



Saskatchewan
Ministry of
Environment

APPROVAL TO OPERATE POLLUTANT CONTROL FACILITIES

Industrial Branch

Issued pursuant to *The Environmental Management and Protection Act* and the regulations there under

APPROVAL NO. PO11-002

WHEREAS, **AREVA Resources Canada Inc.** of Saskatoon, Saskatchewan (the "Company") has applied for approval pursuant to Section 9 of *The Mineral Industry Environmental Protection Regulations, 1996*, Sections 35.1(a) and (c) of *The Environmental Management and Protection Act*, S.S., 2002, c.E10.21 (EMPA), Section 9 of *The Hazardous Substances and Waste Dangerous Goods Regulations*, and Section 8 of the *Clean Air Act* for their facilities at the **Cluff Lake Project** located near Cluff Lake, Saskatchewan at approximate UTM Grid Zone 12/6469000mN / 582000mE in the Province of Saskatchewan.

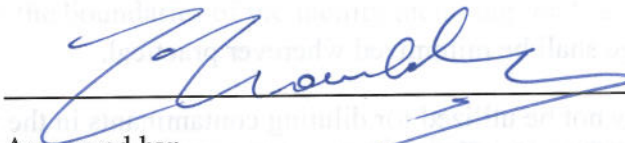
Pursuant to Section 26 of *The Mineral Industry Environmental Protection Regulations, 1996*, Section 58 of *The Environmental Management and Protection Act, 2002*, Section 11 of *The Hazardous Substances and Waste Dangerous Goods Regulations*, and Section 9 of the *Clean Air Act*, the Minister of Saskatchewan Environment (the "Minister") hereby issues to the Company a permit/approval subject to the terms and conditions set forth herein or attached hereto.

This Approval expires on **October 31, 2016** unless sooner terminated.

Dated at Saskatoon, Saskatchewan this 28th day of **January 2011**.



Recommended by:
Alan Merkowsky
Project Officer



Approved by:
Tim Moulding – Manager, Uranium and Northern Operations
For and on behalf of the Minister of the Ministry of Environment



1.0 DEFINITIONS

1.1 Subject to clause 1.2, all words and phrases have the same meaning or definition as in *The Environmental Management and Protection Act, 2002 (EMPA)*, *The Clean Air Act* and regulations there under.

1.2 In this Approval and for the purposes of this Approval:

“Ministry” means the Ministry of Environment of the Province of Saskatchewan;

“Minister” means the Minister of the Ministry;

“Schedule” refers to an attachment to this Approval;

“Environment Officer” means an environment officer appointed pursuant to Section 65 of EMPA, and includes a deputy environment officer, a member of The Royal Canadian Mounted Police or a member of a police service as defined in The Police Act, 1990.

2.0 AUTHORIZATION

Subject to the terms and conditions in this Approval, the Company is authorized to operate:

- a) Pollutant Control Facilities associated with the operation of the facility.
- b) Air Pollution control equipment and industrial sources associated with the operation of the facility.
- c) Sewage Treatment associated with the facility.
- d) Landfill used for the disposal of domestic and industrial waste.
- e) Hazardous Substances and Waste Dangerous Goods Storage Facilities associated with the operation of the facility.

3.0 CONDITIONS

3.1 Pollutant Control Facilities

3.1.1 As much, clean surface water as reasonably possible shall be diverted away from any areas of the development where contamination could occur.

3.1.2 Water usage shall be minimized wherever practical.

3.1.3 Waters may not be utilized for diluting contaminants in the water treatment process, or collected surface runoff.

3.1.4 Runoff from the Dominique-Janine surface areas shall be directed to the Dominique-Janine Extension (DJX) Pit.

3.1.5 The levels of contaminants in the wastewater discharged to the environment from the final point of control shall be as low as reasonably achievable but shall not exceed the concentrations as specified in the attached Schedule 1. The final point of control is at the



Secondary Treatment System (STS) discharge point to Snake Creek.

- 3.1.6 In the event that the authorized concentration of contaminants as specified in Schedule 1 are exceeded at the final point of control, the Company shall immediately terminate the discharge and notify the Ministry and shall identify the cause of the problem and corrective measures to be taken. Effluent discharge shall not resume until the Company is able to achieve the Authorized Concentration of Contaminants specified in Schedule 1.
- 3.1.7 The secondary water treatment ponds (A1-A2) shall be operated in such a manner to provide for a freeboard of 0.5 metres, until the ponds are decommissioned.
- 3.1.8 The valve controlling discharge from the secondary water treatment system to Snake Creek must be maintained in an operable condition to allow for the complete termination of any discharge from this system to the environment in the event that such action is required.

3.2 Air Pollution Control

- 3.2.1 The Company shall properly maintain and operate all air pollution monitoring and abatement equipment associated with air emissions at the facility.
- 3.2.2 The concentration of contaminants in air emissions to the environment from all sources shall be as low as reasonably achievable but shall not exceed the levels specified in The Clean Air Regulations.
- 3.2.3 In the event that the authorized levels of a contaminant as specified in The Clean Air Regulations are exceeded, the Company shall investigate the source of the emission, notify the Ministry, identify the cause of the problem and implement the appropriate corrective measures.
- 3.2.4 Open burning at the domestic landfill may be approved pursuant to conditions imposed by a burning permit that allows the burning of clean wood and paper products only. No other open burning of any scrap or waste material will be allowed unless approved by ministry staff.
- 3.2.5 The Company shall make every reasonable effort to minimize fugitive dust emissions from all sources within the boundaries of the facility including roads and storage areas.

3.3 Sewage Treatment

- 3.3.1 The Company shall operate the sanitary sewage works that were approved by the Ministry subject to the monitoring schedule and the conditions contained in the attached Table 10.
- 3.3.2 Operating records of the sanitary sewage works shall be maintained and reported quarterly.



3.4 Landfill

- 3.4.1 The disposal of domestic and industrial wastes into landfills shall be conducted under the requirements of The Municipal Refuse Management Regulations, Section 10 (2) and The Environmental Management and Protection Act, Section 81(1), dated October 1, 2002.
- 3.4.2 No radioactive materials or Waste Dangerous Goods (WDG) may be deposited in the landfill.
- 3.4.3 The Cluff Lake Project Waste Management Guidelines Procedure, based on the 4 R's (Reduce, Re-use, Recycle and Recover), shall be reviewed on an annual basis and the results shall be reported in the Annual Environmental Report.
- 3.4.4 The Company shall ensure that the disposal method, type, and quantity of wastes from the operation is accurately recorded and logged.

3.5 Hazardous Substances and Waste Dangerous Goods

- 3.5.1 The Company shall store all Hazardous Substances and Waste Dangerous Goods in accordance with the requirements of The Hazardous Substances and Waste Dangerous Goods Regulations and are stored in the approved facilities listed in Table 14 of this operating approval.
- 3.5.2 All hazardous substances and waste dangerous goods shall be handled according to the Cluff Lake Project Waste Management Guidelines procedure.

3.6 Domestic Waste Incinerator

- 3.6.1 The incinerator shall be operated in such a fashion as to minimize impact on the environment.
- 3.6.2 The Plibrico Model CAB 50 propane incinerator is approved for use only with domestic wastes (including cardboard and paper) generated at the Cluff Lake Project.
- 3.6.3 The Company shall operate, maintain and service the incinerator following procedures established by the manufactures.
- 3.6.4 All personnel operating the incinerator shall be trained in its operating procedures. The training shall be documented by the company.
- 3.6.5 The incinerator shall not be operated at greater than design capacity.
- 3.6.6 All ash produced shall be disposed of at the domestic landfill. The company shall ensure complete incineration of all material before the ash is emptied.

3.7 General

- 3.7.1 In the event of a conflict between this approval and any Provincial Acts or regulations there under, the requirements of the legislation or regulations shall prevail, unless the



requirements of this approval are more stringent.

- 3.7.2 All aspects of decommissioning and operation of the approved pollutant control facilities and all other facilities at the Company's decommissioning project shall be conducted in such a manner as to minimize the effects on surface and ground water quality and on the surrounding aquatic and terrestrial ecosystems.
- 3.7.3 The facility and all plans and records pertaining to the operation of the facility shall be made available at all reasonable times for inspection by representatives of the ministry.
- 3.7.4 The Company shall not construct, alter or operate any pollutant control facility without first having obtained, and complied with, a valid construction approval or permit, pursuant to The *Environmental Management and Protection Act, 2002* and *Mineral Industry Environmental Protection Regulations, 1996*.

4.0 INSPECTIONS

- 4.1 The Company shall conduct environmental inspections by qualified Company designated personnel at the locations and frequency listed in Table 1. The inspection dates and findings are to be recorded in a manner acceptable to the Ministry, and records retained on file until written authorization for disposal is granted.
- 4.2 Exposed synthetic liners in the A1 and A2 ponds shall be inspected in the spring and fall. Any maintenance or repairs required will be completed prior to pond use.
- 4.3 The STS and feed pump system shall be inspected in the spring to ensure that they are operable prior to any required use. If the systems are not used during the open water season it will be checked again in the fall to ensure operation.
- 4.4 When operating, inspections of the secondary treatment system, A1 and A2 ponds and associated works shall be performed by qualified personnel at least once during each twenty-four hour period.

5.0 MONITORING

- 5.1 The Company shall maintain and operate all monitoring systems pertaining to environmental monitoring and spill control at the pollutant control facilities in accordance with the plans and specifications for which the applicable construction approval was issued.
- 5.2 The Company shall review and evaluate, on at least an annual basis, the adequacy and proper functioning of environmental monitoring and spill control systems. This review shall include but not be limited to:
- a) inspection patrols by Company personnel;
 - b) care and maintenance of monitoring instrumentation, controls, and alarms;
 - c) calibration of instrumentation;
 - d) inspection and monitoring record-keeping and reporting;



- e) training of all personnel involved in maintaining the monitoring and control system for spill control.

5.3 Monitoring programs shall be established and conducted by the Company in accordance with attached tables listed below:

- Table 2: Meteorological Monitoring Schedule
- Table 3: Radon Monitoring Schedule
- Table 4: Effluent and TMA Monitoring Schedule
- Tables 5: Contaminant Flowpaths, Sources, Groundwater Flowpaths and Surface Water Receptors
- Table 6: Sanitary Sewage Works Monitoring
- Table 7: Potable Water Monitoring Schedule
- Tables 8: Soil Cover Monitoring
- Table 9: Sediment Quality Monitoring
- Table 10: Benthic Macroinvertebrate Monitoring Schedule
- Table 11: Fish Monitoring Schedule
- Table 12: Water Quality and Limnological Monitoring Schedule
- Table 13: Soil and Terrestrial Vegetation Monitoring Schedule

5.4 Analytical and sampling QA/QC programs acceptable to the Ministry shall be reviewed annually by the Company.

6.0 REPORTING

6.1 Quarterly Reporting

- 6.1.1 The Company shall submit a quarterly report to the Ministry within 45 days after the end of the quarter. A fourth quarter report will not be required as the information will be included in the Annual Report in accordance with Section 6.2 of this approval. Information provided in the quarterly reports shall include:

- a) Results of sampling programs that have occurred within the quarter;
 - i) The Company shall review the data prior to submission with respect to accuracy and completeness, effluent quality limits and Saskatchewan Surface Water Quality Objectives explaining reasons for any unusual results or excursions, and shall report the results of any remedial actions taken.
 - ii) Monitoring data shall be presented numerically in tables and in a graphical format for specific parameters at stations requested by the Ministry. The graphical format will present individual sampling analysis for specific parameters and be presented as an-accumulation of at least the most recent 12 months of data,
- b) Results of inspections;
- c) Summary of any incidents that had or could have an impact on the environment;
- d) Any other information obtained during the quarter that has an environmental significance.



6.2 Annual Report

- 6.2.1 An Annual Environmental Report based on each calendar year, shall be submitted to the Ministry by March 31st of the following year. This report shall include but not be limited to:
- a) data from the environmental monitoring programs, summaries, and interpretation of the data with respect to water and air quality trends, contaminant loadings, and limits;
 - b) results of all monitoring programs required in this Approval and shall be available electronically to the Ministry in a format acceptable to the Ministry.
 - c) a report with respect to volumes of effluent discharged and concentration of contaminants at the final point of control;
 - d) comparisons of the results of water quality monitoring specific to the Saskatchewan Surface Water Quality Objectives for the Protection of Aquatic Life and Wildlife in Island Creek at the Dolomites;
 - e) documentation of any past or proposed operational changes, changes in the treatment systems or any significant events that could affect monitoring programs or the environment;
 - f) status of compliance with Schedule 1 and the results of inspections, as per requirements in Section 4.1;
 - g) results of the on going quality assurance/quality control program for the field and laboratory procedures performed by both Company field staff and their analytical laboratories and discussions of the annual review conducted pursuant to clause 5.4;
 - h) results of the annual review of the environmental monitoring and spill control systems required under clause 5.2;
 - i) results of the review of contingency plans in accordance with clause 7.2;
 - j) description and quantity of waste placed into the landfill and a summary of waste dangerous goods shipped from the Cluff Lake site;
 - k) spills or unauthorized discharges as per clause 7.3;
 - l) an updated list (if changes occurred during the reporting year) of industrial sources, fuel burning equipment and incinerators as defined by *The Clean Air Act* which are employed at the Cluff Lake Project. The list shall include the specific make, model, size, date of manufacture, age, associated air pollution abatement equipment, type and quantity of fuel consumed and use or intended use;
 - m) annual operating records of the sanitary sewage treatment works, including:
 - (i) the rate of sanitary sewage released from Germaine Camp facility;
 - (ii) the quantity of sanitary sewage release from the Germaine Camp facility;
 - (iii) analytical results of the monitoring required in Table 6;
 - (iv) an evaluation of the water quality information available for Germaine Lake, including a graphical comparison of historical versus present coliform counts.
 - n) status reports on the decommissioning and reclamation activities at the Cluff Lake Project. Any activities that may or will affect the financial assurance for the site shall be reviewed.
 - o) the assessment of mass loadings and material balances for all liquid effluent contaminants released to the environment;



- p) the results of the annual geotechnical inspection; this report shall cover recommendations for erosion repair on covers and stability of the dams and dykes based on visual inspections
- q) the results of the hydrogeological monitoring program shall include a summary of data and a detailed interpretation of this information.
- r) inspection results and repairs of exposed synthetic liners required pursuant to clause 4.2; and
- s) water balance including an estimate of the potential spring runoff from the decommissioned TMA based on measurements of the snow pack present on the TMA in March and the volumes of waters pumped from the STS and discharged to the environment.

6.3 Status of the Environment Report

- 6.3.1 The Company shall prepare and submit a Status of the Environment (SOE) Report following Ministry guidelines prior to May 30, 2015.

7.0 ENVIRONMENTAL CONTINGENCY PLANS

- 7.1 The Company shall maintain an Environmental Contingency Plan, which shall include but not be limited to the following:
- a) An Emergency Response Contingency Plan, for which guidelines are available, required pursuant to *The Hazardous Substances and Waste Dangerous Goods Regulations*, for all hazardous substances to be stored on site; and
 - b) A General Contingency Plan to include the following:
 - (i) response to spillage of contaminated water outside of contained areas; and
 - (ii) a general response plan for spills of unspecified hazardous materials.
- 7.2 The Contingency Plan in Condition 7.1 shall be reviewed annually by the Company and modified as necessary to reflect changes in operations and technology.
- 7.3 If, during the period of this Approval an unauthorized discharge of hazardous substance or waste material occurs, or if such a discharge is foreseeable, the Company shall:
- a) employ the appropriate emergency response plan and notify the Ministry;
 - b) in the event of a spill as defined in *The Environmental Spill Control Regulations*, immediately notify the Ministry at the 24 hour spill response number (1-800-667-7525);
 - c) terminate, contain, and clean up the spill commensurate with minimizing environmental damage and public safety hazards, both from the spill and from the clean up activities;
 - d) submit to the Ministry, a written report on the spill occurrence, in accordance with *The Environmental Spill Control Regulations*, not later than seven (7) days after the initial report;



- e) all accidental releases of contaminated materials from areas of primary containment into secondary containment must be reported to the Ministry as an "Incident" within 72 hours of the occurrence.

8.0 ALTERATIONS

- 8.1** The Company shall not, except as described in Condition 8.2, carry out alterations to existing pollutant control facilities without first obtaining an approval pursuant to Section 5 of The Mineral Industry Environmental Protection Regulations, 1996.
- 8.2** Condition 8.1 notwithstanding, the Company may in an emergency, carry out such alterations at their own discretion and without prior notification of the Ministry, in order to protect persons, property, or the environment, providing:
 - a) The Ministry is notified within 24 hours of the alteration(s) carried out, with full details submitted for approval within seven (7) days; and
 - b) The Ministry may require changes to the alterations following a review of the submitted information.
- 8.3** The Company shall provide “as constructed” plans and specifications of alterations referred to in Condition 8.1 and 8.2 within ninety (90) days of their completion.

SCHEDULE 1
AREVA RESOURCES CANADA INC. – CLUFF LAKE PROJECT
AUTHORIZED CONCENTRATION OF POLLUTANTS
IN LIQUID EFFLUENT

Pollutant	Maximum Monthly Arithmetic Mean Concentration^(1,2)	Maximum Grab Sample Concentration^(1,2)
Total Arsenic	0.5 mg/L	1.0 mg/L
Total Copper	0.3 mg/L	0.6 mg/L
Total Lead	0.2 mg/L	0.4 mg/L
Total Nickel	0.5 mg/L	1.0 mg/L
Total Selenium	0.6 mg/L	1.2 mg/L
Total Uranium	2.5 mg/L	5.0 mg/L
Total Vanadium	0.5 mg/L	1.0 mg/L
Total Zinc	0.5 mg/L	1.0 mg/L
Total Radium (Ra-226) ⁽³⁾	0.37 Bq/L	1.11 Bq/L
Total Thorium (Th-230)	1.85 Bq/L	3.7 Bq/L
Total Lead (Pb-210)	0.92 Bq/L	1.84 Bq/L
Total Suspended Solids	15.0 mg/L	30 mg/L
Un-ionized Ammonia ⁽⁴⁾	0.5 mg/L	1.0 mg/L

- Notes: pH: The pH of water discharged to the environment shall be between 6.0 and 9.5 in 75% of samples during any month, and the pH level of grab samples shall never be less than 5.0 or greater than 10.0.
1. All concentrations shown are as total concentrations unless otherwise specified.
 2. This represents a maximum annual arithmetic mean concentration for those parameters not sampled monthly.
 3. In the event that total radium-226 concentration in a grab sample exceeds 1.11 Bq/L, a sample of dissolved radium-226 shall be collected through a 3 µm filter.
 4. Un-ionized ammonia is that portion of the total ammonia nitrogen which is in the form NH₃. The un-ionized concentration in the effluent is dependant upon the pH and temperature of the receiving waters.

Table 1: Routine Inspections Schedule

General Inspection Area	Location Description	Inspection Frequency
WATER MANAGEMENT ⁽¹⁾	D Pit	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
	DJX Pit	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
	Low Lying areas near DP FAR	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
	North Diversion Ditch	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
South Diversion Ditch	Annually ⁽¹⁾	
	Quarterly ⁽²⁾⁽³⁾	
EFFLUENT DISCHARGE ⁽²⁾	Discharge to Snake Creek	Daily when STS is operating
	A1 and A2 Pond	Daily when STS is operating
	Temporary Settling Area	Daily when STS is operating
	TMA/ North Diversion Outlet	Daily when STS is operating
	STS and Pumping System	Daily when STS is operating
EROSION EVALUATION AND CONTROL	Main Dam	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
	Tailings Management Area (including viewpoint photos)	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
	Claude Waste Rock Pile (including viewpoint photos)	Annually ⁽¹⁾
		Quarterly ⁽²⁾⁽³⁾
Claude Pit Cover	Annually ⁽¹⁾	
	Quarterly ⁽²⁾⁽³⁾	
FUEL STORAGE ⁽²⁾	Genset Fuel Tank	Daily ⁽⁴⁾
	Germaine Fuel Tanks	Daily ⁽⁴⁾
	Airport Fuel Tank	Daily ⁽⁴⁾
	Main Fuel Farm	Daily ⁽⁴⁾
OTHER AREAS ⁽²⁾	Airport Generator	Daily ⁽⁴⁾
	Germaine Sewage Treatment Plant	Daily ⁽⁵⁾
	Germaine Water Treatment Plant	Daily ⁽⁵⁾
	Culverts controlling Cluff Creek discharge on road to Fuel Farm	Daily ⁽³⁾
	Domestic Landfill	Weekly
	Barrel Lay down Area	Monthly
	Radon track etch cups	Quarterly ⁽⁶⁾

Notes:

- (1) Annual geotechnical inspection conducted by a qualified engineer
- (2) Inspections will be done by AREVA staff
- (3) During the ice-free season
- (4) Until such a time as the tank/generator is no longer necessary
- (5) Inspections will continue until sewage and potable water systems are decommissioned
- (6) Refer to Table 3 - inspect track etch cups to ensure they are in place and have not been damaged by animals

Table 2: Meteorological Monitoring Schedule

Parameters	Monitoring Frequency
Hourly wind speed (km/hr)	Semi-annually ⁽¹⁾
Hourly wind direction (degrees quadrant)	Semi-annually ⁽¹⁾
Daily maximum temperature (°C)	Daily ⁽²⁾
	Semi-annually ⁽¹⁾
Daily minimum temperature (°C)	Daily ⁽²⁾
	Semi-annually ⁽¹⁾
Precipitation (mm)	Daily ⁽²⁾
Evaporation (mm)	Daily ⁽²⁾⁽³⁾
Monthly precipitation pH measurements	Monthly ⁽⁴⁾

Notes:

- (1) Measured at automated weather station and data downloaded Semi-annually by campaign monitoring staff
- (2) Measured manually when staff are on-site – daily measurements will be attempted but may not always be possible based on staffing
- (3) During the ice-free season
- (4) Measured manually by site staff

Table 3: Radon Monitoring Schedule

Sample ID	Sample Location	Easting	Northing	Frequency
TRK0001E	Sandy Lake Road, 2000m West of STS (reference)	578525	6469864	Annually (in duplicate)
TRK0007E	500m West of Mill	581899	6469169	
TRK0011E	South of TMA, edge of trees behind TZ140	580941	6468329	
TRK0017E	1.5 km NW of DJX and 1 km West of Claude Waste Rock Pile	584455	6470919	

Note: track etch cups will be visually inspected on a quarterly basis to ensure they are still in place and have not been damaged by animals
Coordinate system = NAD1927, UTM Zone 12N



Table 4: Effluent and TMA Monitoring Schedule

Station Number	Sampling Location	Parameters	Frequency
TMA6100S	Secondary Treatment System (STS) Discharge to Snake Creek	HCO ₃ /CO ₃ , Ca, Cl, Mg, K, Na, SO ₄ , TSS, TDS, Ra-226, U, As, Cu, Co, Fe, Se, Mn, Ni, Zn, Pb, pH, Mo, conductivity, total hardness, sum of ions, turbidity, field pH and field temperature	Weekly ⁽²⁾
		HCO ₃ /CO ₃ , Ca, Cl, Mg, K, Na, SO ₄ , Total N, Total P, NH ₃ N, TSS, TDS, Pb-210, Ra-226, Po-210, Th-230, U, As, Ag, B, Hg, Se, Bi, Cd, Co, Cr, Cu, Fe, Mn, Ni, Al, Pb, Zn, Ba, Mo, V, pH, Conductivity, Turbidity, Total Hardness, Sum of Ions, field pH and temperature	Quarterly ⁽²⁾⁽³⁾
		As, Ba, Al, Cu, Pb, Mo, Ni, U, Zn, Ra-226, Th-230, Pb-210, Po-210, TSS, NH ₃ -N (24 hr composite)	Monthly ⁽¹⁾⁽²⁾
		Volume of water treated and released; kg chemicals used (BaCl ₂ , FeSO ₄)	Monthly ⁽²⁾
		96-hour static trout bioassay	Quarterly ⁽²⁾
TMA4000S	STS Feed water ⁽¹⁾	HCO ₃ /CO ₃ , Ca, Cl, Mg, K, Na, SO ₄ , TSS, TDS, Ra-226, U, As, Cu, Co, Fe, Se, Mn, Ni, Zn, Pb, pH, Mo, Conductivity, Total Hardness, Sum of Ions, Turbidity	Monthly ⁽²⁾

Notes:

(1) Monthly composite of weekly samples

(2) When in operation

(3) As future operation of the STS is anticipated to be minimal, a sample will be taken at the time of initial discharge of any future effluent treatment period; quarterly thereafter.

Table 5: Contaminant Flowpaths, Sources, Groundwater Flowpaths and Surface Water Receptors

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
Mining Area							
1	Claude waste rock pile through Claude pit and into Claude lake	Source - Claude Waste Rock Pile	HYD01-05AG	GW	Tri-annual	Continuous	
		Upgradient of Claude Pit	HYD01-02G	GW		Tri-annual	
		Claude Pit Backfill	CDP1001G	GW		Continuous	
		Downgradient of Claude Pit	HYD0132G	GW		Tri-annual	
		Downgradient of Claude Pit	HYD0133G	GW		Tri-annual	
		Downgradient of Claude Pit	HYD06-134G	GW		Continuous	
		Downgradient of Claude Pit	HYD06-131G	GW		Tri-annual	
		Southwest side of Claude Pit	HYD01-11G	GW	Biennial	Biennial	
		Receptor - Claude Lake	CDE1000S	SW	Quarterly		Quarterly
2	Claude Waste Rock Pile through Peat Trenches and into Claude Creek	Source - Claude Waste Rock Pile	HYD01-05AG	GW	Tri-annual	Continuous	
		Southwest toe of Claude Pile	HYD01-10AG	GW		Continuous	
		Upgradient of peat trench 1 and 2	HYD07-10G	GW	Semi-annual	Semi-annual	
		Upgradient of peat trench 1 and 2	HYD06-03G	GW		Continuous	
		Upgradient of peat trench 1 and 2	HYD07-12G	GW		Semi-annual	
		Downgradient of peat trench 1	HYD06-04G	GW		Semi-annual	
		Downgradient of peat trench 1	HYD06-05G	GW		Continuous	
		Downgradient of peat trench 1	HYD06-06G	GW		Semi-annual	
		Claude Creek above Confluence with Peter River	CDE2100S	SW		Quarterly	
		Upgradient of peat trench 2 - Bedrock	HYD07-11G	GW	Biennial	Biennial	

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
		At north end of peat trench 2	HYD07-13G	GW		Biennial	
		Within peat trench 2	HYD07-14G	GW		Biennial	
		Within peat trench 2	HYD07-15G	GW		Biennial	
		Within peat trench 2	HYD07-16G	GW		Biennial	
		Within peat trench 2	HYD07-17G	GW		Biennial	
		Between peat trench 1 and 2	HYD07-18G	GW		Biennial	
		Between peat trench 1 and 2	HYD07-19G	GW		Biennial	
		Between peat trench 1 and 2	HYD07-20G	GW		Biennial	
		Between peat trench 1 and 2	HYD07-21G	GW		Biennial	
		South of peat trench 1	HYD0401G	GW		Biennial	
		West side of Claude Creek	HYD07-22G	GW		Biennial	
		West side of Claude Creek - Bedrock	HYD07-23G	GW		Biennial	
		West side of Claude Creek	HYD07-24G	GW		Biennial	
3	Claude Waste Rock Pile East toward Peter River	Source - Claude Waste Rock Pile	HYD01-05AG	GW	Tri-annual	Continuous	
		East toe of Claude Pile	HYD01-08AG	GW		Continuous	
		200 m east of Claude Pile	HYD0297AG	GW	Semi-annual	Continuous	
		East toe of Claude Pile	HYD0312G	GW		Continuous	
		200 m east of Claude Pile	HYD10-04G	GW		Continuous	
		750 m east of Claude Pile	HYD0301G	GW		Continuous	
		Receptor - Peter River	PTR1500S	SW			Semi-annual

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
4	Claude Waste Rock Pile South toward Peter River	Source - Claude Waste Rock Pile	HYD01-05AG	GW	Tri-annual	Continuous	
		South toe of Claude Pile	HYD0306G	GW		Continuous	
		315 m south of Claude Pile	HYD0405G	GW		Tri-annual	
		420 m south of Claude Pile	HYD0404G	GW		Continuous	
		125 m south of Claude Pile	HYD9713G	GW	Semi-annual	Continuous	
		100 m south of Claude Pile	HYD0321G	GW		Semi-annual	
		400 m south of Claude Pile	HYD0403G	GW		Continuous	
		Receptor - Peter River	PTR1600S	SW			Semi-annual
5	Former DJN Waste Rock Pile toward Claude Creek	Source - DJN Waste Rock Pile	HYD10-05G	GW	Tri-annual	Continuous	
		100 m west of former DJN pile	HYD01-15AG	GW		Tri-annual	
		100 m west of former DJN pile - Bedrock	HYD01-15BG	GW		Tri-annual	
		North end of DJN pit	HYD07-9845G	GW		Tri-annual	
		Claude Creek above Confluence with Peter River	CDE2100S	SW	Quarterly		Quarterly
6	Former DJN Waste Rock Pile toward Peter River	Source - DJN Waste Rock Pile	HYD10-05G	GW	Tri-annual	Continuous	
		50 m east of DJN pile	HYD0316G	GW	Semi-annual	Continuous	
		120m east of DJN pile	HYD01-17G	GW		Continuous	
		100m southeast of DJN pile	HYD9919AG	GW		Continuous	
		Receptor - Peter River	PTR1900S	SW			
		Peter River north of Mill Road	CFFHYD-3	SF			Semi-annual

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
7	Flooded DJX Pit to Cluff Lake	Source - DJX Pit (at surface)	MNW6100S	SW	Quarterly	Quarterly	
		South end of DJX pit	HYD06-01G	GW	Semi-annual	Continuous	
		80 m south of DJX pit	HYD01-18G	GW		Continuous	
		100m south of DJX pit	HYD9848AG	GW		Continuous	
		Receptor - Cluff Lake	CFF1000S	SW			Semi-annual
		Cluff Creek downstream of Cluff Lake	CFFHYD-2	SF		Semi-annual	
		50 m east of the flooded DJX pit	HYD0407G	GW	Biennial	Biennial	
8	D Pit to Boulder Creek	Source - D Pit at surface	BLD2000S	SW	Annual	Annual	
		Adjacent to D Pit	DWW0041G	GW	Every Five Years	Every Five Years	
9	DP Mine Fresh Air Raise	DP Mine Fresh Air Raise	MNW2100G	GW	Semi-annual	Semi-annual	
		adjacent to DP FAR	HYD06-07G	GW	Every Five Years	Every Five Years	
		adjacent to DP FAR	HYD06-08G	GW			
		adjacent to DP FAR	HYD06-09G	GW			
		200 m south of DP FAR	HYD0107G	GW			
Remaining wells on the current program; data redundant to Semi-annual wells		20 m northwest of Claude waste rock pile	HYD07-03G	GW	Annual	Annual	
		40 m north of Claude waste rock pile	HYD9718G	GW			
		300 m southwest of Claude waste rock pile	HYD0402G	GW			
		300 m south of Claude waste rock pile	HYD01-14G	GW			
		Bedrock well south of former DJN pile	HYD9919BG	GW			
		50 m south of former DJN pile	HYD0408G	GW			

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
		50 m west of DJX flooded pit	HYD9846AG	GW			
		100 m south of DJX flooded pit	HYD06-02G	GW			
		120 m south of DJX flooded pit	HYD07-9849G	GW			
	Flooded Mines and Pits	DP Mine Fresh Air Raise	MNW2100G	GW	Semi-annual	Semi-annual	
		DJ Exhaust Raise	MNW6220G	GW		Semi-annual	
		Claude Pit Backfill	CDP1001G	GW	Tri-annual	Continuous	
		DJX Pit Water - Surface	MNW6100S	SW	Quarterly	Quarterly	
		DJX Pit Water - 1/6 depth	MNW6100S	SW			
		DJX Pit Water - 2/6 depth	MNW6100S	SW			
		DJX Pit Water - 3/6 depth	MNW6100S	SW			
		DJX Pit Water - 4/6 depth	MNW6100S	SW			
		DJX Pit Water - 5/6 depth	MNW6100S	SW			
		DJX Pit Water - Bottom	MNW6100S	SW			
		DP Mine underground cement hole near bottom	MNW2050G	GW	Annual	Annual	
		DJ Mine underground cement hole near bottom	MNW6210G	GW			
		D Pit Water - Surface	BLD2000S	SW			
		D Pit Water - 10 m depth	BLD2000S	SW			
		D Pit Water - 20 m depth	BLD2000S	SW			

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
Surface Water Monitoring in the Mining Area		Claude Lake at outlet	CDE1000S	SW	Quarterly		Quarterly
		Claude Creek above entry to Peter River	CDE2100S	SW			Quarterly
		Peter River upstream	PTR1000S	SW	Semi-annual		
		Peter River north	PTR1500S	SW			Semi Annual
		Peter River south	PTR1600S	SW			Semi Annual
		Peter River above confluence with Claude Creek	PTR1900S	SW			
		Peter River below confluence with Claude Creek	PTR3000S	SW			Semi Annual
		Peter River at inlet to Cluff Lake	PTR4000S	SW			Semi Annual
		Earl Creek upstream	ERL1000S	SW	Biennial		
		Earl Creek at Mill Road crossing	ERL3000S	SW			
		Boulder Creek at inlet to Cluff Lake	BLD4000S	SW			
				Cluff Lake at outlet	CFF1000S	SW	Semi-annual
Tailings Management Area							
Tailings Management Area		Reference - 250 m north of TMA	TZZ0257G	GW	Semi-annual	Semi-annual	
		Reference - Upgradient of TMA - East side	HYD06-148G	GW		Semi-annual	
		Source - Cover well	FN1200G	GW		Continuous	
		Source - Cover well	CS1100G	GW		Continuous	
		Source - east side of Liquids Pond Area	HYD10-06G	GW		Continuous	
		Source - west side of Liquids Pond	HYD10-07G	GW		Continuous	

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
		Area					
		Source - Cover well	FS1300G	GW	Tri-annual	Continuous	
		Source - Cover well	CN1000G	GW		Continuous	
		Source - Bedrock well near CN1000G	HYD01-21BG	GW		Tri-annual	
		Source - on inner part of TMA Main Dam	HYD06-197G	GW		Tri-annual	
		Downgradient of STS	TZZ0293G	GW	Biennial	Biennial	
10	Upper Solids Pond Seepage	Overburden well down gradient of main dam	TZZ0142G	GW	Annual	Semi-annual	
		Bedrock well down gradient of main dam	TZZ0140G	GW		Semi-annual	
		OB well below mid point of Upper Solids Area	HYD06-9838AG	GW	Semi-annual	Semi-annual	
		OB well near Snake Lake below Upper Solids Area	HYD98-19AG	GW	Tri-annual	Tri-annual	
		Bedrock well near Snake Lake below Upper Solids Area	HYD98-19CG	GW			
		Bedrock well downgradient of southwest corner of main dam	HYD98-38CG	GW	Every 5 years	Every 5 years	
		TMA seep	TMA8000S	SW	Semi-annual		
11	Lower Solids Pond Seepage	Below Lower Solids downgradient of HYD06-197G	HYD0192G	GW	Semi-annual	Semi-annual	
		Below Lower Solids	TZZ0287G	GW		Semi-annual	
		Below Lower Solids	HYD9853AG	GW		Semi-annual	
		TMA seep	TMA7800S	SW			

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
12	Liquids Pond Seepage	Liquids Pond below Main Dam	TZZ0280G	GW	Semi-annual	Semi-annual	
		New well just upgradient of Snake Lake	HYD10-08G	GW		Semi-annual	
		Near TMA outlet	HYD98-23EG	GW		Semi-annual	
		TMA seep - SWAMP DITCH AREA	TMA7601S	SW			
		Downgradient of northwest corner of main dam	HYD98-23CG	GW	Every 5 Years	Every 5 Years	
Surface water monitoring around the TMA	Receptor - Outlet of Snake Lake	ISL2000S	SW	Semi-annual			
	Snake Creek below Snake Lake	ISLHYD-3	SF			Semi-annual	
	Bridle Creek above Agnes Lake	ISL5300S	SW	Annually			
	Bridle Creek at Sandy Lake road crossing	ISLHYD-2	SF			Annually	
TMA Runoff Monitoring	Spillway overflow near former cobble dam	TMA4600S	SW	Annual - early in the spring runoff event			
Landfill monitoring	Cluff Center	HYD01-101G	GW	Biennial	Biennial		
	Cluff Center	HYD01-102G	GW				
	South of former mill area	HYD01-105G	GW				
	Mill Road Landfill	HYD01-106G	GW				
	TMA Industrial Landfill	HYD06-114G	GW				
	TMA Industrial Landfill	HYD06-115G	GW				
	TMA Industrial Landfill	HYD01-116G	GW				

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
		Former Drum Storage Area	HYD06-9723G	GW			
		Former Drum Storage Area	HYD06-120G	GW			
		Domestic Landfill	HYD9710G	GW			
		Domestic Landfill	HYD9711G	GW			
	Island Lake Fen	Near Island Lake outlet	HYD01-19AG	GW	Semi-annual	Continuous	
		Near Island Lake outlet	HYD01-19BG	GW			
		Near Agnes Lake inlet	HYD06-20AG	GW			
		Near Agnes Lake inlet	HYD01-20BG	GW			
		Island Creek at Dolomites	ISL5100S	SW	Quarterly		
		Island Creek at Dolomites	ISLHYD-1	SF			Semi-annual
		Near Agnes Lake outlet	HYD10-01AG	GW	Semi-annual	Continuous	
		Near Agnes Lake outlet	HYD10-01BG	GW			
		Near Agnes Lake outlet	HYD10-01CG	GW			
		Centre of Island Lake fen, south of flow path	HYD10-02AG	GW			
		Centre of Island Lake fen, south of flow path	HYD10-02BG	GW			
		Centre of Island Lake fen, south of flow path	HYD10-02-CG	GW			
		Centre of Island Lake fen, north of flow path	HYD10-03AG	GW			
		Centre of Island Lake fen, north of flow path	HYD10-03BG	GW			
		Centre of Island Lake fen, north of flow path	HYD10-03CG	GW			

Flow-path	Contaminant Flowpath	Location Description	Monitoring Location	Sample type and parameters ⁽¹⁾	Analytical Frequency	Water Elevation Monitoring Frequency	Stream-flow Monitoring Frequency
Surface Water Monitoring Downstream of the TMA		North Diversion Ditch at outlet to spillway	ISL1150S	SW	Semi-annual		
		South Diversion Ditch at outlet to Snake Lake	ISL1250S	SW			
		Outlet of Snake Lake	ISL2000S	SW			
		Outlet of Island Lake	ISL4000S	SW	Quarterly		
		Island Creek at Dolomites	ISL5100S	SW			
		Island Lake	ISL4100S	SG		Semi-annual	
Overall Site Performance							
Surface Water Monitoring for Evaluation of Overall Site Performance		Douglas River at bridge - Upstream reference	ISL6400S	SW	Semi-annual		
		Douglas River at Sandy Lake Outlet	ISL6000S	SW			

Notes:

(1) GW (groundwater) parameters: Ca, Cl, F, Mg, Na, K, SO₄, pH, total hardness, specific conductivity, sum of ions, NO₃, alkalinity, bicarbonate, carbonate, hydroxide, TDS, Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, An, U, Ra-226

SW (surface water) parameters: Ca, Cl, F, Mg, Na, K, SO₄, pH, total hardness, specific conductivity, sum of ions, NO₃, alkalinity, bicarbonate, carbonate, hydroxide, TDS, dissolved organic carbon, Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, An, U, Pb-210, Po-210, Ra-226, Th-230

LW (landfill well) parameters: Hydrocarbons, BTEX, TPH, phenols

SF (streamflow) parameter: water flow

SG (staff gauge) parameter: water elevation

Table 6: Sanitary Sewage Works Monitoring Schedule

Station Number ⁽¹⁾	Sampling Location ⁽²⁾	Parameters	Frequency
DOM1100S	Influent From Germaine Camp to the Sewage Treatment Plant	TKN, NH ₃ , NO ₃ , P-total, P-ortho, TOC, BOD, TSS, VSS, Cl, Conductivity, pH, Temperature, Alkalinity, Total Coliform Bacteria ⁽¹⁾ , Fecal Coliform Bacteria ⁽¹⁾	Quarterly
DOM1200S	Effluent From Germaine Camp Sewage Treatment Plant Discharge To The Lagoon		
DOM1300S	Effluent From Lagoon Seepage To Germaine Lake		
GRM1000S	Germaine Lake Northwest Bay – Mid (Depth Composite) ⁽¹⁾		
GRM2000S	Germaine Lake South Bay-Mid (Depth Composite) ⁽¹⁾		

Notes:

(1) Coliform bacteria samples (Locations GRM1000S and GRM2000S) are to be collected from surface only

(2) Sampling will continue, until these facilities are decommissioned

Table 7: Potable Water Monitoring Schedule

Station Number	Sampling Location ⁽¹⁾	Sample Type	Parameters	Frequency
DOM1000S	Water Treatment Plant ⁽²⁾	Potable Water	Ag, Al, alkalinity, As, Ba, B, Ca, Cd, Cl, CO ₃ , Co, conductivity, Cr, Cu, F, Fe, hardness, Hg, HCO ₃ , Mg, Na, Ni, NO ₃ , Pb, Pb-210, pH, Po-210, Sb, Se, SO ₄ , TDS, Th-230, U, V, Zn,	Annual
			Ra-226, U	Quarterly
			Chlorine Residual, Turbidity	Daily
DOM1010S	Potable Water in the distribution system ⁽³⁾	Potable Water	Chlorine Residual	Daily
			Chlorine Total	
		Bacteriological	E. coli, Total Coliform, Nitrate	Bi-Weekly

Notes:

(1) Sampling will continue, until these facilities are decommissioned

(2) Samples are collected after chlorination, but prior to entry into the distribution system

(3) Samples are collected from the Iron Crest laboratory sink, which is a suitable representative of potable water in the distribution system



Table 8: Soil Cover Monitoring

Station Number	Sampling Location ⁽¹⁾	Parameters	Monitoring Frequency	Download Frequency
CWR1000A	Claude Waste Rock Pile Cover	<i>In Situ</i> Moisture Content	Continuous	Quarterly
		<i>In Situ</i> Suction/Temperature		
CWR1000B		<i>In Situ</i> Moisture Content		
CWR1000C		<i>In Situ</i> Moisture Content		
CWR1000DV ⁽²⁾		Moisture Content	M ⁽³⁾	not applicable
CWR1000		Volume of Surface Runoff	Continuous ⁽³⁾	Quarterly
CN1000L	Tailings Management Area Cover	<i>In Situ</i> Moisture Content	Continuous	Quarterly
		<i>In Situ</i> Suction/Temperature		
CS1100L		Water Table Elevation		

Notes:

- (1) Locations - See attached maps, Figures 1, 2 and 3
- (2) Sixteen Diviner 2000 locations installed throughout Claude Waste Rock Pile
- (3) During non-frozen conditions



Table 9: Sediment Monitoring Schedule

Station Number	Sampling Location ⁽¹⁾	Parameters	Frequency ⁽⁴⁾
ISL5500X	Heather Lake	Sediment particle size, organic carbon and chemistry ^(2,3)	2014
GLAD02X	Glady Lake		
DUC01X	Duck Lake		
ISL2000X	Snake Lake		
ISL4000X	Island Lake		
SKT1000X	Saskatoon Lake		
CEM1000X	Lac Philip		
CFF1010X	Cluff Lake at North End		
ISL2000X	Snake Lake	Depth profile sediment chemistry ⁽⁵⁾	2014
ISL4000X	Island Lake		
CFF1010X	Cluff Lake at North End		

Notes:

(1) Heather and Glady Lakes are shallow reference lakes to be compared to Island, Snake and Duck Lake; Saskatoon Lake and Lac Philip are deeper reference lakes to be compared to Cluff Lake results

(2) Five stations per sample location, 0-2 cm and 2-5 cm core splits separated in the field; 0 – 2 cm split analyzed for Ra-226, Pb-210, Th-230, Po-210, U, As, Pb, Zn, Cu, Ni, Fe, Se, Co, Mo, Al, % moisture, loss on ignition; 2 – 5 cm split frozen and archived

(3) Particle size and total organic carbon to be conducted on the 0 – 5 cm horizon

(4) Sediments and benthic invertebrate sampling to be conducted concurrently

(5) Similar to 2004 sediment sampling (COGEMA 2005), sediment cores will be collected from a depositional area of each lake and 3 replicates collected from each sampling location:

- The upper 10 cm of each replicate will be sectioned at 2 cm intervals; each interval will be analyzed for U, As, Pb, Zn, Cu, Ni, Fe, Se, Co, Mo, Al, % moisture and loss on ignition
- Corresponding depth intervals from the 3 replicates will be composited for each sampling location for Ra-226, Pb-210, Th-230 and Po-210 analysis



Table 10: Benthic Macroinvertebrate Monitoring Schedule

Station Number ⁽¹⁾	Sampling Location ⁽²⁾	Parameters ^(3,4)	Frequency ⁽⁵⁾
ISL5500B	Heather Lake	Community Structure, Abundance, Biomass and Habitat	2014
GLAD02B	Glady Lake		
DUC01B	Duck Lake		
ISL2000B	Snake Lake		
ISL4000B	Island Lake		
SKT1000B	Saskatoon Lake		
CEM1000B	Lac Philip		
CFF1010B	Cluff Lake at North End		

Notes:

(1) Five replicate stations per sampling location; a composite of 10 Ekman dredges per station

(2) Heather and Glady Lakes are shallow reference lakes to be compare with Island, Snake and Duck Lake; Saskatoon Lake and Lac Philip are deeper reference lakes to compare with Cluff Lake

(3) Taxonomy for benthic invertebrates will be separately conducted on each replicate and will include:

- taxonomic composition (identified and enumerated to the lowest practical taxonomic level), relative abundance, biotic indices (biomass, Simpson's diversity, evenness, Bray-Curtis Index);
- statistical analysis of the data (ANOVA)

(4) Habitat description recorded at each sampling location (water depth, current characteristics, occurrence, abundance, and type of macrophytes and substrate classification)

(5) Sediment and benthic invertebrate sampling to be conducted concurrently

Table 11: Fish Monitoring Schedule

Station Number	Sampling Location	Parameters	Frequency
CFF1000F	Cluff Lake	Fish Tissue Analysis ^(1,4)	2014
ISL6000F	Sandy Lake		
ISL4000F	Island Lake	Macrophyte Survey ⁽³⁾ and Fish Community Assessment ⁽⁴⁾ , Fish Tissue Analysis ^(1,4) , Fish Population Survey ⁽²⁾	
ISL2000F	Snake Lake	Macrophyte Survey ⁽³⁾ and Fish Community Assessment ⁽⁴⁾ , Fish Tissue Analysis ^(1,4)	
SKT1000F	Saskatoon Lake	Fish Tissue Analysis ^(1,4) ,	
		Fish Population Survey ⁽²⁾	

Notes:

(1) Where feasible, 5 fish of each a piscivorous and a benthivorous species will be collected for fish tissue analysis:

- Parameters: length, wet weight, sex, age, Ra-226, Po-210, Pb-210, Th-230, U, As, Ni, Pb, Zn, Cu, Co, Mo, Al, Cd, Se

- Analytical parameters reported in both bone and flesh from each individual fish

(2) Fish Population Survey will use the same sentinel species as in the 2004 and 2009 fish population assessments (e.g. white sucker)

(3) Macrophyte survey along previously defined transects will be used to monitor fish habitat

(4) During the course of fish tissue sample collection, fish by-catch will be documented to support characterization of the fish community

Table 12: Water Quality and Limnological Monitoring Schedule

Station #	Sampling Location	Parameters ⁽¹⁾	Frequency
ISL5500S	Heather Lake	HCO ₃ /CO ₃ , Ca, Cl, Mg, K, Na, SO ₄ , Total N, Total P, NH ₃ N, TSS, TDS, Pb-210, Ra-226, Po-210, Th-230, U, As, Ag, B, Hg, Se, Bi, Cd, Co, Cr, Cu, Fe, Mn, Ni, Al, Pb, Zn, Ba, Mo, V, pH, Conductivity, Turbidity, Total Hardness, Sum of Ions, Limnological ⁽²⁾ and Physical Parameters ⁽³⁾	2014
GLAD02S	Glady Lake		
DUC01S	Duck Lake		
ISL2000S	Snake Lake		
ISL4000S	Island Lake		
CFF1010S	Cluff Lake at North End		
	Lac Philip		
SKT1000B	Saskatoon Lake		

Notes:

(1) Grab samples collected from each sampling location.

(2) Limnological parameters include dissolved oxygen, temperature, and specific conductance.

(3) Physical parameters include ice thickness and snow depth.

Table 13: Soil and Terrestrial Vegetation Monitoring Schedule

Station #	Sampling Location	Sample Type	Parameters ⁽⁴⁾	Frequency
Sandy Lake	North of Sandy Lake ⁽¹⁾	Soil, lichen, blueberry	See Note 4	2014
Station 4000	Cluff Centre near high volume air sampler ⁽²⁾			
Germaine Lake	Near Germaine Camp ⁽³⁾	Blueberry	See Note 4	

Notes:

(1) UTM Coordinates – NAD83 Zone 12 E572307 N6465532

(2) UTM Coordinates – NAD83 Zone 12 E586039 N6469577

(3) UTM Coordinates – NAD83 Zone 12 E582882 N6466201

(4) Collect and analyze two separate blueberry samples: 1. berries, 2. stems with leaves

- Soil Parameters: Wet weight (measured at the analytical laboratory prior to chemical analysis), dry weight, % moisture, loss on ignition, pH, Se, As, Pb, Cu, Mo, Ni, Zn, U, Ra-226, Pb-210, Po-210, Th-230.
- Lichen Parameters: Raw Weight (measured in the field immediately after sample collection), wet weight (measured at the analytical laboratory prior to chemical analysis), dry weight, ash weight, Se, As, Pb, Cu, Mo, Ni, Zn, U, Ra-226, Pb-210, Po-210, Th-230.
- Blueberry Parameters: Wet weight (measured at the analytical laboratory prior to chemical analysis), dry weight, % moisture, ash weight, As, B, Cd, Co, Pb, Cu, Mn, Mo, Ni, Se, Sr, Zn, U, Ra-226, Pb-210, Po-210, Th-230.

Table 14: Approved Hazardous Substances and Waste Dangerous Goods Storage Facilities

Tank, Warehouse or Outdoor Site (Reference #)	Serial No.	Capacity (Litres)	Location
T-1C	Unknown	25,000	STS – Ferric Sulphate
T-2C	Unknown	20,000	STS – Barium Chloride
T-4R	77C	50,000	Generator Diesel Fuel Tank
t-8	45906.79-3	73,000	Mill Gasoline Fuelling Station
T-9	45906.79-2	73,000	Mill Diesel Fuelling Station
T-10	45906.79-1	73,000	Mill Diesel Fuelling Station
T-40R	Unknown	2500	Germaine Camp Diesel Tank
T-2R	Unknown	4500	Germaine Camp Diesel Tank
T-Airport	Unknown	35,000	Airport – Jet Fuel / Kerosene
O-5	N/A	80 m ²	Mill – Outdoor drum Storage