

10 Environmental Monitoring Programs

10. Environmental Monitoring Programs

The following subsections present pre-construction, construction and post-construction monitoring programs.

10.1 Pre-construction Planning and Monitoring

Preconstruction monitoring provides data on the environmental baseline conditions which exist in the project area prior to the commencement of any construction activity. The information from preconstruction monitoring will be used as a reference for comparison with data collected during post-construction to assess effects of the project. Additional activities in this phase involve ensuring that the requisite approvals and permits are procured by the appropriate parties and proper procedures such as emergency response plans are documented and in place.

Table 10.1 lists the activities which are included in the pre-construction monitoring phase.

10.2 Construction Monitoring

The purpose of the construction monitoring program outlined in Table 10.2 is to

- ensure that construction activities are being undertaken as per the contract plans and specifications and that mitigation measures are being applied as per the EA commitments and as defined in applicable permits and approvals
- verify that construction activities and/or mitigation measures are not creating unintended, adverse environmental effects (e.g., if proposed sediment control measures are not providing the desired level of environmental protection, work would be stopped or alternate procedures applied
- identify the need for corrective or alternate mitigation measures
- provide a record of construction monitoring results. Typically, the site inspector would provide weekly reports detailing progress, issues and actions taken to resolve those issues.

At the end of the construction period, site restoration and clean-up activities will be part of the Contractor's responsibilities at site. It is anticipated that final inspection of construction works and restoration activities will result in the preparation of a list of deficiencies, to be addressed by the Contractor, prior to final payment. Monitoring and documentation of that process is typically undertaken by the site inspector in conjunction with the project engineer or Owner. SREL will be responsible for the review and acceptance of the constructed works, including site restoration measures, prior to project turnover.

Table 10.1 Pre-Construction Monitoring Program

Item	Description	Responsibility	
		Owner	Contractor
Environmental Baseline Monitoring	- Ensure all baseline field investigations are complete (completed as per Sections 2 and 4 of screening document)	X	
Environmental Permits and Approvals	- Ensure all necessary permits and approvals are in place prior to commencement of relevant construction activities - See list of required permits and approvals in Section 11	X	X
Tender Specifications	- Incorporate all environmental protection and mitigation obligations as per the EA document	X	
Contractor Obligations	- Ensure contractor is aware of all environment and safety commitments prior to construction	X	
Finalize Land Ownership and Tenant Agreements	- Ensure agreements in place with all owners and/or tenants prior to construction as necessary	X	
Ministry of Labour Notice of Project	- Submit "Notice of Project" to the Ministry of Labour		X
Historic/ Archaeological Sites	- Ensure Stage 1 and 2 heritage assessments have been completed	X	
Blasting	- Obtain NRCan Temporary Magazine Licence prior to blasting - Obtain approval from DFO for blasting (if required) - Conduct pre-blasting survey of Purk's Place and historic church buildings	X	X
Photographic record	- Prepare photographic record of existing environment prior to construction	X	
Sediment and Erosion Control Plan Drawing	- To be prepared and implemented prior to the commencement of site works that may cause sediment and erosion		X
Spill Response and Clean-up Plan	- To be prepared prior to the commencement of site works and equipment/materials readily available on site; workers to be trained in spill response and clean-up.		X
Emergency Response Plan and Training	- Plan to be prepared prior to the commencement of site works covering responses to accidents, injuries, spills and extreme weather events (floods, cold, ice, etc) and readily available on site. ERP training to be conducted for all construction workers.		X
Site Preparation	- Flag work area boundaries prior to commencement of site works		X
Acid Rock Drainage	- Conduct acid base accounting on rock samples prior to commencement of site works to determine management of excavated materials.		X
Municipal Services	- Conduct locates for water and sewer lines prior to construction		X

Table 10.2 Construction Monitoring Program

Issue	Description of Monitoring Activity
General Environmental Protection Monitoring	
EA commitments	- Ensure EA mitigation commitments are met by the Contractor as applicable.
Photographic record	- Prepare photographic record of construction activities.
Spills and Emergencies	<ul style="list-style-type: none"> - Monitor and verify compliance with Spill Response and Cleanup and Emergency Response Plans (i.e., Contractor has adequate cleanup materials on site, staff are trained in use and application of materials and procedures, etc). - Verify reporting and clean up of spills (per Emergency and Spill Response Plans).
Sewage and solid waste disposal	- Verify that appropriate sewage and waste disposal practices are applied throughout the construction period.
Fuel oil storage/solvents	<ul style="list-style-type: none"> - Verify on-site storage is per mitigation recommendations (i.e., bermed storage areas away from watercourses and drainage paths, etc). Monitor on-site storage areas throughout the construction period. - Monitor equipment throughout the construction period to ensure that it is well maintained (i.e., not leaking or prone to leaking). - Inspect work area following construction for the visual presence of potentially contaminated soil (e.g., fuel marks on ground).
Sediment/runoff control, erosion and sedimentation	<ul style="list-style-type: none"> - Monitor to verify compliance with Sediment and Erosion Control Plan and Drawing, and effectiveness of mitigation measures; undertake remedial actions as required to address deficiencies. - Monitor bank and slope stability at potentially affected areas throughout the construction period and recommend improvements where necessary. - Monitor soil compaction conditions around the work site and assess requirements for remediation following construction
Site restoration	<ul style="list-style-type: none"> - Monitor/verify site cleanup and restoration activities (i.e., seeding/ landscaping activities, etc). - Monitor/verify site recovery/post-construction restoration progress (as per expectations noted in contract specification).
Natural Environment Component Monitoring	
Air quality	<ul style="list-style-type: none"> - Regular inspection of vehicle and machinery exhaust equipment to ensure efficient operation. - Visual monitoring of dust generated in the project area during construction to establish the need for mitigation requirements, and assess the effectiveness of applied mitigation.
Water quality	<ul style="list-style-type: none"> - Verify adequacy of Contractor’s in-water and on-land sediment and erosion controls (use applicable guidelines such as MNR’s Instream Sediment Control Techniques Field Implementation Manual). - Visually monitor instream turbidity levels during construction. Stop work or apply alternative mitigation if high turbidity levels observed. - Samples of rock excavated from sites will be submitted for a modified acid base accounting (ABA) test at the start of construction.
Aquatic habitat and biota	<ul style="list-style-type: none"> - Verify that in-stream work occurs within approved timing windows, unless otherwise approved by MNR/DFO. - Verify approval for blasting in or near water (as required) and verify that blasting is undertaken in accordance with conditions of approval. - Verify that fish are removed from dewatered areas in accordance with the commitments in this EA. Ensure appropriate license from MNR is obtained.

Issue	Description of Monitoring Activity
	- Verify that fish habitat mitigation measures are constructed and undertaken as per conditions of DFO Authorization.
Vegetation and Wildlife Habitat	- Site inspector to monitor clearing activities to ensure compliance with contract specifications. Ensure tree clearing is conducted outside of the bird nesting season.
Social Environment Monitoring	
Health and Safety	- Verify contractor's Temporary Magazine Licence conditions. - Monitor to verify Contractor's use of a standard warning code during blasting operations. - Monitor signage and fencing to maintain public safety relative to construction activities and equipment (Contractor responsible for signage and fencing as per contract specifications).
Archaeological Resources	- Site inspector to ensure that all archaeological resources uncovered during construction are adequately handled as per Ministry of Culture requirements.

10.3 Post-Construction Operational Period

Post-construction monitoring occurs after all the infrastructure is in place and the facilities are operational. Information obtained from this phase of monitoring serves to verify predicted operational impacts and also serves to evaluate the effectiveness of implemented mitigation measures. Table 10.3 summarizes proposed post-construction monitoring and will be the responsibility of SREL's environmental consultant. Compliance monitoring to be undertaken as part of the MRWMP is discussed in Section 9.1.13.

Table 10.3 Operational Monitoring Program

Issue	Description of Monitoring Activity	Year		
		1	3	6
Walleye spawning	- Monitor walleye spawning and spawning habitat characteristics throughout the study area	X	X	X
Fish community	- Monitor fish community in the study area (repeat baseline electrofishing survey)	X	X	X
Benthic Invertebrates	- Monitor benthic invertebrate community in the study area (repeat baseline survey)	X	X	X
Sound Levels	- Monitor sound levels in the study area as per the requirements of the Certificate of Approval (Air)	X		
Ragged Rapids GS Operations	- Ongoing liaison between North Bala GS operator and OPG Ragged Rapids GS operator to ensure no adverse effects on downstream generators	Ongoing		
Moon River Walleye Spawning Flows	- The effectiveness of attempts to maintain consistent spawning flows under changing watershed conditions, as watershed conditions permit, in conjunction with minimum flow needs	Ongoing		
Flow Distribution Plan/Strategy	- Monitoring of flow distribution will be ongoing to assess effectiveness in meeting flow objectives (e.g., scenic flows, fish spawning/incubation)	Ongoing		
Flood Mitigation	- Monitoring will be conducted on an ongoing basis to assess the effectiveness of flood mitigation strategies given the additional Lake Muskoka/Bala Bay discharge capacity	Ongoing		

In addition to the above-noted monitoring requirements, dialogue will be ongoing with MNR and OPG in order to communicate and coordinate flow releases upstream of Lake Muskoka by MNR and downstream flow releases from Lake Muskoka by SREL to downstream hydro facilities of OPG.