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
2-Sep-20	0:38	S1	PEMA						PM, JG
2-Sep-20	7:30	S1	PEMA					relocated	PJM, NS
2-Sep-20	7:40	P5	Sorex sp.					mortality; voucher specimen	PJM, NS
2-Sep-20	7:00	M2	green frog					escaped	PJM, NS
3-Sep-20	7:50	M2	NW salamander					relocated	NS, PJ
5-Sep-20	1:40	S5	PEMA						JC, PM
5-Sep-20	6:00	S6	PEMA					young; grey pelage	NS, TP
6-Sep-20	6:45	S6	PEMA					immature; relocated	TP, PM
6-Sep-20	19:25	M3	garter snake						PM, MT
7-Sep-20	1:31	S4	PEMA						PM, MT
7-Sep-20	7:20	S5	PEMA					relocated	PJM, JZ
7-Sep-20	19:00	P4	garter snake						TP
8-Sep-20	13:00	P9	PEMA					mortality; buried offsite	PJM, ML

Area G1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
2-Sep-20	1:50	P12	MIOR					(creeping vole)	PM, JG
3-Sep-20	6:50	P23	Sorex sp.	55	45			relocated	NS, PJ
3-Sep-20	7:10	M1	green frog					tadpole	NS, PJ
3-Sep-20	7:20	M4	NW Salamander					relocated	NS, PJ
3-Sep-20	12:35	M3	NW Salamander						NS, RW
4-Sep-20	6:25	M2	green frog						NS, PJ
4-Sep-20	6:40	P18	Sorex sp.	45	40				NS, PJ
4-Sep-20	6:55	M1	green frog					tadpole	NS, PJ
4-Sep-20	7:00	M4	green frog					tadpole	NS, PJ
5-Sep-20	0:30	M1	Long-toed Salamander					tadpole	JC, PM
5-Sep-20	0:50	M2	NW Salamander					tadpole	JC, PM
5-Sep-20	0:50	M2	NW Salamander					tadpole	JC, PM
5-Sep-20	12:35	M1	green frog					adult; euthanized	JC, PM
6-Sep-20	0:18	P23	Sorex sp.	50	40				JC, MT
6-Sep-20	12:10	M1	NW Salamander					juvenile	TP
6-Sep-20	18:50	M3	green frog						PM, MT
7-Sep-20	0:34	P20	Sorex sp.	50	45				PM, MT
7-Sep-20	0:57	S5	PEMA						PM, MT
7-Sep-20	1:06	M3	NW Salamander						PM, MT
7-Sep-20	6:50	S7	PEMA						PJM, JZ
7-Sep-20	12:39	M3	NW Salamander						JC, AD
8-Sep-20	6:20	P9	Sorex sp.	60	55				NS, PJ
8-Sep-20	18:30	M3	NW Salamander						RD
9-Sep-20	6:20	M4	Long-toed Salamander					tadpole	PJM, NS
9-Sep-20	6:40	P22	Sorex sp.	40	40				PJM, NS

Area F1

Day	Time (hr)	Trap	Species	Body length (mm)	Total length (mm)	Weight (g)	Photo #	Notes	Initials
3-Sep-20	13:40	M2	green frog					escaped	NS, RW
3-Sep-20	14:00	M3	green frog					escaped	NS, RW
4-Sep-20	8:00	S6	Sorex sp.	55	45			relocated	NS, PJ
4-Sep-20	13:40	M3	green frog					euthanized	PJM, RW
5-Sep-20	2:20	S1	PEMA						JC, PM
5-Sep-20	2:30	M4	NW Salamander						JC, PM
5-Sep-20	3:00	P10	Sorex sp.	40	40				JC, PM
5-Sep-20	19:15	M3	green frog					escaped	RW
6-Sep-20	1:51	P10	Sorex sp.	50	45				JC, MT
6-Sep-20	1:51	P10	Sorex sp.	45	40				JC, MT
6-Sep-20	19:50	M3	green frog						PM, MT
7-Sep-20	2:17	M4	NW Salamander						PM, MT
7-Sep-20	13:23	M3	Salamander sp						JC, AP
7-Sep-20	13:23	M3	Vole sp.						JC, AP
8-Sep-20	7:10	M3	green frog					tadpole	NS, PJ
9-Sep-20	1:30	P11	Sorex sp.	45	40			mortality	PM, JG
9-Sep-20	1:38	P12	Sorex sp.	45	40				PM, JG
10-Sep-20	6:30	P10	Sorex sp.	50	40			relocated	NS
10-Sep-20	7:00	M4	NW Salamander					relocated	NS
11-Sep-20	6:30	M3	green frog					escaped minnow	NS, JC
11-Sep-20	6:30	M3	NW Salamander					relocated	NS, JC

APPENDIX 4: PERMIT TRACKER

1. Agency agreement: The agency agreement is a legal contract between the agency and the client. It outlines the scope of the agency's services, the duration of the agreement, and the compensation. The agency agreement is a key document in the relationship between the agency and the client.

APPENDIX 5: PERMIT CONDITIONS TRACKER

APPENDIX 6: STATUS OF TOCA COMMITMENTS TABLE

Ref	Objective Commitments & Assurances	Timing	Delivered By	Status Update	
				Ongoing	Complete
1.0 Responsible Environmental Management					
1.1	Develop, implement, and maintain an Environmental Management Plan (EMP) for the Project to demonstrate how the design, construction and operation, including maintenance, of the Project: - Will be carried out to avoid or mitigate negative impacts; - Will be carried out in an environmentally responsible manner, in accordance with DBSS 165 [Protection of the Environment]; - Will employ Best Management Practices (BMPs3); and - Will comply with federal and provincial legislation, permits, approvals and authorizations, including the Environmental Assessment Certificate (EAC).	All phases	Contractor	X	
1.2	Prepare and implement a Construction Environmental Management Plan (CEMP), (which is a component of the EMP), including relevant sub-plans, for the Project prior to the start of relevant construction activities.	Pre-construction	Contractor	X	
1.3	Obtain required statutory permits, approvals, and authorizations before proceeding with construction that requires such permits.	All phases	Contractor	X	
1.4	Adhere to the terms and conditions of the: EAC; federal screening report; the EMP; DBSS 165 [Protection of the Environment]; and any other applicable permits, licenses and approvals.	Pre-construction, construction	Contractor	X	
1.5	Establish an Inter-Agency Environmental Review Committee (IAERC), in accordance with the Terms of Reference developed during Application review, to provide for agency review and comment on plans and designs prior to construction, including but not limited to: - Detailed design of stormwater management infrastructure;	Pre-construction, construction	MOTI / Contractor	N/A	

	- Detailed vegetation and wildlife mitigation plans and mitigation monitoring plans; and - Environmental management plans.				
1.6	Provide all project related EMPs, including component EMPs, to applicable regulatory agencies in the IAERC for review and comment, at least 30 calendar days prior to the start of construction that requires such plans.	Pre-construction	Contractor	N/A	
1.7	Relevant sub-plans to be included in the CEMP will include those to address environmental issues identified in the Application and supporting documentation submitted to the EAO during the Application review, and described in the Application (Section 11, pg. 523), including but not limited to: - Agriculture Mitigation Plan; - Air Quality and Dust Control Plan; - Archaeological Mitigation / Monitoring Plan; - Construction and Hazardous Waste Management Plan; - Contaminated Sites Management Plan; - Contractor Awareness and Education Plan; - Environmental Monitoring Plan; - Fisheries Habitat Mitigation and Compensation Plan; - Health and Safety Plan; - Invasive Species Management Plan; - Noise and Vibration Management Plan; - Spill Management and Emergency Response Plan; - Surface Water Quality and Sediment Control Plan; - Wildlife and Habitat Management Plan.	Pre-construction	Contractor	X	
1.8	Manage contamination encountered during project development, regardless of the current assessment of potential contamination, in accordance with applicable regulatory requirements.	All phases	Contractor	X	
1.9	Prepare and implement an Operational Environmental Management Plan, prior to operation and maintenance activities. Provide the operational EMP to relevant reviewing and regulatory agencies, for review and comment, at least 30 calendar days prior to the onset of operation and maintenance activities.	Pre-construction	Contractor	TBD	
1.10	At a minimum, review the Wildlife and Habitat Management Plan and modify if required, three years post- construction and make a decision regarding the next review date and/or determine the closure date for the plan(s). The method for review, modification, and decision on closure of the plan(s) will be defined by the applicable regulatory agencies within the IAERC	Operations	Contractor	N/A	
2.0 Monitoring					
2.1	Ensure that environmental monitoring and reporting for the Project will be conducted, with respect to the terms and conditions of the EAC and other regulatory permits, approvals and authorizations as applicable.	Construction	Contractor	X	
2.2	Incorporate a monitoring component into all applicable sub-plans of the construction EMP developed for the construction phase of the Project.	Pre-construction	Contractor	X	
2.3	Outline in each of the sub-plans of the construction EMP: - Rationale for monitoring; - Parameters to be monitored;	Pre-construction	Contractor	X	

	- Monitoring program details; and - Required follow-up actions.				
2.4	The Owner will engage an Environmental Monitor for the construction phases of the Project to undertake environmental monitoring activities and oversee implementation of each of component plans of the EMP developed for the Project. The Environmental Monitor will monitor, evaluate, and report to the owner on construction activities and the effectiveness of the environmental management strategies and mitigation measures, with respect to the terms and conditions of the Application and other regulatory Permits, Approvals and Authorizations that may apply. The Monitor will be responsible for making onsite decisions and taking on-site action to avoid/respond to potential environmental effects which could include temporary stop work orders if necessary.	Construction	Contractor	X	
2.5	Implement environmental quality management program through monitoring, auditing and reporting activities for the Project with respect to the terms and conditions of the EAC and other regulatory permits, approvals and authorizations.	All phases	Contractor	X	
3.0 Incident Management					
3.1	Respond to environmental incidents, including spill incidents in accordance with the Emergency Response Plan to minimize effects and risks to the general public, on-site workers and the environment.	All phases	Contractor	X	
3.2	Include protocols, consistent with the BC Spill Reporting Regulation, for reporting spills to appropriate emergency response authorities, including; - The Provincial Emergency Program, in the case of any spills of reportable deleterious substances into waters frequented by fish, regardless of the amount of the spill; and - To adjacent property owners and occupiers, including local government, where utilities cross the highway and there is a potential for an incident to extend beyond the Project boundaries.	Pre-construction	Contractor	X	
3.3	Train all field Project personnel regarding implementation of the Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans.	All phases	Contractor	X	
3.4	Incorporate relevant municipal contacts into the emergency contacts for the Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans prepared for construction of the Project.	Pre-construction	Contractor	X	
3.5	Follow applicable DBSS 165 and Canadian Council of Ministers of Environment codes and procedures if temporary fuel storage/fueling facilities are required during construction. Where there is a difference in standards, the most stringent measure for environmental protection will take precedence.	Construction	Contractor	X	
4.0 Community Consultation					
4.1	Consult with local governments, stakeholders and the public during all stages of Project development.	Pre-construction; construction	MoT, Contractor	X	
4.2	Conduct community open houses and information sessions during the design review stage to obtain input on design refinements, during the preliminary and final design review stages.	Pre-construction	MoT, Contractor	N/A	
4.3	Provide regular public information updates on the progress of construction, the schedule, and upcoming milestones.	Construction	MoT, Contractor	X	

4.4	Consult with the Corporation of Delta (CoD) and the City of Surrey (CoS) during all stages of project development and construction.	Pre-construction; construction	Contractor	X	
4.5	Provide updated media information materials, as part of the Project commitment to making project information available to the public.	All phases	Contractor	X	
4.6	Track project enquiries and responses.	All phases	Contractor	X	
4.7	Discuss potential economic opportunities generated by the Project with participating First Nations throughout the Post-EA Certification, Design and Construction Phases of the Project.	Pre-construction; construction	MoT, Contractor	X	
4.8	Obtain input from participating First Nations to identify appropriate measures to mitigate potential project related impacts on their previously identified interests in relation to fisheries and habitat matters.	Pre-construction	Contractor	X	
5.0 Stormwater Management					
5.1	Ensure that the design, construction and maintenance of stormwater management infrastructure for the Project takes an integrated approach to stormwater management and contributes to maintaining, or improving, drainage and water quality conditions directly adjacent to the corridor.	All phases	Contractor	TBD	
5.2	Design, construct and maintain stormwater management infrastructure, such that it to meets the performance objectives outlined in the Stormwater Management Plan Outline (July, 2007) and the Application. Monitoring of the infrastructure will be undertaken to confirm performance objectives are met or, if necessary, additional steps are taken to ensure performance objectives are achieved.	All phases	Contractor	X	
5.3	Consult with municipalities adjacent to the new construction area such that the approach to the management of stormwater and drainage design is complementary to, and can be integrated with, adjacent municipal stormwater infrastructure.	Pre-construction	Contractor	TBD	
5.4	Provide final designs for stormwater management infrastructure to relevant First Nations and reviewing and regulatory agencies for review and comment at least 30 calendar days prior to relevant construction activities in order to verify that the proposed infrastructure achieves agreed upon performance measures identified in the Stormwater Management Plan Outline (July 2007).	Pre-construction	Contractor	TBD	
5.5	Drain stormwater and road runoff away from red and blue listed plant communities and do not construct integrated stormwater management infrastructure in such habitat areas.	Construction; operation	Contractor	TBD	
5.6	Obtain input from participating First Nations regarding mitigation measures outlined in the stormwater and drainage plan and effective integration of those measures into the design and operation of the Project.	Pre-construction	Contractor	TBD	
6.0 Agriculture					
6.1	Consult with the Agricultural Land Commission (ALC), Ministry of Agriculture and Lands (MAL), Delta Farmers' Institute (DFI), individual farm owners and the CoD, through all future stages of Project development, construction and operation, to ensure impacts to agricultural lands and operations are minimized where possible and appropriately addressed where impacts are unavoidable.	All phases	MoT, Contractor	X	
6.2	Obtain ALC approvals regarding areas within the Agricultural Land Reserve (ALR) required for the project, prior to construction.	Pre-construction	MoT, Contractor		X

6.3	Develop and implement an Agricultural Mitigation Plan as outlined in the Application that identifies potential impacts to agriculture as a result of project construction activities and measures for avoiding and addressing such impacts where possible. The scope will include those measures outlined in the Application and the Agricultural Enhancement Strategy (April 2008), including but not limited to mitigation measures focused on: - Road access; - Drainage and irrigation; - Utilities; and - Maintaining the agricultural land base.	Pre-construction	Contractor	X	
6.4	Finalize and implement specific agricultural enhancement initiatives, including but not limited to, compensation mechanisms focused on improving road access and drainage and irrigation, as part of the application process to the ALC and summarily as part of the Agricultural Enhancement Strategy (April 2008).	Pre-construction; construction	MoT	X	
6.5	Retain the services of a Professional Agrologist to: - Liaise with the owner, Design-Builder and farmer(s); - Oversee a consultation and dispute resolution process for individual farmers affected by the Project; and - Oversee monitoring and effectiveness of measures proposed to address impacts to agriculture during design, construction and operation.	All phases	MoT	X	
6.6	Avoid, to the extent possible, using agricultural lands outside of the Right-Of-Way (ROW), for staging areas. For all agricultural lands that are required for use as staging areas, implement construction BMPs (as noted in the Agriculture Mitigation Plan in the EMP) to manage potential construction related effects and restore lands to pre-construction condition, or better agricultural capability, upon completion of project works.	Pre-construction; construction	Contractor	X	
6.7	Consult with individual farm owners, as well as MAL, ALC, CoD, DFI and other stakeholders, to identify potential impacts to agricultural operations and infrastructure and ensure that such impacts are avoided, mitigated for, or appropriately addressed during future stages of design and construction of the Project. The scope of potential impacts to farm operations includes, but is not limited to: - Agricultural drainage; - Utilities; - Road Access; and - Pollinators.	Pre-construction; construction	MoT; contractor	X	
6.8	Undertake reasonable measures to facilitate the consolidation of parcels of isolated agricultural lands, to promote continued agricultural use of such lands.	All phases	MoT	X	
6.9	Undertake reasonable measure to minimize potential loss of ALR lands, including existing farm(s) by: - Refining the Project footprint where feasible; and - Optimizing use of existing ROW.	Pre-construction; construction	Contractor	X	
7.0 Air Quality					
7.1	Ensure that the construction works and operations for the Project are conducted in compliance with environmental permits and approvals and that all reasonable measures are taken to address project-related effects on air quality.	Construction, operation	Contractor	X	

7.2	Develop and implement an Air Quality and Dust Control Plan for the construction phase of the project. The plan will: - Include an air quality monitoring program with thresholds, which if exceeded, will trigger the implementation of additional mitigation and corrective measures; - Commit to the best available, known and effective, measures for mitigating construction related air emissions, including diesel particulate matter (PM), as identified by relevant regulatory agencies. This would include, where practical, the use of diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs) on all on-road and off-road project equipment in combination with use of a B20 biodiesel blend; - Include an anti-idling policy for construction equipment and other vehicles associated with construction related activities; - Commit to fugitive dust minimization strategies (e.g. wheel wash and sweeping), and dust suppression techniques (e.g. watering) on roads; and - Identify site specific considerations, where applicable, such as proximity to sensitive environmental or human receptors.	Pre-construction; construction	Contractor	X	
7.3	Provide the Air Quality and Dust Control Plan to Metro Vancouver, Environment Canada (EC), Ministry of Environment (MoE), Transport Canada, Health Canada (HC) and other relevant agencies for review and comment at least 30 calendar days prior to relevant construction activities.	Pre-construction	MoT, Contractor	X	
7.4	Avoid burning as a means for disposing of land clearing debris.	Construction	Contractor	X	
8.0 Traffic Management					
8.1	Ensure that the design of the Project is integrated with local road networks, and that construction of the proposed project includes measures for avoiding or minimizing impacts to local road networks.	Pre-construction; construction	MoT, Contractor	X	
8.2	Prepare and implement a Traffic Management Plan in coordination with CoS and CoD to address construction related traffic conditions.	Pre-construction; construction	Contractor	X	
8.3	Consult with the CoD, CoS, MoT district office, and other stakeholders to design and construct project infrastructure so that it is effectively integrated with existing and planned local road networks.	Pre-construction; construction	Contractor	X	
9.0 Noise and Vibration					
9.1	Ensure that potential noise impacts associated with the project are considered and mitigation provided for during design, construction and operation of the project.	All phases	Contractor	X	
9.2	Prepare and implement a Noise and Vibration Management Plan for the construction phase of the Project that will include specific mitigation measures, and locations where they will be applied to address construction related noise.	Pre-construction; construction	Contractor	X	
9.3	Prepare a noise complaint protocol as part of the CEMP Noise and Vibration Management Plan to respond in a timely manner to concerns and complaints raised by residents and take reasonable actions to reduce the Project-related construction noise in question.	Pre-construction	Contractor	X	
9.4	Provide the construction Noise and Vibration Management Plan to the CoS, CoD and other stakeholders for review and comment 30 calendar days prior to the onset of relevant construction activities.	Pre-construction	Contractor	X	

9.5	Design and construct mitigation measures to address potential operational noise impacts on residential areas as part of the project according to the MoT Noise Policy (1993) [referenced as the Noise Policy in this Agreement].	Pre-construction; construction	Contractor	TBD	
9.6	Conduct noise monitoring at the baseline sites during the first year after construction is complete to assess the effectiveness of mitigation measures, with a commitment to further mitigation if necessary, technically feasible and practical.	Operation	Contractor	TBD	
9.7	Consult with the CoD and CoS to look for opportunities to use tree planting and landscaping to mitigate potential visual, noise and air quality impacts.	Pre-construction; construction	Contractor		
9.8	Participate in meetings with affected communities and residents to address site-specific noise issues in the event that late evening or night time construction works prove necessary in the vicinity of residential areas.	Pre-construction; construction	Contractor	TBD	
9.10	Perform pre-condition surveys to document existing state of buildings and facilities in the vicinity of SFPR construction activities as per standard geotechnical BMPs. This will form the baseline conditions, against which post-construction condition surveys will be carried out to assess any vibration impacts to buildings and facilities as a result of Project construction.	Pre-construction	Contractor	X	
9.11	Monitor ground vibrations, as per standard geotechnical BMPs, adjacent to buildings to confirm that vibration levels are within ranges expected to avoid construction-related vibration.	Construction	Contractor	X	
10.0 Contaminated Sites and Property Acquisition					
10.1	Ensure that potential site contamination is investigated, and managed in compliance with the Contaminated Sites Regulation (Environmental Management Act), during all stages of project development including property acquisition, design and construction.	All phases	Contractor	X	
10.2	Assess all Tier 1 and Tier 2 properties required for the ROW for potential contamination prior to construction and take steps, as required, to investigate and address site contamination that may exist.	Pre-construction; construction	MoT; Contractor	X	
10.3	Manage any contaminated groundwater encountered in accordance with the requirements of the Environmental Management Act and associated regulations.	Pre-construction; construction	MoT; Contractor	X	
10.4	Undertake risk assessment and remediation activities, as required, and manage potential contamination in compliance with the provincial Environmental Management Act and Contaminated Sites Regulation.	Pre-construction; construction	MoT; Contractor	X	
10.5	Should contaminated groundwater be identified along the route, include measures to control/mitigate the potential for impacts to surface water in future stormwater design.	All phases	MoT; Contractor	X	
10.6	Notify MoE of potential migration of contaminants from known or identified Tier 1 off-corridor properties of concern discovered during supplementary investigations or Project-related activities and use information to manage and mitigate contaminated sites issues prior to construction.	Pre-construction	Contractor	X	
10.7	As part of the CEMP, the Contaminated Sites Management, Construction and Hazardous Waste Management and Spill Management and Emergency Response Plans, develop and implement a protocol for identifying and managing contaminated and potentially contaminated materials during the construction phase of the Project.	Pre-construction; construction	Contractor	X	
11.0 Fisheries					

11.1	Ensure that all works and activities associated with the construction, operation and maintenance of the project are conducted in compliance with the Fisheries Act. This includes implementing mitigation measures and best management practices to ensure that the project does not cause any unauthorized harmful alteration, disruption or destruction of fish habitat, that the project does not cause any harm or mortality to fish, and that the project does not cause or result in the deposit of a deleterious substance of any type, including sediment, into a watercourse that is frequented by fish.	All phases	Contractor	X	
11.2	Obtain an authorization under subsection 35(2) of the Fisheries Act for any unavoidable harmful alteration, disruption or destruction of fish habitat prior to relevant construction works or activities.	All phases	Contractor	X	
11.3	Develop and construct fish habitat compensation measures that offset all project impacts to fish habitat. These fish habitat compensation measures will be constructed by the proponent as directed by Fisheries and Oceans Canada and in accordance with any s. 35(2) Fisheries Act authorizations.	Pre-construction; construction	Contractor	X	
11.4	Implement appropriate measures to adequately mitigate the effects of the creation of impervious surfaces on volume of surface runoff, rate of runoff, and water quality. These will meet performance targets established in the Stormwater Management Plan Outline (July, 2007) for the project.	Pre-construction; construction; operation	Contractor	TBD	
11.5	Establish and maintain riparian setback areas from drainage channels and watercourses in accordance with regulatory requirements.	Pre-construction; construction; operation	Contractor	X	
11.6	Take all reasonable measures to prevent substances that may be harmful to fish from entering the aquatic environment at the construction sites in the proximity to fish and aquatic habitat, paying particular attention to discharges of suspended sediments, construction waste, handling of uncured concrete and other deleterious substances.	Construction	Contractor	X	
11.7	Construct bridges for watercourse crosses in the vicinity of Delta Ravines (i.e. Norum, McAdam, Collings, Nelson View and Gunderson Creeks), as shown in plans attached to the Application (Technical Volume 1) and over a minimum 450 m portion of the Fraser Heights Wetlands, using the design and the construction methods outlined in the draft Fraser Heights Wetlands Bridge Preliminary Design Report.	Pre-construction; construction	Contractor	N/A	
11.8	Obtain input from the Musqueam Indian Band and other participating First Nations to identify appropriate measures to mitigate potential project related impacts on the identified interests of the Musqueam Band in relation to fisheries and habitat matters. Identify potential opportunities for mutually agreeable opportunities to assist in advancing the fisheries interests of the Musqueam Indian Band or other participating First Nations.	All phases	MoT, contractor	X	
11.9	Review with the applicable regulatory agencies, including but not limited to DFO and MOE, proposals for compensation habitat, including opportunities for habitat to be constructed in advance of other Project construction (i.e. "habitat banking"), to determine the ratio of habitat types and to which drainage compensation will apply.	Pre-construction	Contractor	X	
11.10	Follow BMPs in the construction of all new ditches and stormwater watercourses.	Construction	Contractor	X	

11.11	Retain maintenance responsibility for compensation sites within the Project limits. For sites constructed in areas outside of the Project limits, establish site-specific agreements for access and maintenance with the relevant stakeholder/landowner.	Operations	Contractor		
12.0 Water Quality					
12.1	Ensure that the construction works and operations for the Project are conducted in compliance with environmental requirements and BMPs in order to avoid impacts to water quality.	All phases	Contractor	X	
12.2	Develop and implement a Surface Water Quality and Sediment Control Plan and provide the plan for review and comment by relevant environmental agencies at least 30 calendar days prior to the start of relevant construction activities.	Pre-construction	Contractor	X	
12.3	Sample water from potentially impacted drinking water wells to assess potential adverse effects to water quality associated with during construction and operation phases of the project. Provide sampling water quality data to the local health authority for review and comment.	Construction; operation	Contractor	TBD	
12.4	The Surface Water Quality and Sediment Control Plan will at a minimum: - Identify requirements for additional water quality monitoring prior to and during construction to ensure preventative and mitigation measures can be taken as appropriate, to avoid impacts to water quality; - Identify potential water quality contaminants of concern generated by construction activities and associated preventative and mitigative measures; - Include a BMP maintenance plan to ensure BMPs implemented are functioning as designed and corrective actions are taken when required; and - Be submitted to the applicable regulatory agencies at least 30 calendar days prior to start of construction activities for review.	Pre-construction; construction	Contractor	X	
13.0 Wildlife and Vegetation					
13.1	Ensure that the design, construction, and operation of the project, avoids where practical and technically feasible, impacts to vegetation and wildlife.	All phases	Contractor	X	
13.2	Prepare and implement a Wildlife and Habitat Management Plan to avoid and, where necessary, mitigate potential impacts to vegetation, wildlife and wildlife habitat. Provide the Plan to relevant regulatory and reviewing agencies for review and comment at least 30 calendar days prior to relevant construction activities beginning. The Wildlife and Habitat Management Plan will include best practices including but not limited to those identified in the Application (Table 7.717, draft Wildlife Mitigation Crossing Plan (April 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)], and Zones of Influence memo (July 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] in order to avoid, and where necessary, mitigate potential effects on vegetation and wildlife. This plan will also identify protocols for the survey and salvage of vegetation and wildlife as appropriate and required.	Pre-construction; construction	Contractor	X	
13.3	Develop and implement mitigation measures to avoid and minimize impacts to wildlife during construction and operation of the project including, but not limited to those measures identified in the Application (September, 2006), draft Wildlife Mitigation Crossing Plan (April 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] and Zones of Influence Assessment memo (July 2007) [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)].	Pre-construction; construction	Contractor	X	

13.4	During the design phase, MoT will finalize its determination of the type and location of sound barriers to be constructed along the perimeter of Burns Bog. For the south-western alignment (adjacent to Crescent Slough), this design will include the construction of a solid sound barrier or a barrier that will provide equivalent mitigation. MoT will ensure on-going consultation with TC, EC, MoE and other IAERC members as appropriate, during design regarding the proposed type and location of sound barriers to be installed around Burns Bog.	Pre-construction	MoT, Contractor	TBD	
13.5	Consult with the MoE and the Canadian Wildlife Service (CWS) of Environment Canada, to identify suitable compensation, including but not limited to that identified in the Wildlife and Habitat Management Plan and Habitat Compensation Plan (February, 2007) [replaced by Habitat Compensation Plan (May 2007)], to address residual effects on vegetation and wildlife as a result of the Project.	Pre-construction	Contractor	X	
13.6	Work with reviewing and regulatory agencies to develop and implement a comprehensive and long term Mitigation Monitoring Plan (MMP) [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan], based on the Vegetation and Wildlife Mitigation Monitoring Strategy (April 2007) [replaced by the SFPR Vegetation and Wildlife Mitigation Monitoring Plan], to monitor the effectiveness of proposed mitigation measures in addressing Project-related effects on vegetation and wildlife, including species at risk. Data collection and monitoring in support of the implementation of the MMP will begin prior to construction and continue for a period of time, to be determined with relevant regulatory agencies, during operation. Information collected in relation to the MMP will be used to guide detailed planning of mitigation, assess the effectiveness of such mitigation, and determine where additional measures may be required. The MMP will include scientifically defensible thresholds or performance measures to facilitate the evaluation of the effectiveness of mitigation.	All phases	Contractor	X	
13.7	Undertake site-specific vegetation surveys in accordance with the regionally supported Protocols for Rare Plants Surveys, to identify the presence and distribution of red- and blue-listed plants species prior to final design and construction. Provide information on the presence and distribution of such plants species to MoE for review and use the information to guide final design and construction to avoid or mitigate impacts to these species.	Pre-construction	Contractor	X	
13.8	Avoid direct impacts to sensitive red and blue listed plant communities where possible and adhere to construction exclusion windows determined by regulators.	Construction	Contractor	X	
13.9	Develop a plan for salvaging plants and seeds, for review by MoE, where impacts to red and blue listed plant species cannot be avoided, for replanting off-alignment.	Pre-construction	Contractor		
13.10	Make all reasonable efforts to avoid impacts to confirmed streambank lupine habitat and confirmed stream bank lupine seed banks in the project corridor, as identified in consultation with the Streambank lupine recovery team, during design construction and operation of the Project. Where impacts to such areas cannot be avoided, work with the Ministry of Environment and the Streambank Lupine Recovery team to identify and carry out appropriate mitigation measures including, but not limited to, the stockpiling of soil containing streambank lupine seeds.	Construction	Contractor	X	

13.11	Undertake pre-construction bird nest surveys and restrict clearing during the breeding season. Pre- construction bird nest surveys will include, but not necessarily be limited to the following: - Conduct pre-construction raptor, heron or any listed species nest and roost tree surveys, consistent with applicable BMPs, to determine presence of active/inactive raptor and heron nests in the corridor and work scheduling with respect to the nest locations and applicable timing restrictions; - Prepare pre-construction bird nest survey protocols should works include clearing of vegetation during the general bird breeding time period as determined by MOE; - Conduct pre-construction bird nest surveys to the satisfaction of the MOE should the Design-Builder intend to seek approval from the MOE for vegetation clearing within the bird breeding time period (defined by MOE) in any year during the Term.	Pre-construction	Contractor	X	
13.12	Consult with MoE on the development and implementation of an Invasive Species Management Plan to address potential effects of the project related to the spread of invasive plant and aquatic wildlife species within the project corridor.	Pre-construction; construction	Contractor	X	
13.13	Include large mammal crossings adjacent to the perimeter of Burns Bog. The final number and location of wildlife crossings will be identified in the Wildlife Mitigation Crossing Plan [replaced by the Wildlife and Wildlife Habitat Mitigation Plan (September 2008)] which will be finalized in consultation with MoE and EC.	Pre-construction	Contractor	X	
13.14	Follow the design criteria outlined in the MOT Manual of Aesthetic Design Practice and the MOT Landscape Policy and Design Standards that form the landscape and site restoration design criteria for the Project.	Pre-construction; construction	Contractor	X	
13.15	Use data collected through the MOT administered Wildlife Accident Reporting System to identify areas of increased wildlife collisions and to monitor direct effects on wildlife.	Operations	Contractor	TBD	
13.16	Identify the location of sensitive wildlife habitats, including but not limited to habitat for species at risk, red and blue listed plant communities and high biodiversity habitats, on detailed design drawings in order to avoid or minimize potential effects to these areas.	Pre-construction	Contractor	X	
14.0 Species at Risk					
14.1	Ensure that all reasonable measures are taken to avoid or lessen effects of the Project on listed wildlife species and their critical habitat and that potential effects that could occur are monitored. All mitigation and monitoring measures will be undertaken in a manner that is consistent with applicable recovery strategy and actions plans.	Pre-construction; construction	MoT, contractor	X	
14.2	Undertake a salvage program for Pacific water shrew from, at a minimum, high and moderate-rated habitat adjacent to the SFPR. Other areas potentially requiring salvage will include lower-rated habitat, connected to higher-rated habitat, and will be determined in consultation with MoE and the PWS Recovery Team.	Pre-construction; construction	Contractor	X	
14.3	Consult with MoE regarding the mitigation of potential effects on Pacific water shrew, and take all practical steps to apply the most recent Pacific water shrew best management practices to address potential effects, including identifying additional opportunities to avoid direct effects to areas, designated as critical habitat by the PWS Recovery Team, during design, construction and operation.	Pre-construction; construction	Contractor	TBD	

14.4	Consult with MOE to develop a mitigation and compensation strategy for Pacific water shrew, where opportunities are available, based on habitat quality and connectivity to surrounding habitat. Undertake sampling program, where required, to determine the presence and distribution of Pacific water shrew to support detailed design of mitigation.	Pre-construction; construction	MoT, Contractor	TBD	
14.5	Detailed design of wildlife crossing mitigation for southern red-backed vole (RBV) will be conducted assuming the presence of RBV in high and moderate rated habitat identified in the EA. Monitoring of the use of wildlife crossing structures will include provisions for assessing the use of such structures by RBV.	Pre-construction	Contractor	TBD	
14.6	Undertake a review of local museum specimens to confirm the distribution of <i>Sorex rowheri</i> within the Lower Fraser Valley. Where possible, use findings to support detailed design of mitigation.	Pre-construction	Contractor	TBD	
14.7	Use information obtained through the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)] to support detailed planning of mitigation to address potential noise, visual and collision effects of the project on barn owl. Undertake long term monitoring of the effectiveness of such mitigation as part of the implementation of the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)].	All phases	Contractor	TBD	
14.8	Use information obtained through the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)] to support detailed planning of mitigation, including pre-construction salvage where appropriate, to address potential effects of the project, including those related to collision and changes in hydrology, on red-legged frog and western toad. Undertake long term monitoring of the effectiveness of such mitigation as part of the implementation of the Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan (February 2008)].	All phases	Contractor	X	
14.9	Consult with MOE to plan and undertake at least one preconstruction, one construction and two operational inventories of at-risk aquatic insects in habitat known to or suspected of supporting such species and potentially affected by the project, including but not necessarily limited to the Fraser Heights Wetland, to confirm the findings of the environmental assessment and to monitor potential impacts of the project on aquatic insects.	All phases	Contractor	X	
14.10	Consult with the Canadian Wildlife Service to develop and implement a Mitigation Monitoring Plan [currently known as the SFPR Vegetation and Wildlife Mitigation Monitoring Plan] to monitor and assess the effectiveness of measures proposed to avoid or mitigate potential effects on Sandhill Crane. The Plan will identify: - species habitat requirements; - existing conditions in the project area; - potential project related effects and mitigation; - core indicators for assessing the effectiveness of mitigation; and - proposed study methodology and data interpretation and reporting protocols.	Pre-construction; construction	MoT	TBD	
15.0 Burns Bog					
15.1	Avoid potentially significant impacts to hydrological and ecological values associated with Burns Bog (i.e. alignment refinements to avoid ecological and hydrological values, development of hydrological mitigation that meet the hydrologic objectives identified).	All phases	MoT, Contractor	X	

15.2	Consult with the MV, CoD, MoE, EC, and the Burns Bog Management Planning Committee (BBMPC) and Scientific Advisory Panel (SAP) to ensure design, construction and operation of the Project complements long term management objectives established for the Burns Bog Ecological Conservation Area.	All phases	Contractor	TBD	
15.3	Consult with the reviewing agencies to finalize construction and post construction monitoring requirements related to Burns Bog including, but not limited to, those identified in the Vegetation and Wildlife Mitigation Monitoring Strategy (April 2007) [replaced by the SFPR Vegetation and Wildlife Mitigation Monitoring Plan]. Monitoring requirements with respect to Burns Bog will include but not be limited to those relating to: air quality, water quality, water levels, red-listed plant communities, and wildlife	Construction, operation	Contractor	X	
15.4	Share environmental data from Burns Bog collected as part of the development of the SFPR project, with agencies responsible for the management of the Burns Bog Ecological Conservancy Area in order to support the implementation of the long term management plan for the Bog.	All phases	Contractor	TBD	
15.5	Design, construct and operate hydrology mitigation infrastructure, to mitigate potential effects of the project on the hydrology of Burns Bog, in a way that meets the following performance objectives: - Site specific solutions – the design, construction and operation of hydrology mitigation will be based on, and take into account, site specific conditions. - Compatibility between highway water management and bog water management – Providing for active water level controls in the Bog that are independent of SFPR-related water management. - Prevention of mineral migration into the Bog. – Where indicated, providing a low permeability barrier between the SFPR highway ditch and the lagg ponds/ditches by: using material to construct the berm that supports appropriate vegetation on the berm and prevents the introduction of mineral material into the Bog; and maintaining hydraulic gradients so that Type 1 bog waters flow toward the highway at all times. - Resilience – Providing a design that is sufficiently robust to maintain and actively manage water levels under average and extreme conditions and if Bog conditions change. - Highway and mitigation construction does not preclude future restoration of Burns Bog – Providing flexibility of design that allows, for example, for future water control structures that allow for raising of water level as part of future bog restoration. - Holistic design – Hydrology mitigation concepts are designed in way that ensure they will be compatible with, and help achieve multiple, mitigation requirements. As the design of hydrology mitigation is advanced, it will be documented in a Hydrology Work Plan [currently known as Hydrology Workplan (Burns Bog)]. This document will be finalized prior to commencement of pre-load activities around Burns Bog.	All phases	MoT	TBD	
15.6	Pre-load activities around Burns Bog, including areas north of the Highway 99 interchange and west of Nordel Way, will not commence until TC (and other decision-making authorities as required) has reviewed and is satisfied with the final Hydrology Work Plan and the status of the hydrology mitigation design.	Pre-construction	MoT	TBD	

15.7	Provide opportunities for the active involvement of agencies responsible for the management of the Burns Bog Ecological Conservancy Area, and the Scientific Advisory Panel (SAP), in the design, construction and operation of project related works adjacent to Burns Bog including but not limited to those proposed as mitigation for potential project related effects.	All phases	MoT, contractor	TBD	
15.8	Consult with MV, CoD, EC and MoE on the development of a water balance model and a drainage model to support the design, construction and operation of hydrology mitigation infrastructure adjacent to Burns Bog and support implementation of the Burns Bog Ecological Conservancy Area Management Plan.	Pre-construction	Contractor	TBD	
15.9	Finalize an Air Quality Management Plan [currently known as SFPR Air Quality Management Plan (Burns Bog Segment)], in consultation with TC, EC and other IAERC members as appropriate, prior to commencing pre-loading activities around Burns Bog. This document will identify all technically and economically feasible mitigation measures to be implemented to prevent generation and transmission of dust during the pre-load and construction phases of the project.	Pre-construction	MoT, contractor		X
15.10	Collect a minimum of 4 months of baseline dust fall monitoring between June and September 2008. Following the collection of this information, the MoT will meet with TC and EC to discuss the baseline monitoring information collected and the approach for continued data collection, prior to the commencement of pre-loading activities around Burns Bog (i.e., north of the Highway 99 interchange and west of Nordel Way).	Pre-construction	MoT		X
15.11	Work co-operatively with the Tsawwassen First Nation to maintain appropriate access for TFN members to Burns Bog to facilitate TFN's harvesting rights pursuant to the Tsawwassen Final Agreement.	All phases	MoT, Contractor	TBD	
15.12	Ensure that the development and operation of Stormwater management infrastructure does not compromise the ability to achieve hydrology mitigation objectives adjacent to Burns Bog.	All phases	MoT, Contractor	TBD	
15.13	Implement the monitoring and follow-up activities identified in the Screening document, for a period of five years after the project has commenced operation, to ensure the effectiveness of mitigation measures related to aerial deposition, hydrology, and Sandhill crane in the vicinity of Burns Bog.	All phases	MoT, Contractor	TBD	
16.0 Archaeology					
16.1	Ensure that the design, construction and operation of the Project is advanced in a way that avoids, or minimizes potential impacts to known archaeological sites, including the Nottingham Farm, St. Mungo and the Glenrose Cannery sites, as well as other sites that may be encountered during project planning and development.	All phases	Contractor		X
16.2	Work with participating First Nations who have identified related interests within the context of the ongoing environmental review process and the BC Archaeology Branch regarding investigation of unsurveyed areas within the Project area assessed as having archaeological potential at an appropriate level for an archaeological impact assessment and develop mitigation measures consistent with the BC Archaeological Impact Assessment Guidelines.	Pre-construction	MoT, Contractor	X	

16.3	Obtain a valid Heritage Conservation Act Section 14 Heritage Inspection Permit with adequate provisions to address requirements for investigations and potential impacts to previously unrecorded archaeological sites should they arise. Immediately report previously undocumented archaeological sites that come to light during the construction phase of the Project to the BC Archaeology Branch and participating First Nations.	Pre-construction; construction	MoT, Contractor	X	
16.4	Include required edits and revisions to the Application in the final Heritage Conservation Act Permit report.	Pre-construction	MoT	X	
16.5	Work with the Musqueam Indian Band and other interested First Nations in developing a mutually acceptable Site Management Plan (SMP) for the Glenrose / St. Mungo area [currently known as Archaeological Impacts and Mitigation Strategy St. Mungo and Glenrose Cannery], to encourage the preservation of archaeological deposits through the protection and management of archaeological and heritage resources during planning, design, construction and operation phases of the SFPR project. The Plan will include, but not be limited to: - a summary of existing information (archaeology and oral history); - summary of existing site conditions; - site management objectives (short, medium and long term); and - site management strategies (preconstruction, construction, post-construction phases).	Pre-construction	MoT	N/A	
16.6	Develop and implement an archaeological mitigation program focused on intact archaeological deposits that includes systematic data recovery (excavation) and archaeological monitoring for the St. Mungo and Glenrose Cannery Sites. Develop methodology and sample size with input from the Archaeology Branch and First Nations. Obtain Heritage Conservation Act Section 14 Heritage Investigation Permits and Section 12 Alteration Permits prior to mitigation and/or alteration of known archaeological sites.	Pre-construction, construction	Contractor	N/A	
16.7	Work with the Musqueam Indian Band and other interested First Nations in establishing a final design for the SFPR segment in the Glenrose / St. Mungo area focused on minimizing potential project related impacts on identified archaeological resources.	Pre-construction,	MoT, Contractor	N/A	
16.8	Work with the Musqueam Indian Band and other interested First Nations to further explore options/opportunities to establish appropriate First Nation recognition and/or interpretation measures in relation to the Glenrose / St. Mungo sites.	All phases	MoT	N/A	
16.9	Undertake appropriate archaeological site impact mitigation measures, including construction monitoring and systematic data recovery (i.e., an archaeological excavation), at the St. Mungo and Glenrose Cannery archaeological sites and support these measures with field programs that involve the Musqueam Indian Band and other interested First Nations as appropriate. The proposed mitigation strategy will be based on an archaeological site management plan for the St. Mungo, Wet Site and Glenrose Cannery archaeological sites currently under development in conjunction with representatives of the Musqueam Indian Band.	All phases	MoT, Contractor	N/A	
16.10	Report the discovery of previously undocumented archaeological sites that may come to light during the construction phase of the SFPR project to the British Columbia Archaeology Branch and interested First Nations. Engage an archaeologist to investigate and assess such sites under the terms and conditions of a Heritage Conservation Act permit.	All phases	Contractor	X	

16.11	Provide opportunities for members of the Musqueam Indian Band and other interested First Nations to participate in field programs supporting the implementation of archaeological site mitigation measures.	All phases	MoT, contractor	X	
16.12	Notify and invite First Nations to participate in specified archaeological work that is to occur at identified archaeological sites within their respective asserted traditional territories.			X	
17.0 Heritage					
17.1	Ensure that the design, construction and operation of the proposed project is advanced in a way that avoids, or minimizes potential impacts to heritage buildings	All phases	MoT, contractor	X	
17.2	Consult with the Delta Heritage Advisory Commission and the Surrey Heritage Committee to define heritage interests and work with the Delta Museum and Archive to develop a photo record and inventory of potentially affected heritage houses.	Pre-construction, construction	Contractor	N/A	
17.3	Prior to construction, undertake pre-condition surveys with respect to heritage buildings, as further described in commitment 9.9.	Pre-construction	Contractor	N/A	
17.4	Avoid, where practical and technically feasible, direct impacts to heritage buildings.	All phases	Contractor	NA/	
18.0 Navigable Waters					
18.1	Obtain regulatory approval related to crossings of designated Navigable Waters pursuant to the Navigable Waters Protection Act (NWPA), including but not necessarily limited to, McAdam Creek, Collings Creek, Manson Canal, and Crescent Slough, prior to commencement of works.	Pre-construction, construction	MoT, Contractor	N/A	
19.0 Socio-economic					
19.1	Mitigate potential Project-related visual/lighting impacts through use of screening, fencing and landscaping in consultation with local government. Use dark-sky compliant lighting for the Project.	Pre-construction, construction	Contractor	TBD	
19.2	Manage potential impacts to emergency response services by: - Ensuring emergency response plans (including a Spill Response Management and Emergency Response Plan) are in place during the construction phase of the Project, and updated annually, at a minimum; - Consulting first responders in Traffic Management Plan development; and - Consulting with local fire departments to ensure adequate access.	Pre-construction, construction	Contractor	X	
20.0 Rail					
20.1	Avoid or minimize potential impacts from Project works and activities to rail corridors.	All phases	Contractor	X	
20.2	Notify Transport Canada of project works as required under the <i>Notice of Railway Works Regulations</i> . Notify the public and affected stakeholders in accordance with the <i>Railway Safety Act</i> .	All phases	Contractor	TBD	
20.3	Comply with Canadian transportation standards and regulations as well as the design specifications of the respective railway with regard to vertical and horizontal railroad clearance of new or upgraded infrastructure.	Pre-construction	Contractor	TBD	
20.4	Minimize railroad closures during construction.	Construction	Contractor	X	