IRON ORE COMPANY OF CANADA

LABRADOR CITY OPERATIONS

ENVIRONMENTAL PROTECTION PLAN

LUCE LAKE DIVERSION AND DEWATERING

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1 INTRODUCTION

The Iron Ore Company of Canada (IOC) has been operating the Carol Project (Labrador City Operations) in Labrador West since the early 1960s. The company's current mining operations in the region consist of open pit mines, mineral processing (concentrator and pellet plant) and tailings management facilities, transportation infrastructure and other associated components and activities.

IOC is proposing to divert inflows to and dewater Luce Lake North, directly adjacent to Luce Pit, at its Labrador West mine site. This will be done by constructing diversion channels and a low dam and pumping down the lake. The removal of Luce Lake North will minimize the risk of slope failure in the northwest wall of Luce Pit, where water from the lake is entering the pit through a shear zone in the bedrock. Otherwise slope failure and uncontrolled flooding of the pit from the lake would result in significant adverse impacts on operations, safety and the environment.

The Environmental Protection Plan (EPP) for Luce Lake North diversion and dewatering will ensure environmental protection and compliance during planning and construction activities. Ongoing environmental protection and compliance after construction will be assured by some of the measures incorporated during project planning and put in place at construction, while any other ongoing operational issues shall be covered in the site-wide EPP for IOC`s Labrador City Operations. It is important to note that this document does not cover decommissioning. Prior to closure, a project wide EPP will be developed, in consultation with the NL Government.

The objectives of this EPP are:

- Identify potential impacts related to the diversion and dewatering of Luce Lake North including the completion of offset requirements. Potential impacts may be associated with air quality, surface and groundwater, biophysical environment, human health, archeological sites and communities; and
- Implement appropriate controls / mitigation measures to eliminate or minimize potential negative impacts on the environment.

1.1 Purpose

This EPP outlines practical procedures required for all project personnel (i.e., IOC employees, contractors and suppliers) to reduce or eliminate the potential negative environmental effects associated with the Project.

This EPP also:

- ensures that commitments to reduce environmental effects are met;
- documents commitments and mitigations identified in the Environmental Assessment process;
- documents appropriate protection measures to be undertaken during the construction and dewatering of Luce Lake North;
- provides a reference document for personnel when planning and / or conducting specific activities;
- provides direction for developing contingency plans for accidental events;

- communicates changes in the program through the revision process;
- provides a reference to and instructions for IOC to understand applicable legal and other requirements;
- includes a quick reference for both project personnel and regulators to monitor compliance and recommend improvements; and
- provides direction at the corporate level for ensuring commitments made in policy statements are implemented and monitored.

Any deviation from the procedures and commitments outlined in the EPP must first be discussed with, and approved by, the Environmental Manager and the relevant provincial or federal authority (if applicable).

1.2 Scope and Application

The scope of this EPP covers the construction and dewatering activities as well as fish offset work. It does not include existing IOC Operations. Section 2 provides more detail on the components of the Project. This document should be utilized in the design phase of the project to ensure controls are established prior to construction, as well as during the construction of the project components. All potential operational concerns after construction shall be addressed in the site-wide EPP.

2 PROJECT DESCRIPTION

Luce Lake North is located within IOC's existing property boundaries, adjacent to Luce Pit, and is entirely within the IOC`s Labrador City Operations (Figure 1). The area is not accessible to the public and has been surrounded by mining activities since the early 1960s.

Figure 1. 2014 Aerial Map of IOC's Labrador City Operations

Luce Lake has a surface area of 152 ha and consists of two basins. The northern basin (Luce Lake North) has a surface area of 102 ha and a maximum depth of 21 m. The volume of Luce Lake North is approximately 8,439,287 m3. The shallower southern basin, Lower Luce Lake has a maximum depth of approximately 1.5 m and contains submerged vegetation and a center island.

Luce Lake North is bounded on the north by a waste rock dump, by Luce Pit and Lower Luce Lake to the south, and by the Main Mine Road and the Automatic Train Operation (ATO) railway on the east. The western side of Luce Lake North is surrounded by low-lying vegetation and a haul road. The diversion and dewatering of Luce Lake North includes the following components:

1) Construction of diversion channels around Luce Lake North to reduce surface water inflows to Luce Lake North;
2) Construction of a dam to isolate Luce Lake North from Lower Luce Lake;
3) Relocation of fish from Luce Lake North;
4) Completion of measures to offset any serious harm to fish and fish habitat due to the diversion and dewatering of Luce Lake North;
5) Redirection of groundwater discharges from Luce Pit that are currently pumped to Luce Lake North;
6) Controlled dewatering of Luce Lake North; and
7) Installation of a sump pump system in the Luce Lake North basin to manage groundwater infiltration, surface water inflows, and snowmelt runoff.

2.1 Diversion Channels

Diverting flows away from Luce Lake North will possibly require construction of up to three diversion channels, to redirect water from the southwest, west and east sides of Luce Lake North. Along the south side of Luce Lake North, a discharge channel (White Lake Diversion [WLD] Extension), will pick up flows from the WLD Sedimentation Pond, dewatering discharges from Luce Pit. A second diversion channel (Luce North Diversion [West]), will collect surface runoff from the west side of the watershed and discharge into the existing WLD Sedimentation Pond. Surface inflows from the eastern side of Luce Lake North will be collected in a third diversion channel (Luce North Diversion [East]), which will use an existing ditch that will be cleaned and re-graded. The second and third channels may not be necessary if the flows are low enough to be captured by the pumping system that will ultimately remain at the bottom of the lake. The diversion channels will have a typical trapezoidal shape and are designed to sustain anticipated annual flows, so that there are no adverse effects on downstream fish habitat.

Where the water is considered as a discharge from mine dewatering activities, the Final Discharge Points will be revised accordingly. Discharge water from Luce pit is passed through a sediment pond and will be treated through a water treatment plant for pH and total suspended solids as of 2016, prior to discharge into the diversion channel. The discharge from Luce Lake North pumping during and following dewatering will be free of sediments due to the use of a floating pumps platform and a sump within the lakebed. If the water level in the Luce Lake North sump decreases such that the pumped water becomes sediment-laden, pumping will be halted and resume only when sediments settle below the level of the pumps.

2.1.1 Dam Between Luce Lake North and Lower Luce Lake

A dam will be required to prevent backflow into Luce Lake North from Lower Luce Lake during dewatering of Luce Lake North and thereafter.

2.1.2 Fish Relocation

Prior to draining Luce Lake North, fish capture and relocation programs will be carried out so as to minimize serious harm to fish. The plan will include live capture and relocation of fish from Luce Lake North to another water body within the same system and with the same species composition. The carrying capacity of Lower Luce Lake is not great enough to support the entire Luce Lake North fish population; all fish will likely be released within Wabush Lake. All relocated fish will be identified at the

species level and an estimate of length recorded. Relocation activities will continue until capture rates are considerably reduced and the target capture rate for cessation will be finalized with DFO.

2.1.3 Fish Offsetting

The *Fisheries Act* allows the Minister of DFO to issue an Authorization under Section 35 (2) of the Act to permit work, an undertaking or an activity to occur that results in 'serious harm to fish' that are part of a commercial, recreational or Aboriginal fishery, or serious, permanent change to ecosystem productivity that support such a fishery. An Authorization under Section 35 (2) will be issued by DFO with an approved Offsetting Plan which offsets any serious harm to fish or serious, permanent change to ecosystem productivity that support a fishery. This document represents the Fish Offset Plan for the dewatering of Luce Lake North.

2.1.4 Timing for Relocation of Luce Lake North Inflows

The Luce Pit dewatering wells and sump pumping systems currently contribute the greatest inflow to Luce Lake North. During the drawdown of Luce Lake North, the discharge of the Luce Pit dewatering wells and sumps will be redirected toward Lower Luce Lake, thereby ending the continuous recycling of Luce Lake North water from the pit to the body of the lake. The largest contribution otherwise to Lower Luce Lake as part of this project will be the dewatering of the body of Luce Lake North. Therefore, the relocation of Luce pit wells and sumps, the dewatering of the body of the lake, and all the other inflows, will need to be carefully scheduled not to exceed the receiving environment's capacity. A detailed analysis of the current pumping system configuration, the individual pumping rates, and the capacity of Lower Luce Lake to receive water from the diversions and dewatering will allow a diversion schedule to be developed to ensure that the total diverted flows do not exceed the maximum permissible monthly pumping rates to Lower Luce Lake.

2.1.5 Controlled Dewatering of Luce Lake North

Maximum permissible pumping rates for the controlled dewatering of Luce Lake North have been developed in consideration of downstream fish habitat and the life cycles of resident fish. The process included identifying the predicted habitat characteristics associated with increased flow rates due to pump down and developing acceptable pumping ranges that would maintain habitat integrity and protection of the sensitive life-stage(s).

Initially, a floating pumps platform will be advanced into Luce Lake North and discharge pipes placed over the dam and into Lower Luce Lake. The Luce Lake North bathymetry indicates the lake will divide into two basins during dewatering (North Pool and South Pool) when the water level decreases to approximately 7 to 8 meters below the current lake level, while at 12 meters below the current lake level, the North Pool will again separate into two smaller basins. The pump down plan has been developed to address this situation.

2.1.6 Operation and Maintenance

Once Luce Lake North has been diverted and dewatered, ongoing dewatering in the lakebed will be required to manage groundwater infiltration, precipitation, snow melt runoff and surface runoff not captured by the diversion channels. The remaining Luce Lake North depression will be monitored for seepage and water collection. The area will be operated as a sump and water will be pumped into Lower

Luce Lake. As outlined above, the discharge from Luce Lake North pumping following dewatering will make use of a floating pumps platform. If the water level in the Luce Lake North sump decreases such that the pumped water becomes sediment-laden, pumping will be halted and resume only when sediments settle below the level of the pumps. Water quality and water levels will be monitored at discharge points and further treatment or control measures will be implemented if necessary.

3 ROLES AND RESPONSIBILITIES

This project-specific EPP is based on the site-wide EPP. Those sections developed only for this project will subsequently be integrated to the site-wide EPP. As such, the following roles and responsibilities should be understood to apply to the site-wide EPP.

3.1 IOC

The Iron Ore Company of Canada will:

- provide final approval for the EPP and any subsequent revisions;
- monitor and inspect the work being carried out; and
- liaise with relevant government agencies and community interest groups as required

The designated Environmental Advisors will:

- Ensure the implementation of the EPP;
- Review and monitor the effectiveness of the EPP;
- Review revision requests and ensure revisions are distributed to EPP holders;
- Maintain document control through IOC's existing system;
- Report to the Manager of Environment;
- Hold an environmental orientation session for the contractor and its personnel, and any other personnel to be involved in the project on an as-needed basis;
- Ensure EPP holders and their staff are familiar with the EPP and its procedures;
- Ensure that all applicable approvals, authorisations and permits are obtained;
- Monitor or designate a representative to monitor project work to ensure compliance with the EPP, and all regulatory requirements and commitments; and
- Report to the Operational and Development Site Project Managers, Manager of Environment, and / or appropriate agency all incidents of non-compliance.

All EPP Holders will:

- Keep their copy of the EPP current and ensure all revisions are entered on the revision control record;
- Familiarize themselves and their personnel with the EPP and any revisions; and
- Initiate changes to improve the quality of the plan.

3.2 Contractors

The contractors shall be accountable and responsible for implementing all procedures / protections outlined in this document. The contractor and site personnel will:

- Familiarize themselves with the EPP;
- Implement the EPP commitments;

- Ensure all personnel and subcontractors comply with the EPP, all requirements of the contract and with all applicable laws and regulations;
- Maintain a training record;
- Maintain regular contact with the Environmental Advisor, including, but not limited to:
    - immediately report concerns to the Environmental Advisor over any aspect of the EPP, and
    - immediately report any spills or other event that may have an effect on human or environmental health and / or safety;
- Ensure the implementation of any conditions outlined in approvals, authorizations and permits;
- Complete a pre-job hazard analysis to ensure controls are appropriate to mitigate the environmental risks; and
- Carry out clean-up, reclamation or restorative measures.

3.3 Environmental Awareness and Training

Through orientation and ongoing awareness training throughout the undertaking, IOC will ensure that all project personnel are competent to do their jobs properly. Employees will understand their roles and responsibilities, as well as the potential environmental effects of the overall project and their specific work activities.

4 RELEVANT LEGISLATION

There are federal, provincial and municipal regulatory requirements for the diversion and dewatering of Luce Lake North. All work must be compliant with relevant guidelines and standards. The following sections outline the legislation that is applicable for the project. These compliance requirements will be incorporated early into project planning to ensure compliance.

4.1 Federal

The following federal legislation is relevant to this project:

- *Transportation of Dangerous Goods Act, 1992*;
- *Species at Risk Act* (SARA);
- *Migratory Bird Convention Act*;
- *Fisheries Act*;
- Federal Policy on Wetland Conservation;
- *Explosives Act*; and
- *Canadian Environmental Protection Act, 1999* – E2 Regulations.

4.2 Provincial

The following provincial legislation is relevant to this project:

- *Environmental Protection Act*;
    - Environmental Assessment Regulations
    - Air Pollution Control Regulations
    - Waste Management Regulations
    - Storage and Handling of Gasoline and Associated Products Regulations
    - Used Oil Control Regulations
- Government of NL Aboriginal Consultation Policy;
- *Water Resources Act*;
    - Environmental Control Water and Sewage Regulations
    - Relevant Policy Directives (Allocation of Water Use, Infilling Bodies of Water, Development in Wetlands)
    - Guidelines for Canadian Drinking Water Quality
- *Wild Life Act*;
- *Endangered Species Act*;
- *Historic Resources Act*;
- *Forestry Act*;

- *Urban and Rural Planning Act*; and
- *Dangerous Goods Transportation Act*.

4.3 Municipal

The project is partially located within the Town of Labrador City's municipal boundary. All development must comply with the Town of Labrador City's Plans and Development Regulations.

4.4 Compliance Monitoring

Inspections and monitoring ensure the implementation of the environmental protection measures that are specified in this document and that will be specified in the applicable contracts and other relevant permits, approvals and authorizations. Monitoring will also ensure that all development project activities comply with applicable regulatory requirements and that mitigation measures are being employed effectively.

The Environment Department is responsible for environmental compliance monitoring on-site. Compliance monitoring will be required for various activities during the project. Project personnel will comply with relevant approvals, authorizations, permits and legislation.

5 POLICIES AND REPORTING

Table 1 provides a listing of some of IOC's environmental and other plans / procedures that are relevant to the project. All plans / procedures are can be located on IOC's intranet site Mine to Port.

Table 1 IOC Environmental Management Plans and Procedures

Environmental Management Plans and Procedures	
Closure & Rehabilitation of Disturbed Landscapes	Dewatering-Pits & Lakes
Waste Rock Dumps - Design of New Landforms	MMER Emergency Response Plan
Land and Watercourse Disturbance Permit	Effluent Management Plan
Contaminated Soils Management	MMER Final Discharge Point Monitoring Program
Environmental Reporting	Spill Response & Reporting
Fugitive Dust Management Operations	Waste Disposal-Used Oil
Groundwater Monitoring for Contamination	Waste Disposal-Used Tires
Glycol-Handling	Waste Disposal- Septic Wastes
Halocarbons-In Use Equipment	Waste Segregation - General Requirements
Hazardous Materials Storage	Waste Disposal-Electrical Equipment Containing Oil

5.1 Internal Communication

Environmental performance and issues will be communicated internally as required. The Operational and Construction Project Managers are responsible for communicating IOC policies and procedures and legal and other requirements to project personnel. Project personnel will report all environmental incidents and near misses to the Environmental Advisors as per the IOC Emergency Call Out & Reporting Procedures.

5.2 External Communication

Apart from the regular reporting required under the Certificate of Approval to operate the mine, when required, IOC will report on environmental issues to the Newfoundland and Labrador Department of Environment and Conservation (NLDEC). Issues which may be communicated include but are not necessarily limited to:

- Stream crossings;
- Dust;
- Erosion;
- Historic resources;
- Wildlife encounters; and
- Permits and authorizations.

Any spills of petroleum products or other hazardous materials will be reported to the IOC Emergency Services and Security (709) 944-8400, ext. 8320, who will report the incident to the IOC Environment Department.

Any activity having the potential environmental impact to fish and fish habitat outside the realm of the authorization (such as stream crossings and culvert installations) should be forwarded to the IOC Environment Department, who will consult the Department of Fisheries and Oceans (DFO) for review and subsequent issuance of appropriate Letters of Advice.

Other compliance reporting required by permits or through compliance requirements not listed above will also be submitted to the IOC Department of Environment, or appropriate departments at IOC.

6 ENVIRONMENTAL PROTECTION PLANS AND PROCEDURES

All work will be conducted according to the conditions set out in the permits and / or approvals and authorizations from the provincial and federal governments. Prior to the start of any work, the Environment Department will be consulted to determine if all approvals have been granted and to provide task specific permit requirements. The following guidance outlines the environmental protection procedures to be implemented for the Luce Lake Diversion and Dewatering project execution.

All procedures apply during planning and construction. The handover of this project to operations will be completed upon reaching the desired water level in Luce Lake. Procedures for operations and maintenance will be integrated into the site-wide EPP.

6.1 Vegetation Clearing

Environmental Concerns

Vegetation clearing (e.g., trees, shrubs, etc.) will be required in advance of site preparation activities. Concerns include habitat loss, impacts to nesting birds, erosion and sedimentation into vegetative areas and waterbodies. Clearing vegetation also may impact historical / archeological sites.

Environmental Protection Procedures

a) A Site Clearance Permit must be completed and submitted to the Environment Department.

b) Clearing or removal of trees will be restricted to only those areas designated by IOC.

c) Minimization of Project footprint and clear delimitation of clearing limits and work areas.

d) Avoiding ecologically sensitive areas such as hardwoods and aquatic habitats wherever possible and practical.

e) Clearing will consist of cutting to within 15 cm of the ground and disposing of all standing trees, as well as removing all shrubs, debris and other perishable materials from the area indicated on the engineering / survey drawings.

f) Where practical, vegetation will be stored so that it can be later used as a seed source, moisture retention aid, and shade for new growth during reclamation.

g) Reasonable effort will be made to dispose of usable timber by providing the timber for local use off-site. Otherwise, timber will be mulched and mixed with excavated soils.

h) Slash and any other construction material or debris will not be permitted to enter any watercourse, and will be piled above spring flood levels. No burning is permitted.

i) Trees will be either sawed or mulched using mechanized cutting / mulching equipment. The use of mechanical clearing methods, such as bulldozers, will not occur except where it can be demonstrated that there is no merchantable timber, and where the resulting terrain disturbance and erosion will not result in the loss of topsoil or the sedimentation of water bodies.

j) Timber shall be felled inward toward the work area to avoid damaging any standing trees within the immediate work area.

k) Fire-fighting tools and water delivery systems must be available.

l) In principle, a 100 m buffer zone of undisturbed vegetation must be maintained around all water bodies and watercourses. Where this buffer cannot be maintained, as is the case of most activities for this project, the Environment Department will be consulted to determine the appropriate buffer requirement and any additional mitigations, in compliance with regulatory permits and authorizations.

m) Workers will not destroy or disturb any artefacts or features indicative of an archaeological /historic resource. Such resources should be avoided until a report has been made to the Provincial Archaeology Office and clearance to proceed has been received.

n) Where feasible, vegetation clearing will be scheduled to avoid disturbance during the critical nesting period, from May 1st to August 15th.

    i. If clearing is scheduled between May 1st and August 15th, conduct ground searches during the breeding season in advance of vegetation clearing. Ground surveys will be conducted by trained personnel with demonstrated experience in nesting surveys. The survey will be conducted in the identified area of interest no more than 7 day prior to the start of disturbance and will be conducted via transects and targeting nesting habitat. If breeding behavior is observed based on the indicators established by Bird Studies Canada and the Quebec Breeding Bird Atlas (QBBA 2010) or if a nest is identified, the trained personnel will determine the appropriate exclusion zone and no clearing will occur in that area until the nesting period is over unless approval is obtained from the NL Wildlife Division.

    ii. No clearing shall take place within 800 m of an active raptor nest between the months of May 1st and August 15th. If a nest is encountered during clearing activities, the area is to be demarcated and clearing is to be avoided until the Environment Department determines work may continue in consultation with the NL Wildlife Division.

    iii. Should additional nests / dens be identified by the contractor / originator, clearing activities must stop and the Environment Advisor contacted immediately to establish appropriate buffer zones.

o) If a Species at Risk (SAR) or Species of Conservation Concern (SCC) is identified during construction, construction shall be halted and reported to the Environment Department who will contact the NL Wildlife Division and/or Environment and Climate Change Canada (ECCC) for further instructions.

p) IOC is aware of the value of wetlands and will attempt to avoid such disturbance of wetlands outside of the work areas where feasible.

q) All equipment used will be handled and maintained according to the Equipment Use and Maintenance procedures (section 6.10).

6.2 Buffer Zones

Environmental Concerns

Buffer zones are vegetated boundaries maintained along water bodies and other sensitive habitats. Without adequate buffer zone vegetation, streams, ponds and lakes can become laden with silt from run-off. Vegetation also provides cover for fish. Streamside vegetation may:

- provide shade thereby helping to regulate water temperature;
- provide stream bank stability thereby preventing erosion and subsequent introduction of sediment into the water;
- intercept precipitation, and through evaporation and transpiration, regulate the amount of water discharged into the stream;
- provide insect drop which is a food source for fish; and
- introduce leaf litter and decaying vegetative matter into the stream which provides food for aquatic organisms on which fish feed.

Environmental Protection Procedures

a) In principle, a 100 m buffer zone of undisturbed vegetation must be maintained around all water bodies and watercourses. Where this buffer cannot be maintained, as is the case of most activities for this project, the Environment Department will be consulted to determine the appropriate buffer requirement and any additional mitigations, in compliance with regulatory permits and authorizations.

b) Avoidance of wetland areas during Project design and implementation wherever possible and practical.

c) Where possible, a vegetated buffer will be left between wetlands and maintained following construction and Project infrastructure and activities. Construction workers will be informed about the location, importance and recognition of wetlands, and will be directed not to enter them, particularly while operating construction or transportation equipment.

d) Any work within 15 m of a waterbody will require a permit under the *Water Resources Act*.

e) When slopes are greater than 30%, DFO recommends a minimum width of the buffer zone will be calculated by the following formula: Buffer Width (m) = 20 m + 1.5 x slope (%).

f) Sediment control structures are to be placed outside of the buffer requirements.

g) If archaeological/historic resources are encountered, all work must cease in the area and the Environment Department will consult with the Provincial Archaeology Office to an appropriate course of action. Further details are provided in Section 7.4 for Historic and Archaeological Sites.

6.3 Marshalling and Storage Areas

Environmental Concerns

Areas will be required for storing and maintaining equipment and supplies during the construction and operational phases of this project. Concerns include:

- Vegetation and soil disturbance may cause erosion and run-off of sediment into nearby water bodies; and
- Spills / leaks of hydrocarbons from storing and maintenance activities.

Environmental Protection Procedures

a) Existing marshalling and storage areas will be used where feasible. Any new marshalling, maintenance or storage areas required for the project will only be established within the IOC Labrador City property.

b) Establishing any new marshalling or storage areas will follow the procedures for vegetation clearing, grubbing and debris disposal, and erosion prevention. All organics or overburden material must be stored and used for rehabilitation of the site.

c) External storage areas will be placed on level terrain and kept free of ponding or run-off.

d) Drainage from areas of exposed fill will be controlled by grade or ditching and directing run-off away from water bodies.

e) Any maintenance work completed on equipment must have the appropriate spill material available and drip pans must be used.

f) Secondary containment required where hazardous products are stored. The size of the containment must be adequate to fully contain the material and at minimum should be 110% the capacity of the material.

g) Marshalling and storage areas not required during operations will be rehabilitated.

6.4 Ditching & Channels

Environmental Concerns

Trenching maybe required for the pipeline from the Luce Lake sumps to the discharge upstream of Lower Luce Lake, as well as for the creation of the diversion channel(s). Environmental concerns associated with trenching include potential runoff of sediment-laden water can result in sedimentation of fish habitat and lower water quality.

Environmental Protection Procedures

a) Topsoil and excavated overburden will be stored in stockpiles for later use as fill material or for rehabilitation where practicable. Any unsuitable material will be disposed of in a disposal area approved by the Environmental Advisor.

b) Excavators and backhoes should be used to excavate trenches in order to minimize land disturbance. The use of bulldozers should be avoided.

c) Channel and ditching design and construction will make use of measures to reduce and control the release of sediment-laden water with filtration through erosion control devices, hydro-seeding, silt fences, straw bales, geotextiles or other devices. See Erosion Prevention and Siltation Controls procedure (section 6.5)

d) The existing White Lake Diversion outflow channel will be backfilled and seeded, and the finished grade is to be level with the surrounding surface.

6.5 Erosion Prevention and Siltation Controls

Environmental Concerns

Eroded material may cause alter drainage patterns, increase stream velocities and cause siltation in water bodies and, subsequently, decrease suitable habitat for aquatic and terrestrial animals.

Environmental Protection Procedures

a) The Contractor selected to complete the execution work will provide a site-specific erosion and sediment control plan.

b) Area to be disturbed should be minimized where possible. Vegetative buffers will be maintained around waterbodies and sensitive areas.

c) Natural drainage patterns will be preserved to the extent possible (diversions channel grading, trenching in lake bed, and pumping).

d) Channels and drainage ditches will be stabilized (e.g., lining with vegetation or rock, terracing, interceptor swales, installation of rock check dams) to reduce soil erosion. Any such measures will be properly maintained following installation.

e) Excavation, embankment construction and grading in the vicinity of stream crossings will be done in a manner that avoids or reduces erosion and sedimentation of watercourses or bodies.

f) All areas of exposed erodible soil will be stabilized by back-blading, grading and / or compacting to meet engineered slope requirements. Roughening the slopes with horizontal depressions will also reduce the risk of erosion.

g) Incorporation of the following measures in project design of channels upstream of receiving environments: widening and deepening channels to reduce velocity and increase retention time, meander the channel, add strategically placed boulders, and install rip rap.

h) Where necessary, consider incorporating of sedimentation / settling ponds, collection ditches and other associated infrastructure in project design upstream of receiving environments.

i) Suitable slopes will be hydro-seeded to minimize erosion and dust lift off.

j) Where there is potential for erosion along exposed slopes and a natural vegetation buffer of less than 20 m from the high water mark exists between erodible areas and water bodies, silt fence will be installed to control silt runoff. Engineering requirements will vary depending on the

locations of the silt fence and will take into consideration such factors as drainage / surface area of exposed soil and time of year that the silt fences are used.

k) If an environmental inspection reveals that silt is entering a watercourse, further mitigation measures will be implemented, such as temporary drainage ditches, settling ponds, hay bales, ditch blocks / check dams or sediment dam traps, to intercept run-off. The necessary or appropriate measures will be determined in the field.

l) Inspections are required prior to and following any major storm event (>25 mm of rain in 24 hr period) and routine inspections during periods of significant melt (April to June).

m) Existing or new siltation control structures used in this work will be monitored regularly by the Environmental Advisors for excessive accumulation of sediment.

n) Accumulated sediment from control structures will be removed as necessary to ensure the effectiveness of the systems. Excess water will be removed from siltation control systems prior to excavation of sediment.

o) Implement a water quality monitoring system and program.

6.6 Dust Control

Environmental Concern

The environmental concerns associated with dust include human health effects and potential effects on aquatic ecosystems and vegetation.

Environmental Protection Procedures

a) Plan activities to minimize dust emissions and implementation of dust control procedures.

b) Dust from operating activities will be controlled using water or calcium chloride. Calcium chloride will not be used within 15 m of a waterbody.

c) Dust can be controlled by retaining trees and shrubs to act as windbreaks and natural erosion prevention. The amount of vegetation to be cleared will be minimized and exposed areas should be considered for hydro-seeding.

6.7 Water Management

Environmental Concerns

Pumping of sump water to Lower Luce Lake as well as the outlet of the diversion channel will require sediment control and energy dissipation structures at the discharge points. A revision of the area's Final Discharge Points for compliance monitoring will enable IOC to ensure no adverse effects on the receiving environment during construction and maintenance of the system. Concerns associated with this work include damage to fish habitat and reduced water quality.

Environmental Protection Procedures

a) Manage and monitor water discharge points in compliance with applicable federal and provincial regulatory requirements.

b) Design and establishment of sedimentation / settling ponds, collection ditches and other associated infrastructure.

c) Establish a monitoring plan upstream of Lower Luce Lake at the discharge points for water quality effects.

d) Monitor stations are established at the outflow of Lower Luce Lake and downstream along Luce Brook to monitor potential effects on water flows and levels.

e) Provide notification to ECCC regarding changes in Final Discharge Points, as per MMER

6.8 Stream Crossings and Encroachment

Environmental Concerns

This project's stream crossings and encroachment will correspond to the following planned activities, in chronological order:

- Dam construction to separate Luce Lake North from Lower Luce Lake;
- Construction of discharge outlets from channels upstream of Lower Luce Lake;
- Placement of culverts over existing channels to reach Luce Lake North with pumping platform on the south shore of Luce Lake North; and,
- Advancing materials on the south shore of Luce Lake North to launch a floating pumps platform.

The sequence of these activities is designed to minimize the potential soil / sediment disturbance in Luce Lake North to affect Lower Luce Lake.

The environmental concerns associated with the installation of stream crossings and encroachment include erosion/siltation, disturbance of waterfowl, potential mortality of fish, and loss of fish habitat.

Environmental Protection Procedures

General procedures

a) All Erosion Prevention and Siltation Controls and Buffer Zones procedures apply.

b) Within the project's boundaries, a fish relocation plan will be implemented as approved under the *Fisheries Act* prior to construction.

c) Where fish are present outside the project's boundaries, construction activities between September 1 and June 15 will be undertaken under the direct supervision of the Environmental Advisor.

d) Work will be performed in such a way as to ensure deleterious substances including, but not limited to, materials such as sediment, fuel and oil do not enter Lower Luce Lake.

e) The number of water crossings will be minimized during project design and construction phases.

f) Where practicable, work will take place in dry conditions, either by the use of cofferdams or by diverting the stream.

g) Limit and restrict the use of heavy equipment in and near watercourses; an excavator will be used from shore rather than a bulldozer in the watercourse. Where it is absolutely necessary to do so, in-stream work will be performed by rubber tired vehicles only, and will only be done in compliance with approvals from the relevant provincial and federal agencies.

h) Cofferdams of non-erodible material will be used to separate work areas from the watercourse when excavating for culverts and footings.

i) Cofferdams will be removed upon completion of construction and the streambed returned as closely as possible to its original condition.

j) Ensure that all equipment is mechanically sound to avoid leaks of oil, gasoline and hydraulic fluids.

k) Stabilize all bank sections which contain loose or erodible materials. If banks must be sloped for stabilization, no material shall be deposited within the watercourse. Sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse.

Culverts

a) Stream crossings will be constructed in compliance with the required Culvert Approval and guidelines from the NLDEC and DFO, respectively.

b) IOC will consult with DFO to develop mitigation strategies to reduce the effects of in-stream work during sensitive periods where applicable.

c) Culverts will be sized to handle the 1 in 10 year return period flood in accordance with all provincial requirements.

d) In the event of fish being present, installation of cylindrical culverts shall be counter sunk such that the culvert bottom is 15% the diameter below the streambed (for culverts greater than 2000 mm in diameter), and 300 mm for culverts up to 2000 mm in diameter.

e) Ensure that the natural low flow regime of the watercourse is not altered. A culvert will be installed only after site specific information such as localized stream gradient, fish habitat type and species present have been evaluated.

f) Use culverts of sufficient length to extend a short distance (minimum of 300 mm) beyond the toe of the fill material.

g) Use backfilling material which is of a texture that shall support the culvert and limit seepage and subsequent washing out.

h) Remove fill and construction debris from the culvert area to a location above the peak flow level to prevent its entry into the stream.

6.9 Dewatering

Environmental Concerns

The major concerns associated with site dewatering is the potential for siltation and mortality and / or habitat destruction for freshwater species.

Development, approval and implementation of an appropriate Offsetting Plan for any potential serious harm to fish, pursuant to the requirements of the federal *Fisheries Act* and associated Authorization will be completed prior to any work with the potential for serious harm to fish. Fish will be retrieved and relocated prior to start of construction activities. Given the size and depth of Luce Lake North, further attempts to retrieve and relocate fish as the lake draws down will be conducted to minimize any residual harm to fish.

Environmental Protection Procedures

a) The timing and volume of water discharged from Luce Lake North will be based on the receiving capacity of Luce Brook, downstream of Lower Luce Lake.

b) Monitoring of water levels during and after construction in Lower Luce Lake, Luce Brook, and Tinto Brook (upstream of Wabush Lake), will be conducted using IOC and Water Survey of Canada (Environment Canada) water level gauges.

c) Pumping will be halted in periods when the monitored flows and water levels exceed the monthly calculated biological criteria related to fish life cycles across species and seasons.

d) The use of floating pumps during pump down and design of a sump in the lakebed for ongoing pumping with the floating pumps platform will minimize entry of sediment-laden waters to Lower Luce Lake.

e) Filtration or other suitable measures, such as settling ponds, silt fences and dykes, will be provided to remove silt, and reduce the turbidity of water pumped from work areas before discharging.

f) Energy dissipation structures will be used to prevent scouring and erosion at discharge locations. All Erosion Prevention and Siltation Controls procedures apply.

g) Discharged water will follow natural surface drainage patterns to the extent possible.

h) Water quality will be monitored prior to discharge to the environment, in compliance with applicable federal and provincial regulatory requirements.

6.10 Equipment Use and Maintenance

Environmental Concerns

A variety of vehicles and heavy equipment will be used throughout the construction and operational phases of the project. Environmental concerns associated with the operation of such equipment includes noise, air emissions, increase in artificial lighting and accidental spills and leaks that may contaminate on-site water bodies or sensitive receptors.

Environmental Protection Procedure

a) Pre-use inspections are to be completed on all equipment. All equipment shall be regularly maintained and inspected. If problems are identified the equipment will be serviced to prevent the risk of a spill / leak.

b) Construction equipment will be in good operating condition, free of leaks and with all appropriate emission filters.

c) All pieces of equipment will have exhaust systems that are regularly inspected and properly functioning to manufacturers specifications.

d) Spill kits will be maintained on site, strategically located and clearly labelled.

e) Drip pans will be placed underneath pumps.

f) Hoses and connections on equipment will be inspected routinely for leaks and drips.

g) Equipment maintenance and fuelling activities will be performed at sites designated by the Environmental Advisor and in compliance with applicable regulations.

h) The Mine Maintenance Facility should be the primary location for vehicle/equipment maintenance as this facility is properly equipped for this activity. Other designated areas should only be used for vehicle/equipment maintenance when it is absolutely necessary.

i) All leaks will be repaired and reported immediately to the Environmental Advisor.

j) All fuel and other hazardous materials will be handled according to the Storage, Handling and Transfer of Fuel and Other Hazardous Material procedures (see section 6.12).

k) Vehicles and equipment will be stored at designated areas a minimum of 100 m from water bodies when not in use.

l) All equipment (e.g., diesel generators, etc.) shall meet the requirements of the NL Air Pollution Control Regulations under the Environmental Protection Act, as required.

6.11 Vehicle Traffic

Environmental Concerns

Vehicular traffic can result in interactions with wildlife, fugitive dust, emissions and noise as well as historic resources. IOC is committed to the proper operation and maintenance of its vehicles to reduce environmental effects.

Environmental Protection Procedures

a) All vehicle and equipment use, including use of all-terrain vehicles, will be restricted to designated routes within and between work, marshalling, maintenance and storage areas.

b) All vehicles and equipment will be properly maintained to meet emissions standards.

c) Travel in areas outside designated work areas will not be permitted.

d) All vehicles and equipment will yield to wildlife (see section 7.2 for Wildlife Encounters).

e) Chasing and / or harassing wildlife with vehicles and equipment will not be permitted.

f) Avoiding / minimizing the use of artificial lighting.

g) Heavy equipment (e.g., dump trucks and front-end loaders) will only be used in work areas.

h) Site roads will be monitored for signs of erosion and appropriate action will be taken to repair roads, when necessary.

i) Dust suppression on site roads will be done by watering the roads as part of IOC's ongoing fugitive dust reduction measures (see section 6.6 for Dust Control).

j) Lower speed limits will be implemented to reduce the potential for collision with wildlife and to reduce dust generation.

k) All grader operators and loader operators involved in road maintenance are to be informed of proper road maintenance techniques.

l) All culverts crossing roadways must be clearly marked. Grading or pushing material in these areas is strictly forbidden.

m) All personnel operating motor vehicles within the mine site require Induction, Mine Orientation and a Pit Permit. Personnel going to the mine site without a Pit Permit require Mine Orientation and an escort possessing a Pit Permit to ensure compliance with Mine traffic rules.

6.12 Storage, Handling and Transfer of Fuel and Other Hazardous Material

Typical hazardous substances that may be used on site include, but are not necessarily limited to:

- chlorinated and non-chlorinated solvents (e.g., cleaner-degreasers);
- flammable gases (e.g., acetylene);
- waste petroleum products (e.g., used engine oil);
- corrosives (e.g., battery acid);
- glycol (e.g., antifreeze);
- ozone-depleting gases (e.g., freon);
- petroleum, oil and lubricants; and
- ammonium nitrate.

Environmental Concerns

The primary concern with using hazardous substances is that there may be an uncontrolled release to the environment through spillage, and subsequent adverse effects on terrestrial and aquatic habitat and species, soil, groundwater quality, and human health and safety.

Environmental Protection Procedures

a) The Workplace Hazardous Materials Information System (WHMIS) Regulations under the Occupational Health and Safety Act will apply to all handling and storage of hazardous materials. All relevant current Material Safety Data Sheets (MSDS) will be readily available on site.

b) All necessary precautions will be taken to prevent and reduce the spillage, misplacement or loss of fuels and other hazardous materials. In the event of a spill on-land or in the freshwater environment, the Canadian Coast Guard will be contacted immediately at 1-800-563-2444.

c) If present, satellite fuel storage tanks (and associated fuelling equipment) will largely be replaced with a mobile fuelling truck for re-fuelling mobile equipment. Personnel transferring fuel from tank trucks to mobile units will inspect transfer equipment prior to product transfer.

d) All fuel storage systems will be registered and comply with the Storage and Handling of Gasoline and Associated Products (GAP) Regulations. Verification of the storage tank approval will be retained for IOC.

e) Prior to being introduced to site for temporary or permanent usage, all hazardous materials and chemicals will go through product approval process and inventories managed in online database.

f) Only persons who are qualified and trained in handling these materials as stated in the manufacturer's instructions and government laws and regulations will handle fuel and other hazardous materials.

g) Fuel truck drivers must be in attendance for the duration of refuelling operations.

h) No fueling will occur within 100 m of a waterbody.

i) Fuel and other hazardous materials will be stored at least 100 m from any waterbody.

j) Handling and fuelling procedures will comply with the Gasoline and Associated Products (GAP) regulations and any additional requirements put forth by NLDEC in order to limit potential contamination of soil or water.

k) The appropriate fuel spill control and clean-up material must be available while fueling.

l) Fuel storage areas and non-portable transfer lines will be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers will be visible under all weather conditions.

m) Waste oils, lubricants, and other used oil will be retained in a tank or closed container, and disposed of in accordance with the Used Oil Control Regulations.

n) Contracted fuel suppliers will, before transporting or positioning fuel or oil, have on file at IOC a copy of their fuel and hazardous material spills contingency plan. See section 7.1 for the Fuel and Hazardous Materials Spills contingency plan.

o) Transportation of hazardous and dangerous materials shall be conducted in accordance with provincial, territorial and federal transportation regulations. Transportation documents shall be retained in a retrievable filing system and stored for the duration of the undertaking.

p) Fuelling or servicing of mobile equipment will be conducted in designated areas.

q) Drum storage areas will not be located within 100 m of a water body. Drums containing hydrocarbon or other hazardous materials will be transported, stored, handled and disposed of such that spillage or leakage does not occur. Drums will be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry building with an impermeable floor. The location of drum storage areas must be approved by IOC.

r) Small quantities of hazardous material (drums, cans and other containers under 20 L volume) will be stored in a secure location protected from weather and freezing, as well as vehicular traffic.

s) Where hazardous materials are to be stored outdoors, a designated area will be established, graded and fitted with an impermeable membrane covered with local soil and surrounded by an earth berm.

t) If required, a hazardous waste storage area will be constructed in compliance with all applicable federal and provincial legislation.

u) All petroleum and chemicals must be stored on a secondary containment.

6.13 Solid Waste Disposal

Environmental Concerns

Solid waste (e.g., domestic and industrial wastes, paper, cardboard and wood), if not properly controlled and disposed of, will be unsightly and could cause human safety and health concerns. It could also attract wildlife leading to the potential for human-wildlife conflicts.

Environmental Protection Procedures

a) All solid waste will be handled according to the Environmental Protection Act.

b) Solid waste produced by site personnel and operations will be regularly collected and disposed of at the Labrador City Operations on-site landfill.

c) Waste accumulated on site prior to disposal will be confined so that it does not pose an environmental or health hazard.

d) Work areas will be kept clear of waste and litter to reduce the potential for attracting wildlife and reducing potential interactions with wildlife (see procedures in Section 7.4 for handling wildlife encounters).

e) Any waste that may attract animals (i.e., food) will be stored in covered, wildlife-proof containers.

f) Burning of waste is not permitted.

g) All hazardous wastes generated, as a result of the treatment alternatives, will be handled according to the procedures for handling fuel and hazardous materials (Section 6.12).

6.14 Stream Enhancement

Environmental Concerns

Revegetation activities as well as in-stream modifications are planned as part of the Fish Offset plan. The following activities will occur on public land in an area that was affected by forest fires in 2013 east of Wabush.

- Transplanting of shrubs and tree seedlings
- Hand seeding
- Addition of boulder clusters and overhang cover structures
- Spawning gravel additions

The environmental concerns associated with bank revegetation and in-stream activities include erosion/siltation, disturbance of waterfowl, potential mortality of fish, and loss of fish habitat. In addition to all applicable procedures above, particularly those for Erosion Prevention and Siltation Controls and Stream Crossings and Encroachment, the following procedures will apply.

Environmental Protection Procedures

a) Limit soil compaction from transport to and from stream reaches where practicable. For example, use hand seeding instead of hydro-seeding, relocate nearby regrowth instead of purchased shrubs, use burned and felled trees for overhangs, etc.

b) Use existing access trails where possible. For remote stretches of streams, create new access strategically to minimize fragmentation of the landscape.

c) Gravel placement shall be completed on ice in winter to avoid site disturbance.

d) All use of motor vehicles must comply with the Equipment Use and Maintenance procedures.

e) Any methods of crossing over streams, such as building a bridge or fording, shall be planned in compliance with DFO legislation and policies and well as permits and approvals from the NL Water Resources department.

f) Fording shall be avoided as much as possible. If necessary:

   i. Spawning habitat shall be avoided.

   ii. Crossings shall be restricted to a single location and crossings made at right angles to the watercourse.

   iii. Equipment activity within the watercourse shall be reduced by limiting the number of crossings.

   iv. Ensure that all equipment is mechanically sound to avoid leaks of oil, gasoline and hydraulic fluids.

v. Stabilize the entire fording area using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way, and the ford area is not natural bedrock, or is easily disturbed by fording. When the substrate of the ford area is not subject to easy disturbance by fording, or coarse material is not easily available within the right-of-way, then fording under existing substrate conditions may occur under the direction of the Environmental Advisors.

vi. Ensure that fording activities are halted during high flow periods.

vii. Fording activities shall not decrease the depth of the watercourses to less than 20 cm. Where the existing depth is less than 20 cm, that depth shall be maintained.

6.15 Fish Relocation

Environmental Concerns

The environmental concerns associated with fish relocation include incidental catch of other wildlife and potential mortality, disturbance of waterfowl, potential mortality of fish, and loss of fish habitat.

Environmental Protection Procedures

a) Use methods for live capture of fish that are established and recognized in Newfoundland and Labrador.

b) Hold fish no more than one hour in containers of cool water before release downstream to Wabush Lake. Use aerators in the holding containers and place containers in a shaded, relatively cool area. Constantly monitor water temperature and fish stress levels (i.e. reduced movement, changes in breathing patterns or floating to surface).

c) Adapt check time interval for various methods based on catch rates.

7 CONTINGENCY PLANS

Contingency plans to address accidents and unplanned situations have been developed, and will be modified as required throughout the project. Notwithstanding the existence of these contingency plans, preventative measures will be adopted as the first line of defence against the possibility of accidents.

The contingency plans below are limited to those of particular relevance to this project. All contingency plans developed in the side-wide EPP also apply.

7.1 Fuel and Hazardous Materials Spills

Fuel and hazardous materials can be damaging to vegetation, soil, surface water, ground water, wildlife, aquatic organisms, historic resources and human health and safety. In the event of a spill or release of fuel or hazardous materials, refer to the IOC Contingency Plan and Emergency Call-Out Procedure.

7.2 Wildlife Encounters

Wildlife encounters pose a risk for stress or injury to both the wildlife and site personnel. Control measures and environmental protection procedures have been put in place to reduce this risk to wildlife and humans.

As a protection measure, recreational hunting, trapping or fishing by project personnel is not permitted at any of the project site.

The following procedures are to be implemented to prevent wildlife encounters:

a) Site and working areas will be kept clean of food scraps and garbage.

b) Waste will be collected for disposal in wildlife / bear-resistant containers. Waste will be transferred to the on-site landfill routinely as needed.

c) No attempt will be made to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot.

d) Equipment and vehicles will yield the right-of-way to wildlife.

e) No personal pets, domestic or wild, will be allowed on the site.

f) All personnel should be aware of the potential for encounters with wildlife (black bears, wolves, foxes, etc.) and instructed to immediately report all sightings to Security. At their discretion, the IOC Environmental Department will notify the NL Department of Natural Resources (DNR).

g) When nuisance animals (e.g. black bear) are identified in the project area, the Environmental Advisor will be responsible for all subsequent actions. Responsive actions will also be the responsibility of the Environmental Advisor, who may consult with the DNR. All actions must comply with Wildlife Division regulations and permits.

h) The Environmental Advisor will authorize the use of deterrent measures for wildlife.

i) Any incidents that result in the displacement or killing of wildlife shall be reported to Security.

j) Under provincial wildlife regulations, the displacement and release of any animal is the sole jurisdiction of the NL DNR and is to be undertaken only under appropriate supervision.

k) If the nest or den of any raptor, other bird or animal is encountered during development, activity in the vicinity of the nest is to be curtailed until the NL DNR is contacted and appropriate mitigation is applied.

7.3 Forest Fires

Activities related to the project could result in an accidental fire, which could spread to the surrounding area. Such events could be damaging to vegetation and wildlife, as well as human health and safety.

IOC or the contractor will take all precautions necessary to prevent fire hazards when working at the site.

These include but are not limited to:

a) Disposal of all flammable waste on a regular basis.

b) Smoking will be permitted in designated areas only.

c) IOC or the contractor making available, in proper operating condition, sufficient firefighting equipment to suit its labour force and fire hazards. Such equipment will comply with, and be maintained to the manufacturer's standards.

d) IOC or the contractor must ensure that its personnel are trained in the use of such equipment.

e) In the event of a forest fire, IOC or the contractor will take immediate steps to contain or extinguish the fire.

f) IOC will appoint a supervisory staff member as On-Scene-Commander for the purpose of fighting any forest fires.

g) Fires should be reported immediately to the Environmental Advisor, the Wabush Forestry office (709) 282-6881 and ultimately to the Forest Management Unit office in Corner Brook (709) 637-2408. The following information will be provided:

   i. name of the reporter and phone number;

   ii. time of detection of the fire;

   iii. size of the fire; and

   iv. location of the fire.

h) The police will also be notified immediately at (709) 944-7602.

7.4 Historic and Archaeological Sites

Historic resource material that is disturbed, destroyed or improperly removed from a site represents a cultural loss of information and history that could otherwise be handled and interpreted in an efficient and appropriate manner.

In case of a suspected discovery of archaeological/historic resources the following procedures shall apply;

a) Stop all work in the immediate area of the discovery until authorized personnel from IOC, having consulted with the Provincial Archaeologist, permit resumption of the work.

b) Under the Historic Resources Act, RSNL 1990, c.H-4, all archaeological sites and artefacts are the property of the Crown, and shall not be disturbed.

c) Report the find immediately to the Environmental Advisor who in turn will contact the Provincial Archaeology Office for further direction.

d) Mark the site's visible boundaries. Personnel will not move or remove any artifacts or associated material unless the integrity of the material is threatened.

e) The Environmental Advisor will report the find with the following information to the Provincial Archaeology Office, Department of Tourism, Culture, Industry and Innovation, St. John's, and comply with the instruction provided:

   i. nature of the find;

   ii. precise descriptive and map location and the time of the find;

   iii. nature of the activity resulting in the find;

   iv. identity of the person(s) making the find;

   v. present location of the material, if moved, and any protective measures initiated for the material and the site; and

   vi. any extenuating circumstances.

8 REFERENCE DOCUMENTS

For relevant IOC documents, please refer to Mine to Port or contact the area Environmental Advisor. Key reference material is listed below.

Provincial Government Guidelines (Water Resources Division, NLDEC):

- Environmental Guidelines for Watercourse Crossings;
- Environmental Guidelines for Stream Crossings by All-Terrain Vehicles;
- Environmental Guidelines for Culverts;
- Environmental Guidelines for Fording;
- Environmental Guidelines for Diversions, New Channels, Major Alterations;
- Environmental Guidelines for Pipe Crossings; and
- Environmental Guidelines for General Construction Practices.

DFO Operational Statements:

- Aquatic Vegetation Removal in Freshwater Systems Operational Statement;
- Beaver Dam Removal Operational Statement;
- Culvert Maintenance Operational Statement;
- Maintenance of Riparian Vegetation in Existing Right-of-ways Operational Statement; and
- Overhead Line Construction Operational Statement.

DFO Fact Sheets:

- Fact Sheet on Effects of Silt on Fish and Fish Habitat;
- Fact Sheet on Blasting – Fish and Fish Habitat Protection;
- Fact Sheet on Ditching;
- Fact Sheet on Temporary Fording Sites;
- Fact Sheet on Filter Fabric;
- Fact Sheet on Rock Check Dam;
- Fact Sheet on Resource Road Construction;
- Fact Sheet on Instream Work in the Dry – Cofferdams;
- Fact Sheet on Streambank Stabilization;
- Fact Sheet on Instream Work in the Dry – Temporary Diversion;
- Fact Sheet on Instream Work in the Dry – Elevated Pipes;
- Fact Sheet on Culvert Stabilization;
- Fact Sheet on Temporary Settling Basins;
- Fact Sheet on Stream Clean-up; and

- Fact Sheet on Culvert Installation.

Other Pertinent Federal Documents

- Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, Wright and Hopky, 1998;
- Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador. Fisheries and Oceans Canada, St. John's, NF, Gosse, M.M., et. al. 1998; and,
- Forestry Guidelines for the Protection of Fish Habitat in Newfoundland and Labrador, Scruton, D.A., et. al. 1997.

Other Pertinent Provincial Documents

- Environmental Policy for Infilling Bodies of Water W.R. 91-1(Water Resources Act, NLDEC);
- Environmental Policy for Land and Water Developments W.R. 95-01 (Water Resources Act, NLDEC);
- Environmental Policy for Development in Shore Water Zones W.R. 97-1 (Water Resources Act, NLDEC); and
- Environmental Policy for Development in Wetlands W.R. 97-2 (Water Resources Act, NLDEC).

9 CONTACT LIST

IRON ORE COMPANY OF CANADA
Security
Labrador City, NL
Tel: (709)944-8400 ext. 8320

ENVIRONMENT CANADA - ENVIRONMENTAL PROTECTION
Mount Pearl, NL
Tel: (709) 772-4285
Fax: (709) 772-5097

ENVIRONMENT CANADA - CANADIAN WILDLIFE SERVICE
Environmental Conservation Branch
Mount Pearl, NL
Tel: (709) 772-3278
Fax: (709) 772-5097

FISHERIES AND OCEANS CANADA
St. John's Client Service Centre
Tel. (709) 772-5846
Fax: (709) 772-2659

GOVERNMENT SERVICES CENTRE
Happy Valley-Goose Bay, NL
Tel. (709) 896-5428
Fax. (709) 896-4340

DEPARTMENT OF NATURAL RESOURCES – FORESTRY SERVICES
District Office
Wabush, NL
Tel: (709) 282-6881

DEPARTMENT OF MUNICIPAL AFFAIRS & ENVIRONMENT
Wildlife Division
Corner Brook, NL
Tel: (709) 637-2025

DEPARTMENT OF TOURISM, CULTURE INDUSTRY AND INNOVATION
Provincial Archaeologist
St. John's. NL
Tel: (709) 729-2462

ROYAL NEWFOUNDLAND CONSTABULARY
Booth Avenue
Labrador City, NL
Tel: (709) 944-7602