Response to Comments on
Component Study

## FRESHWATER FISH AND FISH HABITAT COMPONENT STUDY ADDENDUM

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# NEWFOUNDLAND AND LABRADOR REFINERY PROJECT EIS FRESHWATER FISH \& FISH HABITAT COMPONENT STUDY POINTS TO BE ADDRESSED 

Wildlife Division - Overall, the component study is acceptable. Additional information/explanation is required for several sections. Specific comments related to information presented are outlined below. Pictures of the surveyed ponds were very beneficial.

Page 16 Section 5.3. Population estimates based on sampling from a single section of stream are very weak. Additional surveys should be conducted to increase the precision of the population estimates and ensure an appropriate estimate is obtained.

## NLRC Response:

The population estimates from each electrofishing station are conducted as part of standard operating procedures to give an indication of the relative abundance of each species within the Project area and are not specifically used in HADD determination for the Project footprint. The HADD quantification approach used by DFO is very conservative and as such, does not rely on the quantity/density of fish within a stream/pond but merely the presence of the species to have that species included in the quantification. In this respect, the total quantity of habitat surveyed in each watershed to conclude species presence is considered adequate for HADD determination. It should be noted that select ponds have been identified for additional sampling by DFO (please see below).

Section 6.4.5 and 6.4.6. Insufficient survey effort was applied to make the conclusion that the ponds do not contain any fish habitat. Addition surveys should be conducted to verify this preliminary conclusion.

## NLRC Response:

Several ponds have been identified as requiring additional survey information regarding verification of species presence in order to finalize the fish habitat quantification. However, adequate surveys have been completed to provide the basis for an acceptable Fish Habitat Compensation strategy as part of the environmental assessment. This additional survey data will be submitted as a data addendum.

## Fisheries \& Oceans, Canada (DFO) -

## General Comments

DFO - HES has completed its review of the Marine Fish and Fish Habitat Component Study for the Newfoundland and Labrador Refinery Project in Southern Head, NL. The document does provide a good description of the studies which have been completed to establish baseline conditions related to freshwater fish and fish habitat which shall assist
the proponent in predicting impacts to fish and fish habitat in the freshwater environment as a result of project development. However outlined below are items which require attention and/or additional information.

General Comment: As indicated in the report two methodologies were used when completing the riverine habitat classification/quantification to establish baseline conditions within the project area, which included the Beak (1980) and the new DRAFT Standard Methods Guide for the Classification and Quantification of Fish Habitat in Rivers of Newfoundland and Labrador. Please be advised that as this is a new system revisions to the methodology may be warranted during its implementation to ensure that it is scientifically defensible while being publicly accountable.

## NLRC Response:

NLRC was required to use both survey methods in the quantification process and acknowledges that the alternate method is still a draft. It is anticipated that any revisions of the methods would not impede or invalidate the data collected and presented as it relates to habitat classification and/or quantification.

Section: Executive Summary Page: iii and iv Subject: T1-1 Species Present

Table E1 on page iii indicates that brook trout are the only species present within T1-1 and P2, while sampling via electrofishing reported on page iv indicated brook trout and American eel were captured within T1. Please revise Table E1 to reflect this.

## NLRC Response:

Agreed. Table will be revised and submitted as a data addendum.
Section: 5.1.2 Habitat Quantification Page: $10 \quad$ Subject: American Eel Presence

As indicated fish species presence was determined through the use of fyke nets, minnow traps and electrofishing. Fish captured were considered indicative of species utilizing that habitat for life processes, with the exception of Watson Brook drainage basin where Atlantic Salmon, brook trout and three spine stickleback are all know to occur, therefore were all included in Habitat Equivalent Unit (HEU) calculations. Electrofishing within T1 indicated the presence of American eel in the project area. As such Watson's Brook should be considered useable for American eel unless further sampling is conducted to prove otherwise as fish sampling methods implemented may not have been sufficient to determine definitively the absence of American eel. Likewise T3 and P3 should also be considered useable for American eel. As such please revise table E1 to reflect the presence of American eel and calculate the HEU's for American eel for P1, P2, P3, P7, P8, T2, T2-1, T2-2, T2-3 and T3.

## NLRC Response:

It is unclear why the inclusion of a species in a watershed where it was not
identified should occur, simply based on proximity to other watersheds. However, American eels were captured within a pond of the Watson's Brook watershed and based on that information, HEUs for this species will be calculated for the identified ponds and reaches within that watershed. This additional survey data will be submitted as a data addendum.

## Section: 6.1.1 Habitat Quantification Page: $19 \quad$ Subject: Overland Flow

 This section indicates that 3.14 units of overland flow were identified on T1-1 and that this is not considered fish habitat and as such not included in any of the totals. Can this overland flow be considered an intermittent stream? Is it an obstruction to fish migration? Please clarify.
## NLRC Response:

The overland flow would not be considered an intermittent stream or fish habitat but merely high flow runoff from these relatively isolated small ponds. There is no real "substrate" or defined bank to these sections and the flow location could change from year to year high flows. Substrate consists of grasses (not aquatic) typically found in the area.

## Section: 6.1.1 Stream T1-Table 6.2 Page: $21 \quad$ Subject: Reach 1 and 2

 Table 6.2 indicates that reach 1 and 2 have a tidal influence and therefore no mean velocity measurements were taken. Why were velocity measurements not taken? Although it is recognized that water velocities in these type of areas are influenced by the high and low tide, velocity measurements should have been conducted especially when applying the new riverine habitat quantification system where Habitat Suitabilities Indices (HSI) for species present are calculated based on substrate and water velocity. As such the HSI value and resulting HEU (identified in Table 6.6 - page 24) for brook trout (identified within T1) for reach 1 and 2 has been calculated to be zero. As such please collect the necessary velocity measurements to recalculate the HSI and HEU for brook trout for these reaches.
## NLRC Response:

At the time of the surveys, the velocities measured were flowing upstream due to tidal influences and were therefore determined to be invalid. The tidal nature of the lower two reaches was also the reason that it was discounted as freshwater stream habitat in that life-cycle stages such as spawning cannot be completed. Velocity measurements will be re-attempted and the habitat quantified however, the tidal influence on the habitat suitability should be considered when determining quantification for freshwater habitat. The additional survey data will be submitted as a data addendum.

Section: 6.1.1 Stream T1-1 Table 6.3 Page: $22 \quad$ Subject: Reach 12
Table 6.3 indicates that reach 12 has a mean velocity of zero, while field sheet data indicates that only one cross section was surveyed on this 70 metre reach to produce a mean velocity values. The field sheet data also notes that surface velocity is visible. As such a minimum of three cross sections should have been surveyed to obtain mean velocity value.

## NLRC Response:

Agreed. Additional transects will be conducted in this reach and the data incorporated into a revised mean velocity value and HEU. The additional survey data will be submitted as a data addendum.

Section: 6.1.1 Stream T1-1 Table 6.3 Page: $22 \quad$ Subject: Reach 14 Table 6.3 indicates that reach 14 ( 120 m in length) is pond type habitat. As such the appropriate methodology to quantify this reach (i.e. lacustrine habitat quantification) should have been implemented. Please clarify as to why this habitat was not quantified.

## NLRC Response:

Agreed. This pond was overlooked and will be surveyed as per the lacustrine habitat quantification. The additional survey data will be submitted as a data addendum.

Section: 6.1.2 Stream T2 Table 6.8 Page: $25 \quad$ Subject: Reach 4
Table 6.8 indicates that reach 4 ( 180 m in length) is overland flow and as such has not been included when calculating HEU's. Lacustrine habitat quantification of P7 (upstream from T2) indicates that an Atlantic salmon was captured during fish sampling. Was this Atlantic salmon resident or anadromous? Can this overland flow be considered an intermittent stream? Does it provide access from P7 to Watson's Brook or is it an obstruction to fish migration? Please clarify.

## NLRC Response:

The overland flow would not be considered an intermittent stream or fish habitat but merely high flow runoff from these relatively isolated small ponds. There is no real "substrate" or defined bank to these sections and the flow location could change from year to year high flows. Substrate consists of grasses (not aquatic) typically found in the area. Flow was seen during surveys and as such could provide opportunistic corridors to species in the watershed under the appropriate conditions (eg. American eels). In most situations, this section of stream would be considered a barrier to migration.

In order to be conservative, all salmon in P7 were called Atlantic salmon and were not assumed to be resident for habitat quantification.

Section: 6.1.3 Stream T3 Table 6.11 Page: $27 \quad$ Subject: Reach 5, 6, 7 Table 6.11 indicates that reach 5,6 and 7 ( 650 m total length) is overland flow and as such has not been included when calculating HEU's. Can this overland flow be considered an intermittent stream? Is it an obstruction to fish migration? Could these sections serve as migrational corridors between P3 and T3 and as such could be included in when quantifying fish habitat? Please clarify.

## NLRC Response:

The overland flow would not be considered an intermittent stream or fish habitat but merely high flow runoff from these relatively isolated small ponds. There is no real "substrate" or defined bank to these sections and the flow location could change from year to year high flows. Substrate consists of grasses (not aquatic) typically found in the area. Flow was seen during surveys and as such could provide opportunistic corridors to species in the watershed under the appropriate conditions (eg. American eels). In most situations, this section of stream would be considered a barrier to migration.

Section: 6.3.5 Pond 5 (2007) Page: $\quad$ Subject: Fish Sampling Pond 5 In general, the methods and effort employed for fish sampling appear adequate for identifying fish utilization within the project area. However with respect to Pond 5 a second method of sampling should have been employed for completeness before these waterbodies are deemed not to contain fish. Additional sampling methods such as seining and/or angling should be implemented to determine the presence of fish.

## NLRC Response:

Agreed. Additional sampling will be conducted at Pond 5 as per discussions with DFO. The additional survey data will be submitted as a data addendum.

Section: 6.3.10 Pond 10 (2007) Page: Subject: Fish Sampling Pond 10 While it is recognized that P10 is a smaller waterbody with some drainage into P8 a sufficient level of effort should have been implemented into a sampling program prior to this waterbody deemed not to contain fish. A fish sampling program implementing either a seine net, shoreline electrofishing and/or angling should be completed to determine the presence of fish.

## NLRC Response:

Agreed. Additional sampling will be conducted at Pond 5 as per discussions with DFO. The additional survey data will be submitted as a data addendum.

Section: Appendix C (Electrofishing data sheets) Subject: T1 Station 1 Electrofishing raw data indicates that some brook trout were captured with 'fish lice' on them. Were these 'sea lice' or freshwater copepods? The reason for this question is; that if some of the brook trout using these streams are anadromous then the utilization patterns for adults may be different than if the populations are resident.

## NLRC Response:

The "fish lice" were indeed freshwater copepods.

