TECHNICAL MEMORANDUM

DATE June 22, 2017 **PROJECT No.** 1658927.3100

TO Ryan Vanengen
Agnico Eagle Mines Limited

CC Lasha Young, Jen Range, Dionne Filiatrault

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FISH-OUT DIVING WATERBIRD PROTECTION PLAN

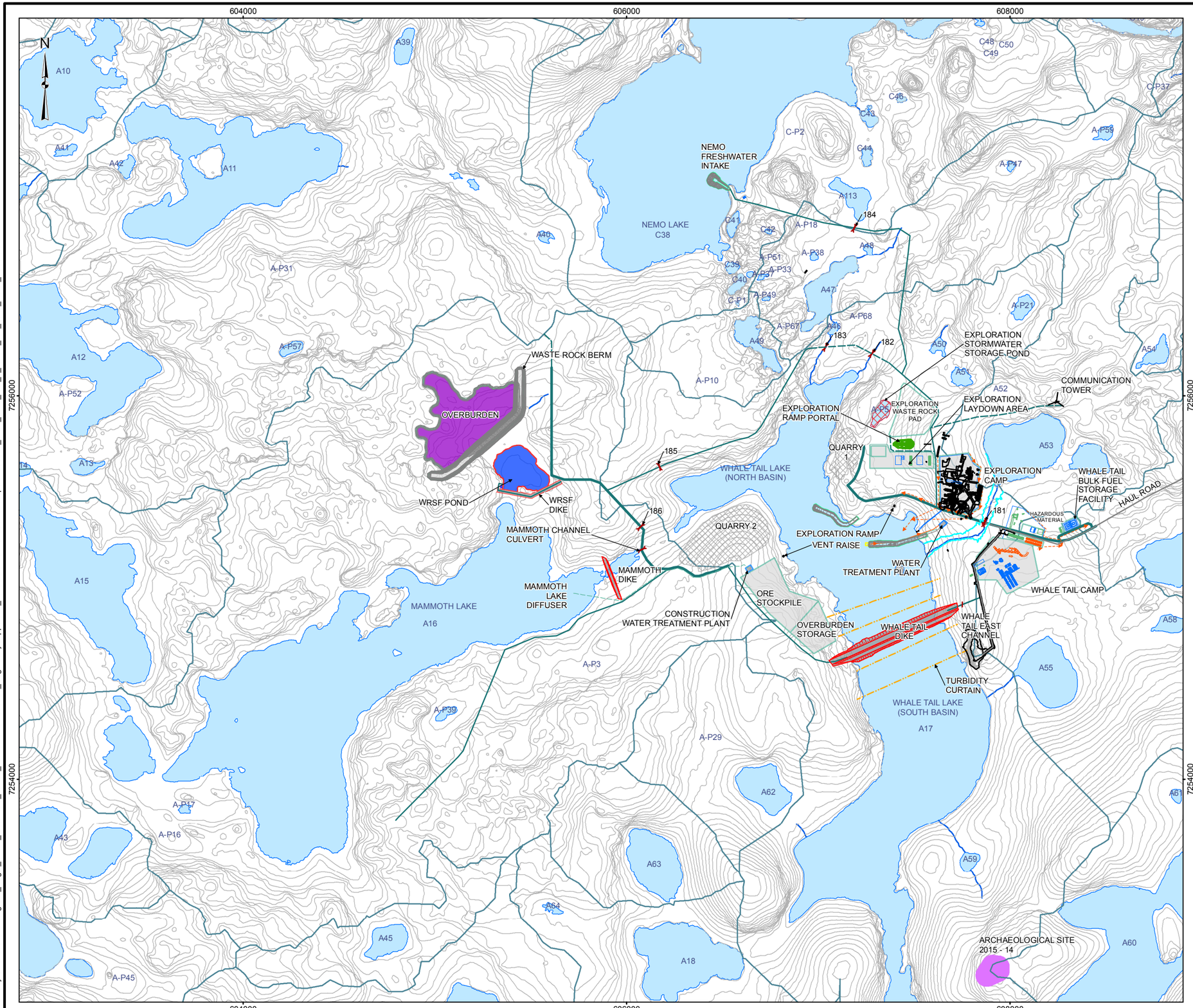
Introduction

Agnico Eagle has proposed to dewater the Whale Tail Lake (North Basin) in 2018 which will require a fish-out (refer to Figure 1).

Agnico Eagle has extensive experience conducting fish-out programs at the Meadowbank Mine, which have been guided by the *General fish-out protocol for lakes and impoundments in the Northwest Territories and Nunavut*, and modified for each fish-out based on previous experience and community input to protect fish and waterbirds. Agnico Eagle has completed four fish-outs between 2008 and 2016. The first fish-out program took place during the summer of 2008 in the northwest arm of Second Portage Lake (Azimuth 2009); the second fish-out took place during the summer of 2010 in the Bay-Goose basin in the eastern portion of the Third Portage Lake (North-South 2011); the third was completed in the summer of 2013 in Vault Lake; and a fourth fish-out was completed of Phaser Lake in 2016. The fish-out programs have incorporated inputs from the local community including public presentations in Baker Lake, consultation during the preparation of the 2012 No Net Loss (NNL) Plan, hiring of local employees and reviews of the 2008, 2010, 2013, and 2016 fish-out programs with the Hunters and Trappers Organization (HTO) and Fisheries and Oceans Canada (DFO) during, and following the completion of the respective programs.

During the four fish-out programs, no known mortalities of diving birds occurred. Nevertheless the following plan was developed to address the potential for mortality of diving birds during the fish-out of Whale Tail Lake (North Basin), as diving bird mortalities have occurred at other mining developments (for example, 10 diving bird mortalities occurred during the Kennady Lake fish out for Gahcho Kué [De Beers 2015] and three during the Sable Lake and Two Rock Lake fish salvage at Ekati [ERM 2017]).

Baseline studies have indicated that diving birds in the Whale Tail area include Common Loon, Red-throated Loon, Red-breasted Merganser and Long-tailed Duck. Lakes in the Whale Tail area are typically ice free by July, and Agnico Ealge intends to initiate the North Basin fish-out by mid-July, immediately following the construction of the Whale Tail Dike (Figure 1).



LEGEND

- ROAD
- TEMPORARY ROAD
- COLLECTION CHANNEL
- CULVERT
- CONTACT WATER PUPE
- FRESHWATER PIPE
- TURBIDITY CURTAIN
- DIKE
- OVERBURDEN
- QUARRY
- STORM WATER STORAGE POND
- NATURAL WATERSHED
- POND/SUMP
- ARCHAEOLOGICAL SITE
- WATERBODY
- WATERCOURSE

REFERENCE

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM 6108-600-210-001_R2(2018)s.dwg.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT
DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

400 0 400
METRES

PROJECT
AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

WHALE TAIL LAKE (NORTH BASIN)

Golder Associates

PROJECT		1658927	FILE No.	
DESIGN	CP	24 May 2017	SCALE AS SHOWN	REV. 0
GIS	CDB	24 May 2017		
CHECK	JR	24 May 2017		
REVIEW	CP	24 May 2017		

FIGURE 1

Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1658927_RegulatorySupport\02_PRODUCTION\3100\MXD\Report\1658927_3100_3110_FIG_1_Whale_Tail_Lake_North_Basin.mxd

Effects Pathways and Mitigation

The fish-out may lead to mortality of diving birds during the Whale Tail fish-out due to entanglement in submerged gill nets.

Prior to de-watering of Whale Tail Lake (North Basin), a fish-out will be required. Based on past fish-out experience and following Tyson et al. (2011), gill nets are the most effective means to fish-out lakes, but may lead to incidental mortality of diving birds. The primary guild of birds at risk due to the fish-out is diving birds, whose primary foraging strategy involves diving for fish and invertebrates. Diving birds with potential to occur on Whale Tail Lake include loons and diving ducks.

The primary goal and objective is to remove fish from Whale Tail Lake. However, for any deterrent to be implemented, it must also not significantly reduce the catch for fish in gill nets.

The following steps have been considered to reduce the risk that gill nets pose to diving birds:

- Monitor the lake for the presence of diving birds
- Actively deter diving birds observed on the lake
- Avoid areas of the lake where diving birds are nesting
- Document mortalities

Monitoring for Diving Bird Presence

Diving bird presence, abundance and distribution of diving birds will be documented. Daily surveys will be completed by boat to document observations of diving birds. Observations should be recorded on the data sheet (Appendix 1). Observations of diving birds should be reported to the fish-out supervisor, who may suggest either deterrence of the birds or avoidance of the area. Surveys will be initiated in late June, prior to the lake becoming ice-free and prior to the nesting season and deployment of gillnets. Surveys will be initiated by a biologist, who will train select members of the fish-out crew to continue the monitoring throughout the fish-out.

Bird Deterrents

The most effective means of reducing the risk of diving bird entrapment in gillnets is to deter the diving birds from Whale Tail Lake during the fish-out. Clearing by boat and commercial bird deterrents will be used to discourage use of the lake. Deterrent action (including deployment of commercial bird deterrents and hazing by boat) will begin prior to the lake becoming ice-free in July, and prior to the initiation of the fish-out, to discourage nesting before gillnets are deployed.

As described in Appendix 2 (Technical Overview of Recommended Hazing Devices), motorboats may be used to disperse birds. Ideally, a fast, loud boat should be used, with bangers launched at regular intervals. The boat should actively chase the diving birds, while taking care not to cause the bird harm or drown. Hazing by motorboat should not be used within 200 metres of a gillnet, to avoid the risk of chasing the bird into the net.

Commercially available visual and audio deterrents will be deployed around netting areas. Above-water auditory and visual deterrents (including Breco buoys, marine Phoenix Wailer and effigies, see Appendix 2), and under-water ‘pingers’ have the potential to deter diving birds, and are likely to have little impact on gill net catch (Figure 2). Another deterrent method includes the use of coloured flagging or ‘streamers’ attached to gillnets underwater. During the Kennady Lake fish-out for the Gahcho Kué Project, all gillnets were fitted with flagging tape streamers,

floating owl and eagle effigies were deployed on the lake. Monitoring was undertaken to identify and avoid areas of high loon activity.

Despite these measures, a total of 10 loon mortalities occurred between July 7 and August 28, 2014. This included six red throated loon, three yellow-billed loon and one common loon. Mortalities occurred on both day and overnight sets, on both large and small mesh nets, in water depths ranging from 2 to 12 metres. There was some indication that the deterrents were successful, as only three of the mortalities occurred on nets with flagging tape streamers.

Similarly, at the Sable Lake and Two Rock Lake fish salvage at Ekati (ERM 2017), One adult female long-tailed duck, one common loon (age and sex unknown), and one duckling (unknown species), were caught and died in fish nets. Following the first mortality, additional monitoring of fishing nets daily for waterfowl, moving the eagle decoys around the perimeter of Two Rock Lake on a daily basis, and deploying deterrents (bear bangers and screamers) to deter waterfowl from fish-out lakes (ERM 2017).

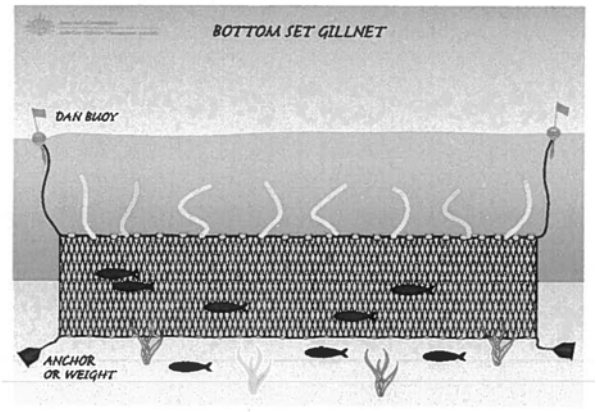


Figure 2: Gillnet with streamers attached

Avoiding Areas with Known Nests

If diving bird nests are observed, gillnet deployment should be avoided within the vicinity of the nest and the area used for foraging by the diving bird. Further monitoring and mitigation will be required in this instance, in consultation with Environment and Climate Change Canada.

Document Mortalities

If any diving bird mortalities occur due to entanglement in gillnets, the occurrence should be documented using the datasheet provided (Appendix 1). Details of the species, net type, and water depth should be documented. The carcass should be kept frozen, and Environment and Climate Change Canada should be contacted for further instruction, as the carcass may be used for study.

References

De Beers. 2015. Gahcho Kué Interim Fish-Out Report. Prepared by De Beers Canada Inc. April 2015.

ERM. 2017. Ekati Diamond Mine: 2016 Wildlife Effects Monitoring Program. Prepared for Dominion Diamond Ekati Corporation by ERM Consultants Canada Ltd.: Yellowknife, Northwest Territories.

APPENDIX 1
Diving Bird Monitoring Protocol

DAILY DIVING BIRD MONITORING PROTOCOL

Objective

Agnico Eagle has proposed to dewater the Whale Tail Lake (North Basin), which will require a fish-out. As gillnets can entangle and kill diving birds, monitoring is required to document diving birds before and during fish-out gillnet deployment.

Method

Each day, the entire surface (with emphasis on shorelines) should be scanned for diving birds. The location, species and number of diving birds should be documented, using the attached sheet. Presence or suspected presence of nests should also be documented.

Surveys should be initiated in mid to late June, prior to ice-out and prior to the initiation of the fish-out, and continue until the completion of the fish-out.

Diving birds present in the area are listed below. Be familiar with these species before starting the survey.

- Common Loon
- Red-throated Loon
- Red-breasted Merganser
- Long-tailed Duck

At the completion of the survey, submit the data sheet to the fish-out supervisor.

Follow-up

- If a migratory bird is observed during the daily survey, deterrent actions should be considered (including hazing and deployment of commercial bird deterrents)
- If a migratory bird nest is observed, the area should be avoided to protect the nest and breeding pair. Further discussion with Environment and Climate Change Canada will be required
- In the event of a diving bird mortality, complete the attached data sheet and retain the carcass

DAILY DIVING BIRD MONITORING DATA SHEET

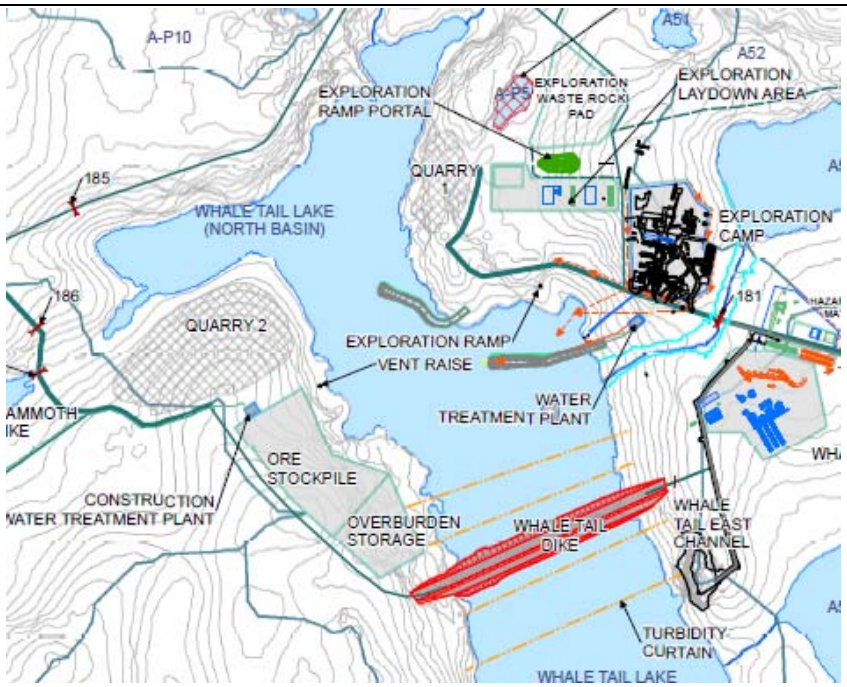
Date:		**Start Time:**	
		End Time:	
Field Crew Names:			
Weather:			

Indicate if any sections of Whale Tail Lake (North Basin) were not surveyed:

Indicate in the table below the number of individuals of each species observed today, and document any evidence of nesting

Species	Total number observed	Evidence of nesting?
Common Loon		
Red-throated Loon		
Red-breasted Merganser		
Long-tailed Duck		
Other diving birds		

Indicate on the map below the locations of each diving bird observation

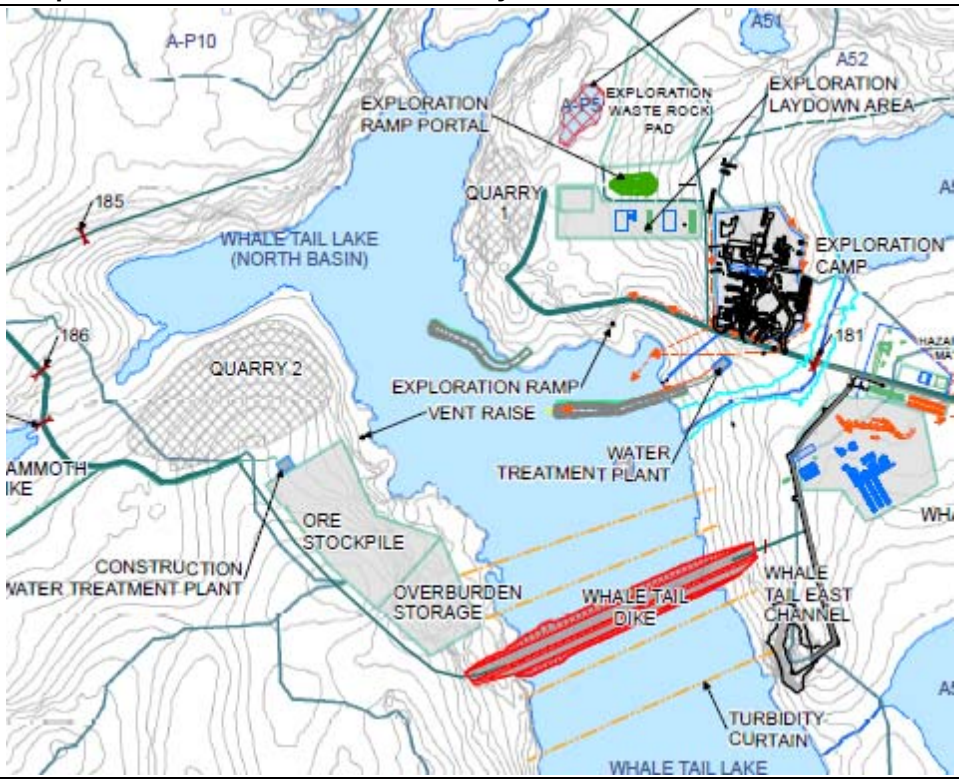


Was any mitigation implemented to protect migratory birds today?			
Report prepared by:		**Reviewed fish-out supervisor:**	

DIVING BIRD MORTALITY DATA SHEET

Date:		**Name:**	
Diving Bird Species:			
Gillnet Set Time and Date:		**Check Time and Date:**	
Fish-out Net Set ID:		**Mesh Size where Caught:**	
Weather:		**Water Depth:**	
Photo Numbers:			

Indicate on the map below the location of the mortality:



Could anything have been done to prevent this mortality? What mitigation was in place to prevent this mortality (streamers, effigies, pingers, etc.)

Please place the carcass in a plastic bag, store in the freezer, and label the bag with date, species, and contact information. Contact Environment and Climate Change Canada for further instructions.

Report prepared by:		**Reviewed fish-out supervisor:**	