

### Oil and Gas Commission

6534 Airport Road, Fort St. John, B.C V1J 4M6

# PERMIT

### PE-110459

Under the Provisions of the Environmental Management Act

### LNG Canada Development Inc. 400 4<sup>th</sup> Avenue SW Calgary, Alberta T2P 0J4

is authorized to discharge effluent to the environment from the site wide facility project, located at the LNG Canada Export Terminal Project in Kitimat, BC. The discharge is subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

### 1. **DEFINITIONS**

For the purpose of this Permit, the following definitions apply:

- 1.1. Act means the Environmental Management Act;
- 1.2. *Discharge* means the total mass of a solid, liquid or gaseous material introduced into the environment;
- 1.3. *Manager* means an OGC employee authorized to exercise the powers of the OGC under Section 14 of the *Environmental Management Act*;
- 1.4. *OGC* means the B.C Oil and Gas Commission;
- 1.5. *Permit Holder* means LNG Canada Development Inc.;
- 1.6. *Effluent* means discharge from the authorized works at those discharge locations identified and described herein.

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### 2. <u>AUTHORIZED DISCHARGES</u>

- **2.1** This subsection applies to the discharge of effluent from the project area into **BEAVER CREEK DOWNSTREAM**. The site reference number for this discharge is E321171.
  - 2.1.1 The average authorized discharge rate is 10000 m<sup>3</sup>/d, the maximum authorized rate of discharge is 15000 m<sup>3</sup>/d cumulatively discharged into Beaver Creek.
  - 2.1.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.1.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
  - 2.1.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.1.5 Record the daily discharge volume & rate.
  - 2.1.6 The location from which the source of the discharge originates is defined as PID/PIN 004-333-519, 013-119-621, 004-334-078, 030-237-939, 004-333-021, 004-333-276, 004-329-627, 030-473-667, 013-085-638, 016-334-558, 004-332-041, 013-085-484, 030-666-961, 009-834-290, 270-353-530, 228-428-280, DL 981 & DL 7940, which constitutes the main plant site and all of its construction activities as well as those portions of PIDs 007-737-939, 009-460-641, 004-331-079, 013-119-76, 005-628-229, 013-119-613, 013-119-753, 030-112-133, (007-736-649) & Road Plan 5715 which include all construction activities associated with the River Water Intake pipeline right of way as outlined in Appendix A.
  - 2.1.7 The point of discharge into Beaver Creek downstream is defined as 54.027724, -128.694667, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.1.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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- **2.2** This subsection applies to the discharge of effluent from the project area into **BEAVER CREEK UPSTREAM**. The site reference number for this discharge is E323931.
  - 2.2.1 The average authorized discharge rate is 10000 m<sup>3</sup>/d, the maximum authorized rate of discharge is 15000 m<sup>3</sup>/d cumulatively discharged into Beaver Creek.
  - 2.2.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.2.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
  - 2.2.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.2.5 Record the daily discharge volume & rate.
  - 2.2.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.2.7 The point of discharge into Beaver Creek upstream is defined as 54.0325, -128.70184 as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.2.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.3** This subsection applies to the discharge of effluent from the project area into **ANDERSON CREEK**. The site reference number for this discharge is E321191.
  - 2.3.1 The average authorized discharge rate is 20000  $\text{m}^3/\text{d}$ , the maximum authorized rate of discharge is 30000  $\text{m}^3/\text{d}$ .
  - 2.3.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.

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- 2.3.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
- 2.3.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.3.5 Record the daily discharge volume & rate.
- 2.3.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.3.7 The point of discharge into Anderson Creek is defined as 54.015212, 128.682144, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.3.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.4** This subsection applies to the discharge of effluent from the project area into **KITIMAT RIVER SIDE CHANNEL NORTH**. The site reference number for this discharge is E321211.
  - 2.4.1 The average authorized discharge rate is 20000 m<sup>3</sup>/d, the maximum authorized rate of discharge is 30000 m<sup>3</sup>/d.
  - 2.4.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.4.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
  - 2.4.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.4.5 Record the daily discharge volume & rate.

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- 2.4.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.4.7 The point of discharge into Kitimat River Side Channel North is defined as 54.028325, -128.677101, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.4.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.5** This subsection applies to the discharge of effluent from the project area into **KITIMAT RIVER SIDE CHANNEL SOUTH**. The site reference number for this discharge is E321231.
  - 2.5.1 The average authorized discharge rate is 20000 m<sup>3</sup>/d, the maximum authorized rate of discharge is  $30000 \text{ m}^3/\text{d}$ .
  - 2.5.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.5.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
  - 2.5.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.5.5 Record the daily discharge volume & rate.
  - 2.5.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.5.7 The location of the discharge to Kitimat River Side Channel South is defined as 54.021672, -128.674235, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.5.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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- **2.6** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 1**. The site reference number for this discharge is E323691.
  - 2.6.1 The maximum authorized rate of discharge is  $2100 \text{ m}^3/\text{d}$ .
  - 2.6.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.6.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.6.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.6.5 Record the daily discharge volume & rate.
  - 2.6.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.6.7 The location of the discharge to Ground Surface 1 is defined as vegetated area east of Haisla Blvd, 54.0458, -128.6875, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.6.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.7** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 2**. The site reference number for this discharge is E323711.
  - 2.7.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.7.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.7.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.

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- 2.7.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.7.5 Record the daily discharge volume & rate.
- 2.7.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.7.7 The location of the discharge to Ground Surface 2 is defined as vegetated area east of Haisla Blvd, 54.0436, -128.6892, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.7.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.8** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 3**. The site reference number for this discharge is E323712.
  - 2.8.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.8.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.8.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.8.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.8.5 Record the daily discharge volume & rate.
  - 2.8.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.

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- 2.8.7 The location of the discharge to Ground Surface 3 is defined as vegetated area east of Haisla Blvd, 54.0422, -128.6903, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.8.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.9** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 4**. The site reference number for this discharge is E323713.
  - 2.9.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.9.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.9.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.9.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.9.5 Record the daily discharge volume & rate.
  - 2.9.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.9.7 The location of the discharge to Ground Surface 4 is defined as vegetated area east of Haisla Blvd, 54.0415, -128.6909, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.9.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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- **2.10** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 5**. The site reference number for this discharge is E323714.
  - 2.10.1 The maximum authorized rate of discharge is  $3900 \text{ m}^3/\text{d}$ .
  - 2.10.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.10.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.10.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.10.5 Record the daily discharge volume & rate.
  - 2.10.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.10.7 The location of the discharge to Ground Surface 5 is defined as vegetated ditch, 54.0436, -128.6914, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.10.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.11** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 6**. The site reference number for this discharge is E323715.
  - 2.11.1 The maximum authorized rate of discharge is  $800 \text{ m}^3/\text{d}$ .
  - 2.11.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.11.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life and/or Drinking Water Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.

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- 2.11.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.11.5 Record the daily discharge volume & rate.
- 2.11.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.11.7 The location of the discharge to Ground Surface 6 is defined as the ditch between Haisla Blvd & CN Rail, 54.0420, -128.6936, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.11.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.12** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 7**. The site reference number for this discharge is E323752.
  - 2.12.1 The maximum authorized rate of discharge is  $1450 \text{ m}^3/\text{d}$ .
  - 2.12.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.12.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.12.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.12.5 Record the daily discharge volume & rate.
  - 2.12.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.

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- 2.12.7 The location of the discharge to Ground Surface 7 is defined as the vegetated area within the right of way north of Ocelot Rd and the main project site, 54.0324, -128.6934, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.12.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.13** This subsection applies to the discharge of effluent from the project area to **GROUND SURFACE 8**. The site reference number for this discharge is E323771.
  - 2.13.1 The maximum authorized rate of discharge is  $1450 \text{ m}^3/\text{d}$ .
  - 2.13.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.13.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life Standards, and/or Protocol 9-*Establishing Local Background Concentrations in Groundwater*.
  - 2.13.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.13.5 Record the daily discharge volume & rate.
  - 2.13.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.13.7 The location of the discharge to Ground Surface 8 is defined the vegetated area north of Ocelot Road and the main project site, 54.0324, -128.6914, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.13.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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- **2.14** This subsection applies to the discharge of effluent from the project area to the **OXBOW WATERCOURSE**. The site reference number for this discharge is E323751.
  - 2.14.1 The maximum authorized rate of discharge is  $13660 \text{ m}^3/\text{d}$ .
  - 2.14.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.14.3 The effluent quality at the point of discharge shall meet the applicable water quality guidelines, unless background is elevated for a given parameter at which point Table 2, Appendix C applies.
  - 2.14.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.14.5 Record the daily discharge volume & rate.
  - 2.14.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.14.7 The location of the discharge to Oxbow, east of Haisla Blvd, 54.0367, -128.6967, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.14.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

### 3 **GENERAL REQUIREMENTS**

### 3.1 Maintenance of Works and Emergency Procedures

The Permit Holder shall inspect the authorized works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Permit Holder, which prevents continuing operation of the authorized works, the Permit Holder shall immediately notify the Manager and take appropriate remedial action.

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Instances of permit noncompliance shall be self-disclosed upon discovery, as outlined within Chapter 3 of the OGC Compliance and Enforcement Manual; OGCWaste.Management@bcogc.ca shall also be informed of the self-disclosure.

### 3.2 Bypasses

The discharge of contaminants above the permit objectives, which have bypassed the authorized works, is prohibited unless the consent of the Manager is obtained and confirmed in writing.

### 3.3 **Process Modifications**

The Permit Holder shall notify the Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge in a way that may negatively impact the receiving environment.

### **3.4** Discharges to Private Land

The written consent of the land owner shall be obtained prior to any discharges to private land.

### 3.5 Post Disposal

The Permit Holder shall ensure that all equipment associated with the discharge is removed from the work area in a manner as to minimize environmental impact.

### 4. MONITORING AND REPORTING REQUIREMENTS

The Manager may alter the monitoring and reporting program as needed. The need for changes to the program will be informed by the results submitted as well as any other information obtained by the OGC and the Ministry of Environment in connection with the discharges.

### 4.1 Discharge and Compliance Monitoring

- 4.1.1 The Permit Holder shall maintain information, analytical data and flow measurements for inspection by OGC.
- 4.1.2 The Permit Holder shall retain a qualified professional to implement the adaptive treatment approach.
- 4.1.3 The Permit Holder shall retain a qualified professional to implement, the following monitoring plan during periods of active discharges:

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### Table 1: Effluent Monitoring & Sampling

Water Discharge	Frequency	Parameters
Discharges to Surface Waters: Anderson Creek	Daily	temperature, pH, conductivity, dissolved oxygen, turbidity.
Kitimat Side Channel (north) Kitimat Side Channel (south) Ocelot Oxbow Beaver Creek (upstream) Beaver Creek (downstream)	DAILY* sampling after Day 1 of discharge for 7 days to demonstrate history of compliance, then WEEKLY* for 4 weeks to demonstrate history of compliance, then MONTHLY*	All discharge locations: pH, salinity, hardness, alkalinity, dissolved organic carbon, TSS, major ions (Ca, Cl, F, Mg, K, Na, SO <sub>4</sub> ), TDS, nutrients (NH <sub>3</sub> , NH <sub>4</sub> , NO <sub>2</sub> , NO <sub>3</sub> , total nitrogen and total phosphorous), total and dissolved metals, sulphide (as unionized H <sub>2</sub> S). <u>In addition to the above, analyze the following</u> parameters in groundwater dewatered from <u>Areas A through D (as outlined in Appendix</u> <u>A]), as applicable:</u> Source Area A: MTBE Source Area B: PAHs, MTBE Source Area C: MTBE Source Area D: PAHs, cyanide (WAD) <u>In addition to the above, analyze the following</u> parameters when dewatered groundwater <u>south &amp; east of MW20-06 (Appendix B) is</u> <u>discharged to surface waters</u> : chloroform, toluene, MTBE
	Day 1 & WEEKLY* thereafter of discharge for 4 weeks to demonstrate history of compliance, then MONTHLY*	96-h LC50 rainbow trout toxicity test**
Discharges to Ground: Ground Surface 1 Ground Surface 2 Ground Surface 3	Daily	Assess discharge location for potential ecological impact (scouring, visual indications of contamination, wildlife, excessive pooling, etc.)
Ground Surface 4 Ground Surface 5 Ground Surface 6 Ground Surface 7 Ground Surface 8	THREE TIMES PER WEEK* sampling after Day 1 of discharge for 1 week to demonstrate history of compliance; provided compliance is met for three consecutive	All ground discharge locations: pH, hardness, DOC, ammonia, chloride, fluoride, nitrite, sulphate, dissolved metals, sulphide (as unionized H <sub>2</sub> S) In addition to the above:

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## Environmental Stewardship Branch

Water Discharge	Frequency	Parameters
	events, then WEEKLY* for 4 weeks to demonstrate history of compliance, then MONTHLY*	Ground discharge locations associated with discharge of dewatered groundwater south & east of MW20-06 (Appendix B) shall also be sampled for: MTBE, chloroform and toluene.

Notes:

Ca = calcium; CI = chloride, F = fluoride, Mg = magnesium; K = potassium, Na = sodium, SO<sub>4</sub> = sulphate; DOC = dissolved organic carbon;  $H_2S$  = hydrogen sulphide; LC50 = lethal concentration (50%); MTBE = methyl tert-butyl ether;  $NH_3$  = ammonia;  $NH_4$  = ammonium;  $NO_2$  = nitrite;  $NO_3$  = nitrate; PAHs = polycyclic aromatic hydrocarbons; TDS = total dissolved solids; TSS = total suspended solids; WAD = weak acid dissociable

\*Frequency of sampling may be reduced once there is a demonstrated history of compliance at the current sampling frequency. Authorization for frequency reduction will be at the written discretion of the Manager.

\*\* If the discharge salinity is ≥10 ppt this test may not be suitable and an appropriate alternative test should be implemented as per the most recent edition of the British Columbia Environmental Laboratory Manual.

Golder (Golder Associates Ltd.). 2020. Technical Assessment Report to Support Site-Wide Waste Discharge Authorization. LNG Canada Export Terminal Project. 18114047-018-R-Rev0. 13 August 2020.

4.1.4 Active monitoring of the receiving environment shall be implemented as informed by adaptive management, and mitigation measures will be designed to avoid negative impacts to the receiving environment through adaptive management until the assimilative capacity of the receiving environment is better understood. The monitoring frequency will be informed by interpretation of the monitoring data and the adaptive management approach.

Monitoring locations in each of the respective receiving environments suitable for validating or updating discharge criteria such as background concentrations, will be established to support the adaptive management approach.

- 4.1.5 Monitoring data collected to support the validation or update of the discharge criteria will be presented and approved by the Manager, before changes to the background concentrations are adopted.
- 4.1.6 Sampling & monitoring shall comply with the methods outlined within the most recent edition of the British Columbia Field Sampling Manual.
- 4.1.7 Analyses will be performed using standard analytical methods, as specified in the most recent edition of the British Columbia Environmental Laboratory Manual.
- 4.1.8 If, in the opinion of the qualified professional responsible for the monitoring program, the discharge is or is likely causing adverse effects to the environment, the discharge shall be halted immediately.
- 4.1.9 If, in the opinion of the qualified professional responsible for the monitoring program, the discharge is or is likely causing adverse effect to the environment, the Manager shall be notified immediately at (250) 794-

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4.1.10 Photographs of the authorized works and of the authorized discharges shall be taken during active discharge, to portray the average discharge and the average status of the receiving environment. These shall be submitted with the annual report or upon request from the OGC.

### 4.2 Reporting

- 4.2.1 During the period of active discharge, the Permit Holder shall provide the Manager and the Haisla First Nation with updates every two weeks of the monitoring results from the discharge and flow monitoring. Reporting shall include data reporting of the analytical results, and interpretive reporting providing a summary of treatment plant function and receiving environment monitoring. Reporting dates will be the 14<sup>th</sup> and 28<sup>th</sup> of each calendar month. and submitted the OGC to via OGCWaste.Management@bcogc.ca.
- 4.2.2 In the event an exceedance of applicable objectives is observed, the Permit Holder shall notify the Manager immediately upon receipt of the laboratory results.
- 4.2.3 The Permit Holder shall submit an annual report by March 31st of each year, summarizing the discharge operations of the previous year. The annual report shall include the photographs outlined in subsection 4.1.10 and shall include the submission of an Annual Status Form. The final report shall be submitted to the OGC via OGCWaste.Management@bcogc.ca and the Haisla First Nation.

Date Issued: April 13<sup>th</sup>, 2021 Most Recent Amendment: October 13<sup>th</sup>, 2021 Akbar Khan, P.Eng. Environmental Management Officer

PERMIT: PE-110459

# Appendix A



51900		2700	2200
LEGEND		CLIENT	
SURFACE WATER SAMPLE LOCATION (GOLDER 2020)		LNG CANADA DEVELOPMENT	INC.
INFERRED GROUNDWATER FLOW DIRECTION			
PROPOSED RWI PIPELINE ROW		PROJECT	
BEAVER CREEK (REDIRECTED)	NOT FOR CONSTRUCTION	PROPOSED AMENDMENT TO V	WASTE DISCHARGE PERMIT
WATERCOURSE		(PE110459)	
WETLAND	0 300 60		
MAIN PROJECT SITE		TITLE	
	1:15,000 METRES		
	NOTE(S) 1. LOCATIONS ARE APPROXIMATE.	-	
	REFERENCE(S)	- CONSULTANT	YYYY-MM-DD 2021-07-15
	1. BACKGROUND IMAGERY COPYRIGHT © 20200728 ESRI AND ITS LICENSORS. SOURCE: MAXAR, USED UNDER LICENSE, ALL RIGHTS RESERVED, CAPTURE		DESIGNED MO/JC
	DATA: 20190808 AND 20180726 2 TOPOGRAPHIC MAP © ESRLAND ITS LICENSORS, LISED LINDER LICENSE, ALL	GOLDER	PREPARED CC/CDAB
	RIGHTS RESERVED	MEMBER OF WSP	REVIEWED GG
	3. ORTHOMMAGE (20200301) AND FOTORE SURFACE WATER PROVIDED BY STANTEC CONSULTING 20200728.	•	APPROVED JF
	4. WATER DATA CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.	PROJECT NO. CONTROL	REV. FIGURE
	COORDINATE SYSTEM: NAD 1983 UTM ZONE 9N	18114047 4630	0 1



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LEGEND				NMO
WATERCOURSE		LNG CANADA DEVELOPMENT	INC.	S SH
FUTURE SURFACE WATER				WHAT
AREA: A		PROJECT		ATCH
AREA: B		TECHNICAL ASSESSMENT RE	PORT FOR SITE-W	/IDE WASTE
AREA: C		DISCHARGE AUTHORIZATION		r DES DES
AREA: D	0 200 400	0		
SITE BOUNDARY		TITLE		
	1:9,000 METRES	SITE-WIDE AREAS INCLUDED	IN TECHNICAL AS	
				THIS P
	1. LOCATIONS ARE APPROXIMATE.	CONSULTANT	YYYY-MM-DD 20	20-08-13
		-	DESIGNED	<u></u>
	SOURCE: MAXAR. USED UNDER LICENSE, ALL RIGHTS RESERVED. CAPTURE		PREPARED	
	2. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL	<b>GOLDER</b>	REVIEWED EI	
	RIGHTS RESERVED. 3. ORTHOIMAGE (20200501) AND FUTURE SURFACE WATER PROVIDED BY			[
	STANTEC CONSULTING 20200728.		REV	FIGURE
	COORDINATE SYSTEM: NAD 1983 UTM ZONE 9N	18114047 4550	0	2

## Appendix B



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•	PROPOSED AMENDED PERMIT DISCHARGE LOCATION TO SURFACE WATER				PROJECT					ATCH WF
—	BEAVER CREEK (REDIRECTED)		NOT FOR CONSTRU	CTION	PROPOSED	AMENDMENT TO V	VASTE DISCHA	RGE PERMIT	Г	ES NOT M
	WATERCOURSE				(1 - 110-100)					IT DO
	WATERBODY	C	500	1,000	TITLE					REMEN
			1:20,000	METRES	LOCATION	MAP				EASUF
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		REFERENCE(S)					YYYY-MM-DD	2021-07-15		- 19
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		DATA: 20190808 AND 20180726				GOLDER	PREPARED	CC/CDAB		Ē
		RIGHTS RESERVED.	NO FUTUDE OUDER OF WATER TO STORE	DENSE, ALL		MEMBER OF WSP	REVIEWED	GG		Ē
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		4. WATER DATA CONTAINS INF GOVERNMENT LICENCE – BR COORDINATE SYSTEM: NAD 1	FORMATION LICENCED UNDER THE OP ITISH COLUMBIA. 1983 UTM ZONE 9N	EN	PROJECT NO. 18114047	CONTROL	REV. 0		FIGURE	



- DISCHARGE TO GROUND SURFACE
- DISCHARGE TO SURFACE WATER
- MONITORING WELL LOCATION (GOLDER 2020)
- SURFACE WATER SAMPLE LOCATION (GOLDER 2020)
- PROPOSED RWI PIPELINE

WATER BODY

WETLAND

<b>NOT FOR CONSTRUCTIO</b>	Ν	PRO

PROJECT PROPOSED AMENDMENT TO WASTE DISCHARGE PERMIT (PE110459)



NOTE(S)

### RIVER WATER INTAKE RIGHT OF WAY DEWATERED GROUNDWATER DISCHARGE LOCATIONS

LNG CANADA DEVELOPMENT INC.

1. LOCATIONS ARE APPROXIMATE.					
	CONSULTANT		YYYY-MM-DD	2021-06-11	
REFERENCE(S) 1. BACKGROUND IMAGERY COPYRIGHT © 20200728 ESRI AND ITS LICENSORS.			DESIGNED	JC	
SOURCE: MAXAR. USED UNDER LICENSE, ALL RIGHTS RESERVED. CAPTURE DATA: 20190808 AND 20180726			PREPARED	CDAB	
2. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.		GOLDER	REVIEWED	GG	
3. FUTURE SURFACE WATER PROVIDED BY STANTEC CONSULTING 20200728.			APPROVED	JF	
COORDINATE SYSTEM: NAD 1983 UTM ZONE 9N	PROJECT NO.	CONTROL	F	REV.	FIGURE
	18114047	4630	(	0	B1

### Appendix C

Parameter	Units	Anderson Creek	Kitimat Side Channel (north)	Kitimat Side Channel (south)	Ocelot Oxbow	Beaver Creek (upstream)	Beaver Creek (downstream)
pH range	pH units	5.5-9.0	5.5-9.0	5.5-9.0	5.5-9.0	6.5-9.0	6.5-9.0
Sulphide (unionized)	mg/L	0.01*	0.01*	0.01*	0.005*	**	**
Total Iron***	μg/L	1,536	11,812	11,812	8,573	1,600	6,490
Total Chromium	μg/L	**	1.7***	1.7***	**	**	**
Dissolved Aluminum	μg/L	158***	**	**	**	116***	192***
Dissolved Iron***	μg/L	960	10,127	10,127	6,646	989	5,059
Other Parameters	None in concentrations that may have an adverse effect on the receiving environment. Confirm through adaptive monitoring as outlined in Table 1, including comparison to applicable water quality guidelines for the protection of the most sensitive water use (aquatic life) and background (ambient plus 20%) where applicable. Treated effluent comparisons to short-term water quality guidelines where available.						

#### Table 2: Surface Water Discharge Criteria

Notes:

\* End of pipe limit contingent on no adverse effects in the receiving environment

\*\* None in concentrations that may have an adverse effect on the receiving environment. Confirm through adaptive monitoring as outlined in Table 1, including comparison to applicable water quality guidelines for the protection of the most sensitive water use (aquatic life) and background (ambient plus 20%) where applicable. Treated effluent comparisons to short-term water quality guidelines where available.

\*\*\* End of pipe limit based on available background data



### Oil and Gas Commission

6534 Airport Road, Fort St. John, B.C V1J 4M6

# PERMIT

### PE-110459

Under the Provisions of the Environmental Management Act

### LNG Canada Development Inc. 400 4<sup>th</sup> Avenue SW Calgary, Alberta T2P 0J4

is authorized to discharge effluent to the environment from the site wide facility project, located at the LNG Canada Export Terminal Project in Kitimat, BC. The discharge is subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

### 1. **DEFINITIONS**

For the purpose of this Permit, the following definitions apply:

- 1.1. Act means the Environmental Management Act;
- 1.2. *Discharge* means the total mass of a solid, liquid or gaseous material introduced into the environment;
- 1.3. *Manager* means an OGC employee authorized to exercise the powers of the OGC under Section 14 of the *Environmental Management Act*;
- 1.4. *OGC* means the B.C Oil and Gas Commission;
- 1.5. *Permit Holder* means LNG Canada Development Inc.;
- 1.6. *Effluent* means discharge from the authorized works at those discharge locations identified and described herein.

Devin Scheck, P.Ag Supervisor, Environmental Stewardship

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### 2. <u>AUTHORIZED DISCHARGES</u>

- **2.1** This subsection applies to the discharge of effluent from the site wide project area into **BEAVER CREEK**. The site reference number for this discharge is E321171.
  - 2.1.1 The average authorized discharge rate is 10000 m<sup>3</sup>/d, the maximum authorized rate of discharge is 15000 m<sup>3</sup>/d cumulatively discharged into Beaver Creek.
  - 2.1.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.1.3 The effluent quality at the point of discharge shall meet the discharge criteria outlined in Appendix C, for the applicable receiving environment.
  - 2.1.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.1.5 Record the daily discharge volume & rate.
  - 2.1.6 The location from which the source of the discharge originates is defined as PID/PIN 004-333-519, 013-119-621, 004-334-078, 030-237-939, 004-333-021, 004-333-276, 004-329-627, 030-473-667, 013-085-638, 016-334-558, 004-332-041, 013-085-484, 030-666-961, 009-834-290, 270-353-530, 228-428-280, DL 981 & DL 7940, as outlined in Appendix A.
  - 2.1.7 The point of discharge into Beaver Creek is defined as 54.026273, -128.691617, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.1.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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- This subsection applies to the discharge of effluent from the river water intake 2.2 project area into **BEAVER CREEK**. The site reference number for this discharge is E323931.
  - 2.2.1 The average authorized discharge rate is 10000  $m^3/d$ , the maximum authorized rate of discharge is 15000 m<sup>3</sup>/d cumulatively discharged into Beaver Creek.
  - 2.2.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.2.3 The effluent quality at the point of discharge shall meet the discharge criteria outlined in Appendix D.
  - 2.2.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.2.5 Record the daily discharge volume & rate.
  - 2.2.6 The location from which the source of discharge originates is from the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
  - 2.2.7 The point of discharge into Beaver Creek is defined as 54.0325, -128.70184 as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.2.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- 2.3 This subsection applies to the discharge of effluent from the site wide project area into ANDERSON CREEK. The site reference number for this discharge is E321191.
  - 2.3.1 The average authorized discharge rate is 20000  $m^3/d$ , the maximum authorized rate of discharge is  $30000 \text{ m}^3/\text{d}$ .
  - 2.3.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.

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**PERMIT: PE-110459** 

Date Issued: April 13th, 2021 Data Update: May 12th, 2021

- 2.3.3 The effluent quality at the point of discharge shall meet the criteria outlined in Appendix C, for the applicable receiving environment.
- 2.3.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.3.5 Record the daily discharge volume & rate.
- 2.3.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.3.7 The point of discharge into Anderson Creek is defined as 54.015212, -128.682144, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.3.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.4** This subsection applies to the discharge of effluent from the site wide project area into **KITIMAT RIVER SIDE CHANNEL NORTH**. The site reference number for this discharge is E321211.
  - 2.4.1 The average authorized discharge rate is 20000 m<sup>3</sup>/d, the maximum authorized rate of discharge is 30000 m<sup>3</sup>/d.
  - 2.4.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.4.3 The effluent quality at the point of discharge shall meet the criteria outlined in Appendix C, for the applicable receiving environment.
  - 2.4.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.4.5 Record the daily discharge volume & rate.

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- 2.4.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
- 2.4.7 The point of discharge into Kitimat River Side Channel North is defined as 54.028325, -128.677101, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.4.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.5** This subsection applies to the discharge of effluent from the site wide project area into **KITIMAT RIVER SIDE CHANNEL SOUTH**. The site reference number for this discharge is E321231.
  - 2.5.1 The average authorized discharge rate is 20000 m<sup>3</sup>/d, the maximum authorized rate of discharge is  $30000 \text{ m}^3/\text{d}$ .
  - 2.5.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.5.3 The effluent quality at the point of discharge shall meet the criteria outlined in Appendix C, for the applicable receiving environment.
  - 2.5.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.5.5 Record the daily discharge volume & rate.
  - 2.5.6 The location from which the source of the discharge originates is as defined within subsection 2.1.6.
  - 2.5.7 The location of the discharge to Kitimat River Side Channel South is defined as 54.021672, -128.674235, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

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- 2.5.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.6** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 1**. The site reference number for this discharge is E323691.
  - 2.6.1 The maximum authorized rate of discharge is  $2100 \text{ m}^3/\text{d}$ .
  - 2.6.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.6.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.6.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.6.5 Record the daily discharge volume & rate.
- 2.6.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.6.7 The location of the discharge to Ground Surface 1 is defined as vegetated area east of Haisla Blvd, 54.0458, -128.6875, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

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- 2.6.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.7** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 2**. The site reference number for this discharge is E323711.
  - 2.7.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.7.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.7.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.7.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.7.5 Record the daily discharge volume & rate.
- 2.7.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.7.7 The location of the discharge to Ground Surface 2 is defined as vegetated area east of Haisla Blvd, 54.0436, -128.6892, as outlined in Appendix B. Exact

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discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

- 2.7.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.8** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 3**. The site reference number for this discharge is E323712.
  - 2.8.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.8.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.8.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.8.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.8.5 Record the daily discharge volume & rate.
- 2.8.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.8.7 The location of the discharge to Ground Surface 3 is defined as vegetated area east of Haisla Blvd, 54.0422, -128.6903, as outlined in Appendix B. Exact

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PERMIT: PE-110459

discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

- 2.8.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.9** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 4**. The site reference number for this discharge is E323713.
  - 2.9.1 The maximum authorized rate of discharge is  $3850 \text{ m}^3/\text{d}$ .
  - 2.9.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.9.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.9.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.9.5 Record the daily discharge volume & rate.
- 2.9.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.9.7 The location of the discharge to Ground Surface 4 is defined as vegetated area east of Haisla Blvd, 54.0417, -128.6903, as outlined in Appendix B. Exact

Devin Scheck, P.Ag Supervisor, Environmental Stewardship

Date Issued: April 13<sup>th</sup>, 2021 Data Update: May 12<sup>th</sup>, 2021

PERMIT: PE-110459

discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

- 2.9.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.10** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 5**. The site reference number for this discharge is E323714.
  - 2.10.1 The maximum authorized rate of discharge is  $3900 \text{ m}^3/\text{d}$ .
  - 2.10.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.10.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.10.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.10.5 Record the daily discharge volume & rate.
- 2.10.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.10.7 The location of the discharge to Ground Surface 5 is defined as vegetated ditch, 54.0436, -128.6914, as outlined in Appendix B. Exact discharge

Devin Scheck, P.Ag Supervisor, Environmental Stewardship

PERMIT: PE-110459

locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

- 2.10.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.11** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 6**. The site reference number for this discharge is E323715.
  - 2.11.1 The maximum authorized rate of discharge is  $800 \text{ m}^3/\text{d}$ .
  - 2.11.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.11.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.11.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.11.5 Record the daily discharge volume & rate.
- 2.11.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
- 2.11.7 The location of the discharge to Ground Surface 6 is defined as the ditch between Haisla Blvd & CN Rail, 54.0420, -128.6936, as outlined in

Devin Scheck, P.Ag Supervisor, Environmental Stewardship

Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.

- 2.11.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.12** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 7**. The site reference number for this discharge is E323752.
  - 2.12.1 The maximum authorized rate of discharge is  $1450 \text{ m}^3/\text{d}$ .
  - 2.12.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.12.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.12.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.12.5 Record the daily discharge volume & rate.
- 2.12.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.

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- 2.12.7 The location of the discharge to Ground Surface 7 is defined as the vegetated area within the right of way north of Ocelot Rd and the main project site, 54.0324, -128.6934, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.12.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.13** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **GROUND SURFACE 8**. The site reference number for this discharge is E323771.
  - 2.13.1 The maximum authorized rate of discharge is  $1450 \text{ m}^3/\text{d}$ .
  - 2.13.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.13.3 The effluent discharged shall not exceed the British Columbia Contaminated Site Regulation Schedule 3.2, Aquatic Life & Drinking Water Standards. Applicable discharge limits include:

Contaminant of Concern	Authorized Limit
Sulphide	20 µg/L
MTBE	95 μg/L
Other Contaminants	None in concentrations that may have an adverse effect on the receiving environment

- 2.13.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
- 2.13.5 Record the daily discharge volume & rate.
- 2.13.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.

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Date Issued: April 13<sup>th</sup>, 2021 Data Update: May 12<sup>th</sup>, 2021

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- 2.13.7 The location of the discharge to Ground Surface 8 is defined the vegetated area north of Ocelot Road and the main project site, 54.0324, -128.6914, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
- 2.13.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.
- **2.14** This subsection applies to the discharge of effluent from the river water intake pipeline project area to **OXBOW WATERCOURSE**. The site reference number for this discharge is E323751.
  - 2.14.1 The maximum authorized rate of discharge is  $13660 \text{ m}^3/\text{d}$ .
  - 2.14.2 The authorized discharge period is continuous, 24 hours per day, 7 days per week.
  - 2.14.3 The effluent quality at the point of discharge shall meet the criteria outlined in Appendix D, for the applicable receiving environment.
  - 2.14.4 The authorized works are those determined necessary by the qualified professional implementing the adaptive treatment approach, dependent on the results of pre-screening. Such works will include gathering, treatment, and discharge equipment necessary for the protection of the receiving environment.
  - 2.14.5 Record the daily discharge volume & rate.
  - 2.14.6 The location from which the source of the discharge originates is part of the excavation/construction activities associated with a 2.5 km river water intake pipeline north of the main project site, as outlined in Appendix A.
  - 2.14.7 The location of the discharge to Oxbow, east of Haisla Blvd, 54.0367, -128.6967, as outlined in Appendix B. Exact discharge locations may be modified to field fit for minimal environmental disturbance, for the protection of the environment, or safety concerns.
  - 2.14.8 The effluent water may not be discharged in a manner or quantity that impairs the proper ecological function or otherwise causes excessive erosion of the drainage system into which the discharge of water is conveyed.

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### 3 GENERAL REQUIREMENTS

### **3.1** Maintenance of Works and Emergency Procedures

The Permit Holder shall inspect the authorized works regularly and maintain them in good working order. In the event of an emergency or condition beyond the control of the Permit Holder, which prevents continuing operation of the authorized works, the Permit Holder shall immediately notify the Manager and take appropriate remedial action.

Instances of permit noncompliance shall be self-disclosed upon discovery, as outlined within Chapter 3 of the OGC Compliance and Enforcement Manual; OGCWaste.Management@bcogc.ca shall also be informed of the self-disclosure.

### 3.2 Bypasses

The discharge of contaminants, which have bypassed the authorized works, is prohibited unless the consent of the Manager is obtained and confirmed in writing.

### **3.3 Process Modifications**

The Permit Holder shall notify the Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

### **3.4** Discharges to Private Land

The written consent of the land owner shall be obtained prior to any discharges to private land.

### 3.5 Post Disposal

The Permit Holder shall ensure that all equipment associated with the discharge is removed from the work area in a manner as to minimize environmental impact.

### 4. MONITORING AND REPORTING REQUIREMENTS

The Manager may alter the monitoring and reporting program as needed. The need for changes to the program will be informed by the results submitted as well as any other information obtained by the OGC and the Ministry of Environment in connection with the discharges.

### 4.1 Discharge and Compliance Monitoring

Date Issued: April 13th, 2021 Data Update: May 12th, 2021

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- 4.1.1 The Permit Holder shall maintain information, analytical data and flow measurements for inspection by OGC.
- 4.1.2 The Permit Holder shall retain a qualified professional to implement the adaptive treatment approach.
- 4.1.3 The Permit Holder shall retain a qualified professional to implement, the following monitoring plan during periods of active discharges:

Water Source Area	Frequency	Parameters
All Areas	Daily	Field Parameters: temperature, pH, conductivity, dissolved oxygen, turbidity
	DAILY* sampling after Day 1 of discharge for 7 days to demonstrate history of compliance, then WEEKLY* for 4 weeks to demonstrate history of compliance, then MONTHLY* Day 1 & WEEKLY* thereafter of discharge for 4 weeks to demonstrate history of compliance, then MONTHLY*	Laboratory Analyses: conventional parameters, major ions (Ca, Cl, F, Mg, K, Na, SO <sub>4</sub> ), salinity, TDS, alkalinity, nutrients (NH <sub>3</sub> , NH <sub>4</sub> , NO <sub>4</sub> , NO <sub>3</sub> , Total Nitrogen, Total Phosphorous), total and dissolved metals, sulphide; and, additional analyses for groundwater from Areas A through D as applicable. 96-h LC50 rainbow trout toxicity test**
А	Daily <sup>*</sup> sampling after Day	Additional Analyses: MTBE
В	to demonstrate history of	Additional Analyses: PAHs, MTBE
C	compliance, then	Additional Analyses: MTBE
D	WEEKLY* for 4 weeks to demonstrate history of compliance, then	Additional Analyses: PAHs, cyanide
	MONTHLY*	

 Table 1. Effluent Monitoring & Sampling for Discharges to Surface Water

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\*Frequency of sampling may be reduced once there is a demonstrated history of compliance at the current sampling frequency. Authorization for frequency reduction will be at the written discretion of the Manager.

\*\* If the discharge salinity is  $\geq 10$  ppt this test may not be suitable and an appropriate alternative test should be implemented as per the most recent edition of the British Columbia Environmental Laboratory Manual.

Wotor Source	Frequency	Deremotors
Area	Frequency	rarameters
River Water Intake Pipeline Right of Way (ROW)	Daily Field Observations	Assess the discharge location for potential ecological impact (scouring, visual indications of contamination, wildlife, excessive pooling, etc.).
	Three times per week for one week*	Routine – hardness as CaCO3, DOC, pH
	Once per week for four weeks* Once per month thereafter	General Ions – Ammonia, chloride, fluoride, nitrite, sulphate
	1	Metals – Dissolved
		Sulphides – Dissolved unionized as H <sub>2</sub> S
		Organics – MTBE, chloroform, toluene (only when discharging from south ROW)
	Every two weeks	96-h LC50 rainbow trout toxicity test**

 Table 2. Effluent Monitoring & Sampling for Discharges to Ground

\*Frequency of sampling may be reduced once there is a demonstrated history of compliance at the current sampling frequency. Authorization for frequency reduction will be at the written discretion of the Manager.

\*\*If the discharge salinity is  $\geq 10$  parts per thousand, this test may not be suitable and an appropriate

alternative test should be implemented as per the most recent edition of the British Columbia Environmental Laboratory Manual

4.1.4 Active monitoring of the receiving environment shall be implemented, and mitigation measures be designed to avoid negative impacts to the receiving environment through adaptive management until the assimilative

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capacity of the receiving environment is better understood. The monitoring frequency will be informed by interpretation of the monitoring data and the adaptive management approach.

Monitoring locations in each of the respective receiving environments suitable for validating or updating discharge criteria listed as background concentrations in Appendix C & D will be established.

- 4.1.5 Monitoring data collected to support the validation or update of the discharge criteria listed in Appendix C & D will be presented and approved by the Manager, before changes to the background concentrations are adopted.
- 4.1.6 Sampling & monitoring shall comply with the methods outlined within the most recent edition of the British Columbia Field Sampling Manual.
- 4.1.7 Analyses will be performed using standard analytical methods, as specified in the most recent edition of the British Columbia Environmental Laboratory Manual.
- 4.1.8 If, in the opinion of the qualified professional responsible for the monitoring program, the discharge is or is likely causing adverse effects to the environment, the discharge shall be halted immediately.
- 4.1.9 If, in the opinion of the qualified professional responsible for the monitoring program, the discharge is or is likely causing adverse effect to the environment, the Manager shall be notified immediately at (250) 794-5236. Haisla First Nation representatives shall be notified as soon as practicable.
- 4.1.10 Photographs of the authorized works and of the authorized discharges shall be taken during active discharge, to portray the average discharge and the average status of the receiving environment. These shall be submitted with the annual report or upon request from the OGC.

### 4.2 Reporting

During the period of active discharge, the Permit Holder shall provide the 4.2.1 Manager and the Haisla First Nation with updates every two weeks of the monitoring results from the discharge and flow monitoring. Reporting shall include data reporting of the analytical results, and interpretive reporting providing a summary of treatment plant function and receiving environment monitoring. Reporting dates will be the 14<sup>th</sup> and 28<sup>th</sup> of each calendar month. and submitted to OGC the via OGCWaste.Management@bcogc.ca.

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- 4.2.2 In the event an exceedance of applicable objectives is observed, the Permit Holder shall notify the Manager immediately upon receipt of the laboratory results.
- 4.2.3 The Permit Holder shall submit an annual report by March 31st of each year, summarizing the discharge operations of the previous year. The annual report shall include the photographs outlined in subsection 4.1.10 and shall include the submission of an Annual Status Form. The final report shall be submitted to the OGC via OGCWaste.Management@bcogc.ca and the Haisla First Nation.

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### Appendix A





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	23	COORDINATE SYSTEM: NAD 1983 UTM	M ZONE 9N		F 1	PROJECT NO.	CONTROL 4530	R O	EV.	FIGURE





- DISCHARGE TO GROUND SURFACE  $oldsymbol{igstar}$
- ۲ DISCHARGE TO SEWER (NOT PART OF WDA)
- $oldsymbol{0}$ DISCHARGE TO SURFACE WATER - BEAVER CREEK OR OXBOW

NOTE(S)

- $\bullet$ MONITORING WELL LOCATION (GOLDER 2020)
- SURFACE WATER SAMPLE LOCATION (GOLDER 2020)
- PROPOSED RWI PIPELINE ROW
- WATERCOURSE
  - WATER BODY

25

WETLAND

LNG CANADA DEVELOPMENT INC.

PROJECT TECHNICAL ASSESSMENT REPORT FOR RIVER WATER INTAKE (RWI) WASTE DISCHARGE AUTHORIZATION AMENDMENT



#### TITLE POTENTIAL DISCHARGE LOCATIONS

1. LOCATIONS ARE APPROXIMATE.							<u>L</u>
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<b>REFERENCE(S)</b> 1. BACKGROUND IMAGERY COPYRIGHT © 20200728 ESRI AND ITS LICENSORS.			DESIGNED	J	C		25
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		Treatment Targets By Discharge Location						
СОРС	Units	Beaver Creek <sup>1</sup> (F / DW)	Anderson Creek (F / DW and M) <sup>2</sup>	Kitimat River Side-channel (North and South) (F / DW) <sup>1</sup>				
рН	S.U	6.5 – 9 (F - No IDZ assumed because of low flow in Beaver Creek)	5.5 – 9 (F, modified for Bkg)	5.5 – 9 (F, modified for Bkg)				
Inorganics								
Total ammonia	mg-N/L	1.4 – 2.1 <sup>pH,T</sup> (F)	1.3 – 2.1 <sup>pH,T</sup> (F); 11 (M)	0.58 – 2.1 <sup>pH,T</sup> (F)				
Total alkalinity (CaCO3)	mg/L	20 <sup>Min</sup> (F); 13 <sup>Min</sup> (Bkg)	20 <sup>Min</sup> (F); 5 <sup>Min</sup> (Bkg)	20 <sup>Min</sup> (F); 13 <sup>Min</sup> (Bkg)				
Chloride	mg/L	150 (F)	150 (F); 692 (Bkg)	150 (F)				
Cyanide	mg/L	0.0050 (F)	0.005 (F); 0.001 (M)	0.0050 (F)				
Fluoride	mg/L	0.68 – 1.1 <sup>н</sup> (F); 1.15 (Bkg)	0.42 – 2.9 <sup>H</sup> (F); 1.5 (M)	0.40 – 0.99 <sup>H</sup> (F)				
Sulphate	mg/L	128 – 218 <sup>H</sup> (F)	128 – 429 <sup>H</sup> (F)	128 – 218 <sup>H</sup> (F)				
Sulphide	mg/L	0.002 (F - No IDZ assumed because of low flow in Beaver Creek)	02 (F - No IDZ ed because of low n Beaver Creek) Modified F of 0.01 at end of pipe, assuming that achieved at the IDZ relevant to the dischar circumstances.					
Total Metals <sup>3</sup>	L							
Arsenic	µg/L	5 (F)	5 (F); 12.5 (M)	5 (F)				
Beryllium	µg/L	0.13 (F)	0.13 (F); 100 (M)	0.13 (F)				
Boron	µg/L	1,200 (F)	1,200 (F/M)	1,200 (F)				
Chromium	µg/L	1 <sup>∨I</sup> , 8.9 <sup>III</sup> (F)	1 <sup>∨I</sup> , 8.9 <sup>III</sup> (F); 1.5 <sup>∨I</sup> , 56 <sup>III</sup> (M)	1 <sup>∨I</sup> , 8.9 <sup>III</sup> (F); 1.7 (Bkg)				
Cobalt	µg/L	1 (DW)	1 (DW)	1 (DW)				
Copper	µg/L	2 - 2.2 <sup>DOC,H,pH</sup> (F); 4 (Bkg)	2 - 10 <sup>DOC,H,pH</sup> (F); 2 (M); 4 (Bkg)	2 <sup>DOC,H,pH</sup> (F); 4.7 (Bkg)				
Iron	µg/L	1,000 (F); 6,490 (Bkg)	1,000 (F); 1,536 (Bkg)	1,000 (F); 11,812 (Bkg)				
Manganese	µg/L	120 (DW)	120 (DW); 100 (M)	120 (DW)				
Molybdenum	µg/L	88 (DW)	88 (DW)	88 (DW)				
Selenium	µg/L	2 (F)	2 (F); 3.5 (Bkg)	2 (F)				
Silver	µg/L	0.05 <sup>H</sup> (F)	0.05 <sup>H</sup> (F); 1.5 (M)	0.05 <sup>H</sup> (F)				
Uranium	µg/L	8.5 (F)	8.5 (F)	8.5 (F)				
Vanadium	µg/L	-	50 (M)	-				
Zinc	µg/L	7.5 (F)	7.5 (F); 10 (M)	7.5 (F)				

		Treatment Targets By Discharge Location					
СОРС	Units	Beaver Creek <sup>1</sup> (F / DW)	Anderson Creek (F / DW and M) <sup>2</sup>	Kitimat River Side-channel (North and South) (F / DW) <sup>1</sup>			
Dissolved Metals							
Aluminum	µg/L	8 - 50 <sup>pH</sup> (F); 192 (Bkg)	9.6 - 50 <sup>pH</sup> (F); 158 (Bkg)	8 - 50 <sup>pH</sup> (F); 86 (Bkg)			
Cadmium	µg/L	0.064 - 0.14 <sup>H</sup> (F)	0.039 - 0.46 <sup>H</sup> (F)	0.035 - 0.11 <sup>H</sup> (F)			
Iron	µg/L	350 (F); 5,059 (Bkg)	350 (F); 960 (Bkg)	350 (F); 10,127 (Bkg)			
Polycyclic Aromatic Hy	drocarbon	S					
Naphthalene	µg/L	1 (F)	1 (F/M)	1 (F)			
Acridine	µg/L	0.050 (F)	0.050 (F)	0.050 (F)			
Phenanthrene	µg/L	0.30 (F)	0.30 (F)	0.30 (F)			
Anthracene	µg/L	0.10 (F)	0.10 (F)	0.10 (F)			
Pyrene	µg/L	0.020 (F)	0.020 (F)	0.020 (F)			
Fluoranthene	µg/L	0.20 (F)	0.20 (F)	0.20 (F)			
Benzo(a)anthracene	µg/L	0.10 (F)	0.10 (F)	0.10 (F)			
Benzo(a)pyrene	µg/L	0.010 (F)	0.010 (F/M)	0.010 (F)			
Chrysene	µg/L	-	- 0.1 (M) -				
Hydrocarbons							
МТВЕ	µg/L	15 <sup>40</sup> (DW)	15 <sup>AO</sup> (DW); 440 (M) 15 <sup>AO</sup> (DW)				

AO = aesthetic objective; F = freshwater aguatic life; M = marine aguatic life; Bkg = background in receiving environment (as 95<sup>th</sup> percentile + 20%, unless otherwise noted); COPC = contaminant of potential concern; DW = drinking water; Min = guideline or value is a minimum

H = guideline is hardness-dependent; pH = guideline is pH-dependent; T = guideline is temperature-dependent. Dependent guidelines are calculated based on the toxicity modifying factor characteristics of the receiving environment.

1 Treatment target is the lowest applicable guideline for Beaver Creek or the Kitimat River side-channel (lower of AW-F or DW), unless background is elevated for the given parameter, at which point the treatment target is the background concentration (within 20% of ambient).

2 For Anderson Creek, the treatment targets shown are the most stringent of the freshwater and drinking water guidelines (lower of AW-F or DW) and the marine guidelines. Salinity measurements are required to indicate the applicability of marine guidelines, otherwise the lower guideline applies. Background concentrations are shown where elevated above the treatment targets, at which point the treatment target is the background concentration (within 20% of ambient).

3. Total metals concentrations were based on groundwater dissolved metals concentrations due to limited or absent data for total metals.

# Proposed Treatment Targets (Discharge Criteria) for Surface Water Discharge Locations (Beaver Creek and the Oxbow)

Parameters Potentially Requiring Treatment in Dewatered Groundwater <sup>1</sup>	Treatment Target / Discharge Criteria Under Expected Site Conditions				
рН	5.5-9.0 as an allowable range				
Fluoride	1.1 mg/L				
Nitrite	0.020 mg-N/L				
Sulphide (unionized)	Beaver Creek = 0.002 mg/L				
	Oxbow = 0.005 mg/L				
Total Chromium	0.001 mg/L				
Total Oshall	Beaver Creek = 0.001 mg/L				
	Oxbow = 0.004 mg/L				
Total Iron	1.6 mg/L				
Total Manganese	0.335 mg/L				
Dissolved Aluminum	0.116 mg/L				
Dissolved Iron	0.989 mg/L				
Chloroform	0.0018 mg/L				
Toluene	0.00050 mg/L				
МТВЕ	0.015 mg/L				
Parameters to be monitored in dewatered ground water pre- and post-treatment (Golder TAR 2020, Table 12) not identified as COPCs in the TAR screening of available groundwater data.	Applicable BCWQGs or background +20% (if background > BCWQG). Attainment of these discharge criteria to be confirmed in effluent pre- and post-treatment through monitoring.				

BCWQG = British Columbia Water Quality Guideline; COPC = contaminant of potential concern; IDZ = initial dilution zone; mg/L = milligrams per Litre; mg-N/L = milligrams nitrogen per Litre, measured as nitrogen; MTBE = methyl tert-butyl ether; TAR = Technical Assessment Report; °C = degrees Celsius