

FISHERIES AND OCEANS
CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) 2012
PROJECT EFFECTS DETERMINATION REPORT

GENERAL INFORMATION

1. Project Title: Rocky River Fishway Enhancement, Colinet, NL	
2 Proponent: Fisheries and Oceans Canada, Real Property Safety and Security	
3. Other Contacts (Other Proponent, Consultant or Contractor): Public Works and Government Services Canada	4. Role: OGD Consultant
5. Source of Project Information: Cyril Bannister, Project Officer, DFO -RPSS	
6. Project Review Start Date: December 12, 2016	
7. DFO File No.:	8. PWGSC File No:
9. TC File No.:	

BACKGROUND

10. Background about Proposed Development (including a description of the proposed development):

Fisheries and Oceans Canada, Real Property, Safety and Security (DFO RPSS) propose to enhance the existing Rocky River Fishway in Colinet, by constructing an attraction flow system.

PROJECT REVIEW

11. DFO's rationale for the project review:

Project is on federal land ☒ and;

☒ DFO is the proponent

☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit

☐ DFO to provide financial assistance to another party to enable the project to proceed

☐ DFO to lease or sell federal land to enable the project to proceed

☐ Other

12. Fisheries Act Sections (if applicable): n/a

13. Other Authorities

Newfoundland and Labrador Department of Environment and Conservation (DOEC)

14. Other Authorities rationale for involvement:

Water Resources Act – Section 48

15. Other Jurisdiction: N/A

16. Other Expert Departments Providing Advice:

Environment Canada

Fisheries and Oceans Canada

17. Areas of Interest of Expert Departments:

Environment Canada Migratory
Birds/Species at Risk, Fisheries
and Oceans Canada, Fisheries
Protection Program

18. Other Contacts and Responses: N/A

19. Scope of Project (details of the project subject to review):

Project Description

Construction/Installation:

The Rocky River Fishway, located in Colinet, is property of the Department of Fisheries and Oceans – Real Property Safety and Security (DFO-RPSS). The fishway was originally built in 1940 and was reconstructed in 2014. DFO-RPSS is proposing to install diversion walls that will increase water flow to attract passage of salmon.

DFO-RPSS are adding an attraction flow system to the recently upgraded fishway. The attraction flow system will collect water that passes over the rocky falls adjacent to the fishway and divert it to the base of the fishway. This system will increase the volumetric flow and should attract more migrating salmon to the entrance of the fishway.

The fishway enhancement project will consist three (3) new concrete diversion walls and about 40 meters of a flow system pipe. The diversion walls will be placed upstream from the fishway in a configuration that will guide the water flow along the western bank of the river towards the intake of the attraction flow pipe. Diversion Wall #1 will be placed furthest upstream and will replace an existing armourstone diversion wall. Diversion wall #2 will tie into an existing concrete wall that extends from an existing concrete pier of the overlying bridge. Diversion wall #3 will tie into the existing fishway chute and will house the intake of the attraction flow pipe and a section of stop logs to be used to control water level. Refer to Appendix B & Appendix A (Figure 2) for detailed positioning of diversion walls. The diversion walls will be constructed of reinforced concrete and scribed to the bedrock of the riverbed. The diversion walls will be secured by rebar rock anchors that will be drilled and pressure grouted.

The attraction flow pipe will take in water at the top of the fishway and discharge it at two locations at the base of the fishway (i.e. the fishway pool and the entrance of the fishway chute). The HDPE attraction flow pipe system will have a diameter of 300 mm and will include all necessary fittings, connections, valves, wyes, screen caps and pipe hold downs. The first 10 meters of pipe will have a new concrete footing base and be secured by pipe hold downs. The middle section (length of approximately 24 m) will be totally encased in concrete and the lower section (~ 10 m) will be secured with tie downs to existing concrete.

At this point in time it is known that there will be some level of in water work. The project will likely proceed as follows:

- Installation and maintenance of temporary dewatering devices and structures to allow for work in dry condition (e.g. sandbags, bypass pumping and/or construction of settling pond).
- Construction of formwork for new reinforced concrete diversion walls that will be rock anchored into the underlying bedrock
- Removal of all loose and fragmented rock to expose a competent bedrock surface to set concrete for the diversion walls. This may also include some cutting or jackhammering to facilitate the shear key of the diversions walls. Although unlikely, blasting maybe involved.
- Installation of new stop logs, complete with steel guides and sill plate in new diversion wall

- Installation of new attraction flow pipe, complete with concrete leveling base, concrete encasement, pipe hold downs, fittings and other related items
- Concrete will be poured into formwork and allowed to settle.
- Clean-up of site and restoration of site to original condition.

Equipment used to carry out the required project activities will likely include: excavator, backhoe, dumptruck, boom truck, concrete truck, generators, and typical hand tools such as drills, hammers, cement mixers, etc.

Construction is planned for the winter of 2017 and may take place over two years. DFO RPSS policy is to conduct the fish way enhancement construction outside of salmon and brown trout migration periods.

To assist in describing the proposed project, a photograph outlining the major components of the project is available in Appendix A – Figure 2.

Decommissioning

This structure is not presently planned to be decommissioned. At the time of decommissioning, DFO-RPSS will develop a site-specific re-use or reclamation plan that is appropriate for the applicable environmental legislation and Fisheries and Oceans Canada policies.

Scheduling

Subject to regulatory approval. This project is considered a priority for DFO-RPSS planned to commence during the Winter of 2017.

20. Location of Project:

Rocky River is located close to the town of Colinet. The community is situated within Colinet Arm of St. Marys Bay on the Avalon Peninsula. The project site can be accessed from Salmonier Line (Route 91). The project coordinates are 47°15.543'N, 53°26.679'W

21. Environment Description:

The proposed project site is located at the Colinet Rocky River which is on the tip of the northwest arm St. Mary's Bay on the Avalon Peninsula of the island of Newfoundland. The Rocky River is a salmon river.

The existing fishway is a Denil Fishway and consists of a linear prefabricated channel with closely spaced baffles at regular intervals angled against the direction of flow. Between the baffles a backflow is formed, dissipating energy of the flowing water, resulting in a relatively low velocity near the bottom. This allows fish to migrate through the channel.

The fishway is approximately 50 m long and pools are divided by chutes which are notched at the top to allow fish passage. Each pool measures around 3.0 m in length and 3 m in width.

The fishway is located at the mouth of the Rocky River and encompasses a gross drainage area of approximately 300 km². The project site is located atop exposed sedimentary bedrock with continuous cleavage structure. The site is accessible by road through the community of Collinet (Route 91). An existing wooden stairway leads down to the fishway. Aerial photographs and a topographical map are attached (Appendix A).

Species at Risk (Aquatic and Terrestrial)

A search of the Atlantic Canada Conservation Data Centre (ACCDC) database was conducted which produced a list of rare/unique species (i.e. plants and animals) within a 5 km buffer zone (standard ACCDC procedure) of the site of the proposed work. All species were cross-referenced with Schedule 1 of the Species At Risk Act (SARA) and none were found to be listed as extirpated, endangered, threatened or of special concern. The following species at risk (as listed on Schedule 1 of the Species at Risk Act) may occur within the study area: Olive-sided flycatcher (Threatened) and Red Crossbill (*Percna* subspecies, Endangered). Though unlikely to be found within the project footprint, these species may occur within the study area and we request that sightings be reported to ECCC-CWS. Recovery Strategies and Management Plans for SARA-listed species can be obtained at <http://www.sararegistry.gc.ca>.

22. Scope of Effects Considered (sections 5(1) and 5(2)):														
Table 1: Potential Project / Environment Interactions Matrix														
	As per Section 5(1)			Section 5(1c)				Section 5(2)			Due Diligence			
				Aboriginal Interest										
Project Phase / Physical Work/Activity	Fish (Fisheries Act)	Aquatic Species (SARA)	Birds (MBCA)	Health and Socio economic	Physical and cultural heritage	Land use	*HAPA Significance	Health and Socio economic	Physical and cultural heritage	*HAPA Significance	Water (ground, surface, drainage, etc)	Terrestrial / Aquatic Species	Soil	Air Quality
Construction/Installation														
Dewatering of Construction Site	P	-	P	-	-	-	-	P	-	-	P	P	P	P
Formwork Installation	P	-	P	-	-	-	-	P	-	-	P	P	P	P
Debris Removal/Rock Drilling/Potential Blasting	P	-	P	-	-	-	-	P	-	-	P	P	P	P
Concrete Pour	P	-	P	-	-	-	-	P	-	-	P	P	P	P
Operation / Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decommissioning / Abandonment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*structure, site or thing that is of historical, archaeological, paleontological or architectural significance. Legend: P = Potential Effect of Project on Environment; ' - ' = No Interaction														

23. Environmental Effects of Project:

Potential Project/Environment Interactions and their effects are outlined below:

Fish:

- Accidental discharge of heavy machinery fuel/fluids or hazardous substances could negatively impact fish and potential fish habitat.
- Excavation activities (e.g. removal of loose rock) can result in a direct serious harm to fish habitat.
- Blasting activities can result in a direct serious harm to fish.
- Sedimentation events, as a result of working along a steep embankment, pumping activities, and cofferdam placement, may impact fish life cycle.
- Cement production may result in a release to the waterbody, thus impacting fish life cycle (e.g. changes in pH and visibility)

Birds (MBCA):

- Any type of hydrocarbon spill could result in the oiling of birds and their habitat.
- Noise / fumes may result in birds avoiding the site and surrounding area.

Health and Socio economic:

- Changing the design of the existing fishway has the potential to impact the number of tourists that visit the site.

Water:

- Construction related refuse may be deposited in water-body, decreasing water quality.
- Accidental discharge of heavy machinery fuel/fluids or hazardous substances (e.g. concrete washwater) may result in a decrease of marine water quality.
- Construction activities taking place near the shoreline may result in run off / erosion.
- Natural events (e.g. heavy rainfall) may increase the potential for a sedimentation event.

Aquatic/Terrestrial species:

- Accidental discharge of heavy machinery fuel/fluids or hazardous substances (e.g. Concrete washwater) could negatively affect terrestrial/aquatic species in proximity to the project location.
- Improper management of waste material could result in contamination of soil.

Soil:

- Construction activities at site or natural events (e.g. rainfalls) could result in erosion / sedimentation events.
- Hydrocarbon spills could result in contamination of soils.

Air quality:

- Construction activities may result in nuisance impacts due to noise and dust to residents and wildlife.

24. Mitigation Measures for Project (including Habitat Compensation):

Work should be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) are to be used, as appropriate, to prevent erosion and release of sediment and/or sediment laden water during the construction phase.

Mitigation measures taken from the Fisheries and Oceans website must be adhered to in order to reduce or eliminate any potential impact to fish and fish habitat.

These **Measures to Avoid Causing Harm to Fish and Fish Habitat** may be found in Appendix D or at:

<http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>

Time work in water to respect timing windows (refer to DFO response in Appendix C) to protect fish, including their eggs, juveniles, spawning adults and/or organisms upon which they feed.

If blasting is required, the contractor/proponent should consult with DFO FPP to develop a proper blasting plan

All drainage and wash water from concrete production should be properly contained and should not drain into the river environment.

If there is any run off of concrete or associated water, it should be directed to a drainage control device such as a settling pond and appropriately managed. No concrete run off is allowed to enter the water.

Environment Canada has provided advice on the concrete production (Appendix C) which must be followed during activities. It should be noted that any release of a deleterious substance can result in harm to fish and migratory birds and may be in contravention of the Canadian Environmental Protection Act.

Should migratory bird nests be encountered during project activities, work should be minimized to avoid any potential disturbance to any nest site and surrounding environment and EC should be contacted.

Mitigation measures must be implemented to eliminate any potential sedimentation events (e.g. installation of a turbidity barrier, construction of sediment ponds, etc.).

DFO RP should consult with community groups, more specifically the St. Mary's Development Association.

All construction equipment must be fitted with standard and well-maintained noise suppression devices. Appropriate dust suppression methods are to be employed when required. Air filters should be used to minimize exhaust emissions.

All wastes must be recycled where possible or otherwise disposed of appropriately.

Machinery must be checked for leakage of lubricants or fuel and must be in good working order.

Refueling must be done at least 100m from any water body. Basic petroleum spill clean-up equipment should be on-site. All spills or leaks should be promptly contained, cleaned up and reported to the 24-hour environmental emergencies report system (1-800-563-9089). The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event.

The proponent must ensure that all waste material will be disposed of in an environmentally acceptable manner in accordance with applicable Provincial Regulations.

Exercise care so as not to obstruct or damage public or private property in the area.

In addition to the above mitigations, the owner (DFO RPSS) has obtained the necessary permits for the proposed project. The conditions of each of these approvals are available in Appendix C and must be adhered to. These include:

1. Environment Canada provided information to support the environmental management process with respect to legislation falling under the auspices of EC (EAS 2014-012). The original EC response (2014) was used for this project as agreed upon by EC and PSPC. It should be noted that some of the contact names within EC have changed, but the general phone numbers and email addresses are still valid.
2. Department of Environment (NL) Permit to Alter a Body of Water.
3. Transport Canada were consulted. Rocky River is not a scheduled waterway and as per the Navigational Protection Act (NPA), the proposed project has been "Opt Out".
4. Fisheries and Oceans Fishery Protection Program provided advice.

These approvals are attached and all conditions/mitigation measures must be reviewed and implemented by the contractor.

The proponent should ensure that copies of all regulatory approvals are available on-site during project activities.

25. Significance of Adverse Environmental Effects of project:

Significant adverse environmental effects are unlikely, taking into account mitigation measures.

26. Other Considerations (Public Consultation, Aboriginal Consultation, Follow-up)

Public Consultation

DFO RP has consulted with various federal departments through the CEAA 2012 process. It is recommended, as per the mitigations (section 24) that relevant fisher groups or organizations be contacted prior to work start up in order to properly inform and to receive any relevant feedback.

Aboriginal Consultation

Aboriginal fishers are not known to utilize the DFO-RPSS property, nor are there any known aboriginal groups in the surrounding area. As such, aboriginal consultation was not deemed necessary as part of this determination.

Government Consultation

Federal and provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services, during the course of this assessment. A project description was distributed to the following authorities:

- Environment Canada – Migratory Birds/SARA.
- Department of Environment and Conservation (NL) – Permit to Alter a Body of Water
- Fisheries and Oceans Canada – Fisheries Protection Program

It is the proponents' responsibility to ensure that appropriate mitigation measures are adhered to.

Accuracy and Compliance Monitoring

A follow-up program (as defined in S. 2(1) and as applicable to non-designated projects on federal lands) is a program for determining the effectiveness of any mitigation measures. Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

27. Other Monitoring and Compliance Requirements (e.g. *Fisheries Act* or *Species at Risk Act* requirements)

A *Navigation Protection Act* approval may be issued for this project. The proponent is required to adhere to any conditions stipulated within the permit.

CONCLUSION

28. Conclusion on Significance of Adverse Environmental Effects:

The Federal Authority has evaluated the project in accordance with Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the department has determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigative measures as outlined.

29. Prepared by:

30. Date: January 9, 2017

31. Name: Shawn Kean

32. Title: Senior Environmental Specialist, PWGSC-ES

DECISION

33. Decision Taken

- ☒ DFO may exercise its power, duty or function, i.e. may issue the authorization - where the project is not likely to cause significant adverse environmental effects. Confirm below the specific power, duty or function that may be exercised.
- ☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit
 - ☒ DFO to proceed with project (as proponent)
 - ☐ DFO to provide financial assistance for project to proceed
 - ☐ DFO to provide federal land for project to proceed
- ☐ DFO has decided not to exercise its power, duty or function because the project is likely to cause significant adverse environmental effects.
- ☐ DFO to ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances

34. Approved by: _____

35. Date: _____

36. Name: Cyril Bannister

37. Title: Project Officer, DFO-RPSS, NL

38. References: n/a

APPENDICES

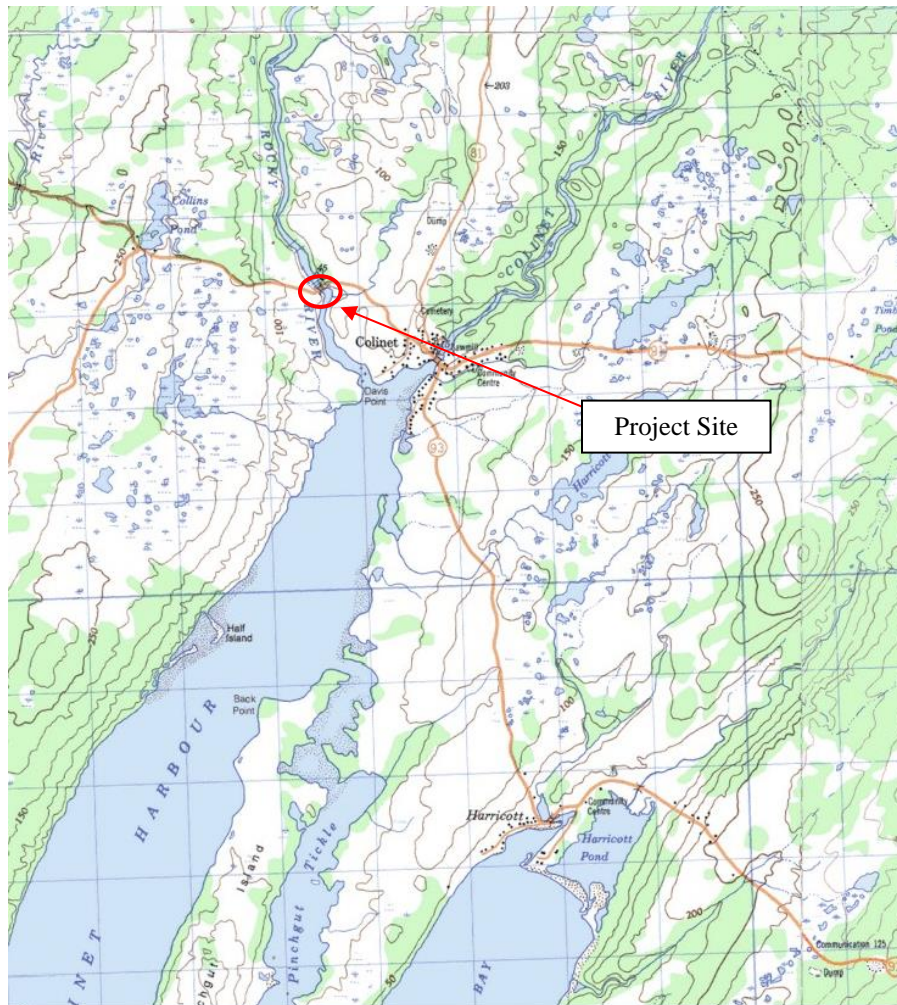
Appendix A - Topographic Map and Aerial Photographs

Appendix B: Site Plan

Appendix C: Regulatory approvals/responses

Appendix D: Measures to Avoid Causing Harm to Fish and Fish Habitat

Appendix A
Topographic Map and Aerial Photo



Description

Figure 1: Topographic Map of Proposed Site
Location: Colinet, NL

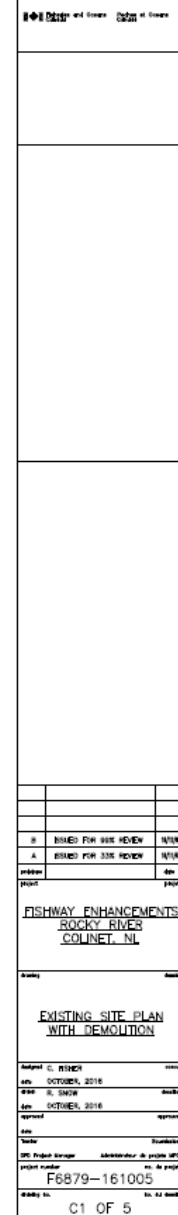
NTS map sheet: 01-N-04 - Placentia



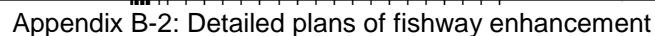


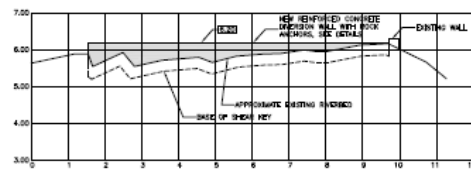
Figure 2: Drone photograph of existing fishway with components of the proposed attraction flow system sketched in.

Appendix B
Site Plan of proposed project

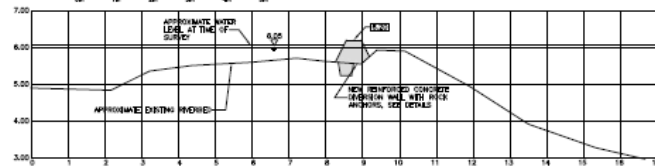


Appendix B-1: Site Plan of Rocky River Fishway

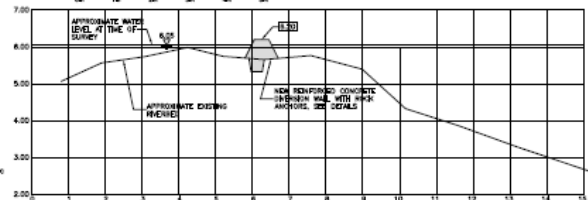




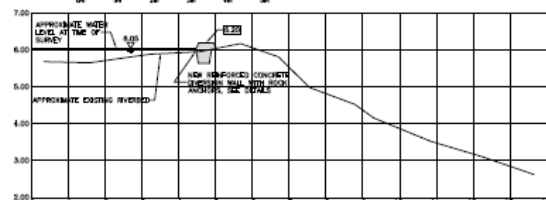
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SCALE 1:50



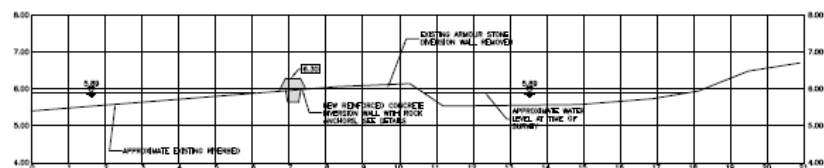
2 DIVERSION WALL #2 - SECTION
SCALE 1:50



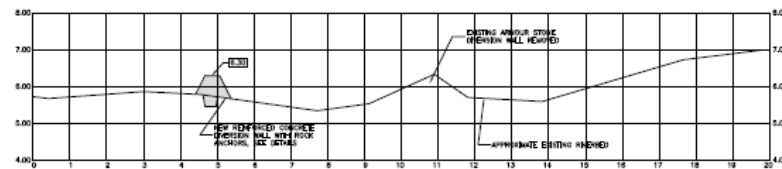
3 DIVERSION WALL #2 - SECTION
SCALE 1:50



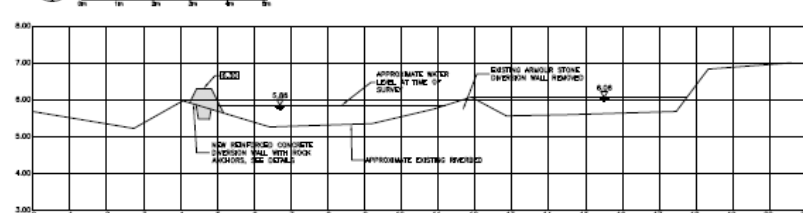
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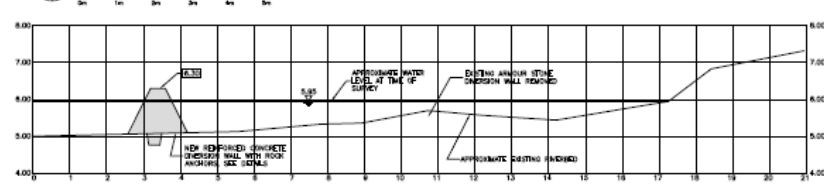
5 DIVERSION WALL #1 - SECTION
SCALE 1:50



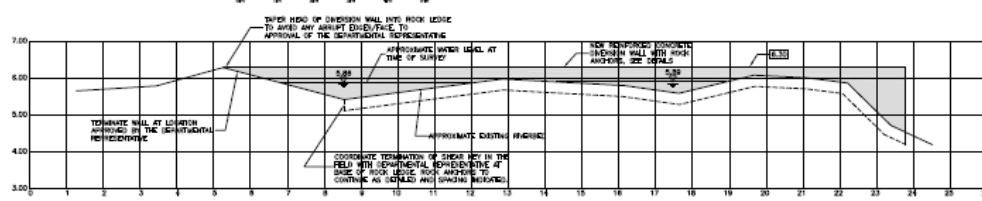
6 DIVERSION WALL #1 - SECTION
SCALE 1:50



7 DIVERSION WALL #1 - SECTION
SCALE 1:50



8 DIVERSION WALL #1 - SECTION
SCALE 1:50



9 DIVERSION WALL #1 - PROFILE
SCALE 1:50

NOTES:

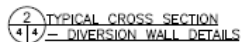
- ALL DIMENSIONS IN MILLIMETERS UNLESS SPECIFIED OTHERWISE.
- ALL DIMENSIONS IN METERS.
- DO NOT SCALE FROM DRAWINGS, USE DIMENSIONS AS SHOWN.
- ICE AND SERIES LOADING FOR DIVERSION WALLS AND CONTROL STRUCTURES DESIGN IS 50 KN/M² (SPECIFIED).
- REMOVE LOOSE AND FRAGMENTED ROCK TO EXPOSE A SOUND COMPETENT BEDROCK SURFACE TO ADEQUATELY OF THE DEPARTMENTAL REPRESENTATIVE PRIOR TO THE PLACEMENT OF CONCRETE OR ROCK. APPLY SHORING AGAINST BEDROCK OR APPROVED EQUAL TO ALL CONCRETE/ROCK INTERFACES.
- ALL EDGES OF CONCRETE TO BE PROVIDED WITH A ROUNDED CHAMFER TO TERMINATE ALL SHARP EDGES.
- PROVIDE REINFORCEMENT AT ALL CORNERS AND INTERSECTIONS TO BE LINE AND USE AND SHORING AS MAIN REINFORCEMENT.
- MINIMUM SPLICE LENGTH IN ACCORDANCE WITH CSA STANDARD A23.3-04.
- CONCRETE COVER TO BE 25MM ALL AROUND, ALL COVERAGES.
- MINIMUM 100mm SAND CONCRETE STRENGTH = 35 MPa.
- REINFORCING STEEL YIELD STRENGTH = 450 MPa.
- REINFORCEMENT AND ROCK ANCHORS SHOWN ON THIS DRAWING FOR CLARITY. REFER TO APPROPRIATE DETAILS ACCORDINGLY.
- ALL CONCRETE CONSTRUCTION JOINTS TO BE FORMED WITH A KEYWAY. THE KEYWAY SURFACES INTERNALLY ROUNDED TO A FULL RADIUS OF 50mm.
- BONDING AGENT TO BE "WELDONITE" OR APPROVED EQUAL. BONDING AGENT TO BE APPLIED TO ALL CONCRETE/ROCK INTERFACES.
- MINIMUM STRENGTH OF GROUT TO BE 40 MPa.
- CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION AND NOTIFY DEPARTMENTAL REPRESENTATIVE OF ANY DISCREPANCIES.
- DEPARTMENTAL REPRESENTATIVE TO INSPECT ALL ROCK ANCHOR LOCATIONS PRIOR TO DRILLING.
- CONFIRM EXACT LOCATION OF NEW DIVERSION WALLS ON-SITE WITH THE DEPARTMENTAL REPRESENTATIVE AFTER DE-WATERING OF THE WORK AREA IS COMPLETE. THE LOCATION AND/OR DEPTH OF THE NEW CONCRETE STRUCTURES MAY REQUIRE SOME ADJUSTMENTS TO THAT SHOWN ON THESE DRAWINGS. PROVIDE ADEQUATE NOTICE TO THE DEPARTMENTAL REPRESENTATIVE TO COORDINATE A SITE VISIT.
- ALL NEW PLACED CONCRETE TO BE TYPED TO MATCH THE EXISTING TYPING AS NOTED. NO POSSIBLE CONTRACTOR SHALL PROVIDE SAMPLES AND COORDINATE IN THE FIELD WITH THE DEPARTMENTAL REPRESENTATIVE PRIOR TO POURING.
- CONSTRUCT FORMWORK SUCH THAT THE NEWLY PLACED CONCRETE WITHIN THE EXISTING FORMWORK AS NOTED, IS PROPERLY COORDINATE IN THE FIELD WITH DEPARTMENTAL REPRESENTATIVE.

1	ISSUED FOR BIDDING REVIEW	10/10/2018
2	ISSUED FOR BIDDING REVIEW	10/10/2018
3	ISSUED FOR BIDDING REVIEW	10/10/2018
4	ISSUED FOR BIDDING REVIEW	10/10/2018
5	ISSUED FOR BIDDING REVIEW	10/10/2018

FISHWAY ENHANCEMENT ROCKY RIVER COUNTY, IN

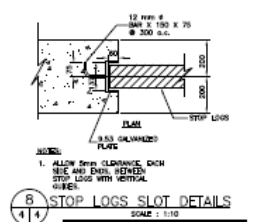
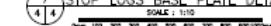
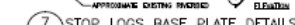
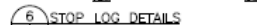
DIVERSION WALL - PROFILES AND SECTION

Author	C. FISHER	10/10/2018
Drawn	S. SMITH	10/10/2018
Checked	C. FISHER	10/10/2018
Scale	1:50	10/10/2018
File Name	F8879-161005	10/10/2018
Project Number	F8879-161005	10/10/2018
Sheet No.	10/10/2018	10/10/2018



1. (a) SLOTTED ANCHORS (SHROUDS)
2. IF THE HEIGHT OF THE DEFLECTION WALL VARIES FROM FRONT TO BACK, THE LARGEST HEADS SHALL GOVERN.
3. THE CONTRACTOR SHALL CONFIRM LOCATIONS OF ROCK ANCHORS WITH DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY DRILLING.
4. IN NO CASE SHALL THERE BE ANY LESS THAN TWO (2) ROCK ANCHORS FOR ONE

3 ROCK ANCHOR DETAILS



1. ALL DIMENSIONS IN MILLIMETERS UNLESS SPECIFIED OTHERWISE
2. ALL ELEVATIONS IN METERS.
3. DO NOT SCALE FROM DRAWINGS, USE DIMENSIONS AS GIVEN.
4. ICE AND SNOW LOADING FOR DESIGNER WALLS AND CONTROL STRUCTURE DESIGN IS 85 kN/m (APPROX.)
5. POSITIVE LOUSE AND UNARMED ROCKS TO EXPOSE A SOUND CONCRETE SURFACE
6. THE DIMENSIONAL REPRESENTATIVE PRIOR TO THE PLACEMENT OF THE CONCRETE SHALL BE CLAMMED AND THE DIMENSIONAL REPRESENTATIVE SHALL BE APPROVED EQUAL TO ALL CONCRETE/ROCK INTERFACES
7. ALL DICES OF CONCRETE TO BE FURNISHED WITH A REINFORCED SURFACE
8. PROVIDE PROTECTION TO ALL ROADS AND INTERSECTIONS TO BE SHOWN. SEE SIZE AND SPACING AS MAIN REINFORCEMENT.
9. MINIMUM SLAB LENGTHS IN ACCORDANCE WITH CAN STANDARD A310-10S.
10. CONCRETE COVER TO BE 75mm ALL DIMENSIONS.
11. CONCRETE 28 DAY COMPRESSIVE STRENGTH - 35 MPa.
12. REINFORCING STEEL YIELD STRENGTH - 450 MPa.
13. REINFORCEMENT AND ROCK ANCHORS DOWNS TO THE DRAWING FOR CLARITY. REFER TO APPROXIMATE LEVELS ADHERE.
14. ALL CONCRETE CONSTRUCTION SHALL BE FURNISHED WITH A REINFORCED SURFACE. PROVIDE INTENTIONALLY REINFORCED TO A FULL MULTITUDE OF 3mm.
15. REINFORCING SHALL BE "WELDED" OR APPROVED EQUAL BENDING.
16. THE REINFORCING SHALL BE INTENTIONALLY REINFORCED TO A FULL MULTITUDE OF 3mm.
17. MINIMUM STRENGTH OF CONCRETE TO BE 40 MPa.
18. CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION AND NOTIFY DIMENSIONAL REPRESENTATIVE OF ANY DISCREPANCIES.
19. DIMENSIONAL REPRESENTATIVE TO INSPECT ALL ROCK ANCHOR LOCATIONS PRIOR TO DRILLING.
20. CONTRACTOR MUST LOCATE ALL NEW DESIGN WALLS ON-SITE WITH THE DIMENSIONAL REPRESENTATIVE. THE DIMENSIONAL REPRESENTATIVE SHALL CONFIRM THE LOCATION AND/OR ELEVATION OF THE EXISTING STRUCTURE. THE DIMENSIONAL REPRESENTATIVE SHALL BE APPROVED EQUAL TO THE DESIGN ON THEIR DRAWINGS. PROVIDE ADVANCE NOTICE TO THE DIMENSIONAL REPRESENTATIVE OF ANY DISCREPANCIES.
21. ALL NEW PLACED CONCRETE IS TO BE TYPED TO MATCH THE EXISTING TYPING AS MUCH AS POSSIBLE. CONTRACTOR SHALL PROVIDE THE DIMENSIONAL REPRESENTATIVE TO BE TYPED WITH THE DIMENSIONAL REPRESENTATIVE PRIOR TO POURING.
22. CONTRACTOR PROVIDING SUCH THAT THE NEWLY PLACED CONCRETE WILL BE TYPED TO MATCH THE EXISTING TYPING. THE DIMENSIONAL REPRESENTATIVE TO BE TYPED WITH THE DIMENSIONAL REPRESENTATIVE PRIOR TO POURING.
23. CONTRACTOR SHALL SUPPLY AND INSTALL PUMP (4) OR SLACK PIPING AND REINFORCING TO BE TYPED TO MATCH THE EXISTING TYPING. CONTRACTOR SHALL WALL, BOLT, BOLTS AND REINFORCEMENT DOWNS TO THE DESIGN FOR CLARITY. REFER TO APPROXIMATE LEVELS ADHERE.
24. ALL DIMENSIONS IN THE FIELD WITH DIMENSIONAL REPRESENTATIVE AND REINFORCING SHALL BE TYPED TO MATCH THE EXISTING TYPING.

Holt, Rinehart and Winston	Holt, Rinehart and Winston

B	ISSUED FOR BIR REVIEW	1/1
A	ISSUED FOR BIR REVIEW	1/1
middle		4
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FISHWAY ENHANCEMENT
ROCKY RIVER
COLINET, NL

Answer)	
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DIVERSION WALL - PROFILE SECTION AND DETAILS

Author: G. FISHER

in OCTOBER, 2016

000 R. SNOW

in	03/06/2018
approved	997

46

Year	Frank
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DPO Project Name	Administrateur de projet
projet number	no. de p.

F6879-161005

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C4 OF 5

Appendix C
Regulatory approvals/responses

Environment Canada (EC)
Regulatory approvals/responses



Environment Canada
Environnement Canada

Environmental Protection Operations
Environmental Stewardship Branch
6 Bruce Street
Mount Pearl, NL A1N 4T3

February 17, 2014

Shawn Kean
Environmental Services
Public Works and Government Services Canada
P.O. Box 4600, 10 Barter's Hill
St. John's, NL, A1C 5T2

Dear Mr. Kean:

RE: Rocky River Fishway Reconstruction, Colinet, NL EAS 2014-012

As requested, Environment Canada (EC) has reviewed the above-referenced project description which was forwarded to our office on February 5, 2014. Based on the information provided, it is understood that the proponent, Department of Fisheries and Oceans – Real Property is proposing to upgrade the existing fishway in Colinet, NL. A Denil Fishway will be installed to ensure salmon have adequate access to the headwaters of the Rocky River. It is likely that concrete walls will be poured at the desired location and the Denil Fishway will be placed within the concrete form. The project scope of work includes:

- Vegetation removal along the steep embankment to provide site access.
- Installation of a cofferdam along the lower section of the fishway to allow for work in dry conditions. The cofferdam will likely consist of large sandbags that will be placed by an excavator/back hoe or boom truck.
- Pumps will be placed within the cofferdam area to remove water.
- Existing concrete pool and weir fishway are to remain in place during the construction phase of the new fishway. The existing concrete structure will eventually be removed.
- The new fishway will be approximately the same size as the existing fishway and should be constructed within the same footprint.
- Contractor is responsible for erecting the necessary formwork for the fishway structure. Concrete will be poured into the formwork and allowed to settle.
- The prefabricated Denil structure will be placed within the concrete walls.

Construction is planned for spring 2014 and may take place over two years. Fish passage will be maintained and timing of the salmon run will be incorporated into the planning of the project. Construction activities will be carried out using an excavator, backhoe, dumptruck, boom truck, concrete truck, generators, and typical hand tools such as drill, hammers, etc.

The limited information presented does not allow EC to identify pertinent expertise, to determine whether potential environmental effects have been adequately considered or to recommend mitigation and monitoring measures that would be applicable or suitable. Consequently, EC can only encourage the proponent to consider the regulatory requirements enforced by EC, comments and advice offered by the Canadian Wildlife Service and general guidance that could be applicable to any watercourse infrastructure project.

Mandate

Environment Canada is responsible for administering several statutes including the *Department of Environment Act*, *Fisheries Act* (Section 36), *Canadian Environmental Protection Act*, *Canada Water Act*, *Canada Wildlife Act*, *Species at Risk Act*, and the *Migratory Birds Convention Act*. EC is also the lead federal department in promoting a variety of policies and programs concerning the environment such as the *Federal Policy on Wetland Conservation*, *Federal Water Policy*, *Toxic Substances Management Policy*, and *Pollution Prevention - A Federal Strategy for Action*. Stemming from these responsibilities, EC possesses expertise relevant to this proposal, and offers the following recommendations to be considered in carrying out the environmental assessment of this project.

REVIEW COMMENTS

Regulatory Requirements

Fisheries Act

Pollution prevention and control provisions of the *Fisheries Act* are administered and enforced by EC. The proponent should be aware of the general applicability of Section 36(3) of the *Fisheries Act* which states: “no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substances or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water”. Environmental protection and mitigation measures should reflect the need to comply with Section 36(3) of the *Fisheries Act*. It is the responsibility of the proponent to ensure that activities are managed so as to prevent the release of substances deleterious to fish. For example, measures should be taken to prevent substances such as lubricating fluids, fuels, etc. from being deposited into water frequented by fish, and drainage from construction and operational drainage must not be harmful to fish.

Migratory Birds Convention Act

Migratory birds, their eggs, nests, and young are protected under the *Migratory Birds Convention Act* (MBCA). Migratory birds protected by the MBCA and associated regulations generally include all seabirds except cormorants and pelicans, all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). Most of these birds are specifically named in the Environment Canada (EC) publication, *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1 (available online at <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564>).

Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities.

Furthermore, paragraphs (1) and (2) of Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

- (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.
- (2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which

it may enter such waters or such an area — that is harmful to migratory birds.

It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.

Species at Risk Act

The *Species at Risk Act* (SARA) amends the definition of “environmental effect” in subsection 2(1) of the *Canadian Environmental Assessment Act* (CEAA) to clarify, for greater certainty, that environmental assessments must always consider impacts on a listed wildlife species, its critical habitat or the residences of individuals of that species.

SARA requires that the person responsible for a federal environmental assessment (EA) must, without delay, notify the competent minister(s) in writing if the project being assessed is likely to affect a listed wildlife species or its critical habitat. Notification is required for all effects, including adverse and beneficial effects, and the requirement to notify is independent of the significance of the likely effect. The person must also identify adverse effects of the project on listed species and their critical habitat. If the project is implemented, the person must ensure that measures are taken to avoid or lessen adverse effects and that effects are monitored. Mitigation measures must be consistent with recovery strategies and action plans for the species.

The complete text of SARA, including prohibitions, is available at www.sararegistry.gc.ca. For guidance on SARA and EA, the proponents may wish to make use of the *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada* available at: http://www.sararegistry.gc.ca/virtual_sara/files/policies/EA%20Best%20Practices%202004.pdf

Canadian Environmental Protection Act

The proponent should be aware of the potential applicability of the *Canadian Environmental Protection Act* (CEPA). The *Canadian Environmental Protection Act* enables protection of the environment, and human life and health, through the establishment of environmental quality objectives, guidelines and codes of practice and the regulation of toxic substances, nutrients, emissions and discharges from federal facilities, and disposal at sea.

Migratory Birds & Species at Risk

The Canadian Wildlife Service of Environment Canada (EC-CWS) has reviewed the above project and offers the following comments.

Vegetation Clearing

Clearing vegetation during construction activities may cause disturbance to migratory birds and inadvertently cause the destruction of their nests and eggs (<http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=FA4AC736-1>). Many species use trees, as well as brush, deadfalls and other low-lying vegetation for nesting, feeding, shelter and cover. This would apply to songbirds throughout the region, as well as waterfowl in wetland areas. Disturbance of this nature would be most critical during the breeding period. The breeding season for most birds within the project area occurs between May 1st and August 31st in this region, however some species protected under the MBCA do nest outside of this time period.

Environment Canada provides the following recommendations:

1. To avoid the risk of nest destruction, the proponent should avoid vegetation clearing during the most critical period of the migratory bird breeding season, which is May 1st through July 31st.

2. To develop and implement a management plan that includes appropriate preventive measures to minimize the risk of impacts on migratory birds (See “Planning ahead to reduce risks to migratory bird nests”, PDF: <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=50C4FE11-801E-4FE3-8019-B2D8537D76CF>). It is the responsibility of the individual or company undertaking the activities to determine these measures. For guidance on how to avoid the incidental take of migratory birds nests and eggs, please refer to the Avoidance Guidelines (Website: <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=AB36A082-1>).

Fuel Leaks

The proponent must ensure that all precautions are taken by the contractors to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared. Furthermore, the proponent should ensure that contractors are aware that under the MBR, “no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.” Biodegradable alternatives to petroleum-based chainsaw bar oil and hydraulic fluid for heavy machinery are commonly available from major manufacturers. Such biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices. Fuelling and servicing of equipment should not take place within 30 meters of environmentally sensitive areas, including shorelines and wetlands.

Stockpiles

Certain species of migratory birds (e.g. Bank Swallows) may nest in large piles of soil left unattended/unvegetated during the most critical period of breeding season (May 1st through July 31st). To discourage this, the proponent should consider measures to cover or to deter birds from these large piles of unattended soil during the breeding season. If migratory birds take up occupancy of these piles, any industrial activities (including hydroseeding) will cause disturbance to these migratory birds and inadvertently cause the destruction of nests and eggs. Alternate measures will then need to be taken to reduce potential for erosion, and to ensure that nests are protected until chicks have fledged and left the area. For a species such as the Bank Swallow, the period when the nests would be considered active would include not only the time when birds are incubating eggs or taking care of flightless chicks, but also a period of time after chicks have learned to fly, because Bank Swallows return to their colony to roost.

Species at Risk

The following species at risk (as listed on Schedule 1 of the *Species at Risk Act*) may occur within the study area: Olive-sided Flycatcher (Threatened) and Red Crossbill (*Percna*; Endangered). Though unlikely to be found within the project footprint, these species may occur within the study area and we request that sightings be reported to EC-CWS.

Water Quality

An EA should include a consideration of potential effects on water quality. The following information should be taken into account in the assessment, mitigation and follow-up monitoring of potential adverse effects.

In addition to Section 5.1 of the MBCA, EC administers and enforces the pollution prevention provisions of the *Fisheries Act*. Subsection 36(3) of the *Fisheries Act* prohibits anyone from depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter such water.

It is the responsibility of the proponent to ensure that all reasonable measures are conducted to prevent the release of substances deleterious to fish from their proposed activities. In general,

compliance is determined at the last point of control of the substance before it enters waters frequented by fish, or, in any place under any conditions where a substance may enter such waters.

Site Preparation and Construction

Invasive Species

To diminish the risk of introducing invasive species, the following best management practices should be taken into account in identifying appropriate mitigation and monitoring measures:

- It is recommended that a variety of species of plants native to the general area be used in re-vegetation efforts. Should seed mixes for herbaceous native species for the area not be available, it should be ensured that plants used in revegetation efforts are not known to be invasive.
- It is recommended that construction equipment be cleaned and inspected prior to transport from elsewhere to ensure that no matter is attached to the machinery that could introduce an invasive species into the area (e.g., use of pressure water hose to clean vehicles prior to transport).
- It is recommended that equipment be regularly inspected prior to, during and immediately following construction in wetland areas and in areas found to support Purple Loosetrife to ensure that vegetative matter is not transported from one construction area to another.

Erosion and Drainage Control

The registration document indicates that the project will entail removal of vegetation. The proponent should ensure that sediments are contained and not permitted to runoff into nearby water bodies. To ensure minimal adverse impacts on the watershed the following recommendations should be considered:

- Construction activities should be coordinated with seasonal constraints (e.g. time clearing, grubbing and excavation activities to avoid periods of heavy precipitation; avoid sensitive periods for fish and wildlife; shut down and stabilize the work site in accordance with pre-established criteria in advance of the winter season).
- Exposed soil areas should be minimized by limiting the area exposed at any one time, and by limiting the amount of time that any area is exposed. Re-vegetation of disturbed areas or covering disturbed areas with a thin layer of brush or slash is recommended to prevent erosion. Exposed soil should be stabilized with anti-erosion devices, such as rip rap, filter fabrics, gravel or wood chip mulches.
- A vegetated buffer zone should be maintained, as appropriate, to protect surface waters.
- Erosion prevention and drainage control measures should be installed or implemented prior to any land disturbance. Control devices such as filter fabrics, sediment traps and/or settling ponds should be in place to receive all drainage from areas disturbed by site preparation and any site clearing, grubbing, scarification and general construction activities. Regular maintenance and repair should be undertaken to ensure continued effectiveness of such control devices.

Construction Materials

At the project planning stage, all available construction materials should be considered (e.g., untreated wood, treated wood, pre-cast concrete, corrosive-resistant steel, plastic lumber), and

those materials best suited to the conditions and intended use of the structure should be selected. Analysis of the preferred construction material should include a consideration of the full life-cycle of the material (ease of use, design factors associated with the construction material, maintenance requirements, and final disposal). Environmental implications (e.g. storm and ice damage) associated with each life-cycle phase should also be considered.

Pressure Treated Wood

The long-term impacts of pressure treated wood in aquatic environments remains uncertain; therefore EC urges that a precautionary approach be taken. If pressure treated wood (e.g. Chromated Copper Arsenate [CCA]) is determined to be the most suitable material for the project, the proponent is encouraged to incorporate the following standards into the planning and management of construction activities:

- Products should be approved for use by Health Canada's Pest Management Regulatory Agency, which sets out use limitations for all treated wood products under the *Pest Control Products Act*;
- Only wood treated according to the 2006 industry publication entitled "*Best Management Practices for the Use of Treated Wood in Aquatic and Other Sensitive Environments*" should be used (this report and its 2006 amendment and 2007 addendum are available at <http://www.WWPInstitute.org/>);
- Only proper construction techniques should be used (e.g. keep as much of the product above the high water mark as possible, and capture sawdust to avoid entry into water bodies);
- The use of pressure treated wood in *freshwater* environments is discouraged;
- According to "*Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region*" by Hutton and Samis (2000), the use limitation restriction for Ammoniacal Copper Quaternary (ACQ) treated wood does not allow its use in aquatic environments when submerged (this report is available online at <http://www.dfo-mpo.gc.ca/Library/245973.pdf>); however, it can be used for above-water applications such as decking.

Concrete Production

Discharges from project activities involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials may have a high pH. Work should be planned and conducted to ensure that sediments, debris, concrete, and concrete fines are not deposited, either directly or indirectly into the aquatic environment. Measures must be taken to prevent any potentially contaminated water (e.g. exposed aggregate wash-off, wet curing, equipment and truck washing) from entering the aquatic environment unless it can be confirmed that this water will not be deleterious to fish or harmful to migratory birds. Containment facilities should be provided at the site.

Disposal of Decommissioned Structures

Provisions for the disposal of existing concrete pool structure and weir fishway should be identified, including *opportunities for recycling/reuse*.

When decommissioning in-water structures, treated wood should be completely removed from the water environment, including bottom sediment (for piles). According to Hutton and Samis (2000), piles should be removed by a slow, steady pull to minimize disturbance of surface habitats and to avoid bringing potentially contaminated sediments to the surface. If the pile breaks off below the biologically-active zone in the sediment, it may not be advisable to dredge the remainder out depending on the sensitivity of the habitat at the site.

Only wood treated according to the 2006 industry publication "*Best Management Practices for the Use of Treated Wood in Aquatic and Other Sensitive Environments*" should be recycled/reused (this report, including its 2006 amendment and 2007 addendum are available at

<http://www.WWPInstitute.org>). Treated wood from structures *not* treated in accordance with the Best Management Practices (i.e. generally structures built prior to 1997, such as those constructed with creosoted wood) should be disposed of at a provincially approved landfill with approval of the owner, or through incineration at an approved hazardous waste incinerator.

Management of Hazardous Materials and Waste

In order to ensure compliance with Section 36 (3) of the *Fisheries Act* and with the *Migratory Birds Convention Act* and their Regulations, provisions for the management of hazardous materials (e.g., fuels, lubricants) and wastes (e.g. contaminated soil, sediments, waste oil) should be identified and implemented so as to ensure the risk of chronic and accidental releases is minimized. In addition, the following mitigation recommendations are made with respect to the transport, storage, use and disposal of petroleum products and toxic substances which, when employed, may minimize impacts to nearby receiving waters:

- Even small spills of oil can have very serious effects on migratory birds and fish. Therefore, every effort should be taken to ensure that no oil spills occur in the area.
- Biodegradable alternatives to petroleum-based chainsaw bar oil and hydraulic fluid for heavy machinery are commonly available from major manufacturers. Such biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices.
- Refuelling and maintenance activities should be undertaken on level terrain, at least **30m** from environmentally sensitive areas, including shorelines and wetlands, on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter surface waters. Waste oil should be disposed of in an approved manner.
- Drums of petroleum products or chemicals should be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry, water-tight building or shed with an impermeable floor.
- In order to ensure that a quick and effective response to a spill event is possible, spill response equipment should be readily available on-site. Response equipment, such as adsorbents and open-ended barrels for collection of cleanup debris, should be stored in an accessible location on-site. Personnel working on the project should be knowledgeable about response procedures. The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event. The proponent should indicate how the contingency plans will be prepared, and response measures implemented, to reflect site-specific conditions and sensitivities. In developing a contingency plan, it is recommended that the Canadian Standards Association publication *Emergency Preparedness and Response* CAN/CSA-Z731-03, be consulted as a useful reference.
- The proponent should report any spills of petroleum or other hazardous materials to the Environmental Emergencies 24 Hour Report Line (1-800-563-9089).

Effects of the Environment on the Project

An EA must include a consideration of the effects of the environment on the project. Sensitivities to climate elements should be identified and assessed, including a demonstration of how the project design would mitigate extreme events such as flooding over its operational lifetime.

Climatological data required to support the EA can be found at <http://www.climate.weatheroffice.ec.gc.ca/>, and value-added data can be obtained from EC's Climate Services. Contact: 1-900-565-1111 or email: weather.info.meteo@ec.gc.ca. Hydrometric station data, both archived and real-time, are available at www.wsc.ec.gc.ca, or by contacting Guy R. Leger at (506) 452-4021 or email: guy.leger@ec.gc.ca.

When applying meteorological information to design parameters for infrastructure, the proponent is encouraged to consider the report, *Water Sector: Vulnerability and Adaptation to Climate Change* (GSCI and MSC, 2000). In this report it is indicated that when accounting for the effect of climate change on extreme events, such as particularly heavy precipitation, the return periods for these events could reduce by at least a factor of two. This would result, by the end of the century, in 100 year event amounts becoming 50 year event amounts. EC encourages the proponent to consider appropriate climatological factors and best available data so as to take steps that would help ensure structures remain effective during and after storm events. Site water management should also be discussed in terms of effects of climate change on reclamation design.

In considering the full life-cycle of the project, any sensitivity to climate change should be identified and adjustments made if necessary. It may be more cost-effective to adjust design criteria at this stage than to retrofit in future.

I trust the above comments will be of assistance. Please feel free to contact me at (709) 772-4313 or shelley.decker@ec.gc.ca if you have any questions or concerns.

Yours truly,

Original Signed by Shelley Decker

Shelley Decker
Environmental Assessment Analyst
Environmental Protection Operations Directorate – Atlantic

cc: M. Hingston
S. Zwicker
J. Mailhiot

Department of Fisheries and Oceans (DFO)

Regulatory approvals/responses



Fisheries and Oceans Canada Pêches et Océans Canada

P. O. Box 5667
St. John's, NL A1C 5X1

Your file Votre référence

Our file Notre référence
17-HNFL-00001

Public Works and Government Services Canada
John Cabot Building, 10 Barbers Hill
St. John's, NL A1C 5T2

Attention: Mr. Dominic Giovannini

Dear Mr. Giovannini:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Rocky River Fishway Enhancement, Colinet

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on January 5, 2017.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act*.

The proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 and 58 of the *Species at Risk Act*.

Our review consisted of:

- Application for Review and associated documentation

We understand that you propose to:

- Construct three (3) new concrete diversion walls and install about 40 meters of a flow system pipe to enhance an existing fishway in Rocky River, Colinet

To avoid the potential of serious harm to fish, we are recommending that the attached mitigation measures be included into your plans.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. The Program is also of the view that your proposal will not contravene sections 32, 33, or 58 of the *Species at Risk Act*. No formal approval is required from the Program under the *Fisheries Act* or the *Species at Risk Act* in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (<http://www.dfo-mpo.gc.ca/pnw->

Canada

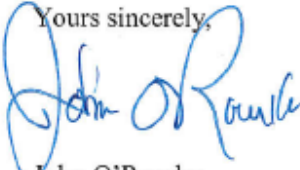
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[ppe/index-eng.html](#)) or consult with a qualified environmental consultant to determine if further review is required by the Program.

Please notify this office at least 10 days before starting your project. A copy of this letter should be kept on site while the work is in progress.

If you have any questions, please contact Triage and Planning at our St. John's office at (709)-772-4140, by fax at (709)-772-5562, or by email at FPP-NL@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,



John O'Rourke
A/Team Leader
Triage and Planning

Attch (3)

Cc. Shawn Kean



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Freshwater Dredging

Fisheries and Oceans Canada

Measures to Avoid Causing Harm to Fish and Fish Habitat

On November 25, 2013 the Fisheries Protection Provisions of the **Fisheries Act** came into force. The **Fisheries Act** requires that projects avoid causing serious harm to fish unless authorized by the Minister of Fisheries and Oceans. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery.

If you are conducting a project near water, it is your responsibility to ensure you avoid causing serious harm to fish in compliance with the **Fisheries Act**. The following advice will help you avoid causing harm and comply with the **Act**.

- a. *Time work in water to protect fish, including their eggs, juveniles, spawning adults, migration and/or the organisms upon which they feed.*
- b. *Sensitive or important fish habitat should be avoided.*
- c. *Conduct in-water work during periods of low flow to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.*
- d. *Minimize duration of in-water work.*
- e. *Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.*
- f. *Minimize the amount of dredged material removed by only dredging the area and depth required.*
- g. *Equipment should be mechanically sound to avoid leaks of oil, gas, and/or hydraulic fluids.*
- h. *Operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbances to the bank and bed of the water body.*
- i. *Use site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required.*

Additional measures that may be required to protect fish and fish habitat can be found on the DFO national website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) and in the *Guidelines for the Protection of Freshwater Fish Habitat in Newfoundland & Labrador* (<http://www.dfo-mpo.gc.ca/Library/240270.pdf>)

Should your plans change please contact the Fisheries Protection Program-Regulatory Review:

Fisheries Protection Program
Fisheries and Ocean Canada
80 East White Hills Road
St. John's NL A1C 5X1
Telephone: (709) 772-4140
Fax: (709) 772-5562
Email: FPP-NL@dfo-mpo.gc.ca

Note: This advice is only applicable to the project specified on the accompanying DFO letter.



Intake Pipe Installation/Water Withdrawal

Fisheries and Oceans Canada

Measures to Avoid Causing Harm to Fish and Fish Habitat

On November 25, 2013 the Fisheries Protection Provisions of the **Fisheries Act** came into force. The **Fisheries Act** requires that projects avoid causing serious harm to fish unless authorized by the Minister of Fisheries and Oceans. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery.

If you are conducting a project near water, it is your responsibility to ensure you avoid causing serious harm to fish in compliance with the **Fisheries Act**. The following advice will help you avoid causing harm and comply with the **Act**.

- a. Shoreline or streambank disturbance should be restricted to the immediate work area. Disturbed shorelines or streambanks should be stabilized.
- b. Operate machinery on land above the high water mark, on ice, or from a floating barge.
- c. Equipment should be mechanically sound to avoid leaks of oil, gas, and/or hydraulic fluids.
- d. If required, fording should be scheduled to avoid potential adverse impacts on spawning activities, spawning habitat, egg incubation, and fish migration.
- e. Sediment-laden water arising within work areas should be treated to remove sediment prior to release into a watercourse.
- f. Detailed guidelines for the provision of fish screens at small-scale water withdrawals up to 125 L/s (e.g. for small municipal, construction, irrigation and private water supply projects) can be found in the *Freshwater End-of-Pipe Fish Screen Guideline* (DFO 1995). <http://www.dfo-mpo.gc.ca/library/223669.pdf>
- g. Screens should be located in areas and depths of water with low concentrations of fish throughout the year.
- h. Screens should be located away from natural or man-made structures that may attract fish that are migrating, spawning, or in rearing habitat.
- i. The screen face should be oriented in the same direction as the flow.
- j. Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
- k. Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.
- l. Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.

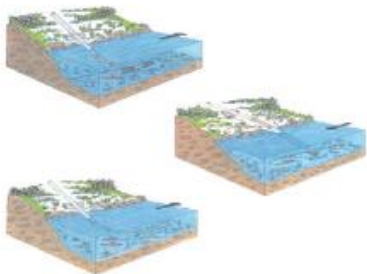


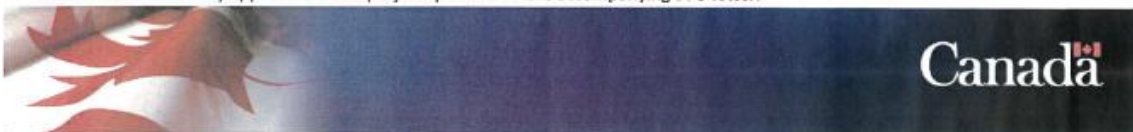
Figure 1: Examples of typical applications and features of end-of-pipe fish screen.

Additional measures that may be required to protect fish and fish habitat can be found on the DFO national website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) and in the *Guidelines for the Protection of Freshwater Fish Habitat in Newfoundland & Labrador* (<http://www.dfo-mpo.gc.ca/Library/240270.pdf>)

Should your plans change please contact the Fisheries Protection Program-Regulatory Review:

Fisheries Protection Program
 Fisheries and Ocean Canada
 80 East White Hills Road
 St. John's NL A1C 5X1
 Telephone: (709) 772-4140
 Fax: (709) 772-5562
 Email: FPP-NL@dfo-mpo.gc.ca

Note: This advice is only applicable to the project specified on the accompanying DFO letter.



Measures to Avoid Causing Harm to Fish and Fish Habitat – Timing

Newfoundland and Labrador Region

In-water project activities listed on the **DFO Projects Near Water** website as “not requiring review by DFO” should be avoided in certain time periods in some waters in Newfoundland and Labrador in order to reduce the risk of harm to salmon and trout populations during important or sensitive life stages.

If you **cannot** avoid working in water during the periods set out below for those project activities, you should submit a Request for Review form for your work to the DFO Fisheries Protection Program at FPP-NL@dfo-mpo.gc.ca:

WATER BODY TYPE/AREA	PERIOD TO <u>AVOID</u> IN-WATER WORK	REASON
Atlantic salmon		
Estuaries and the main stems of scheduled salmon rivers*	May 1 to September 30	Work may disrupt migration of Atlantic Salmon (i.e. smolt, kelt, adults).
Tributary and headwater areas of scheduled salmon rivers on the island of Newfoundland	October 1 to May 31	Work may disrupt spawning of Atlantic Salmon in the fall, or harm eggs and newly hatched fish.
Tributary and headwater areas of scheduled salmon rivers in Labrador	September 15 to June 15	
Brown trout		
Estuaries and the main stems of Brown Trout rivers**	October 1 to November 30	Work may disrupt migration of adult Brown Trout.

* Scheduled salmon waters are identified in the NL Anglers' Guide available on-line at <http://www.nfl.dfo-mpo.gc.ca/NL/AG/ScheduledSalmonRivers>. They are also set out in the *Newfoundland & Labrador Fishery Regulations* at <http://laws-lois.justice.gc.ca/eng/regulations/SOR-78-443/page-12.html#h-16>

** Brown trout waters are identified in the NL Anglers' Guide <http://www.nfl.dfo-mpo.gc.ca/NL/AG/BrownTrout>

As of June 1, 2016

Newfoundland and Labrador Department of Environment and Conservation

Regulatory approvals/responses



Government of Newfoundland and Labrador
Department of Environment and Climate Change
Water Resources Management Division

PERMIT TO ALTER A BODY OF WATER

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: JANUARY 26, 2017

File No: 524
Permit No: ALT9022-2017

Permit Holder: Fisheries and Oceans Canada, Real Property Branch
10 Barter's Hill - John Cabot Building
St. John's, NL, A1C 5X1

Attention: Mr. Cyril Bannister

Re: Colinet (Rocky River) - Fishway Enhancement

Permission is hereby given for : the upgrade of an existing fishway which includes the construction of three (3) new concrete diversion walls and approximately 40 meters of 300 mm of HDPE pipe system and all necessary fittings, connections, valves, wyes, screen caps and pipe hold downs in the Rocky River near the Community of Colinet, as indicated in Appendices A and D of this Permit (attached), in reference to the application received December 22, 2016, and further information provided on or before January 24, 2017.

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Environment and Climate Change under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent (s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.




MINISTER

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Climate Change

File No: 524
Permit No: ALT9022-2017

APPENDIX A
Terms and Conditions for Permit

General Alterations

1. Any work that must be performed below the high water mark must be carried out during a period of low water levels.
2. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.
3. Water pumped from excavations or work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the *Environmental Control Water and Sewage Regulations, 2003*.
4. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.
5. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.
6. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.
7. During the construction of concrete components, formwork must be properly constructed to prevent any fresh concrete from entering a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.
8. Wood preservatives such as penta, CCA or other such chemicals must not be applied to timber near a body of water. All treated wood or timber must be thoroughly dry before being brought to any work site and installed.
9. Any areas adversely affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of this Department.
10. The bed, banks and floodplains of watercourses, or other vulnerable areas affected by this project, must be adequately protected from erosion by seeding, sodding or placing of rip-rap.
11. All waste materials resulting from this project must be disposed of at a site approved by the Department of Service NL.
12. Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.
13. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by wind, wave, ice action, or structural failure.
14. Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.
15. Fill material must be of good quality, free of fines or other substances including metals, organics, or chemicals that may be harmful to the receiving waters.
16. The attached Completion Report (Appendix C) for Permit No. 9022 must be completed and returned to this Department upon completion of the approved works. Pictures must be submitted along with the completion report, showing the project site prior to and after development.
17. This Permit is valid for two years from the date of issue. Work must be completed by that date or the application and approval procedure must be repeated.
18. The location of the work is highlighted on the Location Map for this Permit attached as Appendix D.

19. All work must be carried out within the Permit Holder's legal property boundaries.

Special Conditions

20. A separate permit shall be applied for and obtained prior to commencing any work altering a body of water which is not included by this Permit.

21. Where pumping is used to bypass flow, cofferdams must be installed both above and below areas of construction. The proponent must provide pumps with sufficient capacity to prevent washout of cofferdams.

22. Cofferdams must be properly designed and constructed of suitable materials to prevent leakage and to resist loss of any material as a result of erosion. Cofferdams must be removed upon completion of their intended function. All material must be removed carefully to prevent disturbance of the water body and to prevent water quality degradation.

23. All work involving minor alteration to the stream channel to permit fishway removal or placement must be carried out at a time of low flow, and in a manner that prevents downstream siltation and unnecessary alteration of the channel.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Climate Change

File No: 524
Permit No: ALT9022-2017

APPENDIX B
Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.
2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit and/or Ministerial orders and guidelines, as determined by this Department, the Minister may, after providing ten (10) day notice to the Permit Holder, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.
4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor(s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).
5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.
6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

File No: 524
Permit No: ALT9022-2017

- cc: Dr. Abdel-Zaher Kamal Abdel-Razek, Ph. D., P.Eng.
Manager, Water Rights and Investigations Section
Water Resources Management Division
Department of Environment and Climate Change
P.O. Box 8700
4th Floor, West Block, Confederation Building
St. John's, NL A1B 4J6
aabdelrazek@gov.nl.ca
- cc: Fisheries Protection Division
Ecosystem Management Branch
Fisheries and Oceans Canada
P.O. Box 5667
St. John's, NL A1C 5X1
FPP-NL@dfo-mpo.gc.ca
- cc: Town of Colinet
Ms. Susan Parrott
P.O. Box 8
Colinet, NL A0B 1M0
colinet@eastlink.ca
- cc: Mr. Dominic Giovannini
Public Works and Government Services Canada
10 Barter's Hill - John Cabot Building
St. John's, NL, A1C 5T2
Dominic.Giovannini@pwgsc-tpsgc.gc.ca



Government of Newfoundland and Labrador
Department of Environment and Climate Change
Water Resources Management Division

Appendix C - Completion Report

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: JANUARY 26, 2017

File No: 524
Permit No: ALT9022-2017

Permit Holder: Fisheries and Oceans Canada, Real Property Branch
10 Barter's Hill - John Cabot Building
St. John's, NL, A1C 5X1

Attention: Mr. Cyril Bannister

Re: Colinet (Rocky River) - Fishway Enhancement

Permission was given for : the upgrade of an existing fishway which includes the construction of three (3) new concrete diversion walls and approximately 40 meters of 300 mm of HDPE pipe system and all necessary fittings, connections, valves, wyes, screen caps and pipe hold downs in the Rocky River near the Community of Colinet, as indicated in Appendices A and D of this Permit (attached), in reference to the application received December 22, 2016, and further information provided on or before January 24, 2017.

I (the Permit Holder named above or agent authorized to represent the Permit Holder) do hereby certify that the project described above was completed in accordance with the plans and specifications submitted to the Department of Environment and Climate Change and that the work was carried out in strict compliance with the terms and conditions of the Permit issued for this project.

Date: _____ Signature: _____

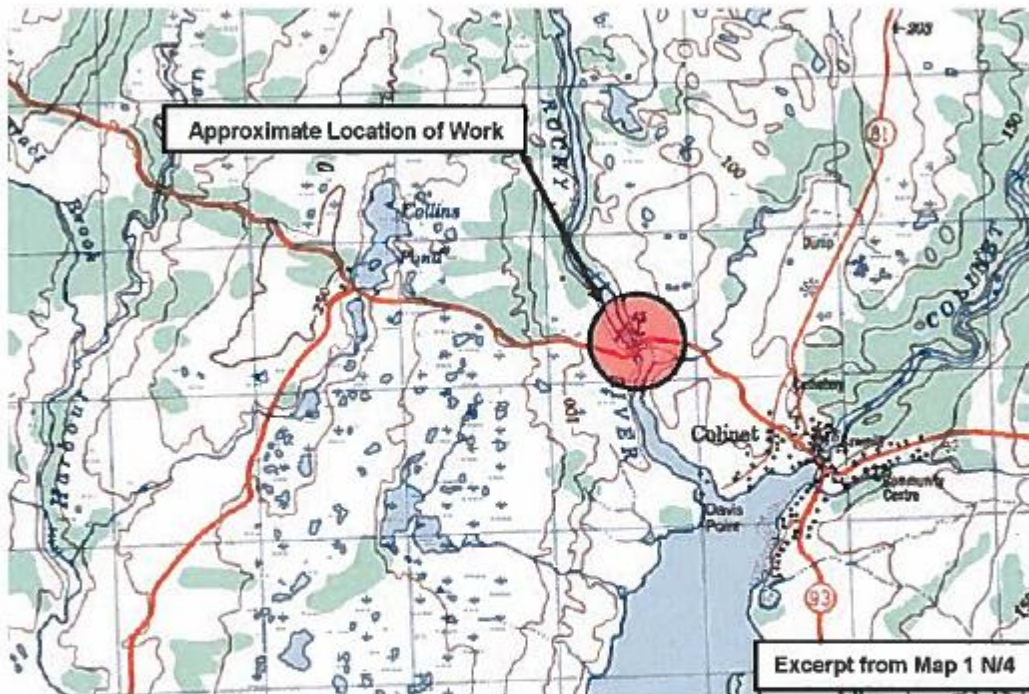
This completion report must be completed and forwarded to the following address upon completion of the approved work.

Department of Environment and Climate Change
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Climate Change

File No: 524
Permit No: ALT9022-2017

APPENDIX D
Location Map for Permit



Appendix D
Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO)

<http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>

Measures to Avoid Causing Harm to Fish and Fish Habitat

If you are conducting a project near water, it is your responsibility to ensure you avoid causing [serious harm to fish](#) in compliance with the [Fisheries Act](#). The following advice will help you avoid causing harm and comply with the *Act*.

PLEASE NOTE: This advice applies to all project types and replaces all “Operational Statements” previously produced by DFO for different project types in all regions.

Measures

Project Planning Timing

- Time work in water to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
- Minimize duration of in-water work.
- Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

Site Selection

- Design and plan activities and works in waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
- Design and construct approaches to the waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.
- Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.

Contaminant and Spill Management

- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse.
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

Erosion and Sediment Control

- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:
 - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).
 - Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
 - Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
 - Repairs to erosion and sediment control measures and structures if damage occurs.
 - Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

Shoreline Re-vegetation and Stabilization

- Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation

and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.

- Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
- Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
- Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- Remove all construction materials from site upon project completion.

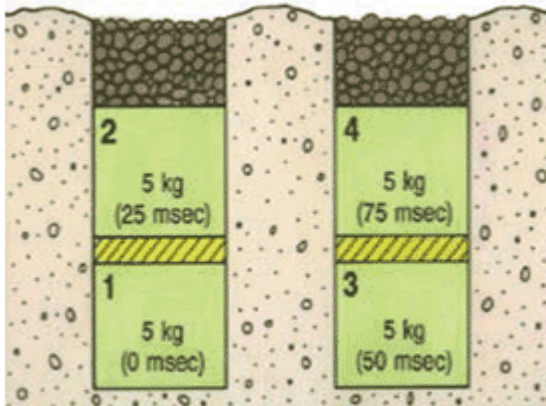
Fish Protection

- Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
- Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - In freshwater, follow these measures for design and installation of intake end of pipe fish screens to protect fish where water is extracted from fish-bearing waters:
 - Screens should be located in areas and depths of water with low concentrations of fish throughout the year.
 - Screens should be located away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - The screen face should be oriented in the same direction as the flow.
 - Ensure openings in the guides and seals are less than the opening criteria to make “fish tight”.
 - Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.

- Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.
 - Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.
 - Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where there is debris loading (woody material, leaves, algae mats, etc.). A 150 mm (6 in.) spacing between bars is typical.
 - Provision should be made for the removal, inspection, and cleaning of screens.
 - Ensure regular maintenance and repair of cleaning apparatus, seals, and screens is carried out to prevent debris-fouling and impingement of fish.
 - Pumps should be shut down when fish screens are removed for inspection and cleaning.
- Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
 - If explosives are required as part of a project (e.g., removal of structures such as piers, pilings, footings; removal of obstructions such as beaver dams; or preparation of a river or lake bottom for installation of a structure such as a dam or water intake), the potential for impacts to fish and fish habitat should be minimized by implementing the following measures:
 - Time in-water work requiring the use of explosives to prevent disruption of vulnerable fish life stages, including eggs and larvae, by adhering to appropriate fisheries [timing windows](#).
 - Isolate the work site to exclude fish from within the blast area by using bubble/air curtains (i.e., a column of bubbled water extending from the substrate to the water surface as generated by forcing large volumes of air through a perforated pipe/hose), cofferdams or aquadams.
 - Remove any fish trapped within the isolated area and release unharmed beyond the blast area prior to initiating blasting
 - Minimize blast charge weights used and subdivide each charge into a series of smaller charges in blast holes (i.e., decking) with a minimum 25 millisecond (1/1000 seconds) delay between charge detonations (see Figure 1).
 - Back-fill blast holes (stemmed) with sand or gravel to grade or to streambed/water interface to confine the blast.
 - Place blasting mats over top of holes to minimize scattering of blast debris around the area.
 - Do not use ammonium nitrate based explosives in or near water due to the production of toxic by-products.

- Remove all blasting debris and other associated equipment/products from the blast area.

Figure 1: Sample Blasting Arrangement



Per Fig. 1: 20 kg total weight of charge; 25 msecs delay between charges and blast holes; and decking of charges within holes.

Operation of Machinery

- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
- Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
- Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
- Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

Date modified:
2013-11-25

