TMI_892- FFH(2)-01.docx

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response | |
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| TMI_892-FFH(2)-01 | FFH(2)-01 | 1 | CEA Agency | Reference to EIS Guidelines: | Part 2, Sections 9.1.2 and 10 |
| | | | | Reference to EIS / Appendix | Sections 6.14 and 6.15, Appendix Q, S, II, TMI_132-FH(1)-11_Table_1 |
| | | | | Cross-reference to Round 1 IRs | TMI_014-PD(1)-01, TMI_132- FH(1)-11 |
| | | | | **Context and Rationale:**<br>• The Agency has uncertainty with the presence of fish and fish habitat in the wetlands within the Project Study Area (PSA), Local Study Area (LSA) and Zone of Influence (ZOI). In another information requirement (SG-WL_2), the Agency requested a review and update of wetland mapping, and a reassessment of habitat within the PSA, LSA and RSA. Response to this information requirement should incorporate findings from SG-WL_2.<br>• According to Section 3.3.4 in Appendix S, all 11 wetlands that were surveyed were identified as having some fish habitat, including nursery and staging/migration habitat.<br>• A map provided in Section 1.1 of Appendix S indicates that several of the surveyed wetlands are located in close proximity to Wabigoon Lake and Thunder Lake. As such, large-bodied fish species may utilize these areas. Characterizing the fish and fish habitat in these wetlands is important to adequately estimate project effects that will need to be offset by the proposed Fish Habitat Offsetting Plan.<br>• In the response to IR# FH(1)-11, the Proponent provided fish and fish habitat information for the surveyed wetlands (TMI_132-FH(1)-11_Table _1). However, it was unclear if the loss of the affected fish-bearing wetland areas were included in the overall fish habitat loss accounting conducted for the proposed Conceptual Fish Habitat Offsetting Plan. | |
| | | | | **Specific Question / Request for Information:**<br>A. Taking responses from SG-WL_2 into consideration, provide an estimate of the loss of fish habitat (in $m^2$) for each fish-bearing wetland that will be affected by the Project.<br>B. Provide updated accounting for fish habitat loss taking into consideration the response to Question A for the proposed Conceptual Fish Offsetting Plan. | |

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**Draft Response:**

Part A:

All of the fish habitat loss associated with wetlands has been captured within the calculated 51,705 m² of fish habitat loss for the Project. Section 3.3.4 of Appendix S of the revised EIS (April 2018) is correct in saying that the 11 wetlands surveyed at that time (WLD1 to WLD11) all contain areas of potential fish habitat. Each of these 11 wetlands have a portion of open water (i.e., creek / tributary or beaver pond) that is considered to be potential fish habitat; however, only WLD2, WLD3, WLD4a, WLD4b and WLD5 would be affected by the Project and are therefore accounted for in the calculation of fish habitat loss (Table 1 below).

Since the creation of Appendix S, additional wetlands have been surveyed in the vicinity of the Project. An updated figure showing the additional wetlands surveyed in June of 2018 as well as all of the fish bearing wetlands anticipated to be affected as a result of the Project is provided as TMI_892-FFH(2)-01_Figure_1 attached. Based on these surveys, additional wetlands have been identified that are fish bearing and that will be affected by the Project. These wetlands have been included in the fish habitat loss accounting presented in Table 1 below.

There are no additional wetlands outside of the ones presented in TMI_892-FFH(2)-01_Figure_1 and Table 1 that would be affected by the Project and have the potential to be fish bearing. The wetlands surveyed (including the 11 wetlands from Appendix S) are presented in Table 1 along with the description of the potential fish habitat loss associated with each wetland.

Table 1: Fish-Bearing Wetlands Impacted by Project

| Wetland Name | Description of Habitat Loss | Total Area of Fish Habitat Loss (m²) | Reach / Wetland Name for Assessment | Tributary or Pond |
|---|---|---|---|---|
| WLD1 | No loss of fish or fish habitat | — | — | — |
| WLD2 | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 2 and 1 beaver pond) | 2,491.65 | T2-B-R1 | Tributary |
| | | | T2-B-R2 | Tributary |
| | | | T2-B-1 | Tributary |
| | | | Tributary 2 – R2 | Tributary |
| | | | T2-A | Tributary |
| | | | WLD2(Pond) | Pond |
| WLD3 | Loss of open water within wetland due to temporary flow reductions (portion of Blackwater Creek Tributary 1) | 722.16 | Tributary 1 -R1 | Tributary |
| WLD4a | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 1 and 1 beaver pond) | 22,083.90 | Tributary 1 – R2 | Tributary |
| | | | WLD4a(Pond) | Pond |
| WLD4b | | 16,340.78 | Tributary 1 – R2 | Tributary |

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| | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 1 and 2 beaver ponds) | | WLD4b(Pond1)<br>WLD4b(Pond2) | Pond<br>Pond |
| WLD5 | Loss of open water within wetland due to dewatering (pond and portion of Blackwater Creek Tributary 4 within the wetland that is underlain by a granular material southeast of the Project) | 6,432.55 | WLD5(Pond) | Pond and Tributary |
| WLD6 | No loss of fish or fish habitat | — | — | — |
| WLD7 | No loss of fish or fish habitat | — | — | — |
| WLD8 | No loss of fish or fish habitat | — | — | — |
| WLD9 | No loss of fish or fish habitat | — | — | — |
| WLD10 | No loss of fish or fish habitat | — | — | — |
| WLD11 | No loss of fish or fish habitat | — | — | — |
| WLD12a | Loss of open water within wetland south of the diversion channel confluence (portion of Blackwater Creek Tributary 2) | 113.37 | Tributary 2 - R2 | Tributary |
| WLD12b | Loss of open water within wetland south of the diversion channel confluence due to permanent loss in flow (portion of Blackwater Creek Tributary 2) | 318.96 | Tributary 2 – R2 | |
| WLD13a | No loss of fish or fish habitat | — | — | — |
| WLD13b | No loss of fish or fish habitat | — | — | — |
| WLD14 | No loss of fish or fish habitat | — | — | — |
| WLD15 | Loss of open water within wetland due to permanent loss in flow (portion of Blackwater Creek Tributary 2) | 508.79 | WLD15(Pond) | Pond |
| WLD16 | Loss of open water within wetland due to permanent loss of flow (portion of Blackwater Creek Tributary 2) | 133.30 | WLD16(Pond) | Pond |
| WLD17 | Loss of open water within wetland due to dewatering (portion of Blackwater Creek Tributary 4 that is underlain by a granular material southeast of the Project) | 223.50 | Tributary 4 | Pond |
| Total Habitat Loss Associated with Wetlands | | 49,369 m² | | |

Notes:
— Either Project does not affect the wetland or the wetland is not considered fish bearing

The Project will result in a loss of 42,713 m² of fish bearing wetland habitat as a result of direct Project effects and 6,656 m² of fish bearing wetland habitat as a result of indirect Project effects for a total of 49,369 m² of fish habitat loss associated with

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wetlands. This has been included in the 51,705 m² of total fish habitat loss accounted for the Project presented in Table 2 of the response to Part B.

Part B: The accounting for fish habitat loss associated with the Project using the reaches identified in TMI_892-FFH(2)-01_Figure_2 is provided in Table 2 and is inclusive of the fish bearing wetlands assessed in Part A.

Table 2: Summary of Fish Habitat Losses Associated with the Project

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Area of Fish Habitat Loss (m²) | Habitat Alteration |
|---|---|---|---|---|
| Blackwater Creek Tributary 1 Catchment | | | | |
| Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | 777 | Flow temporarily reduced or eliminated. (95% reduction in flow) |
| Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area. | WLD4b(Pond1) located partially within proposed open pit. | 13,244 | Overprinted by open pit. |
| | | WLD4b(Pond2) located entirely within proposed open pit. | 3,097 | Overprinted by open pit. |
| | | WLD4a(Pond) located immediately upstream of berm surrounding the operation area. | 22,084 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond1) to WLD4b(Pond2) | 86 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond2) to WLD4a(Pond). | 195 | Overprinted by open pit. |
| Overall Fish Habitat Loss for Tributary 1 Catchment | | | 39,483 | |
| Blackwater Creek Tributary 2 Catchment | | | | |
| Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | 856 | Flow temporarily reduced or eliminated. (86% reduction in flow) |

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| Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to WLD2(Pond) located within operation area. | 237 | Overprinted. |
| | | WLD2(Pond) located within operations area. | 1,445 | Overprinted. |
| | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within berm that surrounds operation area. | 2,560 | Overprinted. |
| Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | 140 | Flow temporarily reduced or eliminated. (100% reduction in flow) |
| Overall Fish Habitat Loss for Tributary 2 Catchment | | | 5,238 | |
| Blackwater Creek Unnamed Tributary Catchment | | | | |
| Unnamed Tributary | The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel | Same as General Reach Location. | 327 | Flow temporarily reduced or eliminated. (65% reduction in flow) |
| Overall Fish Habitat Loss for Unnamed Tributary Catchment | | | 327 | |
| Blackwater Creek Tributary 4 | | | | |
| WLD5(Pond) | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 5,864 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Blackwater Creek Tributary 4 | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 793 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Overall Fish Habitat Loss for WLD5 | | | 6,657 | |
| Total Fish Habitat Loss for Project | | | 51,705 | |

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Agency Comment on Draft Response

None Received

Specific Comment to the Agency

Agency accepted Draft Response as Final.

Although the draft response remains valid, as part of the process for determining completeness of the Round 2 responses, an additional effect of the drawdown created by the dewatering of the open pit and underground mine was identified on the flows within Hoffstrom's Bay Tributary. Specifically, there would be an additional 6.6% reduction in flows in Hoffstrom's Bay Tributary during the operations and closure phase, bringing the total loss of flows during those phases to 14.4%. During the site preparations and construction phase, and during post-closure (once groundwater levels recover) the reduction in flows in Hoffstrom's Bay Tributary will be 7.8%, as a result of the enclosure of catchment areas within the operations area. This would result in an additional loss of 3,096 m² of fish habitat, bringing the total loss of habitat presented in Table 2 of Part B of the draft response up to 54,801 m². An updated version of Table 2 is provided below:

Table 2: Summary of Fish Habitat Losses Associated with the Project

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Area of Fish Habitat Loss (m²) | Habitat Alteration |
|---|---|---|---|---|
| Blackwater Creek Tributary 1 Catchment | | | | |
| Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | 777 | Flow temporarily reduced or eliminated. (95% reduction in flow) |
| Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area. | WLD4b(Pond1) located partially within proposed open pit. | 13,244 | Overprinted by open pit. |
| | | WLD4b(Pond2) located entirely within proposed open pit. | 3,097 | Overprinted by open pit. |
| | | WLD4a(Pond) located immediately upstream of berm surrounding the operation area. | 22,084 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond1) to WLD4b(Pond2) | 86 | Overprinted by open pit. |

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| | | Reach connecting WLD4b(Pond2) to WLD4a(Pond). | 195 | Overprinted by open pit. |
| Overall Fish Habitat Loss for Tributary 1 Catchment | | | 39,483 | |
| Blackwater Creek Tributary 2 Catchment | | | | |
| Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | 856 | Flow temporarily reduced or eliminated. (86% reduction in flow) |
| Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to WLD2(Pond) located within operation area. | 237 | Overprinted. |
| | | WLD2(Pond) located within operations area. | 1,445 | Overprinted. |
| | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within berm that surrounds operation area. | 2,560 | Overprinted. |
| Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | 140 | Flow temporarily reduced or eliminated. (100% reduction in flow) |
| Overall Fish Habitat Loss for Tributary 2 Catchment | | | 5,238 | |
| Blackwater Creek Unnamed Tributary Catchment | | | | |
| Unnamed Tributary | The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel | Same as General Reach Location. | 327 | Flow temporarily reduced or eliminated. (65% reduction in flow) |
| Overall Fish Habitat Loss for Unnamed Tributary Catchment | | | 327 | |
| Blackwater Creek Tributary 4 | | | | |
| WLD5(Pond) | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a | Same as General Wetland Location | 5,864 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively |

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| | granular deposit southeast of the Project | | | assumed 100% loss of the wetland) |
| Blackwater Creek Tributary 4 | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 793 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Overall Fish Habitat Loss for Tributary 4 Catchment | | | 6,657 | |
| Hoffstrom's Bay Tributary | | | | |
| Hoffstrom's Bay Tributary | Includes all of the watercourse upstream of Thunder Lake | Same as General Wetland Location | 3,096 | Decrease of the Hoffstrom's Bay Tributary catchment enclosed within berm around the operations area. |
| | | | | Dewatering of the open pit could temporarily reduce the flows |
| Overall Fish Habitat Loss for Hoffstrom's Bay Tributary Catchment | | | 3,096 | |
| Total Fish Habitat Loss for Project | | | 54,801 | |

**Final Response:**

Part A:

All of the fish habitat loss associated with wetlands has been captured within the calculated 51,705 m² of fish habitat loss for the Project. Section 3.3.4 of Appendix S of the revised EIS (April 2018) is correct in saying that the 11 wetlands surveyed at that time (WLD1 to WLD11) all contain areas of potential fish habitat. Each of these 11 wetlands have a portion of open water (i.e., creek / tributary or beaver pond) that is considered to be potential fish habitat; however, only WLD2, WLD3, WLD4a, WLD4b and WLD5 would be affected by the Project and are therefore accounted for in the calculation of fish habitat loss (Table 1 below).

Since the creation of Appendix S, additional wetlands have been surveyed in the vicinity of the Project. An updated figure showing the additional wetlands surveyed in June of 2018 as well as all of the fish bearing wetlands anticipated to be affected as a result of the Project is provided as TMI_892-FFH(2)-01_Figure_1 attached. Based on these surveys, additional wetlands have been identified that are fish bearing and that will be affected by the Project. These wetlands have been included in the fish habitat loss accounting presented in Table 1 below.

There are no additional wetlands outside of the ones presented in TMI_892-FFH(2)-01_Figure_1 and Table 1 that would be affected by the Project and have the potential to be fish bearing. The wetlands surveyed (including the 11 wetlands from Appendix S) are presented in Table 1 along with the description of the potential fish habitat loss associated with each wetland.

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Table 1: Fish-Bearing Wetlands Impacted by Project

| Wetland Name | Description of Habitat Loss | Total Area of Fish Habitat Loss ($m^2$) | Reach / Wetland Name for Assessment | Tributary or Pond |
|---|---|---|---|---|
| WLD1 | No loss of fish or fish habitat | — | — | — |
| WLD2 | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 2 and 1 beaver pond) | 2,491.65 | T2-B-R1 | Tributary |
| | | | T2-B-R2 | Tributary |
| | | | T2-B-1 | Tributary |
| | | | Tributary 2 – R2 | Tributary |
| | | | T2-A | Tributary |
| | | | WLD2(Pond) | Pond |
| WLD3 | Loss of open water within wetland due to temporary flow reductions (portion of Blackwater Creek Tributary 1) | 722.16 | Tributary 1 -R1 | Tributary |
| WLD4a | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 1 and 1 beaver pond) | 22,083.90 | Tributary 1 – R2 | Tributary |
| | | | WLD4a(Pond) | Pond |
| WLD4b | Loss of open water within wetland due to overprinting (portion of Blackwater Creek Tributary 1 and 2 beaver ponds) | 16,340.78 | Tributary 1 – R2 | Tributary |
| | | | WLD4b(Pond1) | Pond |
| | | | WLD4b(Pond2) | Pond |
| WLD5 | Loss of open water within wetland due to dewatering (pond and portion of Blackwater Creek Tributary 4 within the wetland that is underlain by a granular material southeast of the Project) | 6,432.55 | WLD5(Pond) | Pond and Tributary |
| WLD6 | No loss of fish or fish habitat | — | — | — |
| WLD7 | No loss of fish or fish habitat | — | — | — |
| WLD8 | No loss of fish or fish habitat | — | — | — |
| WLD9 | No loss of fish or fish habitat | — | — | — |
| WLD10 | No loss of fish or fish habitat | — | — | — |
| WLD11 | No loss of fish or fish habitat | — | — | — |
| WLD12a | Loss of open water within wetland south of the diversion channel confluence (portion of Blackwater Creek Tributary 2) | 113.37 | Tributary 2 - R2 | Tributary |
| WLD12b | Loss of open water within wetland south of the diversion channel confluence due to permanent loss in flow (portion of Blackwater Creek Tributary 2) | 318.96 | Tributary 2 – R2 | |

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| | | | | |
|---|---|---|---|---|
| WLD13a | No loss of fish or fish habitat | — | — | — |
| WLD13b | No loss of fish or fish habitat | — | — | — |
| WLD14 | No loss of fish or fish habitat | — | — | — |
| WLD15 | Loss of open water within wetland due to permanent loss in flow (portion of Blackwater Creek Tributary 2) | 508.79 | WLD15(Pond) | Pond |
| WLD16 | Loss of open water within wetland due to permanent loss of flow (portion of Blackwater Creek Tributary 2) | 133.30 | WLD16(Pond) | Pond |
| WLD17 | Loss of open water within wetland due to dewatering (portion of Blackwater Creek Tributary 4 that is underlain by a granular material southeast of the Project) | 223.50 | Tributary 4 | Pond |
| Total Habitat Loss Associated with Wetlands | | 49,369 m² | | |

Notes:
— Either Project does not affect the wetland or the wetland is not considered fish bearing

The Project will result in a loss of 42,713 m² of fish bearing wetland habitat as a result of direct Project effects and 6,656 m² of fish bearing wetland habitat as a result of indirect Project effects for a total of 49,369 m² of fish habitat loss associated with wetlands. This has been included in the 54,801 m² of total fish habitat loss accounted for the Project presented in Table 2 of the response to Part B.

Part B: The accounting for fish habitat loss associated with the Project using the reaches identified in TMI_892-FFH(2)-01_Figure_2 is provided in Table 2 and is inclusive of the fish bearing wetlands assessed in Part A.

Table 2: Summary of Fish Habitat Losses Associated with the Project

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Area of Fish Habitat Loss (m²) | Habitat Alteration |
|---|---|---|---|---|
| Blackwater Creek Tributary 1 Catchment | | | | |
| Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | 777 | Flow temporarily reduced or eliminated. (95% reduction in flow) |
| Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to | WLD4b(Pond1) located partially within proposed open pit. | 13,244 | Overprinted by open pit. |

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| | | | | | berm that surrounds the operations area. | WLD4b(Pond2) located entirely within proposed open pit. | 3,097 | Overprinted by open pit. |
| | | | | | | WLD4a(Pond) located immediately upstream of berm surrounding the operation area. | 22,084 | Overprinted by open pit. |
| | | | | | | Reach connecting WLD4b(Pond1) to WLD4b(Pond2) | 86 | Overprinted by open pit. |
| | | | | | | Reach connecting WLD4b(Pond2) to WLD4a(Pond). | 195 | Overprinted by open pit. |
| | | | | Overall Fish Habitat Loss for Tributary 1 Catchment | | | 39,483 | |
| | | | | Blackwater Creek Tributary 2 Catchment | | | | |
| | | | | Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | 856 | Flow temporarily reduced or eliminated. (86% reduction in flow) |
| | | | | Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to WLD2(Pond) located within operation area. | 237 | Overprinted. |
| | | | | | | WLD2(Pond) located within operations area. | 1,445 | Overprinted. |
| | | | | | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within berm that surrounds operation area. | 2,560 | Overprinted. |
| | | | | Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | 140 | Flow temporarily reduced or eliminated. (100% reduction in flow) |
| | | | | Overall Fish Habitat Loss for Tributary 2 Catchment | | | 5,238 | |
| | | | | Blackwater Creek Unnamed Tributary Catchment | | | | |
| | | | | Unnamed Tributary | The Unnamed Tributary of Blackwater Creek from the headwaters to the | Same as General Reach Location. | 327 | Flow temporarily reduced or eliminated. (65% reduction in flow) |

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| | confluence with Blackwater Creek main channel | | | |
| Overall Fish Habitat Loss for Unnamed Tributary Catchment | | | 327 | |
| Blackwater Creek Tributary 4 | | | | |
| WLD5(Pond) | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 5,864 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Blackwater Creek Tributary 4 | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 793 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Overall Fish Habitat Loss for Tributary 4 Catchment | | | 6,657 | |
| Hoffstrom's Bay Tributary | | | | |
| Hoffstrom's Bay Tributary | Includes all of the watercourse upstream of Thunder Lake | Same as General Wetland Location | 3,096 | Decrease of the Hoffstrom's Bay Tributary catchment enclosed within berm around the operations area.<br>Dewatering of the open pit could temporarily reduce the flows |
| Overall Fish Habitat Loss for Hoffstrom's Bay Tributary Catchment | | | 3,096 | |
| Total Fish Habitat Loss for Project | | | 54,801 | |

TMI_893-FFH(2)-02

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response | |
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| TMI_893-FFH(2)-02 | FFH(2)-02 | 1 | CEA Agency | Reference to EIS Guidelines: | Part 2, Sections 9.1.2, 10 |
| | | | | Reference to EIS / Appendix | Appendix II, Sections 4.2 and 4.3; Table 4.1-1; Section 6.0 |
| | | | | Cross-reference to Round 1 IRs | TMI_127-FH(1)-06 |
| | | | | **Context and Rationale:**<br>• The proposed offsetting options for fish and fish habitat for the Project are conceptually presented in Appendix II of the revised EIS. However, details of the conceptual offsetting options including fish habitat accounting was not provided, and therefore it not possible to determine if the options would be effective, beneficial, and feasible.<br>• According to Section 4.3 in Appendix II, "3,597 m of watercourse" and "[…] 3.942 ha of beaver ponds" will be permanently lost, with "717 m of watercourse" temporarily lost during all phases of the Project. However, an estimate of the fish habitat impacted by the Project (in m2) for each watercourse or waterbody was not provided in Appendix II or elsewhere in the revised EIS.<br>• Section 6.0 of Appendix II states that the "[…] the conceptual offsetting plan includes three primary offsetting measures. They are:<br>o Shoreline stabilization of Wabigoon Lake;<br>o Creation of fish habitat, after mine closure, in ponds adjacent and connected to Blackwater Creek; and<br>o Removal of the dam on Thunder Lake Tributary 2, to allow upstream fish passage.<br>It is further stated in the same section that "each of these concepts is deemed to be worthy of consideration as offsetting for the project". However, there were no fish habitat accounting presented in the revised EIS to validate this statement. It is also unclear whether a single offsetting option, or multiple options, would be considered for the final offsetting plan.<br>• Furthermore, there is uncertainty in whether the identified impacts to fish and fish habitat would be associated with an authorization under Section 35 of the Fisheries Act or an amendment to Schedule 2 of Metal Mining Effluent Regulations of the Fisheries Act.<br>• In addition, the impacts to other valued components from the Fisheries Act instruments was not presented the revised EIS and IR #1 responses, This information is required to conduct an effects assessment under subsection | |

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| | | | | 5(2) of CEAA 2012 (See MARC-REG-01), and includes the identification of changes to the environment (i.e. loss or change to riparian and terrestrial habitat) that are specifically linked to federal decisions, not already captured in section 5(1)(c) of CEAA 2012.<br>) The fish habitat accounting for the predicted fish habitat losses due to the Project and the offsetting options presented in the revised EIS, along with the identification of the applicable regulatory instrument, is required for the Agency and Fisheries and Oceans Canada (DFO) to determine if the proposed Fish Habitat Offsetting Plan would be sufficient to mitigate the effects to fish and fish habitat from the Project. |
| | | | | **Specific Question / Request for Information:**<br>A. Provide an accounting of the amount of fish habitat impacted by the Project (in m2) for each watercourse/waterbody, and explain how it was calculated. Include in this assessment, the fish habitat loss accounting conducted for fish-bearing wetlands as requested in FFH(2)-01.<br>B. To offset the amount of habitat identified in response to Question A, provide an estimate of the amount of fish habitat for each offsetting option (in m2), and explain how it was calculated, using appropriate figures and rationale. Clarify whether a single or multiple offsetting options would be chosen for the Fish Habitat Offsetting Plan.<br>C. For Questions A and B, distinguish between what would be considered under section 35 of the Fisheries Act or Schedule 2 of the Metal Mining Effluent Regulations under the Fisheries Act. |
| | | | | **Response:**<br>Part A: The Project will result in the loss of a total of 51,705 m² of potential fish habitat. This includes 5,935 m² of fish habitat within watercourses, specifically within Blackwater Creek Tributaries 1, 2 and 4, and 45,770 m² of habitat in open water wetlands (i.e., beaver ponds located along Blackwater Creek Tributaries 1 and 2 and open water wetlands underlain by granular materials within the drawdown zone of influence). This is inclusive of all of the fish-bearing wetlands that will be lost as a result of the Project as identified in the response to TMI_892-FFH(2)-01.<br><br>The fish habitat loss associated with open water wetlands was also quantified as part of the response to TMI_892- FFH(2)-01 and was calculated using remote sensing. The loss of Blackwater Creek Tributaries 1 and 2 could not be calculated using remote sensing due to the small size of the tributaries and the dense vegetation covering the majority of the channel. Instead, the loss of Blackwater Creek Tributaries 1 and 2 was calculated using field measurements for channel width (wetted bankfull width) multiplied by the channel length to determine the area of fish habitat loss in m². Use of the wetted bankfull width has been used on other projects to calculate the area of similar creeks that have a very low gradient with wide flood plains.<br><br>The individual areas and methods used in the calculation of each reach of tributary and open water wetlands are provided in Table 1. |

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Table 1: Fish Habitat Losses Associated with the Project

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Area of Fish Habitat Loss ($m^2$) | Habitat Alteration |
|---|---|---|---|---|
| Blackwater Creek Tributary 1 Catchment | | | | |
| Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | 777 | Flow temporarily reduced or eliminated. (95% reduction in flow) |
| Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area. | WLD4b(Pond1) located partially within proposed open pit. | 13,244 | Overprinted by open pit. |
| | | WLD4b(Pond2) located entirely within proposed open pit. | 3,097 | Overprinted by open pit. |
| | | WLD4a(Pond) located immediately upstream of berm surrounding the operation area. | 22,084 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond1) to WLD4b(Pond2) | 86 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond2) to WLD4a(Pond). | 195 | Overprinted by open pit. |
| Overall Fish Habitat Loss for Tributary 1 Catchment | | | 39,483 | |
| Blackwater Creek Tributary 2 Catchment | | | | |
| Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | 856 | Flow temporarily reduced or eliminated. (86% reduction in flow) |
| Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to WLD2(Pond) located within operation area. | 237 | Overprinted. |
| | | WLD2(Pond) located within operations area. | 1,445 | Overprinted. |
| | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within | 2,560 | Overprinted. |

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| | | berm that surrounds operation area. | | |
| Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | 140 | Flow temporarily reduced or eliminated. (100% reduction in flow) |
| Overall Fish Habitat Loss for Tributary 2 Catchment | | | 5,238 | |
| Blackwater Creek Unnamed Tributary Catchment | | | | |
| Unnamed Tributary | The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel | Same as General Reach Location. | 327 | Flow temporarily reduced or eliminated. (65% reduction in flow) |
| Overall Fish Habitat Loss for Unnamed Tributary Catchment | | | 327 | |
| Blackwater Creek Tributary 4 | | | | |
| WLD5(Pond) | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 5,864 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Blackwater Creek Tributary 4 | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 793 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Overall Fish Habitat Loss for WLD5 | | | 6,657 | |
| Total Fish Habitat Loss for Project | | | 51,705 | |

Part B: The fish habitat offsetting / compensation alternatives that were assessed in Appendix II as preliminary options included:

- Shoreline stabilization of Wabigoon Lake;
- Creation of fish habitat, after mine closure, in ponds adjacent and connected to Blackwater Creek; and
- Removal of the dam on Thunder Lake Tributary 2, to allow upstream fish passage.

These alternatives were assessed in order to examine multiple options for the fish habitat offsetting / compensation and ensure the Agency, DFO and ECCC that multiple options were considered. From this assessment, Treasury Metals has determined that for the offsetting / compensation habitat required under the Fisheries Act, 6 ha of pond will be constructed

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during the site preparation and construction phase within the Treasury Metals property, as this type of habitat reflects the majority of the fish habitat lost from Project related activities (i.e., beaver ponds). Although two (2) ponds have been proposed in the Round 2 information request responses, the final design (e.g., location and depth) of these ponds is yet to be determined through consultation with Indigenous communities, DFO and ECCC. The total area of constructed offsetting / compensation habitat is conceptual and will be finalized through consultation with Indigenous communities, DFO and ECCC, but will result in at a minimum of a 1:1 ratio of lost habitat to new habitat.

In addition to these constructed ponds, in order to convey the upstream catchment of Blackwater Creek Tributary 2 around the TSF, the Blackwater Creek Tributary 2 diversion channel is required. As such, no alternative option for the diversion channel is proposed. The diversion channel will be designed and constructed as suitable fish habitat in order to meet the requirements of the MDMER.

Table 2 provides an estimate of the fish habitat proposed for each offsetting/compensation option and explains how these areas have been calculated. A figure showing the locations of the proposed offsetting has been provided as TMI_876-RG(2)-01_Figure_1.

Table 2: Estimate of Proposed Fish Habitat Offsetting/Compensation

| Offsetting/Compensation Measure | Area of Fish Habitat Provided by Offsetting Measure ($m^2$) | Basis for Area Calculated for Offsetting / Compensation Measure |
|---|---|---|
| Diversion of Blackwater Creek Tributary 2, upstream of the operations area | 3,047 | Blackwater Creek Tributary 2 must be realigned to convey non-contact water around the proposed Project site. The most direct route to convey this water was provided as a drawing in the Fish Habitat Offsetting document. The length of this diversion would be 1,219 m straight downvalley. The proposed width of the bankfull channel which would be considered as the offsetting measure is 2.5 m, which when multiplied by the length gives an offsetting area of 3,047.5 $m^2$. |
| Creation of New Pond(s) for Fish Habitat | 60,000 | This offsetting measure would involve the excavation of two new ponds to provide fish habitat. The ponds will be located adjacent to Blackwater Creek immediately downstream of the confluence with Blackwater Creek Tributary 1. The ponds will be located within Treasury Metal's current property boundary of claims and dispositions. The ponds will be connected to an existing creek via a short outlet channel and the water level within the creek it is connected to will set the water elevation for the pond. The new ponds will be excavated such that a total of 6.0 ha of area will be wetted based on this water elevation. |

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Part C: Table 3 provides a listing of the fish habitat losses associated with the Project and includes a clear indication as to whether the loss of habitat would require considered under Section 35 of the Fisheries Act, or Schedule 2 of the Metal Mining Effluent Regulations under the Fisheries Act.

Table 3: Authorization under Section 35 of the Fisheries Act and through a Schedule 2 Amendment under the Metal Mining Effluent Regulations

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Habitat Alteration | Authorization Required | Area of Fish Habitat Loss ($m^2$) |
|---|---|---|---|---|---|
| Blackwater Creek Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | Flow temporarily reduced or eliminated. | Section 35 | 777 |
| Blackwater Creek Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area. | Upstream-most wetland located partially within proposed open pit. | Overprinted by open pit. | Section 35 | 13,244 |
| | | Mid-reach wetland located entirely within proposed open pit. | Overprinted by open pit. | Section 35 | 3,097 |
| Blackwater Creek Tributary 1 Reach 2 | | Downstream-most wetland located immediately upstream of berm surrounding the operation area. | Overprinted by open pit. | Section 35 | 22,084 |
| | | Reach connecting upstream-most wetland to mid-reach wetland and | Overprinted by open pit. | Section 35 | 86 |
| | | Reach connecting mid-reach wetland to downstream-most wetland. | Overprinted by open pit. | Section 35 | 195 |
| Blackwater Creek Unnamed Tributary Reach 1 | The Unnamed Tributary of Blackwater Creek from the headwaters | Same as General Reach Location | Flow temporarily reduced or eliminated | Section 35 | 327 |

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| | to the confluence with Blackwater Creek main channel | | | | |
| Blackwater Creek Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | Flow temporarily reduced or eliminated. | Section 35 | 856 |
| Blackwater Creek Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to wetland located within operation area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 237 |
| | | Wetland located within operations area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 1,445 |
| | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of wetland and within berm that surrounds operation area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 2,560 |
| Blackwater Creek Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | Flow temporarily reduced or eliminated. | Section 35 | 140 |
| Blackwater Creek Tributary 4 Creek | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | Dewatering of the open pit could temporarily drain the open water within the creek (conservatively assumed 100% loss of the watercourse) | Section 35 | 5,864 |
| Blackwater Creek Tributary 4 WLD5(Pond) | | Same as General Wetland Location | Dewatering of the open pit could temporarily drain the open water within the pond (conservatively assumed 100% loss of the pond) | Section 35 | 793 |

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| Total Area (m²) Considered for Authorization under Section 35 of the Fisheries Act | 47,463 |
| Total Area (m²) Considered for Schedule 2 amendment under the Metal and Diamond Mining Effluent Regulations. | 4,242 |

The total proposed offsetting / compensation measures (see Table 2) will be sufficient to address the combined Section 35 fisheries impacts (Offset Plan) and waterbodies considered under Schedule 2 of the MDMER (Compensation Plan). The specific segregation of the measures to satisfy the requirements of both legislations would be determined in discussion with DFO and ECCC. The segregations can be a virtual percentage allocation of the compensation and offset measures to each of the "plans", or if needed, a physical separation between the measures for each plan can be incorporated into the final habitat designs.

Agency Comments on Revised Response

Please provide a comprehensive breakdown of the habitat that will be lost/impacted by the project in terms of its functional value (rearing, foraging, migratory, etc.) for each watercourse/waterbody impacted. Please additionally relate this to the FHCP and FHOP required under the Fisheries Act and MDMER.

Specific Comment to the Agency

A column has been added to Table 3 that provides the "functional value" of all the fish-bearing waters that will be removed as a result of the Project. Table 3 also distinguishes which reaches of fish habitat are considered under Schedule 2 (FHCP) of the MDMER and Section 35 of the Fisheries Act (FHOP). All of the watercourse and waterbodies removed as a result of the Project act as potential full life cycle habitat for small bodied fish species, including rearing and foraging habitats. There are no known seasonal migratory uses of the channels by larger bodied fish, although some localized movements would be expected by resident fish to support their spring spawning and overwintering behaviors. Beaver ponds and pools are expected to be utilized as primary overwintering habitats as the shallow small channels can freeze to the bottom.

Final Response

Part A: The Project will result in the loss of a total of 54,801 m² of potential fish habitat. This includes 9,031 m² of fish habitat within watercourses, specifically within Blackwater Creek Tributaries 1, 2 and 4 and Hoffstrom's Bay Tributary, as well as 45,770 m² of habitat in open water wetlands (i.e., beaver ponds located along Blackwater Creek Tributaries 1 and 2 and open water wetlands underlain by granular materials within the drawdown zone of influence). This is inclusive of all of the fish-bearing wetlands that will be lost as a result of the Project as identified in the response to TMI_892-FFH(2)-01.

The fish habitat loss associated with open water wetlands was also quantified as part of the response to TMI_892- FFH(2)-01 and was calculated using remote sensing. The loss of Blackwater Creek Tributaries 1 and 2 and Hoffstrom's Bay Tributary could not be calculated using remote sensing due to the small size of the tributaries and the dense vegetation covering the majority of the channel. Instead, the loss of Blackwater Creek Tributaries 1 and 2 and Hoffstrom's Bay Tributary

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was calculated using field measurements for channel width (wetted bankfull width) multiplied by the channel length to determine the area of fish habitat loss in m². Use of the wetted bankfull width has been used on other projects to calculate the area of similar creeks that have a very low gradient with wide flood plains.

The individual areas and methods used in the calculation of each reach of tributary and open water wetlands are provided in Table 1.

Table 1: Fish Habitat Losses Associated with the Project

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Area of Fish Habitat Loss (m²) | Habitat Alteration |
|---|---|---|---|---|
| Blackwater Creek Tributary 1 Catchment | | | | |
| Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | 777 | Flow temporarily reduced or eliminated. (95% reduction in flow) |
| Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area. | WLD4b(Pond1) located partially within proposed open pit. | 13,244 | Overprinted by open pit. |
| | | WLD4b(Pond2) located entirely within proposed open pit. | 3,097 | Overprinted by open pit. |
| | | WLD4a(Pond) located immediately upstream of berm surrounding the operation area. | 22,084 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond1) to WLD4b(Pond2) | 86 | Overprinted by open pit. |
| | | Reach connecting WLD4b(Pond2) to WLD4a(Pond). | 195 | Overprinted by open pit. |
| Overall Fish Habitat Loss for Tributary 1 Catchment | | | 39,483 | |
| Blackwater Creek Tributary 2 Catchment | | | | |
| Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | 856 | Flow temporarily reduced or eliminated. (86% reduction in flow) |
| Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm | Reach from berm at downstream end to WLD2(Pond) located within operation area. | 237 | Overprinted. |

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| | that surrounds the operation area. | WLD2(Pond) located within operations area. | 1,445 | Overprinted. |
| | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within berm that surrounds operation area. | 2,560 | Overprinted. |
| Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | 140 | Flow temporarily reduced or eliminated. (100% reduction in flow) |
| Overall Fish Habitat Loss for Tributary 2 Catchment | | | 5,238 | |
| Blackwater Creek Unnamed Tributary Catchment | | | | |
| Unnamed Tributary | The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel | Same as General Reach Location. | 327 | Flow temporarily reduced or eliminated. (65% reduction in flow) |
| Overall Fish Habitat Loss for Unnamed Tributary Catchment | | | 327 | |
| Blackwater Creek Tributary 4 | | | | |
| WLD5(Pond) | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 5,864 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Blackwater Creek Tributary 4 | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | 793 | Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of the wetland) |
| Overall Fish Habitat Loss for Tributary 4 Catchment | | | 6,657 | |
| Hoffstrom's Bay Tributary | | | | |
| Hoffstrom's Bay Tributary | Includes all of the watercourse upstream of Thunder Lake | Same as General Wetland Location | 3,096 | Decrease of the Hoffstrom's Bay Tributary catchment enclosed within berm around the operations area. |

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| | | | | Dewatering of the open pit could temporarily reduce the flows |
| Overall Fish Habitat Loss for Hoffstrom's Bay Tributary Catchment | | | 3,096 | |
| Total Fish Habitat Loss for Project | | | 54,801 | |

Part B: The fish habitat offsetting / compensation alternatives that were assessed in Appendix II as preliminary options included:

- Shoreline stabilization of Wabigoon Lake;
- Creation of fish habitat, after mine closure, in ponds adjacent and connected to Blackwater Creek; and
- Removal of the dam on Thunder Lake Tributary 2, to allow upstream fish passage.

These alternatives were assessed in order to examine multiple options for the fish habitat offsetting / compensation and ensure the Agency, DFO and ECCC that multiple options were considered. From this assessment, Treasury Metals has determined that for the offsetting / compensation habitat required under the Fisheries Act, 6 ha of pond will be constructed during the site preparation and construction phase within the Treasury Metals property, as this type of habitat reflects the majority of the fish habitat lost from Project related activities (i.e., beaver ponds). Although two (2) ponds have been proposed in the Round 2 information request responses, the final design (e.g., location and depth) of these ponds is yet to be determined through consultation with Indigenous communities, DFO and ECCC. The total area of constructed offsetting / compensation habitat is conceptual and will be finalized through consultation with Indigenous communities, DFO and ECCC, but will result in at a minimum of a 1:1 ratio of lost habitat to new habitat.

In addition to these constructed ponds, in order to convey the upstream catchment of Blackwater Creek Tributary 2 around the TSF, the Blackwater Creek Tributary 2 diversion channel is required. As such, no alternative option for the diversion channel is proposed. The diversion channel will be designed and constructed as suitable fish habitat in order to meet the requirements of the MDMER.

Table 2 provides an estimate of the fish habitat proposed for each offsetting/compensation option and explains how these areas have been calculated. A figure showing the locations of the proposed offsetting has been provided as TMI_876-RG(2)-01_Figure_1.

Table 2: Estimate of Proposed Fish Habitat Offsetting/Compensation

| Offsetting/Compensation Measure | Area of Fish Habitat Provided by Offsetting Measure ($m^2$) | Basis for Area Calculated for Offsetting / Compensation Measure |
|---|---|---|
| Diversion of Blackwater Creek Tributary 2, upstream of the operations area | 3,047 | Blackwater Creek Tributary 2 must be realigned to convey non-contact water around the proposed Project site. The most direct route to convey this water was provided as a drawing in the Fish |

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| | | Habitat Offsetting document. The length of this diversion would be 1,219 m straight downvalley. The proposed width of the bankfull channel which would be considered as the offsetting measure is 2.5 m, which when multiplied by the length gives an offsetting area of 3,047.5 $m^2$. |
| Creation of New Pond(s) for Fish Habitat | 60,000 | This offsetting measure would involve the excavation of two new ponds to provide fish habitat. The ponds will be located adjacent to Blackwater Creek immediately downstream of the confluence with Blackwater Creek Tributary 1. The ponds will be located within Treasury Metal's current property boundary of claims and dispositions. The ponds will be connected to an existing creek via a short outlet channel and the water level within the creek it is connected to will set the water elevation for the pond. The new ponds will be excavated such that a total of 6.0 ha of area will be wetted based on this water elevation. |

Part C: Table 3 provides a listing of the fish habitat losses associated with the Project and includes a clear indication as to whether the loss of habitat would be considered under Section 35 of the Fisheries Act, or Schedule 2 of the Metal Mining Effluent Regulations under the Fisheries Act. Table 3 also provides a description of the functional value of each reach of fish bearing habitat that will be removed as a result of the Project (e.g., rearing, foraging, migratory).

Table 3: Authorization under Section 35 of the Fisheries Act and through a Schedule 2 Amendment under the Metal Mining Effluent Regulations

| Reach | General Reach / Wetland Location | Specific Reach / Wetland Location | Habitat Alteration | Authorization Required | Area of Fish Habitat Loss ($m^2$) | Functional Value |
|---|---|---|---|---|---|---|
| Blackwater Creek Tributary 1 Reach 1 | Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area. | Same as General Reach Location. | Flow temporarily reduced or eliminated. | Section 35 | 777 | Full life cycle for small bodied fish species |
| Blackwater Creek Tributary 1 Reach 2 | Upstream end of Blackwater Creek Tributary 2 downstream to berm that | Upstream-most wetland located partially within proposed open pit. | Overprinted by open pit. | Section 35 | 13,244 | Full life cycle for small bodied fish species |
| | | Mid-reach wetland located entirely | Overprinted by open pit. | Section 35 | 3,097 | Full life cycle for small |

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| | | | | | surrounds the operations area. | within proposed open pit. | | | | bodied fish species |
| | | | | Blackwater Creek Tributary 1 Reach 2 | | Downstream-most wetland located immediately upstream of berm surrounding the operation area. | Overprinted by open pit. | Section 35 | 22,084 | Full life cycle for small bodied fish species |
| | | | | | | Reach connecting upstream-most wetland to mid-reach wetland and | Overprinted by open pit. | Section 35 | 86 | Full life cycle for small bodied fish species |
| | | | | | | Reach connecting mid-reach wetland to downstream-most wetland. | Overprinted by open pit. | Section 35 | 195 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Unnamed Tributary Reach 1 | The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel | Same as General Reach Location | Flow temporarily reduced or eliminated | Section 35 | 327 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Tributary 2 Reach 1 | Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area. | Same as General Reach Location. | Flow temporarily reduced or eliminated. | Section 35 | 856 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Tributary 2 Reach 2 | Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area. | Reach from berm at downstream end to wetland located within operation area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 237 | Full life cycle for small bodied fish species |
| | | | | | | Wetland located within operations area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 1,445 | Full life cycle for small bodied fish species |

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| | | | | | | Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of wetland and within berm that surrounds operation area. | Overprinted by Tailings Storage Facility. | Schedule 2 | 2,560 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Tributary 2 Reach 3 | Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area. | Reach from berm surrounding operations area upstream to proposed diversion channel. | Flow temporarily reduced or eliminated. | Section 35 | 140 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Tributary 4 Creek | The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project | Same as General Wetland Location | Dewatering of the open pit could temporarily drain the open water within the creek (conservatively assumed 100% loss of the watercourse) | Section 35 | 5,864 | Full life cycle for small bodied fish species |
| | | | | Blackwater Creek Tributary 4 WLD5(Pond) | | Same as General Wetland Location | Dewatering of the open pit could temporarily drain the open water within the pond (conservatively assumed 100% loss of the pond) | Section 35 | 793 | Full life cycle for small bodied fish species |
| | | | | Hoffstrom's Bay Tributary Reach 1 | Includes all of the watercourse upstream of Thunder Lake | Same as General Reach Location | Dewatering of the open pit could temporarily decrease flows within the tributary (assumed to be 14% loss of the watercourse) | Section 35 | 3,096 | Full life cycle for small bodied fish species |
| | | | | Total Area ($m^2$) Considered for Authorization under Section 35 of the Fisheries Act | | | | | 50,559 | |
| | | | | Total Area ($m^2$) Considered for Schedule 2 amendment under the Metal and Diamond Mining Effluent Regulations. | | | | | 4,242 | |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | The total proposed offsetting / compensation measures (see Table 2) will be sufficient to address the combined Section 35 fisheries impacts (Offset Plan) and waterbodies considered under Schedule 2 of the MDMER (Compensation Plan). The specific segregation of the measures to satisfy the requirements of both legislations would be determined in discussion with DFO and ECCC. The segregations can be a virtual percentage allocation of the compensation and offset measures to each of the "plans", or if needed, a physical separation between the measures for each plan can be incorporated into the final habitat designs. |

## TMI_894-FFH(2)-03

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response | |
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| TMI_894-FFH(2)-03 | FFH(2)-03 | 1 | CEA Agency | Reference to EIS Guidelines: | Part 2, Sections 9.1.2, 10 |
| | | | | Reference to EIS / Appendix | Section 6.14.4.1, 6.14.5; Section 10, Table 10.0-2 |
| | | | | Cross-reference to Round 1 IRs | TMI_128-FH(1)-07 |
| | | | | **Context and Rationale:**<br>• It is stated in Section 6.14.4.1 of the revised EIS that "Construction of the tailings storage facility (TSF) and minewater pond will overprint sections of Blackwater Creek Tributary 2" and "[…] The areas of the Blackwater Creek Tributary 2 catchment that is upstream from the TSF will be connected to Blackwater Creek via a new watercourse that will be constructed, east of the TSF". Executive summary of Appendix JJ further states "The new watercourse will be approximately 1260 m long and will be constructed using natural channel design principles to emulate, to the extent possible, the existing Blackwater Creek Tributary 2 - Reach 2".<br>• It is unclear whether this new watercourse or diversion channel, identified as "Tributary 2 diversion" in Appendix II, Table 4.1-1 and described as a possible habitat gain in Section 4.2, is considered among the offset habitat that would be required under Section 35 of the Fisheries Act, or under the Metal Mining Effluent Regulations. This watercourse is not mentioned among the three primary offsetting measures in Section 6.0 of Appendix II.<br>• Figure 4.2-1 of Appendix JJ shows the conceptual design of the Blackwater Creek Tributary 2 diversion. The Agency notes that this diversion channel is in close proximity to the TSF and the contact water collection ditches. This can be the cause of the following:<br>o Runoff and seepage that bypasses the contact water collection ditches can enter the diversion channel.<br>o During extreme weather events, possible flooding of the contact water collection ditches could spread the contaminated water to the diversion channel.<br>o Diversion channel's proximity to the boundary of the TSF can affect the structural integrity of the TSF. | |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | ) The Agency requires this information to understand the effects on fish and fish habitat from the creation of Blackwater Creek Tributary 2 diversion channel. |
| | | | | **Specific Question / Request for Information:**<br><br>A. Describe whether Blackwater Creek Tributary 2 diversion is considered among the offset habitat that would be required under Section 35 of the Fisheries Act, or under the Metal Mining Effluent Regulations. Update the response to IR# FFH(2)-02 accordingly.<br>B. Provide an assessment of changes in water quality of the Blackwater Creek Tributary 2 diversion channel, considering its proximity to the TSF and any runoff and seepage from the TSF that may bypass the contact water collection ditches and enter the diversion channel.<br>C. Explain how flooding or overflowing from contact water collection ditches may affect the water quality of Blackwater Creek Tributary 2 diversion and areas downstream of it.<br>D. Provide an assessment of potential effects to the structural integrity of the TSF from establishing a diversion channel in its vicinity.<br>E. Describe the effects on fish and fish habitat taking responses from Questions B and D into consideration.<br>F. Describe mitigation measures to prevent adverse effects to fish and fish habitat taking into consideration the response to Question E, if necessary.<br>G. Characterize residual effects, if any, after the mitigation measures described in the response to Question F have been implemented.<br>H. Update the follow-up program for potential effects to fish and fish habitat, including objectives and any monitoring measures that will be implemented to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures. If follow-up is not required, provide a rationale. |
| | | | | **Response:**<br><br>Part A: The proposed offsetting / compensation measures include both the proposed Blackwater Creek Tributary 2 diversion and the proposed construction of two ponds adjacent to Blackwater Creek, as shown in Table 2 of the response to TMI_893-FFH(2)-02. Specifically, The Blackwater Creek Tributary 2 diversion channel will be designed and constructed to provide fish habitat in order to meet the requirements of fish compensation under Schedule 2 of the MDMER. The specific segregation of the offsetting/compensation ponds to satisfy the requirements of both the Fisheries Act and the MDMER would be determined in discussion with DFO and ECCC. The segregations can be a virtual percentage allocation of the compensation and offset measures to each of the "plans" or if needed, a physical separation between the measures for each plan can be incorporated into the final habitat designs.<br><br>Part B: There are no anticipated measurable changes to the water quality in Blackwater Creek Tributary 2 diversion as a result of the proximity to the TSF. As detailed in the responses to TMI_900-MW(2)-04 and TMI_901-MW(2)-05, a |

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| | | | | seepage rate of 2.4 $m^3/d$ through the liner of the TSF represents upper bound estimate for a properly installed HDPE geomembrane underlying mine tailings. Additionally, the proposed TSF liner will only be exposed for a short timeframe (3 to 5 years) during operations, and then covered with tailings in perpetuity. Therefore, it can be reasonably expected that the liner will achieve a service life in excess of 400 years. Finally, the response to TMI_911-GW(2)-04 confirms that, during the operations, closure, and portions of the post-closure phase when the groundwater levels are drawn down due to dewatering, or recovering from the drawdown, the 2.4 $m^3/d$ of seepage from the TSF only 6% (0.144 $m^3/d$) would escape the operations area (modelling suggests this water would reach Blackwater Creek, but a small portion could be expected to first reach the Blackwater Creek Tributary 2 diversion channel). Following the flooding of the open pit, and the recovery of groundwater levels to near pre-disturbance conditions, modelling indicates that as much as 0.8 $m^3/d$ of seepage through the TSF liner would reach Blackwater Creek, with a small portion expected to first reach the Blackwater Creek Tributary 2 diversion channel. The volume of seepage through the TSF liner that could reach the Blackwater Creek Tributary 2 diversion is so small relative to the expected flows that the effect on receiving water quality would not be measurable.<br><br>In accordance with MDMER requirements, no runoff from the operations area will be allowed to directly reach the environment. During the site preparation and construction phase, a perimeter ditch and seepage collection system will be constructed around the entire operations area. The perimeter runoff and seepage collection ditches will be construction to accommodate the design flood event to ensure that water does not overflow the ditching and migrate off-site. The spoils from the construction of the perimeter ditch will be mounded into a berm on the outboard side of the ditch to further isolate the operations area from the surrounding environment. No measurable changes in the receiving water quality are expected in the Blackwater Creek Tributary 2 diversion channel given the measures to be implemented to prevent seepage from the TSF, and runoff from the site reaching the environment.<br><br>Part C: The runoff and seepage collection ditching for the TSF will not overflow and reach the Blackwater Creek Tributary 2 diversion channel. As discussed in Part B, the operations area (including the TSF) will be surrounded by a perimeter runoff and seepage collection system to capture contact water and prevent it from leaving the site. The perimeter runoff and seepage collection ditches will be construction to accommodate the Environmental Design Storm to ensure that water does not overflow the ditching and migrate off-site. All of the contact water collected within the runoff and seepage collection ditching will be diverted to one of the 3 collection ponds around the site, where it will either be used in the process or treated prior to being discharge from site. Additionally, the spoils from the construction of the perimeter ditch will be used to construct a berm on the outboard site of the perimeter ditch, providing secondary protection against contact water from the operations area reaching the environment, and with respect to this question, from reaching the Blackwater Creek Tributary 2 diversion channel.<br><br>Part D: The current location proposed for the Blackwater Creek Tributary 2 diversion channel (please refer to TMI_876-RG(2)-01_Figure_1) represents a conceptual design. While there are not expected to be any effects of the proposed Blackwater Creek Tributary 2 diversion channel on the structural integrity of the TSF, detailed engineering |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | design has yet to be completed for the Project. As part of the detailed engineering design for the Project, which will be in accordance with the Canadian Dam Association guidelines and MNRF Best Management Practices, ensuring the structural integrity of the TSF will be of paramount importance. Based on detailed engineering, the proposed location for the Blackwater Creek Tributary 2 diversion channel could be relocated, if necessary to ensure the structural integrity of the TSF, without altering the purpose and performance requirements of the diversion channel.<br><br>Part E. As described in the responses to Parts B and C, seepage from the TSF and runoff of contact water will not measurably affect the receiving water quality within the proposed Blackwater Creek Tributary 2 diversion channel. As described in the response to Part C, the proposed Blackwater Creek Tributary 2 diversion channel will not be allowed to affect the structural integrity of the TSF. During the detailed engineering design process, the proposed location for the Blackwater Creek Tributary 2 diversion channel can be altered, if necessary, without affecting the purpose and efficacy of the diversion channel. Therefore, no effects to fish and fish habitat are expected with respect to the issues raised in Parts B through D.<br><br>Part F. As described in the response to Part E, no effects on fish and fish habitat are expected with respect to the issues raised in Parts B through D. Therefore, no additional mitigation measures are required to prevent adverse effects to fish and fish habitat. As described in the response to Part D, as part of the detailed engineering design, ensuring the structural integrity of the TSF will be of paramount importance. If necessary, the proposed location for the Blackwater Creek Tributary 2 diversion channel could be relocated to ensure the structural integrity of the TSF, without altering the purpose and performance requirements of the diversion channel.<br><br>Part G. As described in the response to Part E, no adverse effects on fish and fish habitat are expected with respect to the issues raised in Parts B through D. Therefore, there will be no additional residual adverse effects on fish and fish habitat with respect to the issues raised in Parts B through D.<br><br>Part H: As part of the Round 2 information requests provided to Treasury Metals by the Agency, a number of information requests asked for an update to the follow-up program presented in the EIS (April 20, 2018). To effectively capture any changes to the follow-up program, a stand-alone document title “The Goliath Gold Project Follow-up Program Addendum” has been provided as part of the Round 2 information requests submission to the Agency. This document includes all areas of uncertainty identified by the Agency as well as any changes to the follow-up program as a result of changes to the effects assessment through answering the Round 2 information requests. However, no specific modifications to the Follow-Up Program were identified as a result of issues raised in Parts B through D. |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | **Agency Comments on Revised Response**<br><br>Will the diversion channel for Blackwater Creek Tributary 2 be comparable to the existing channel in terms of width and depth in regards to its ability convey flow and provide adequate depth for fish? Additionally, how will the existing floodplain be altered to accommodate the new diversion channel? |
| | | | | **Specific Comment to the Agency**<br><br>The Blackwater Creek Tributary 2 diversion channel will be designed and constructed to emulate the natural habitat upstream of the diversion channel (in both width and depth) equipped with a low flow channel and bankfull channel. The low flow channel and bankfull channel will provide comparable flow conveyance and water depth for fish as the upstream reach of Blackwater Creek Tributary 2.<br><br>For rare extreme flood events, a high flow channel will be constructed with the intent to solely convey flow and will not be designed to accommodate fish passage or resemble a natural floodplain. This is due to the location of the diversion channel and the large cut that will need to be made into the topography to accommodate the diversion channel construction (see Figure 4.2-1 in Appendix II to the revised EIS [April 2018]). It is not possible to accommodate a large floodplain for the diversion channel. There will be no changes to the existing floodplain as a result of the diversion channel. |
| | | | | **Final Response**<br><br>Part A: The proposed offsetting / compensation measures include both the proposed Blackwater Creek Tributary 2 diversion and the proposed construction of two ponds adjacent to Blackwater Creek, as shown in Table 2 of the response to TMI_893-FFH(2)-02. Specifically, The Blackwater Creek Tributary 2 diversion channel will be designed and constructed to provide fish habitat in order to meet the requirements of fish compensation under Schedule 2 of the MDMER. The specific segregation of the offsetting/compensation ponds to satisfy the requirements of both the Fisheries Act and the MDMER would be determined in discussion with DFO and ECCC. The segregations can be a virtual percentage allocation of the compensation and offset measures to each of the "plans" or if needed, a physical separation between the measures for each plan can be incorporated into the final habitat designs.<br><br>Part B: There are no anticipated measurable changes to the water quality in Blackwater Creek Tributary 2 diversion as a result of the proximity to the TSF. As detailed in the responses to TMI_900-MW(2)-04 and TMI_901-MW(2)-05, a seepage rate of 2.4 $m^3/d$ through the liner of the TSF represents upper bound estimate for a properly installed HDPE geomembrane underlying mine tailings. Additionally, the proposed TSF liner will only be exposed for a short timeframe (3 to 5 years) during operations, and then covered with tailings in perpetuity. Therefore, it can be reasonably expected that the liner will achieve a service life in excess of 400 years. Finally, the response to TMI_911-GW(2)-04 confirms that, during the operations, closure, and portions of the post-closure phase when the groundwater levels are drawn down due to dewatering, or recovering from the drawdown, the 2.4 $m^3/d$ of seepage from the TSF |

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| | | | | only 6% (0.144 $m^3/d$) would escape the operations area (modelling suggests this water would reach Blackwater Creek, but a small portion could be expected to first reach the Blackwater Creek Tributary 2 diversion channel). Following the flooding of the open pit, and the recovery of groundwater levels to near pre-disturbance conditions, modelling indicates that as much as 0.8 $m^3/d$ of seepage through the TSF liner would reach Blackwater Creek, with a small portion expected to first reach the Blackwater Creek Tributary 2 diversion channel. The volume of seepage through the TSF liner that could reach the Blackwater Creek Tributary 2 diversion is so small relative to the expected flows that the effect on receiving water quality would not be measurable.<br><br>In accordance with MDMER requirements, no runoff from the operations area will be allowed to directly reach the environment. During the site preparation and construction phase, a perimeter ditch and seepage collection system will be constructed around the entire operations area. The perimeter runoff and seepage collection ditches will be constructed to accommodate an Environmental Design Storm flood event to ensure that water does not overflow the ditching and migrate off-site. The spoils from the construction of the perimeter ditch will be mounded into a berm on the outboard side of the ditch to further isolate the operations area from the surrounding environment. No measurable changes in the receiving water quality are expected in the Blackwater Creek Tributary 2 diversion channel given the measures to be implemented to prevent seepage from the TSF, and runoff from the site reaching the environment.<br><br>Part C: The runoff and seepage collection ditching for the TSF will not overflow and reach the Blackwater Creek Tributary 2 diversion channel. As discussed in Part B, the operations area (including the TSF) will be surrounded by a perimeter runoff and seepage collection system to capture contact water and prevent it from leaving the site. The perimeter runoff and seepage collection ditches will be construction to accommodate the Environmental Design Storm to ensure that water does not overflow the ditching and migrate off-site. All of the contact water collected within the runoff and seepage collection ditching will be diverted to one of the 3 collection ponds around the site, where it will either be used in the process or treated prior to being discharge from site. Additionally, the spoils from the construction of the perimeter ditch will be used to construct a berm on the outboard site of the perimeter ditch, providing secondary protection against contact water from the operations area reaching the environment, and with respect to this question, from reaching the Blackwater Creek Tributary 2 diversion channel.<br><br>Part D: The current location proposed for the Blackwater Creek Tributary 2 diversion channel (please refer to TMI_876-RG(2)-01_Figure_1) represents a conceptual design. While there are not expected to be any effects of the proposed Blackwater Creek Tributary 2 diversion channel on the structural integrity of the TSF, detailed engineering design has yet to be completed for the Project. As part of the detailed engineering design for the Project, which will be in accordance with the Canadian Dam Association guidelines and MNRF Best Management Practices, ensuring the structural integrity of the TSF will be of paramount importance. Based on detailed engineering, the proposed location for the Blackwater Creek Tributary 2 diversion channel could be relocated, if necessary to ensure the structural integrity of the TSF, without altering the purpose and performance requirements of the diversion channel. |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | Part E. As described in the responses to Parts B and C, seepage from the TSF and runoff of contact water will not measurably affect the receiving water quality within the proposed Blackwater Creek Tributary 2 diversion channel. As described in the response to Part C, the proposed Blackwater Creek Tributary 2 diversion channel will not be allowed to affect the structural integrity of the TSF. During the detailed engineering design process, the proposed location for the Blackwater Creek Tributary 2 diversion channel can be altered, if necessary, without affecting the purpose and efficacy of the diversion channel. Therefore, no effects to fish and fish habitat are expected with respect to the issues raised in Parts B through D.<br><br>Part F. As described in the response to Part E, no effects on fish and fish habitat are expected with respect to the issues raised in Parts B through D. Therefore, no additional mitigation measures are required to prevent adverse effects to fish and fish habitat. As described in the response to Part D, as part of the detailed engineering design, ensuring the structural integrity of the TSF will be of paramount importance. If necessary, the proposed location for the Blackwater Creek Tributary 2 diversion channel could be relocated to ensure the structural integrity of the TSF, without altering the purpose and performance requirements of the diversion channel.<br><br>Part G. As described in the response to Part E, no adverse effects on fish and fish habitat are expected with respect to the issues raised in Parts B through D. Therefore, there will be no additional residual adverse effects on fish and fish habitat with respect to the issues raised in Parts B through D.<br><br>Part H: As part of the Round 2 information requests provided to Treasury Metals by the Agency, a number of information requests asked for an update to the follow-up program presented in the EIS (April 20, 2018). To effectively capture any changes to the follow-up program, a stand-alone document title “The Goliath Gold Project Follow-up Program Addendum” has been provided as part of the Round 2 information requests submission to the Agency. This document includes all areas of uncertainty identified by the Agency as well as any changes to the follow-up program as a result of changes to the effects assessment through answering the Round 2 information requests. However, no specific modifications to the Follow-Up Program were identified as a result of issues raised in Parts B through D. |

TMI_895-FFH(2)-04

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response | |
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| TMI_895-FFH(2)-04 | FFH(2)-04 | 1 | CEA Agency | Reference to EIS Guidelines: | Part 2, Sections 9.1.2, 10 |
| | | | | Reference to EIS / Appendix | Section 6.14.1; Appendix Q; Appendix II |
| | | | | Cross-reference to Round 1 IRs | TMI_135-FH(1)-14 |
| | | | | **Context and Rationale:**<br>• It is stated in Appendix II of the EIS, Section 3.1.2 that "The riparian vegetation is dense" along most of Blackwater Creek Tributary 2. A portion of Blackwater Creek Tributary 2 would be diverted; however it is unclear if riparian plantings would be included in the design of the new diversion channel to provide shade and cover, which are important components of fish habitat. Further, there would likely be a time lag until the riparian vegetation planting were sufficiently developed to serve their intended function. This time lag may have an effect on water temperatures in Blackwater Creek Tributary 2 and the mainstream Blackwater Creek, which may further effect fish and fish habitat within these watercourses. | |
| | | | | **Specific Question / Request for Information:**<br>A. Describe how changes in water temperature due to lack of well-developed riparian vegetation on the new Blackwater Creek Tributary 2 diversion would be mitigated.<br>B. Describe the magnitude and temporal extent of the effect of changes in water temperature on fish and fish habitat in Blackwater Creek Tributary 2 and downstream.<br>C. Describe any additional mitigation measures to prevent adverse effects to fish and fish habitat identified in the response to Question B, if necessary.<br>D. Characterize residual effects, if any, after the mitigation measures identified in the response to Question C have been implemented.<br>E. Update the follow-up program for potential effects to fish and fish habitat, including objectives and any monitoring measures that will be implemented to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures. If follow-up is not required, provide a rationale. | |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | **Draft Response:**<br><br>Part A. Following construction of the Blackwater Creek Tributary 2 diversion channel, a riparian zone of native species would be planted to help establish and naturalize the margins of the channel and provide similar habitat as upstream and downstream reaches of the tributary. It is expected that riparian vegetation that could adequately provide shade to the creek would establish in a relatively short time frame, estimated at 2 to 4 years. The channel would be constructed with a high roughness to allow for larger vegetation species (e.g., dogwood and willows) to colonize the riparian areas. The riparian zone would function to mitigate against bank erosion, elevated TSS in the channel and water temperature. Similar to the other existing small tributaries on site, it is predicted that the temperature of the water would be reflective of ambient air temperatures and would not substantively increase relative to the upstream and downstream reaches of the tributary. As a result, changes in temperature are not expected to cause negative effects to fish either in the diversion channel, or the main channel of Blackwater Creek. To place the potential for increased creek temperatures in context, it is important to note that northern Ontario creek systems thermal regimes are primarily governed by ambient air temperature, and that creek systems such as Blackwater Creek are characterized by frequent open water areas by virtue of the occurrence of beaver ponds, and broad, non-treed floodplains. It is also important to stress that the re-aligned channel represents only about 5% of the total length of the Blackwater Creek system.<br><br>To verify potential temperature changes, continuous temperature loggers will be installed both upstream and downstream of the diversion channel (TMI_895-FFH(2)-04_Figure_1) as part of the follow-up.<br><br>Part B. As described in the response to Part A, it is expected that water temperatures within the diversion channel would be reflective of ambient air temperatures, which is similar to the other existing small tributaries adjacent to the Project. With the mitigation measures described in Part A (planting a riparian zone of native species to help establish and naturalize the margins of the channel), there is no need to assign a magnitude and temporal extent of the effect of changes in water temperature on fish and fish habitat in Blackwater creek Tributary 2 and downstream.<br><br>Part C. As described in the responses to Parts A and B, there are no anticipated adverse effects to fish and fish habitat as a result of changes in water temperature in the Blackwater Creek Tributary 2 diversion, and downstream. To verify this, continuous temperature loggers will be installed both upstream and downstream of the diversion channel (TMI_895-FFH(2)-04_Figure_1) as part of the follow-up program.<br><br>Part D. As described in the responses to Parts A through C, there would be no residual effects to fish or fish habitat in the Blackwater Creek Tributary 2, and diversion channel, as a result of changes in water temperature. |

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| | | | | Part E. The follow-up program has been updated to include temperature monitoring of Blackwater Creek Tributary 2 upstream and downstream of the diversion channel to verify the predictions of the EIS that there would be no changes in water temperature that would affected fish or fish habitat. The data from the temperature loggers would be collected on a monthly basis during the period from June 1st to September 30th from the locations identified in TMI_895-FFH(2)-04_Figure_1. These changes can be found in the Fish and Fish Habitat Section of the Goliath Gold Project Follow-up Program Addendum, which has been created to address the Round 2 information requests and supersedes Section 13 of the revised EIS (April 2018). |
| | | | | Agency Comment on Draft Response<br><br>None Received |
| | | | | FINAL RESPONSE<br><br>Agency accepted Draft Response as Final. |

## TMI_896-FFH(2)-05

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response | |
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| TMI_896-FFH(2)-05 | FFH(2)-05 | 1 | CEA Agency | Reference to EIS Guidelines: | Part 2, Sections 9.1.2 and 10 |
| | | | | Reference to EIS / Appendix | Sections 6.14.4.1 - 6.14.4.4 |
| | | | | Cross-reference to Round 1 IRs | TMI_128-FH(1)-07 |
| | | | | **Context and Rationale:**<br>• Section 6.14 of the revised EIS provides an assessment of direct and indirect effects on fish and fish habitat associated with the waterbodies affected by the Project. However, an assessment of effects on fish and fish habitat downstream of the affected watercourses is not provided. Of particular interest, effects to large-bodied fish species at the mouth of Blackwater Creek and Keplyn's Bay, and downstream of Little Creek and Hoffstrom's Bay Tributary as a result of reductions in flow are not discussed in the revised EIS.<br>• According to Appendix Q, Section 4.2.1.1, habitat located where Blackwater Creek flows into Keplyn's Bay "is likely to provide good spawning and nursery habitat for a number of fish species that are present in Wabigoon Lake including Northern Pike and possibly Muskellunge". According to Section 6.14 in the revised EIS, Blackwater Creek will have reduced flows during the site preparation and construction phase, and during the operations phase, with an increase in flow downstream of Blackwater Tributary 1 during the post-closure (abandonment) phase. This section also states that reduction in flows may affect the ability of Blackwater Creek to support stream-resident fish. As such, it is possible that reductions in flows and stream-resident fish throughout all project phases may affect large-bodied species downstream.<br>• The Executive Summary of Appendix Q indicates that only small-bodied species were caught in Little Creek and Hoffstrom's Bay Tributary, but also states that the mouths of these watercourses may provide suitable spawning habitat for northern pike. Section 6.14 indicates that Little Creek and Hoffstrom's Bay Tributary will experience decreased flows beyond the life of the project. As such, it is possible that reductions in flows may affect the ability of these watercourses to support small-bodied fish species, which may in turn affect large- bodied species downstream.<br>• This Agency requires this information to understand both direct and indirect effects on fish and fish habitat downstream of the waterbodies and watercourses affected by the Project. | |

| Unique Identifier | Agency IR # | Annex | Agency / Group / Stakeholder | Cross Reference / Comment / Information Request / Response |
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| | | | | **Specific Question / Request for Information:**<br><br>A. Provide a prediction of the anticipated loss of fish habitat (in m2) in Blackwater Creek, Little Creek, and Hoffstrom's Bay as a result of flow reductions and/or changes in water levels;<br>B. Assess whether reductions in flow and/or changes to water levels would affect the ability of Blackwater Creek, Little Creek, and Hoffstrom's Bay to support stream-resident and small-bodied fish species, and large-bodied species downstream.<br>C. Assess whether the anticipated reductions in stream-resident and small- bodied fish populations in Blackwater Creek, Little Creek, and Hoffstrom's Bay Tributary will result in impacts to large-bodied species downstream.<br>D. Describe mitigation measures to prevent adverse effects to fish and fish habitat taking responses from Questions A to C into consideration;<br>E. Characterize residual effects, if any, after the mitigation measures have been implemented.<br>F. Update the follow-up program for potential effects to fish and fish habitat, including objectives and any monitoring measures that will be implemented to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures. If follow-up is not required, provide a rationale. |
| | | | | **Draft Response:**<br><br>Part A<br>The only predicted losses to fish habitat are to the sections of Blackwater Creek Tributaries 1 and 2 overprinted by the Project, and the tributaries immediately downstream of the Project where virtually all of the upstream catchments are enclosed within the perimeter berm and ditch surrounding the operations area. Discussions of fish habitat loss in Blackwater Creek Tributaries 1 and 2 associated with flow reduction and Project overprinting have been included in the responses to TMI_876-RG(2)-01 and TMI_892- FFH(2)-01. To summarize the responses to these IRs, the total loss of fish habitat as a result of the Project that will be compensated / offset is 51,705 $m^2$.<br>There are no anticipated fish habitat losses in Little Creek and Hoffstrom's Bay resulting from flow reduction or changes in water levels as a result of the Project. Flow is predicted to decrease by less than 10% in both Little Creek and Hoffstrom's Bay Tributary during all phases of the Project (TMI_896-FFH(2)-05_Table_1). Decreases in flows of less than 10% are not expected to result in fish habitat loss within Little Creek and Hoffstrom's Bay Tributary as per the DFO guidance document titled "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" (DFO, 2013).<br>There are no anticipated fish habitat losses in Blackwater Creek (main channel). During the life of the Project there are expected to be higher changes of flows (increases and decreases), within various sections of the main stem of Blackwater Creek. The amount of fish habitat in this watercourse is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. Consequently, the area of habitat is not directly correlated with flow. The area of beaver ponds varies over time when |

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| | | | | existing beaver dams are abandoned and new beaver dams are constructed. In this context, changes in flow arising from the project are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream.<br><br>Part B<br>An evaluation of the changes in flow within Blackwater Creek (main stem), Little Creek, and Hoffstrom's Bay Tributary is provided in TMI_896-FFH(2)-05_Table_1. Throughout the life of the Project, estimated changes in flows in Little Creek and Hoffstrom's Bay Tributary due to the enclosure of portions of the catchment areas within the berm that surrounds the Operations Area are 8.7% and 7.8%, respectively. Decreases in flows of less than 10% are not expected to result in fish habitat loss within Blackwater Creek (main stem), Little Creek and Hoffstrom's Bay Tributary as per the DFO guidance document titled "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" (DFO, 2013).<br>As shown in TMI_896-FFH(2)-05_Table_1, changes in flow (increases and decreases) for various reaches of Blackwater Creek are projected to be more than 10% for certain reaches and for certain phases of the Project. However, as discussed in Part A, the amount of fish habitat in this watercourse is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. Consequently, the area of habitat is not directly correlated with flow. The area of beaver ponds varies over time when existing beaver dams are abandoned and new beaver dams are constructed. In this context, changes in flow arising from the Project are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream.<br><br>Part C<br>As indicated in Part B, the changes in flow in both Little Creek and Hoffstrom's Bay Tributary are less than 10% and is not anticipated to cause any adverse effects to small-bodied fish. There are no anticipated adverse effects to large-bodied fish in either Little Creek or Hoffstrom's Bay as a result of adverse effects to small-bodied fish.<br>For the Blackwater Creek watershed, the 51,705 $m^2$ of habitat loss will be offset / compensated for at a ratio of at least 1:1 with the Blackwater Creek Tributary 2 diversion channel and the proposed offsetting / compensation ponds. The fish compensation will more than offset the loss of small-bodied fish habitat and will be hydrologically connected to Blackwater Creek and will allow for fish passage from the offset / compensation habitat to the Blackwater Creek. It is anticipated that with the construction of the offsetting / compensation habitat, there will not be a decrease in the small-bodied fish population within the Blackwater Creek; therefore, there are no anticipated adverse effects to large-bodied fish populations downstream of the Project as a result of reduced small-bodied fish populations.<br><br>Part D. |

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| | | | | Based on the responses to Part A through C, no additional mitigation measures are identified as being required to prevent adverse effects to fish and fish habitat as a result of changes in flow in Blackwater Creek, Little Creek and Hoffstrom's Bay Tributary.<br><br>Part E<br>Based on the responses to Part A through C, there were no adverse effects identified to fish and fish habitat as a result of changes in flow in Blackwater Creek, Little Creek and Hoffstrom's Bay Tributary, therefore there would be no residual adverse effects.<br>Part F<br>As part of the Round 2 information request process, Treasury Metals received a number of questions regarding the Follow-Up Program. As a result, Treasury Metals has prepared the Goliath Gold Project Follow-Up Program Addendum to capture the responses to these issues and provide a consolidated update to the Follow-Up Program. However, no specific modifications to the Follow-Up Program for potential effects to fish and fish habitat were identified as a result of the changes in flows in Blackwater Creek, Little Creek and Hoffstrom's Bay Tributary.<br><br>Reference:<br>Fisheries and Oceans Canada (DFO). 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries In Canada. Canadian Science Advisory Secretariat Science Advisory Report 2013/017. |
| | | | | <u>Agency Comment on Draft Response</u><br><br>None Received |
| | | | | <u>Specific Comment to the Agency</u><br><br>Agency accepted Draft Response as Final.<br><br>Although the draft response remains valid, as part of the process for determining completeness of the Round 2 responses, an additional effect of the drawdown created by the dewatering of the open pit and underground mine was identified on the flows within Hoffstrom's Bay Tributary. Specifically, there would be an additional 6.6% reduction in flows in Hoffstrom's Bay Tributary during the operations and closure phase, bringing the total loss of flows during those phases to 14.4%. During the site preparations and construction phase, and during post-closure (once groundwater levels recover) the reduction in flows in Hoffstrom's Bay Tributary will be 7.8%, as a result of the enclosure of catchment areas within the operations area. This would result in an additional loss of 3,096 $m^2$ of fish habitat, bringing the total loss of habitat as a result of the Project to 54,801 $m^2$. |

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| | | | | **Final Response:**<br><br>Part A<br><br>There are no anticipated fish habitat losses in Little Creek resulting from flow reduction or changes in water levels as a result of the Project. Flow is predicted to decrease by less than 10% in Little Creek during all phases of the Project (TMI_896-FFH(2)-05_Table_1). Decreases in flows of less than 10% are not expected to result in fish habitat loss within Little Creek and Hoffstrom's Bay Tributary as per the DFO guidance document titled "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" (DFO, 2013).<br><br>During the site preparations and construction phase, enclosure of portions of the Hoffstrom's Bay Tributary catchment will result in a reduction in flows in Hoffstrom's Bay Tributary of 7.8%, which will be permanent. An additional effect of the drawdown created by the dewatering of the open pit and underground mine was identified on the flows within Hoffstrom's Bay Tributary, which would result in an additional 6.6% reduction in flows in Hoffstrom's Bay Tributary during the operations and closure phase, bringing the total loss of flows during those phases to 14.4%. The losses during the site preparation and construction, and closure phases would be 7.8%. The DFO guidance document titled "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" (DFO, 2013) identifies that decreases in flows of less than 10% are not expected to result in fish habitat loss. Therefore, losses in fish habitat within Hoffstrom's Bay Tributary are only expected to occur during operations and closure.<br><br>Losses to fish habitat are also predicted for the sections of Blackwater Creek Tributaries 1 and 2 overprinted by the Project, and the tributaries immediately downstream of the Project where virtually all of the upstream catchments are enclosed within the perimeter berm and ditch surrounding the operations area. Discussions of fish habitat loss in Blackwater Creek Tributaries 1 and 2 associated with flow reduction and Project overprinting have been included in the responses to TMI_876-RG(2)-01 and TMI_892- FFH(2)-01. To summarize the responses to these IRs, the total loss of fish habitat as a result of the Project that will be compensated / offset is 54,801 $m^2$.<br><br>There are no anticipated fish habitat losses in Blackwater Creek (main channel). During the life of the Project there are expected to be higher changes of flows (increases and decreases), within various sections of the main stem of Blackwater Creek. The amount of fish habitat in this watercourse is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. Consequently, the area of habitat is not directly correlated with flow. The area of beaver ponds varies over time when existing beaver dams are abandoned and new beaver dams are constructed. In this context, changes in flow arising from the project are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream.<br><br>Part B<br><br>An evaluation of the changes in flow within Blackwater Creek (main stem), Little Creek, and Hoffstrom's Bay Tributary is provided in TMI_896-FFH(2)-05_Table_1. Throughout the life of the Project, estimated changes in flows in Little |

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| | | | | Creek due to the enclosure of portions of the catchment areas within the berm that surrounds the Operations Area is 8.7%. Decreases in flows of less than 10% are not expected to result in fish habitat loss within Blackwater Creek (main stem) and Little Creek as per the DFO guidance document titled "Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada" (DFO, 2013).<br>As shown in TMI_896-FFH(2)-05_Table_1, changes in flow (increases and decreases) for various reaches of Blackwater Creek are projected to be more than 10% for certain reaches and for certain phases of the Project. However, as discussed in Part A, the amount of fish habitat in this watercourse is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. Consequently, the area of habitat is not directly correlated with flow. The area of beaver ponds varies over time when existing beaver dams are abandoned and new beaver dams are constructed. In this context, changes in flow arising from the Project are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream.<br><br>Part C<br>As indicated in Part B, the changes in flow in Little Creek are less than 10% and is not anticipated to cause any adverse effects to small-bodied fish. There are no anticipated adverse effects to large-bodied fish in Little Creek as a result of adverse effects to small-bodied fish.<br>For the Blackwater Creek watershed, the 54,801 m² of habitat loss will be offset / compensated for at a ratio of at least 1:1 with the Blackwater Creek Tributary 2 diversion channel and the proposed offsetting / compensation ponds. The fish compensation will more than offset the loss of small-bodied fish habitat and will be hydrologically connected to Blackwater Creek and will allow for fish passage from the offset / compensation habitat to the Blackwater Creek. It is anticipated that with the construction of the offsetting / compensation habitat, there will not be a decrease in the small-bodied fish population within the Blackwater Creek; therefore, there are no anticipated adverse effects to large-bodied fish populations downstream of the Project as a result of reduced small-bodied fish populations.<br><br>Part D.<br>Based on the responses to Part A through C, no additional mitigation measures are identified as being required to prevent adverse effects to fish and fish habitat as a result of changes in flow in Blackwater Creek and its tributaries, Little Creek, and Hoffstrom's Bay Tributary.<br><br>Part E<br>Based on the responses to Part A through C, there were no adverse effects identified to fish and fish habitat as a result of changes in flow in Blackwater Creek and its tributaries, Little Creek, and Hoffstrom's Bay Tributary, therefore there would be no residual adverse effects. |

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| | | | | Part F<br>As part of the Round 2 information request process, Treasury Metals received a number of questions regarding the Follow-Up Program. As a result, Treasury Metals has prepared the Goliath Gold Project Follow-Up Program Addendum to capture the responses to these issues and provide a consolidated update to the Follow-Up Program. However, no specific modifications to the Follow-Up Program for potential effects to fish and fish habitat were identified as a result of the changes in flows in Blackwater Creek and its tributaries, Little Creek, and Hoffstrom's Bay Tributary.<br><br>Reference:<br>Fisheries and Oceans Canada (DFO). 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries In Canada. Canadian Science Advisory Secretariat Science Advisory Report 2013/017. |

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| TMI_950-FFH(2)-06 | FFH(2)-06 | 4 | Eagle Lake First Nation | Reference to EIS Guidelines: | Part 2, Section 9.1.2. |
| | | | | Reference to EIS / Appendix | Section 6.14.4.4 |
| | | | | Cross-reference to Round 1 IRs | n/a |
| | | | | **Context and Rationale:**<br><br>Eagle Lake First Nation raised a concern related to effects on fish and fish habitat from increases in flow in Blackwater Creek during abandonment.<br><br>It is stated in Section 6.14.4.4 that "Post-closure, increases in annual flows are predicted for Blackwater Creek downstream from Blackwater Creek Tributary 1". It is further stated in the same section that "There is insufficient information to determine whether the increases in flow could affect upstream fish passage through existing culverts [...] If adverse effects to fish passage due to increased flows will occur, the downstream structures will be mitigated so that there is no negative effect on fish or fish habitat".<br><br>A prediction of the effects on fish and fish habitat was not provided based on the predicted increases in flow in Blackwater Creek during abandonment as noted in Section 6.14.4.4. Further, the mitigation measures to prevent adverse effects on fish and fish habitat due to increases in flow were not provided. | |
| | | | | **Specific Question / Request for Information:**<br><br>A. Taking the comment ELFN 4.6.2.3 provided by Eagle Lake First Nation into consideration, describe the effects on fish and fish habitat from the predicted increases in flow in Blackwater Creek during abandonment.<br><br>B. Describe the mitigation measures to prevent adverse effects on fish and fish habitat taking the response from Question A into account.<br><br>C. Characterize residual effects, if any, after the mitigation measures described in response to Question B have been implemented.<br><br>D. Update the follow-up program for potential effects to fish and fish habitat, including objectives and any monitoring measures that will be implemented to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures. If follow-up is not required, provide a rationale. | |

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**Response:**

Part A: As described in the response to TMI_896-FFH(2)-05, changes in flow in Blackwater Creek are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream. The amount of fish habitat in Blackwater Creek is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. The area of beaver ponds along Blackwater Creek varies over time when existing beaver dams are abandoned, and new beaver dams are constructed.

As described in Section 5.8.4 of the revised EIS (April 2018), "a portion of Keplyn's Bay was separated from Wabigoon Lake by the construction of the railway", and that "flow from Blackwater Creek is conveyed under the railway by at least two corrugated steel pipes." The revised EIS (April 2018) went on to indicate that fish would be able to move freely through these culverts, but that the culverts may be a "barrier to upstream fish migration due to high velocities" during periods with high flows. As part of the revised EIS (April 2018), the potential effects of the Project on flows in the nearby watercourses was evaluated (Section 6.9). Table 1 presented the predicted existing and post-closure flows at modelling node BW2 (see Figure 6.9.2.3-1 of the revised EIS [April 2018]), which corresponds to the mouth of Blackwater Creek, immediately upstream of the portion of Keplyn's Bay where the culverts under the railway are situated.

Table 1: Changes in Post-Closure Spring Flows in Blackwater Creek

| Scenario | Parameter | Calculated Flows ($m^3/s$) in May | |
|---|---|---|---|
| | | Wet Cover | Dry Cover |
| Average Year | Existing Flow ($m^3/s$) | 0.349 | 0.349 |
| | Post-closure Flow ($m^3/s$) | 0.366 | 0.372 |
| | Post-closure Change ($m^3/s$) | +0.0172 | +0.0234 |
| | Post-closure Change (%) | +4.9% | +6.7% |
| Dry Year | Existing Flow ($m^3/s$) | 0.098 | 0.098 |
| | Post-closure Flow ($m^3/s$) | 0.105 | 0.114 |
| | Post-closure Change ($m^3/s$) | +0.0075 | +0.0157 |
| | Post-closure Change (%) | +7.7% | +16.0% |
| Wet Year | Existing Flow ($m^3/s$) | 0.599 | 0.599 |
| | Post-closure Flow ($m^3/s$) | 0.644 | 0.647 |
| | Post-closure Change ($m^3/s$) | +0.0447 | +0.0472 |
| | Post-closure Change (%) | +7.5% | +7.9% |

The flows presented in the above table are for the month of May (consistent with the context and rationale) and are provided for both the wet and dry cover closure options (for consistency). As described in the revised EIS (April 2018), two closure options for the TSF (i.e. wet cover and dry cover) were evaluated. In accordance with the EIS Guidelines,

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| | | | | residual adverse effects were identified as those that remain after the implementation of practical mitigation measures. The wet cover option was identified as the appropriate mitigation measure for mitigating potential effects on post-closure water quality. Therefore, the wet cover option is the closure alternative for which Treasury Metals has identified residual effects in the revised EIS (April 2018). For the wet cover option, the following changes in May flows at the mouth of Blackwater Creek (BW2) were predicted:<br>• an increase of 4.9% during average conditions (from 0.349 to 0.366 $m^3/s$);<br>• an increase of 7.7% for dry conditions (from 0.098 to 0.105 $m^3/s$); and<br>• an increase of 7.5% for wet conditions (from 0.599 to 0.644 $m^3/s$).<br>The increases in flows during the average and dry conditions are not expected to result in conditions that are outside the range of current conditions. Specifically, the predicted post-closure flows during average and dry conditions (see Table 1) are considerably lower than the existing flows experienced during wet condition. Therefore, the culverts should not present a barrier to upstream fish migration due to high velocities. For the 1 in 20 wet year condition, post-closure flows at the mouth of Blackwater Creek were predicted to be 7.5% higher than the current condition. While this nominal increase in flows should not present conditions that would prevent fish passage, Treasury Metals has indicated that a full assessment of the capacities of culverts downstream of the Project would be completed as part of the detailed engineering. In the event that detailed engineering identifies situations where the capacities of the downstream culverts need to be increased (including for ensuring fish passage) Treasury Metals would work with the appropriate Agencies to modify the designs for the downstream culverts, as required.<br><br>Part B. As described in the response to Part A, the only potential effect to fish is as a result of increase in flows during the 1 in 20 year wet condition (7.5% increase), that would result in higher flows through the culverts under the railway causeway in Keplyn's Bay than are currently experienced. Treasury Metals has indicated that a full assessment of the capacities of culverts downstream of the Project would be completed as part of the detailed engineering. In the event that detailed engineering identifies situations where the capacities of the downstream culverts need to be increased (including for ensuring fish passage) Treasury Metals would work with the appropriate Agencies to modify the designs for the downstream culverts, as required (Mit_082). With this mitigation measure in place there are no anticipated effects to fish and fish habitat as a result of increases in flows to Blackwater Creek during the post-closure phase.<br><br>Part C. As described in the responses to Parts A and B, the only potential effect to fish is as a result of increase in flows, which could result in higher flows through the culverts under the railway causeway in Keplyn's Bay than are currently experienced. Treasury Metals has indicated that the capacities of the downstream culverts will be evaluated as part of the detailed engineering process (including for ensuring fish passage) and would work with the appropriate Agencies to modify the designs for the downstream culverts to increase their capacities, as required (Mit_082). With this mitigation measure in place there are no anticipated effects to fish and fish habitat as a result of increases in flows to Blackwater Creek during the post-closure phase. |

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| | | | | Part D. As part of the Round 2 information request process, Treasury Metals received a number of questions regarding the Follow-Up Program. As a result, Treasury Metals has prepared the Goliath Gold Project Follow-Up Program Addendum to capture the responses to these issues and provide a consolidated update to the Follow-Up Program. |
| | | | | **Agency Comments on Revised Response**<br><br>More of a general comment in regards to investigating the capacity of the CN culverts – the culverts need to be able to accommodate fish passage at Q2 flow. |
| | | | | **Specific Comment to the Agency**<br><br>Treasury Metals had indicated as part of the Round 1 responses that a full assessment of the capacities of culverts downstream of the Project would be completed as part of the detailed engineering. Through discussions regarding the draft Round 2 responses with Indigenous communities and applicable government agencies, Treasury Metals has agreed that the assessment of the capacities of the culverts will be completed in the spring of 2019, as soon as safe to proceed.<br><br>Once this is complete, Treasury Metals will be able to determine if the existing culverts will accommodate fish passage at current Q2 flows. The Q2 flow is defined as the flow during a two-year storm event that has a 50% chance of occurring any given year. As discussed in the December 11, 2018 call between Treasury Metals and their consultants, and representatives of CEAA, DFO, MNRF, should the culverts not be able to accommodate fish passage at current Q2 flows, amendments to the culverts, should they be warranted in the opinion of DFO, would be the responsibility of CN Rail. Treasury Metals would not be responsible for mitigating existing issues.<br><br>As part of the evaluation of the culverts, the ability of the existing culverts to accommodate fish passage at future Q2 flows, including the predicted changes as a result of the Project will be determined. If the changes in flows as a result of the Project will adversely affect fish passage at Q2 flows, applicable government agencies will be consulted in developing measures to mitigate the potential effects to fish passage. It should be noted that the increased flows as a result of the Project could potentially affect the fish passage through the culverts would not occur until the post-closure phase of the Project, once the pit lake has filled and discharges to Blackwater Creek re-established. |
| | | | | **Final Response**<br><br>Part A: As described in the response to TMI_896-FFH(2)-05, changes in flow in Blackwater Creek are not expected to have any ecologically meaningful effect on the ability of the streams to support stream-resident small-bodied fish and are not expected to affect large-bodied fish downstream. The amount of fish habitat in Blackwater Creek is largely determined by beaver activity, as the area of habitat provided by beaver ponds is much larger than the area of stream habitat between those ponds. The area of beaver ponds along Blackwater Creek varies over time when existing beaver dams are abandoned, and new beaver dams are constructed. |

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As described in Section 5.8.4 of the revised EIS (April 2018), "a portion of Keplyn's Bay was separated from Wabigoon Lake by the construction of the railway", and that "flow from Blackwater Creek is conveyed under the railway by at least two corrugated steel pipes." The revised EIS (April 2018) went on to indicate that fish would be able to move freely through these culverts, but that the culverts may be a "barrier to upstream fish migration due to high velocities" during periods with high flows. As part of the revised EIS (April 2018), the potential effects of the Project on flows in the nearby watercourses was evaluated (Section 6.9). Table 1 presented the predicted existing and post-closure flows at modelling node BW2 (see Figure 6.9.2.3-1 of the revised EIS [April 2018]), which corresponds to the mouth of Blackwater Creek, immediately upstream of the portion of Keplyn's Bay where the culverts under the railway are situated.

Table 1: Changes in Post-Closure Spring Flows in Blackwater Creek

| Scenario | Parameter | Calculated Flows ($m^3/s$) in May | |
|---|---|---|---|
| | | Wet Cover | Dry Cover |
| Average Year | Existing Flow ($m^3/s$) | 0.349 | 0.349 |
| | Post-closure Flow ($m^3/s$) | 0.366 | 0.372 |
| | Post-closure Change ($m^3/s$) | +0.0172 | +0.0234 |
| | Post-closure Change (%) | +4.9% | +6.7% |
| Dry Year | Existing Flow ($m^3/s$) | 0.098 | 0.098 |
| | Post-closure Flow ($m^3/s$) | 0.105 | 0.114 |
| | Post-closure Change ($m^3/s$) | +0.0075 | +0.0157 |
| | Post-closure Change (%) | +7.7% | +16.0% |
| Wet Year | Existing Flow ($m^3/s$) | 0.599 | 0.599 |
| | Post-closure Flow ($m^3/s$) | 0.644 | 0.647 |
| | Post-closure Change ($m^3/s$) | +0.0447 | +0.0472 |
| | Post-closure Change (%) | +7.5% | +7.9% |

The flows presented in the above table are for the month of May (consistent with the context and rationale) and are provided for both the wet and dry cover closure options (for consistency). As described in the revised EIS (April 2018), two closure options for the TSF (i.e. wet cover and dry cover) were evaluated. In accordance with the EIS Guidelines, residual adverse effects were identified as those that remain after the implementation of practical mitigation measures. The wet cover option was identified as the appropriate mitigation measure for mitigating potential effects on post-closure water quality. Therefore, the wet cover option is the closure alternative for which Treasury Metals has identified residual effects in the revised EIS (April 2018). For the wet cover option, the following changes in May flows at the mouth of Blackwater Creek (BW2) were predicted:

- an increase of 4.9% during average conditions (from 0.349 to 0.366 $m^3/s$);
- an increase of 7.7% for dry conditions (from 0.098 to 0.105 $m^3/s$); and

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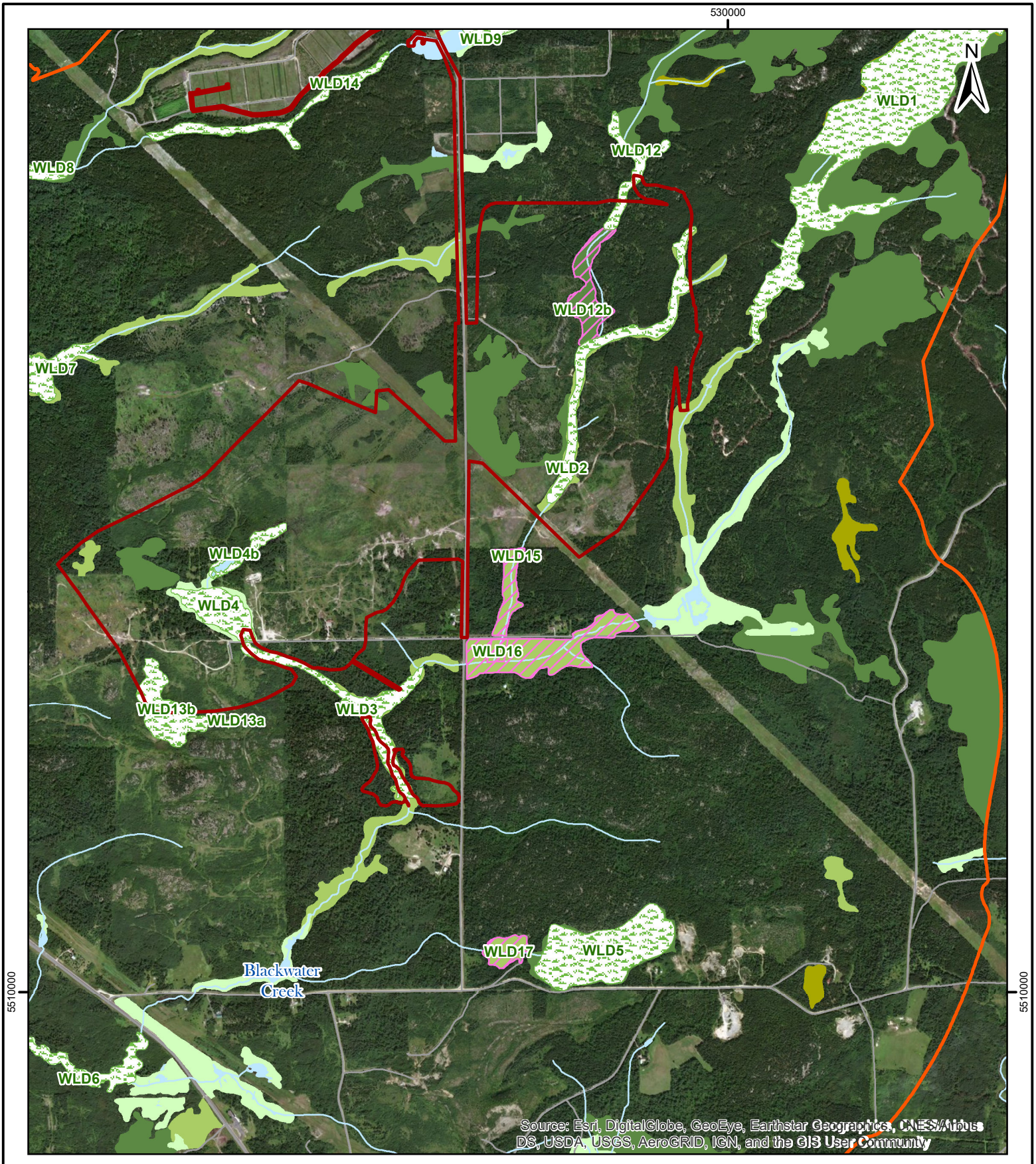
|---|---|---|---|---|
| | | | | ) an increase of 7.5% for wet conditions (from 0.599 to 0.644 m³/s).<br>The increases in flows during the average and dry conditions are not expected to result in conditions that are outside the range of current conditions. Specifically, the predicted post-closure flows during average and dry conditions (see Table 1) are considerably lower than the existing flows experienced during wet condition. Therefore, the culverts should not present a barrier to upstream fish migration due to high velocities. For the 1 in 20 wet year condition, post-closure flows at the mouth of Blackwater Creek were predicted to be 7.5% higher than the current condition. While this nominal increase in flows should not present conditions that would prevent fish passage, Treasury Metals has indicated that a full assessment of the capacities of culverts downstream of the Project would be completed as part of the detailed engineering. In the event that detailed engineering identifies situations where the capacities of the downstream culverts need to be increased to meet Q2 flows (including for ensuring fish passage), Treasury Metals would work with the appropriate Agencies to modify the designs for the downstream culverts, as required.<br><br>Part B. As described in the response to Part A, the only potential effect to fish is as a result of increase in flows during the 1 in 20-year wet condition (7.5% increase), that would result in higher flows through the culverts under the railway causeway in Keplyn's Bay than are currently experienced. Treasury Metals has indicated that a full assessment of the capacities of culverts downstream of the Project would be completed as part of the detailed engineering. In the event that detailed engineering identifies situations where the capacities of the downstream culverts need to be increased (including for ensuring fish passage) Treasury Metals would work with the appropriate Agencies to modify the designs for the downstream culverts, as required (Mit_082). With this mitigation measure in place there are no anticipated effects to fish and fish habitat as a result of increases in flows to Blackwater Creek during the post-closure phase.<br><br>Part C. As described in the responses to Parts A and B, the only potential effect to fish is as a result of increase in flows, which could result in higher flows through the culverts under the railway causeway in Keplyn's Bay than are currently experienced. Treasury Metals has indicated that the capacities of the downstream culverts will be evaluated as part of the detailed engineering process (including for ensuring fish passage) and would work with the appropriate Agencies to modify the designs for the downstream culverts to increase their capacities, as required (Mit_082). With this mitigation measure in place there are no anticipated effects to fish and fish habitat as a result of increases in flows to Blackwater Creek during the post-closure phase.<br><br>Part D. As part of the Round 2 information request process, Treasury Metals received a number of questions regarding the Follow-Up Program. As a result, Treasury Metals has prepared the Goliath Gold Project Follow-Up Program Addendum to capture the responses to these issues and provide a consolidated update to the Follow-Up Program. |




TMI_892-FFH(2)-01_Figure 1

Projection: NAD 1983 UTM Zone 15N

Date created: 2018-11-05

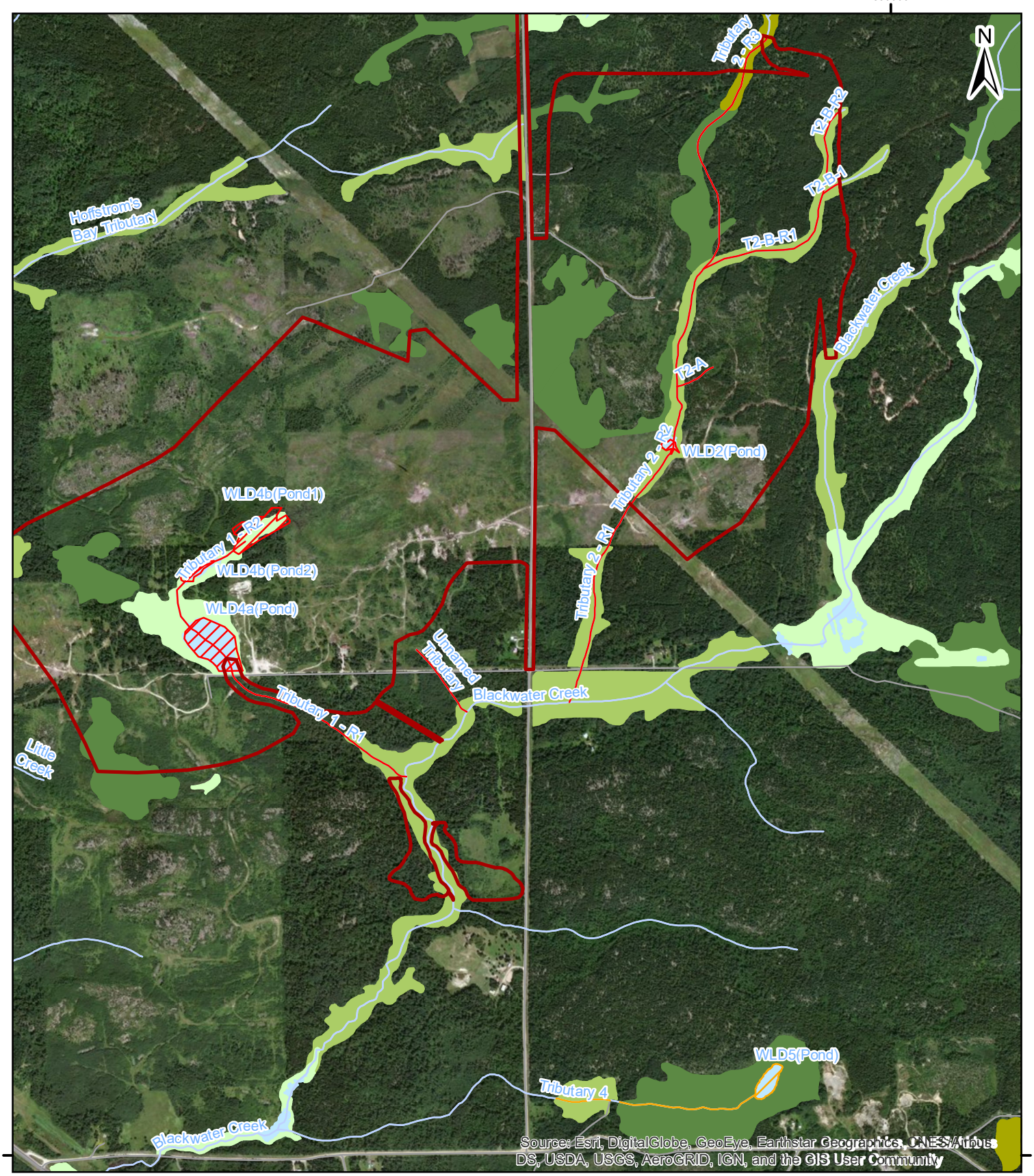
Legend

- PSA
- LSA
- Surveyed Wetlands
- Named Wetlands (unsurveyed)
- Fen
- Marsh
- Swamp - Coniferous
- Swamp - Deciduous
- Waterbody

SCALE: 1:23,259

0 0.15 0.3 0.6 0.9 1.2 Km

RESOURCES GROUP




TMI_892-FFH(2)-01_Figure 2

Projection: NAD 1983 UTM Zone 15N

Date created: 2018-11-05

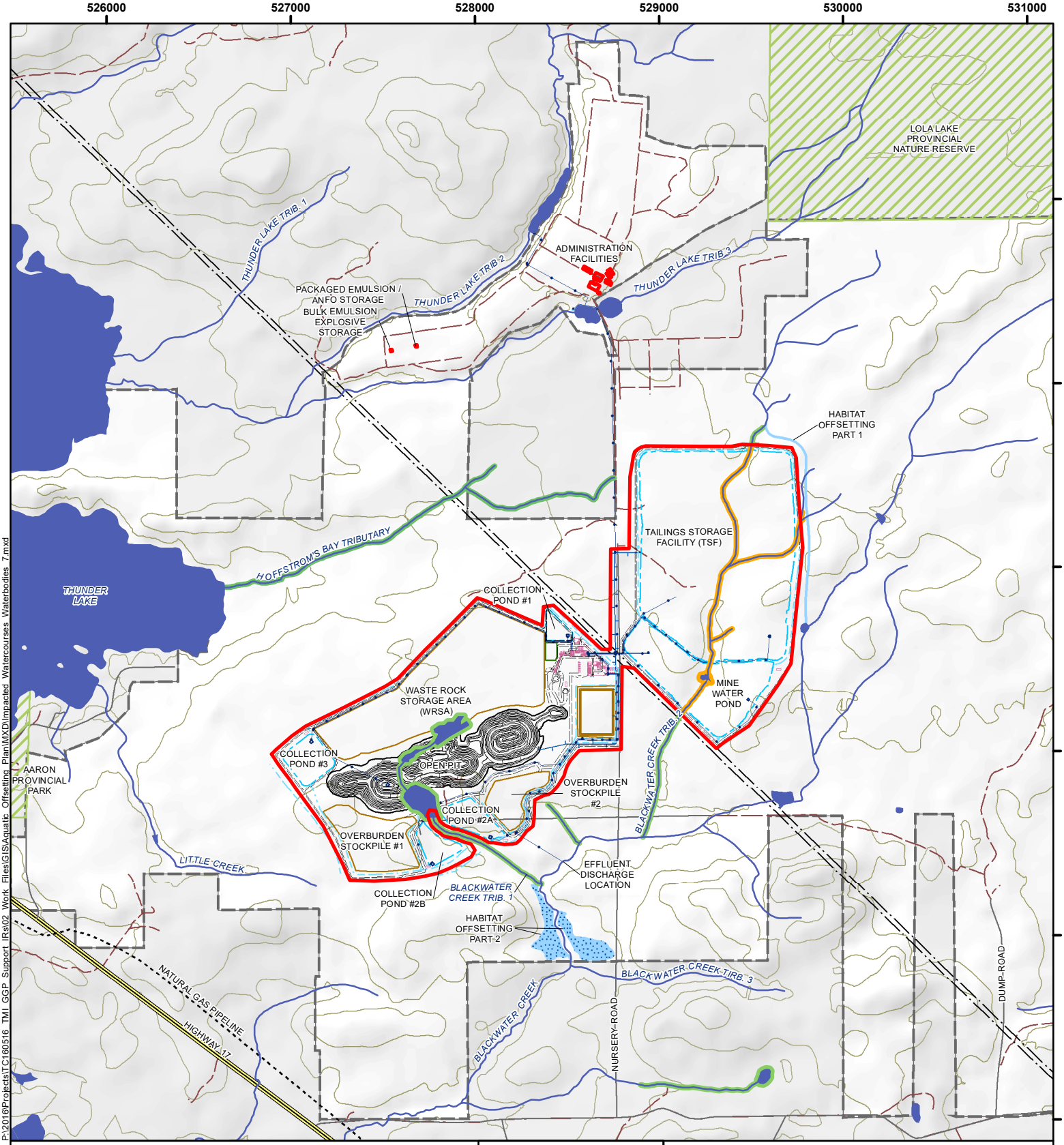
Legend

- PSA
- LSA
- Direct Impact
- Indirect Impact
- Fen
- Marsh
- Swamp - Coniferous
- Swamp - Deciduous
- Waterbody

SCALE: 1:17,454

RESOURCES GROUP

0 0.125 0.25 0.5 0.75 1 Km




## LEGEND

- Hydro Line
- Natural Gas Pipeline
- Highway
- Local Street
- Resource / Recreation Trail
- Provinical Park / Nature Reserve
- Watercourse / Waterbody
- Contours (10 m interval)
- Property Boundary of Claims and Dispositions
- Area Beyond Property Boundary

**Site Infrastructure**

- Operations Area
- Access Haul Roads
- Pipeline
- Ditching
- Emergency Spillway
- Processing Plant and Ancillary Facilities
- Security Fence
- Stockpile

**Fisheries Impacts**

- Schedule 2
- Section 35

**Habitat Offsetting Options**

- Part 1: Blackwater Creek Tributary 2 Diversion (0.3 ha)
- Part 2: Potential New Pond / Basin Along Blackwater Creek (6 ha)

0 250 500 1,000 1,500 2,000 Metres

NOTES:
- Watercourses represent pre-development conditions based on LIO database, as modified by KBM.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

TREASURY wood. METALS Inc.

# GOLIATH GOLD PROJECT

## Fisheries Impacts Compensation and Offsetting Locations

| | |
|---|---|
| PROJECT N°: TC160516 | TMI_876-RG(2)-01_Figure_1 |
| SCALE: 1:28,000 | DATE: November 2018 |

**TMI_896-FFH(2)-05-Table_1: Description of Changes in Flows in Blackwater Creek, Little Creek, and Hoffstrom's Bay Tributary**

| Waterbody | Reach Identifier | Description of Reach | Reach Length (m) (1) | Site Preparation and Construction | | Operations | | Closure | | Post-closure Phase | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Change or Alteration | Change in Flow (%) | Change or Alteration | Change in Flow (%) | Change or Alteration | Change in Flow (%) | Change or Alteration | Change in Flow (%) |
| **Blackwater Creek (main stem)** | BW-R1 | Blackwater Creek between Wabigoon Lake and Tributary 1 | 3,810 | (a)–Loss of the Tributary 1 and Tributary 2 catchment areas enclosed within berm around the operations area. | -24.2% | (a)–Loss of the Tributary 1 and Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown.<br>(c)–Discharge of treated effluent from Project. | -3.9% | (a)–Loss of the Tributary 1 and Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | -31.4% | (a)–Loss of the Tributary 1 and Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown.<br>(c)–Overflow from pit lake. | +5.7% |
| | BW-R2 | Blackwater Creek between Tributary 1 and the diffuser | 184 | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area. | -12.9% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown.<br>(c)–Discharge of treated effluent from Project. | -2.5% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | -21.2% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown.<br>(c)–Gain from pit lake overflow | -12.9% |
| | BW-R3 | Blackwater Creek between the diffuser and Tributary 2 | 507 | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area. | -12.9% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | -21.6% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | -21.2% | (a)–Loss of the Tributary 2 catchment areas enclosed within berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | -12.9% |
| | BW-R4 | Blackwater Creek between Tributary 2 and the constructed watercourse that conveys the upstream catchment area of Tributary 2 to Blackwater Creek | 1,897 | (a)–Gain of the Tributary 2 catchment areas upstream of the berm around the operations area. | +27.3% | (a)–Gain of the Tributary 2 catchment areas upstream of the berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | +15.2% | (a)–Gain of the Tributary 2 catchment areas upstream of the berm around the operations area.<br>(b)-Decrease in groundwater discharge due to dewatering drawdown. | +15.2% | (a)–Gain of the Tributary 2 catchment areas upstream of the berm around the operations area.<br>(b) –Decrease in groundwater discharge due to dewatering drawdown. | +27.3% |
| | BW-R5 | Blackwater Creek upstream from the constructed watercourse that conveys the upstream catchment area of Tributary 2 to Blackwater Creek | 1,800 | None | +0.0% | (a)-Decrease in groundwater discharge due to dewatering drawdown. | -9.5% | (a)-Decrease in groundwater discharge due to dewatering drawdown. | -9.5% | None | +0.0% |
| **Little Creek** | LC-R1 | Includes all of the watercourse upstream of Thunder Lake | 1,900 | (a) Decrease of the Little Creek catchment enclosed within berm around the operations area. | -8.7% | (a) Decrease of the Little Creek catchment enclosed within berm around the operations area. | -8.7% | (a) Decrease of the Little Creek catchment enclosed within berm around the operations area. | -8.7% | (a) Decrease of the Little Creek catchment enclosed within berm around the operations area. | -8.7% |
| **Hoffstrom's Bay Tributary** | HBT-R1 | Includes all of the watercourse upstream of Thunder Lake | 2,580 | (a) Decrease of the Hoffstrom's Bay Tributary enclosed within berm around the operations area. | -7.8% | (a) Decrease of the Hoffstrom's Bay Tributary enclosed within berm around the operations area.<br>(b) Decrease in groundwater discharge due to dewatering drawdown | -14.4% | (a) Decrease of the Hoffstrom's Bay Tributary enclosed within berm around the operations area.<br>(b) Decrease in groundwater discharge due to dewatering drawdown | -14.4% | (a) Decrease of the Hoffstrom's Bay Tributary enclosed within berm around the operations area. | -7.8% |