

ENVIRONMENTAL PROTECTION PLAN
UPPER TERRA NOVA FISHWAY
ACCESS ROAD CONSTRUCTION & DECOMMISSIONING
F6879-071000/08

OWNER/AGENT

Fisheries & Oceans Canada
Real Property Branch
St. John's, NL

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1.0 ENVIRONMENTAL PROTECTION PLAN

Fisheries and Oceans Canada, Real Property Branch (DFO) is committed to all its undertakings in a manner which is protective of the environment. DFO has prepared this environmental protection plan (EPP) for use during the construction and subsequent decommissioning of the Terra Nova River Fishway Access Road. The emphasis of the EPP is on maintaining water quality through erosion and sediment control, and minimizing disturbance to land use, wildlife, and habitat and it has been prepared to communicate this commitment to DFO staff, contractors, regulatory agencies and the public.

1.1 DFO Environmental Policy

DFO's Environmental Policy when planning and implementing projects and programs is to identify and resolve environmental issues based on Federal and Provincial legislation. DFO incorporates the environmental policy into all relevant processes and activities and in so doing protects the province's environment to the best of its ability. In an ongoing basis, DFO shall evaluate the environmental benefits and consequences of its activities and implement practices that eliminate or minimize negative environmental impacts.

1.2 On-Site Meetings

An on-site meeting with the Project Engineer and such other representative of DFO as may be required, the Contractor, and representatives of other agencies as required, will be held prior to the commencement of any work. Additional meetings may be held as required during the project.

1.3 Responsibilities

The primary responsibility for implementing environmental protection rests with the Contractor's Construction Supervisor. DFO's Project Engineer has the responsibility to: (1) ensure that the Contractor and its staff are fully aware of their obligations; (2) approve and monitor the Contractor's *Work Schedule*; (3) advise the Contractor on site-specific environmental and erosion and sediment control issues noted in the project EPP; and (4) ensure compliance with all provisions of the Project EPP and government approvals/authorizations.

The Contractor shall ensure that its employees and Sub-contractors comply with the conditions of the contract and with all applicable environmental laws and regulations of the various government authorities. The Contractor shall also ensure that such other rules and regulations as the Owner may establish for all work pertaining to this project within or outside of the road right of way are followed. The Contractor is referred to the following Environmental Guidelines regarding implementation of the Project EPP for construction procedures at watercourses, copies of which may be obtained from the Provincial Department of Environment and Conservation, Water Resources Division:

Chapter	Title
3	Watercourse Crossings
4	Bridges
5	Culverts
6	Fording
7	Diversions, New Channels, and Major Alterations
9	Pipe Crossings
13	General Construction Practices

The Contractor is required to designate a person responsible for environmental protection. This person will be familiar with the EPP and will be responsible for routine environmental inspection and monitoring, and the provision of verbal and written feedback to the Contractor's Construction Supervisor and the Project Engineer (or designated inspector).

DFO's Project Manager has the responsibility to provide the Project Engineer, and where appropriate the Contractor's Construction Supervisor, with timely advice on the implementation of the Project EPP for various segments of the project.

1.4 Organization and Use of the EPP

This EPP is to be used in conjunction with the following documents, and as such it forms part of the project contracts:

- Upper Terra Nova Fishway Temporary Access Road contract specifications
- Upper Terra Nova Fishway Construction Road Decommissioning contract specifications
- The Government of Newfoundland and Labrador, Department of Municipal and Provincial Affairs Construction Specifications

This EPP is organized as follows:

- **Section 1** provides DFO's Environmental Policy and details the responsibilities for implementing environmental protection measures;
- **Section 2** provides an overview of Environmental items of special consideration;
- **Section 3** provides detailed environmental protection measures to be followed during construction and decommissioning activities.
- **Section 4** provides detailed monitoring plans;
- **Section 5** provides contingency plans for issues that may be encountered during construction.

2.0 AREAS OF SPECIAL ENVIRONMENTAL CONSIDERATION

2.1 Wetlands and Watercourses

2.1.1 Wetlands

Wetlands are defined as land that has the water table at, near, or above the land surface, or which is saturated for long enough periods to promote wetland or aquatic processes (National Wetlands Working Group, 1988). Wetlands include bogs, swamps, and marshes. Wetlands are valuable natural resources providing habitat for a variety of wildlife and plant species, both aquatic and terrestrial. For these reasons, the preservation of wetlands through design and construction practices is of the utmost importance.

For the construction and decommissioning projects, the following practices will be used at wetlands to protect wildlife and habitat, and to minimize affects on drainage and water quality:

- (a) Travel on wetlands by equipment and personnel shall be avoided wherever possible;

- (b) Activities will be timed to coincide with low water levels where possible;
- (c) Crossings will be restricted to a single location and will occur perpendicular to and at narrow points on the wetland;
- (d) Crossings will be limited to the locations indicated on the contract drawings or as directed by site Engineer;
- (e) Equipment shall be in good working order and free of leaks. No equipment maintenance including fuelling shall be carried out within 30 m of a wetland.
- (f) To avoid spreading of invasive plant species, equipment that has been working with topsoil and vegetation prior to arriving on site, shall also be cleaned of mud and vegetation;
- (g) Excavation in wetlands shall be carried out by an excavator operating from a dry stable surface to minimize sediment generation;
- (h) Excavate only what is absolutely necessary to meet engineering requirements. Excavated material shall not be sidecast in the wetland;
- (i) In wetlands associated with cross drainage installations, grubbing shall be minimized by the placement of geogrid and geotextile prior to the placement of fill;
- (j) Vegetation will be retained where possible to provide wildlife habitat. Where applicable, no work near wetlands will be scheduled during the wildlife's breeding season;
- (k) Excavated wetland material shall be retained for placement during decommissioning contract to improve seeding success. Material may be stored at locations specified by the Project Engineer. Note that wetland material typically has a very high organic matter content that may require further mixing with inorganic solids prior to spreading;
- (l) Excavated material shall be replaced with approved fill material as soon as possible to minimize sloughing, over excavation and generation of sediment;
- (m) The fill material shall be clean, coarse fill material with less than 10% fines to minimize the generation of sediment to promote drainage;
- (n) Water control shall be maintained at all times. Water removed from the excavation shall be pumped to an approved sediment control measure (e.g., settlement pond, adjacent vegetated area or filter bag). The Contractor shall ensure that no discharge to adjacent watercourses will occur when total suspended sediment (TSS) concentrations exceed 25mg/L;
- (o) Ditches shall not drain directly to wetlands. Flows must be directed away from wetlands by take-off ditches for dissipation through adjacent vegetated areas.

2.1.2 Watercourses

Watercourses are defined as the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province whether it contains water or not. In-stream work is permitted only between June 1 and September 30 unless authorized by DFO.

DFO is committed to the protection of fish and fish habitat and has therefore designed all water crossings for this project to be temporary structures capable of being installed and removed with minimal instream activities required. General protection measure for watercourses are described in section 3 of this document.

2.2 Wildlife

Characteristic wildlife within the general area of the project includes waterfowl, raptors (birds of prey), caribou, moose, and various furbearers including a re-introduced population of Newfoundland martin.

2.2.1 General Protection Measures

The planning and design of the access road has been carried out with much emphasis on limiting the impact on wildlife habitat. The protection measures considered include:

- Utilizing an existing access road to limit new construction;
- Selecting a route that limited the distance through mature timber stands while also limiting the amount of wetlands encountered;
- Minimizing the road design with respect to limiting road right of way width and keeping roadway excavation and fill to a minimum.
- Using temporary bridges that eliminate in stream activities during construction and decommissioning.
- Limiting the start of construction and decommissioning activities to July to avoid the normal spring breeding season.
- Maintaining a minimum 30 meter natural vegetation buffer zone around all waterways and bodies of water to provide for waterfowl species breeding, molting and staging areas.

General Protection measures that apply during construction include:

- (a) Harassment of wildlife by project personnel will be prohibited;
- (b) All project personnel are required to abide by all protective regulations concerning waterfowl and raptors;
- (c) Fuel and other hazardous material spill contingency plans and emergency response measures will be in place and implemented in the case of an accident;
- (d) Construction vehicles will operate only in the ROW and any areas disturbed outside the right-of-way without the approval of the Engineer shall be rehabilitated at the contractor's expense and as directed by the Engineer;

- (e) Vegetation removal will be restricted to 10 m in the ROW;
- (f) Instream activity will be reduced or avoided;
- (g) Vehicles will be operated at appropriate speeds and yield to wildlife;
- (h) Site personnel shall not disturb, move or destroy migratory bird nests. If a nest or young birds are encountered, the contractor shall cease work in the immediate area of the nest and contact Project Engineer;
- (i) All refuse shall be disposed of at an approved landfill facility. Refuse stored on site prior to removal shall be stored in closed containers;
- (j) Report any nuisance wildlife to the Project Engineer or directly to the local wildlife office;

2.3 Habitat for Species at Risk and Rare Species

The environment registration document for this project has identified the pine martin as a species at-risk in the project area. To mitigate impact, the access road route has been selected to avoid as much as possible mature timber which is the prime pine martin habitat. However, in the event that designated at-risk species are encountered during construction, the Project Engineer and DFO's manager will be notified, and appropriate Federal and Provincial authorities contacted for advice. Designated species are listed on both Provincial and Federal government websites:

http://www.sararegistry.gc.ca/species/default_e.cfm
http://www.env.gov.nl.ca/env/wildlife/wildlife_at_risk.htm

2.4 Heritage Resources

Heritage resources include sites and artifacts of value for their archaeological or historic importance or interest. Mitigation is usually through avoidance.

Should any resources or human remains be encountered during construction, the Contractor shall follow the contingency procedures described in Section 5.2.

2.5 Areas with High Soil Erodibility

If soils are identified as having a moderate to high potential for erosion, the Contractor will be directed to take additional precautions with regards to erosion and sediment control which are detailed in Section 3.0.

3.0 ENVIRONMENTAL PROTECTION MEASURES

3.1 Work Scheduling

The purpose of a specified work schedule is to ensure that construction in any work area is carried out continuously from initiation to completion; to ensure orderly progression of the work; and to offer effective protection of the environment by minimizing both the time and amount of exposed soil on construction sites.

3.1.1 Work Areas

A “work area” is an area, defined by station changes, the limits of which shall be established by the Contractor with the approval of the Project Engineer prior to commencement of work. The size of the work area shall be determined with due consideration to the Contractor’s ability to complete all grading work, to the lines and grades shown on the plans, seeding and final slope protection within a specified time frame agreed to by the Engineer that would limit negative environmental effects.

3.1.2 Unforeseen Circumstances

If conditions are encountered in an active work area which requires extra care or work which the Contractor is unable to continue at that time, the Contractor will be allowed to open up additional work area(s) with the approval of the Project Engineer only after the original work area is temporarily protected, *i.e.*, straw/hay/compost/bark mulch.

Inconvenience to the Contractor, poor planning or not having adequate or appropriate equipment will not be considered unforeseen circumstances.

3.1.3 Non-Compliance

Once the grubbing operation within a specific work area has begun, work shall be continuous from grubbing through to completion. If after 30 calendar days work is not completed in a specific work area, then:

- (a) No additional work area(s) will be allowed to commence until these work areas are completed; and
- (b) All work areas will be immediately protected with straw/hay or compost/bark mulch.

If, in the Project Engineer’s judgement, there is non-compliance with EPP provisions, or if the Contractor receives a warning or citation from DFO, then corrective action may require a shutdown of construction activities, until such time as the non-compliance is satisfactorily corrected.

3.2 Erosion and Sediment Control

The Contractor shall minimize terrain disturbance and erosion resulting from its activities. The Contractor shall, as part of its work, implement erosion and silt control measures where its activities result in a blockage of natural drainage, the diversion of natural drainage, or the exposure of soil or subsoil to potential erosion. Particular measures may include:

- (a) Isolation of disturbed areas through the use of filter fabrics, fencing, or some other equivalent method directed towards prevention and/or control of runoff associated with a disturbed area before it enters a watercourse.
- (b) spreading hay over exposed soils.
- (c) spreading a thin layer of brush, grubbing material, or slash over disturbed areas.

- (d) the installation of baffles or sediment traps at appropriate intervals within the area of disturbance.
- (e) the installation of drainage collectors across the disturbed area to channel drainage into vegetated areas.
- (f) the stabilization of exposed soils at drainage locations with approved rip-rap.
- (g) the pumping of silted water to settling or designated vegetated areas.
- (h) the installation of mud basins of adequate size at run-off locations from exposed areas to contain heavy silt and mud as directed by the Engineer.
- (i) all mitigation measures shall be inspected on a daily basis and repaired as needed to ensure that they function properly.
- (j) the use of extended weather forecasts to ensure that environmental protection measures are designed to withstand storm events.

3.3 Clearing

Clearing work involves travel along the ROW, clearing of trees, piling of merchantable timber and the chipping of all non-salvageable material such as brush, slashings, limbs, fallen branches, and other surface litter. The primary concern during clearing is to prevent ground disturbance that may result in the sedimentation of watercourses and wetlands.

- (a) The clearing width will vary according to the extent of cuts and fills. Safety considerations will be balanced with the conservation of trees in determining the actual clearing limits. Limits will be agreed upon by Contractor and Engineer and marked with red ribbon and all cutting shall be restricted to areas within these limits.
- (b) Clearing for the ROW shall consist of the cutting of only those trees or areas delineated in the field by the Engineer. All “merchantable timber” as defined by the Forestry Division (9 cm (3.5 inches) outside bark diameter at breast height) shall be salvaged and removed from the site. Timber that is temporarily stored within the Right of Way shall be stockpiled outside the fill limits. All portions of the tree must be harvested up to a 5 cm (2.5 inch) top diameter with stump height not exceeding 16 cm (6 inches). Merchantable timber shall be the property of the Contractor.
- (c) All material shall be cut to within **150 mm** of the surface of the ground. All trees and brush shall be cut into lengths to ensure neat piling can be accomplished.
- (d) Slash shall be piled so that it will not damage vegetation outside the right-of-way. A **6.5 m** break in slash piles will be made at least every **200 m** (to allow for lateral drainage and animal access). Slash piles may be placed on alternating sides of the right-of-way.

- (e) Slash and other construction material or debris shall not be permitted within 30 m of any water body, to enter any watercourse, water body or wetland and shall be piled such that seasonal flood waters cannot reach them.
- (f) A ground vegetation buffer zone of 30.0 meters either side of all watercourses is to be maintained.
- (g) Any merchantable timber removed from the buffer zone shall be done in such a manner that does not result in disturbance of the surface or exposure of the underlying soil.

3.3.1 Disposal of Clearing Waste

Clearing waste can be used on side slope to control erosion or placed in windrows outside the ditching limits for use during the decommissioning contract. After the road is decommissioned, this organic clearing waste will be spread across the right-of-way surface.

3.4 Culvert Installation and Removal

This section is intended to cover the protection measures associated with culvert installation for cross drainage as required along the road route and subsequent removal during decommissioning activities.

3.4.1 General Protection Measures

The Contractor shall carry out work required for culvert installation and removal in the decommissioning contract, with due diligence and caution so as to prevent pollution, sedimentation and prevent any changes to existing water quality. The work is to be performed in accordance with the environmental provisions in the contract and as shown on the contract drawings.

The installation and removal of all cross road drainage culverts shall be carried out in the dry by diverting or pumping water around the construction area. Sedimentation basins shall be used to settle out sediment laden water where necessary or where so directed by the Engineer. The sedimentation basins shall be constructed in accordance with instructions from the Engineer.

The Contractor shall note that moving equipment through areas where significant surface drainage is encountered must be carried out in such a manner so as to prevent unnecessary disturbance of embankments or siltation of downstream areas.

Temporary bridging is preferred at such locations where frequent fording would normally be required. For information concerning fording activities, the contractor is referred to conditions as outlined in DFO's "Temporary Fording Sites, Factsheet No. 4" dated 1994.

3.5 Temporary Bridge Installation and Removal

Temporary bridge structures are to be constructed off site and as per the contract drawings and specifications and assembled at the job site during installation. In view of the sensitivity of stream crossings, the scheduling of construction activity at stream crossings in this project

will be generally restricted to the least sensitive period of June 30 to September 1. Any deviation from this scheduled period for conducting the work will require the Contractor obtaining prior approval in writing from DFO.

The Contractor shall be aware that the work required in and around all stream crossings shall be performed with due diligence and caution so as to prevent pollution, sedimentation or any damage to the streams and downstream areas. All work associated with the installation of crossing structures throughout the project shall be undertaken to prevent any change(s) to the existing water quality.

3.5.1 General Protection Measures

- (a) Prior to the commencement of any work associated with the temporary bridging an on-site meeting shall be arranged between the Project Engineer, DFO manager and the Contractor to discuss the installation/removal procedures;
- (b) The Contractor shall adhere to any further stipulations discussed and agreed to by the approved parties as a result of the above on-site meeting. These stipulations shall form part of the Contract;
- (c) A 30 meter buffer zone shall be identified with flagging and maintained on both sides of each watercourse within which no grubbing or filling is to take place until drainage structures and erosion control devices are installed, with the exception of the access road footprint;
- (d) During installation and removal operations, equipment must operate from dry stable ground and avoid undue disturbance to the stream side vegetation or destabilization of embankments;
- (e) Work should be carried out from the downstream section of work and progress to the upstream section.
- (f) Any material excavated along the embankments shall be removed and stockpiled away from the watercourse.
- (g) After removal of structures during decommissioning all disturbed areas adjacent to the watercourse shall be rehabilitated and stabilized as outlined in the contract drawings and specifications.

3.6 Grubbing

Grubbing is the removal of all organic material and unsuitable soil above the underlying subsoil. It also consists of the removal and disposal of all stumps, roots, downed timber, embedded logs, humus, root mat and topsoil from areas of excavations and embankments or other areas as directed by the Project Engineer. Grubbing will be carried out in accordance with the project specifications and drawings.

3.6.1 Protective Measures

- (a) Grubbing limits will be established in the field by the Engineer and Contractor with the intention of limiting the grubbing area to the minimum required to construct the road top and ditching. *The Contractor may be directed to salvage and store live plant material for use along exposed slopes or near stream crossings.* Grubbing operations shall be confined to those portions of the route immediately in advance of other road construction operations, the objective being to limit the exposure of large areas of erodible soils for long periods of time. **Grubbing shall not advance more than 0.5 km beyond fill operations.**
- (b) Where directed by Engineer topsoil shall be stripped, stockpiled, or otherwise secured, to isolate and prevent any runoff from entering an adjacent watercourse. **This grubbing material should not be placed in push lanes but put temporarily along the edge of the ROW for reclamation purposes. This grubbing will be used during decommissioning of the roadway to encourage rapid regeneration of indigenous vegetation.**
- (c) Filter fabric fencing constructed of a suitable woven geotextile shall be erected at the bottom of cuts and at the lower sections of grubbed areas to prevent the migration of soils, where directed by the Engineer. This fencing will need to be carefully placed as outlined in the contract specifications monitored to ensure proper placement, and removed after the site has been completed.
- (d) Grubbing shall not be carried out in any stream, tributary to a stream, any identified and flagged temporary buffer zone or in any location where water is flowing unless approved by the Engineer.

3.7 Grading

Grading for the purposes of the EPP includes the excavating, transporting, disposing or placement of materials within the limits of the work. Grading includes rock and overburden cut and fills, ditch excavation, and sloping and shaping of embankments. It is during these operations, that result in the exposure of large areas of soils, that road construction has the highest potential for erosion.

The most effective and widely used erosion control practices used to minimize erosion include: strict adherence to the Work Schedule, sediment barriers, straw/hay/compost/bark mulch, and diversion of natural drainage. During decommissioning erosion control will also involve the use of erosion control blankets, re-vegetation, and right-of-way surface cross drains.

3.7.1 Protective Measures

The Contractor shall minimize terrain disturbance and erosion resulting from its activities. The Contractor shall, as part of its work, implement erosion and silt control measures where its activities result in a blockage of natural drainage, the diversion of natural drainage, or the exposure of soil or subsoil to potential erosion. Particular measures may include, but are not limited to, the following:

- (a) isolation of disturbed areas through the use of filter fabrics or some other equivalent method directed towards prevention and/or control of runoff associated with a disturbed area before it enters a watercourse;
- (b) spreading hay over exposed soils;
- (c) spreading a thin layer of brush, grubbing material, or slash over disturbed areas.
- (d) the installation of baffles or sediment traps at appropriate intervals within the area of disturbance;
- (e) the installation of drainage collectors across the disturbed area to channel drainage into vegetated areas;
- (f) the re-routing of disturbed drainage courses back into the natural course;
- (g) the stabilization of exposed soils at drainage locations with appropriate rip-rap;
- (h) access road ditching to be installed and maintained during construction with take-off ditches being constructed to direct the runoff to drain through natural vegetation before it reaches any watercourse;
- (i) the pumping of silted water to settling or designated vegetated areas;
- (j) after decommissioning of roadway re-vegetate areas as indicated in contract specifications.
- (k) all mitigation measures shall be inspected on a daily basis and repaired as needed to ensure that they function properly.
- (l) the use of extended weather forecasts to ensure that environmental protection measures are designed to withstand storm events.

3.8 Stabilization

Stabilization includes those measures applied to finished slopes and ditches as part of permanent erosion protection. These measures include: surface roughening; placement of straw/hay, compost, bark mulch, erosion control blanket and seeding. Stabilization will be undertaken in a timely manner, during construction and concurrent with decommissioning.

3.8.1 Surface Preparation

During construction the surface preparation shall include the scarification of the surface to minimize runoff velocities and placement of coarse grained erosion resistant soils.

During decommissioning activities, the surface of all slopes in the right-of-way will be prepared by placing organic soils on the surface of the recontoured slopes. The specified areas will be seeded and all brush and organic debris will be spread over the surface.

3.8.2 Re-Vegetation

During the decommissioning contract, emphasis will be placed on re-vegetation activities to reinstate the project work area and to provide long term erosion control. Specific areas for seeding and seedling re-vegetation are identified on the contract drawings. All seed mixtures and seedlings shall consist of native species as approved by the Engineer and planting procedures shall be as outlined in the latest edition of the Provincial Department of Municipal Affairs Master Construction Specifications. The Contractor shall not carry out this work under adverse weather conditions such as high winds, heavy rainfall or in standing water.

Areas where the road was constructed across wetlands requires complete removal of all imported fills and geogrid/geotextile materials. These materials must be removed in such a manner to avoid undue disturbance of the existing underlying root mat and thus facilitate the natural regeneration of these wetlands.

At the beginning and end of heavily wooded areas along the road route, re-vegetation and natural rock barriers will be put in place to discourage access to these areas by ATV's. The re-vegetation will consist of a combination of planting native tree seedlings, machinery re-planting of established native trees, and native grass seed. The specifics of this re-vegetation is to be further detailed in the decommissioning contract.

Where directed by the Engineer specific areas, such as at some stream crossings, may require special methods of stabilization involving the removal and relocation of clumps of any natural vegetation mat present or returning grubbing material to the site. At such locations the Contractor will be directed to set aside such clumps of vegetation and/or grubbing material during grubbing operations or at the start of the crossing installation. The owner will inspect all re-vegetated areas periodically to ensure that adequate results have been achieved. Additional re-vegetation work will be undertaken if the desired results are not achieved upon direction from the Engineer.

3.9 Borrow Areas

- (a) Borrow materials will come primarily from proposed road cut areas or the widening of these areas within the R.O.W. If additional borrow material is required from a site outside the right-of-way, it shall be a site which is approved by the Mineral Lands Division Provincial Department of Natural Resources. All existing borrow areas shall be used wherever possible and the Engineer must approve all borrow areas for subgrade material.
- (b) The development and operations at new quarry areas used during construction shall also be carried out according to all relevant federal and provincial acts and regulations.
- (c) The development of borrow areas shall be controlled so as to minimize potential environmental damage. The following procedures shall be implemented by the Contractor when using borrow areas:
 - i. The area to be excavated shall be clear cut of all vegetation prior to the removal of any borrow material;

- ii. All stumps, organic material and topsoil shall be stripped from the area to be excavated, segregated, and stockpiled at least **5 m** from undisturbed areas ensuring it is not pushed onto the surrounding trees or vegetation; stockpiled strippings will be kept at least **5 m** from the area of excavation;
- iii. Upon completion of excavation, the area disturbed shall be graded to slopes no steeper than 2:1.
- iv. Following sloping, the grubbing, topsoil and any organic materials shall be re-spread over the disturbed area;
- v. Borrow areas no longer used shall be rehabilitated to permit rapid re-vegetation and to prevent erosion and sedimentation. If necessary, seeding shall be carried out as directed by the Engineer using an approved seed mixture.
- vi. Borrow area rehabilitation must be completed once a site is not used for more than **6 months** or within **1 month** of abandonment. A site in use must have sediment control ponds and erosion protection measures in place if it remains in operation for more than 3 months.

3.10 Dust Control

The Contractor shall implement dust control measures as required by the Project Engineer. Only water shall be used for dust control. The use of chemicals for dust control on this project is prohibited.

Further advice is provided in a new Environment Canada guideline "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (March 2005).

3.11 Noise

The only regulatory requirements for noise control are embodied in municipal by-laws, and these are primarily for construction and nuisance noise to the public. Given the location of this project the normal construction noise should pose no concerns to the public.

Construction noise can affect wildlife and although the effects will probably be short term and transient in nature, the following protective measures will be enforced:

- The Contractor will be responsible to operate equipment with efficient muffling devices and maintain all equipment in good working order to minimize noise levels.
- All stationary noise sources shall be located as far as possible from sensitive wildlife habitat
- Equipment shall not be left idling while in stand-by mode

3.12 Storage, Handling and Transfer of Fuels and Other Hazardous Material

All necessary precautions to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials shall be taken. All Acts and Regulations pertaining to special substances shall be followed. The delivery, storage, use and disposal of these hazardous materials will be handled only by trained personnel in accordance with government laws and regulations. In the event of a spill, follow the procedures detailed in section 5.1.

The following precautions will be taken:

- (a) Equipment used will be mechanically sound with no oil or gas leaks. The Contractor shall undertake frequent inspection of equipment and repair leaks immediately;
- (b) Fuelling, storage and servicing of vehicles and construction equipment is not allowed within 100 m of a watercourse, drainage ditch, areas with a high water table, or exposed and shallow bedrock;
- (c) Spill clean-up materials shall be accessible and maintained in the areas of fuel and chemical storage. Any spilled fuel or lubricants shall be handled as outlined in Section 5.1.
- (d) No equipment shall be washed within 100 m of a watercourse or wetland;
- (e) Storage of petroleum products is not allowed within boundaries for water supply watersheds or designated environmentally sensitive areas. Lubricants, hydraulic fluid, grease, gasoline, diesel or other fuels will not be stored within 100 m of any watercourse;
- (f) All tanks shall be protected from collision damage by the use of snow fencing to alert operators, or by the placement of barriers to impede equipment movement near the tank;
- (g) Handling and fuelling practices shall ensure that contamination of groundwater will not occur;
- (h) Fuel storage areas and transfer lines shall be clearly marked or barricaded to prevent damage from vehicles;
- (i) If drums are stored on their sides, the drums shall be stored so that the bungs are in the "9 and 3" position, on level ground and prevented from rolling;
- (j) Drum storage areas shall be marked or fenced with temporary fence to avoid impacts;
- (k) Day-use quantities can be stored upright or on the side as required. Drip pans lined with absorbent pads shall be used beneath taps;

- (l) All stained soil resulting from the use of chemicals or fuels shall be cleaned-up and disposed of prior to leaving the work area; and
- (m) Waste oils and lubricants will be retained in a closed container, and disposed of in an environmentally acceptable manner.
- (n) Any maintenance such as hydraulic line repairs or similar work shall be carried out by using suitable fluid collection equipment and in a manner which ensures all waste material is collected and suitably disposed of. The Contractor shall ensure that all equipment is mechanically sound to avoid leaks of grease, oil, diesel, gasoline, and hydraulic and transmission fluids. The Contractor shall ensure that no servicing or washing of heavy equipment occurs within **100 m** of a watercourse or designated wetland except within a refueling site approved by the Owner. Such a site will provide containment for accidentally spilled fuels and ensure proper disposal of all waste oil, filters, containers or other such debris in a manner approved by the Provincial Government Services Center.

3.13 Waste Management

- (a) Recyclable materials and materials banned from landfills (paper, cardboard, drink containers, wood, scrap steel, paint, metal and tires) will be collected separately for recycling;
- (b) There shall be no burning of wastes generated on the site;
- (c) Domestic waste from site offices and camps including food waste shall be gathered daily and stored in closed steel containers for removal and disposal at an approved waste disposal site;
- (d) Non-recyclable non-hazardous construction wastes shall be removed from site on an as required basis for disposal at an approved waste disposal site;
- (e) Rags used in equipment maintenance and other potentially combustible materials will be kept in a container separate from the above materials until the combustible material can be removed from site for disposal;
- (f) Waste oils and lubricants will be stored in a labeled tank or drum and disposed of in a disposal facility approved for receiving liquid industrial wastes; and
- (g) Solvents, acids and caustic liquid waste will be collected separately and stored for removal and disposed by a waste management company specializing in liquid and hazardous wastes.

4.0 MONITORING AND INSPECTION

There are two general types of monitoring which are considered in determining the environmental impact of activities and the effectiveness of mitigation measures: environmental compliance monitoring (ECM) and environmental effects monitoring (EEM). Compliance monitoring assesses adherence to environmental regulations. Effects monitoring assesses the accuracy of predictions and the effectiveness or proposed mitigation measures.

ECM and EEM programs will be implemented by DFO to ensure that pre-construction commitments are fulfilled; that the highway is constructed and decommissioned to the satisfaction of all stakeholders, including regulatory authorities; and that public health, safety, and the environment are protected during all work procedures.

4.1 Environmental Compliance Monitoring

This is a process whereby DFO will conduct monitoring to ensure compliance with the EPP, regulatory requirements, conditions of approvals, permits, letters of advice, authorizations, and environmental commitments through regular inspections of construction and operational activities.

The overall responsibility for DFO's compliance monitoring will rest with the Project Engineer who will ensure that daily records of site visits by regulators, incidents of non-compliance and public complaints, etc are recorded. The Project Engineer will also be responsible for the day to day field monitoring and for ensuring that the EPP specifications are enforced and implemented by the Contractor.

The Contractor is responsible for performing their own inspections and monitoring daily to confirm compliance with environmental requirements. They will adjust and deploy mitigation measures based upon observations made and upcoming scheduled events. The contractor's representative will participate during my environmental compliance inspections performed by outside agencies. They will also be expected to participate in inspections performed by DFO representatives and Engineer for environmental compliance. The project EPP and all external environmental standards (i.e., legislation and authorizations) will be used as a basis to monitor compliance.

4.2 Environmental Effects Monitoring

Through general effects monitoring DFO will determine if impacts occur and if so, do they occur at predicted levels. Effects monitoring will provide a measure of the validity of the predictions and provide a means of assessing and re-evaluating whether or not mitigation has achieved its purpose.

DFO will conduct periodic inspections of any borrow sites and all stream crossings and during the full construction and decommissioning periods of the project, DFO will monitor and record any incidents pertaining to wildlife, migratory birds, and fish and any incidents or matters pertaining to soil and water contamination.

The Contractor shall monitor the operation of Contractor-controlled equipment used during the construction phase to ensure it is in good operating condition to ensure noise levels are kept to normal construction levels.

Dust will be monitored visually both by the Contractor and by the Project Engineer and if required, the Project Engineer will provide advice concerning dust control methods. The Project Engineer will carry out visual monitoring of watercourse crossing sites and down stream areas when construction of watercourse crossings are underway to ensure that the Contractor's construction procedures and methods of operation are not resulting in pollution and/or siltation of adjacent or downstream areas.

5.0 CONTINGENCY PLANS

5.1 Chemical and Fuel Spills in the Event of a Hydrocarbon Spill

All spills are to be reported directly to the Project Engineer and in the event of the detection of a fuel or hazardous material spill of **70** litres or more the Contractor and Subcontractors shall abide by the following measures:

- (a) make every effort to stop leakage and contain contaminant flow;
- (b) **immediately** upon detection, report spill location and size to the Canadian Coast Guard spill report number **772-2083** or **1-800-563-9089** and the Resident Engineer/ESO, follow up with a full written report containing information on the cause of the spill, remedial action taken, damage or contamination estimate, and any further action to be taken;
- (c) remove contaminant from spill site by absorbent, pumping, burning, or whatever method is appropriate and acceptable to Owner. Clean up the affected area in accordance with the requirements of the Government Services Centre and then dispose of contaminated debris at an approved waste disposal site.
- (d) take all necessary action to ensure the incident does not recur.

It is required for all spills regardless of volume that may enter waters frequented by fish to be reported to the Spill Line 709-772-2083 or 1-800-563-9089.

The Contractor shall apply the following criteria in reaching decisions on contaminant and clean-up procedures:

- (a) minimize danger to persons;
- (b) minimize pollution to watercourses and wetlands;
- (c) minimize the size of the area affected by a spill; and
- (d) minimize the disturbance to the area and watercourses during clean up.

The above procedures shall also be followed in the event of a spillage of less than 70 litres excepting that a spill of this magnitude is not required to be reported to the Canadian Coast Guard. Any spillage of hydrocarbon product must be reported immediately to the Project Engineer.

5.2 Heritage Resources

The Contractor shall be aware that the Provincial Archaeology Office of the Dept. of Tourism and Culture, requests that all parties involved with fieldwork be advised on the provisions of the Historic Resources Act (1985) protecting archaeological sites and artifacts, and procedures to be followed in the event that either are found:

Section 10(1) – A person who discovers an archaeological object in, on, or forming part of the land within the province shall report the discovery forthwith to the Minister stating the nature of the object, the location where it was discovered and the date of the discovery.

Section 10(2) – No person, other than the one to whom a permit has been issued under the Act, who discovers an archaeological object shall move, destroy, damage, deface or obliterate, alter, add to, mark or in any other way interfere with, remove or cause to be removed from the province that object.

Section 11(1) – The property in all archaeological objects found in, on, or taken from the land within the province, whether or not these objects are in the possession of Her Majesty is vested in Her Majesty.

Should any archaeological remains be encountered, such as stone, bone or iron tools, concentrations of bone, fireplaces, house pits and/or foundations, all work in the area of the find shall cease immediately and contact shall be made with the Provincial Resource Archaeologist (729-2462) as soon as possible. DFO through the Resident Engineer shall be notified immediately upon discovery of any historic resources.

5.3 Contaminated Sites

In the event that buried debris or contaminated soil is encountered during road construction, the following procedure shall be followed:

- (a) On detection, cease excavation activity in the area of the discovery and contact the Project Engineer. Under no circumstances shall the material be excavated without authorization of the Project Engineer;
- (b) The Project Engineer or a representative of DFO's Environmental Services Section will visually inspect the material to assess potential for hazardous materials;
- (c) If hazardous materials are suspected, the Project Engineer shall obtain samples following safe sampling practices;
- (d) Contaminated soil or debris containing regulated material, suspected asbestos containing material, or other hazardous materials, shall be covered until a management plan is developed and a contractor appropriately trained in the handling of hazardous materials is retained; and
- (e) The Project Engineer shall consult with the Provincial Environment Department on the appropriate clean up program and disposal requirements.