Appendix 38

Whale Tail 2021 Report on the Implementation of Measures to Avoid and Mitigate Serious Harm

AGNICO EAGLE

MEADOWBANK COMPLEX

WHALE TAIL PIT

2021 REPORT ON THE IMPLEMENTATION OF MEASURES TO AVOID AND MITIGATE SERIOUS HARM

In Accordance with

DFO *Fisheries Act* Authorization 16-HCAA-00370

and

DFO *Fisheries Act* Authorization 20-HCAA-00275

Prepared by:
Agnico Eagle Mines Limited – Meadowbank Complex

March, 2022

EXECUTIVE SUMMARY

In July, 2018, Agnico Eagle Mines Ltd. (Agnico) was issued *Fisheries Act* Authorization (FAA) 16-HCAA-00370 for the Whale Tail Pit project, and in July, 2020, Agnico was issued FAA 20-HCAA-00275 for the Whale Tail Pit Expansion Project.

Conditions 2.1 - 2.3 of FAA 16-HCAA-00370 and Conditions 2.1 and 2.2 of 20-HCAA-00275 describe a suite of measures and standards to avoid and mitigate impacts to fish and fish habitat that are required to be implemented while Project activities are ongoing, to ensure impacts to fish and fish habitat are limited to those authorized.

This report has been developed in fulfillment of Condition 3 of these FAAs, which indicates that Agnico will monitor the implementation of these avoidance and mitigation measures and provide a stand-alone report to DFO annually.

In fulfillment of Condition 3.1, **Section 2** of this document summarizes the implementation of the specified measures and standards to avoid and mitigate serious harm to fish. Photos and/or figures of the mitigation measures are included, as applicable (according to Condition 3.1.3 of 16-HCAA-00370 and Condition 3.1.1 of 20-HCAA-00275), along with a commentary on effectiveness based on relevant monitoring results, and any required contingency measures in the event that the mitigation did not function successfully (according to Condition 3.1.4/3.1.2).

As required by FAA 16HCAA-00370 Condition 3.1.1, an evaluation of the effectiveness of the FAA-listed monitoring programs (and other relevant monitoring programs) in validating changes to fish and fish habitat predicted in the Project FEIS is provided in Section 12.5.1.3 of the 2021 Annual Report to the NIRB as a component of the Post-Environmental Assessment Monitoring Program. This approach was proposed to DFO in October, 2021, in an effort to reduce redundancy in reporting and better focus this report on the implementation and effectiveness of the avoidance and mitigation measures.

In summary, all measures and standards to avoid and mitigate serious harm to fish identified in Condition 2 of FAA 16HCAA-00370 and 20HCAA-00275 were implemented as required in 2021. Based on the results of associated monitoring programs, no contingency mitigation measures were required for the protection of fish and fish habitat. These and other mitigation measures and standards (see Appendix A) were therefore considered effective in limiting impacts of construction activities to fish and fish habitat to those authorized.

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SECTION 1 • INTRODUCTION

In July, 2018, Agnico Eagle Mines Ltd. (Agnico) was issued *Fisheries Act* Authorization (FAA) 16HCAA-00370 for the Whale Tail Pit project. Approved fish habitat offsetting related to this FAA is described in the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018).

In July, 2020, Agnico was issued FAA 20HCAA-00275 for the Whale Tail Pit Expansion Project. Approved fish habitat offsetting related to this FAA is described in the Whale Tail Pit Expansion Project - Fish Habitat Offsetting Plan (March, 2020).

This report was developed in response to Condition 3 of these FAAs, which relates to monitoring and reporting of specified measures and standards to avoid and mitigate serious harm to fish. In particular, this report addresses Condition 3.1 of both FAAs:

Condition 3.1: ***The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization, and provide a stand-alone report to DFO, by March 31, annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.***

In fulfillment of Condition 3.1, **Section 2** of this document summarizes the implementation of the specified measures and standards to avoid and mitigate serious harm to fish, as identified in Section 2 of FAA 16-HCAA-00370 and 20-HCAA-00275. Where appropriate and available, dated photographs with GPS coordinates (or other identifiers) and inspection reports are provided or referenced, as required in FAA 16-HCAA-00370 Condition 3.1.3 and FAA 20-HCAA-00275 Condition 3.1.1.

While presented somewhat differently between the two FAAs, these measures and standards may be summarized as:

1. Sediment and erosion control - Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity. And: *Before commencing any works, undertakings and/or activities that have the potential to release sediment into waters frequented by fish, the Proponent shall prepare and implement site specific sediment and erosion control plans for any near or in-water works under the guidance of a certified Professional in erosion and sediment control (CPESC or equivalent).*

2. Adherence to the *General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut* (Tyson et al., 2011) and approved fish-out work plans for the Whale Tail Pit and Whale Tail Pit Expansion Projects;

3. Adherence to the *Freshwater Intake End-of-Pipe Fish Screen Guideline* (Fisheries and Oceans Canada, 1995) (FAA 16HCAA-00370) or the *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* (https://www.dfo-

mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html) (FAA 20HCAA-275) for any and all intake in waterbodies that support fish;

4. Development of a Blasting Mitigation Plan, which shall adhere to the guidance in *Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000 – 2002* (Cott and Hanna, 2005);

5. Adherence to the *Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut* (Fisheries and Oceans Canada, 2010);

6. Ensure that all project infrastructure in watercourses is designed and constructed in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish bearing streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada. And: *The Proponent shall provide detailed engineering plans to DFO for review and approval for construction works that have the potential to impact fish and fish habitat, at least 90 days prior to the commencement of the works.*

Section 2 of this report also provides a commentary on the effectiveness of the measures and standards, based on results of relevant monitoring programs, including those specified under Condition 2.4 of FAA 16-HCAA-00370 and Condition 2.3 of FAA 20-HCAA-00275:

1. Most recent Core Receiving Environment Monitoring Program;

2. Most recent Water Quality and Flow Monitoring Plan;

3. Most recent Water Quality Monitoring and Management Plan for Dike Construction and Dewatering.

Section 2 of this report also provides details of any contingency measures that were required to be followed to prevent further impacts in the event that these avoidance and mitigation measures did not function properly (in fulfillment of FAA 16-HCAA-00370 Condition 3.1.4 and FAA 20-HCAA-00275 Condition 3.1.2).

Finally, while not included in this report, Section 12.5.1.3 of the 2021 Annual Report to the NIRB further provides an evaluation of the effectiveness of the above-described monitoring programs (and other relevant monitoring programs) in validating changes to fish and fish habitat predicted in the Project FEIS, as required by FAA 16-HCAA-00370 Condition 3.1.1 (discussed in **Section 3**).

SECTION 2 • AVOIDANCE AND MITIGATION MEASURES

A commentary on the implementation of each FAA-listed measure to avoid or mitigate serious harm to fish and fish habitat in 2021 is provided below.

2.1 SEDIMENT AND EROSION CONTROL

According to FAA 16HCAA-00370 and 20HCAA-00275, *"before commencing any works, undertakings and/or activities that have the potential to release sediment into waters frequented by fish, the Proponent shall prepare and implement site specific sediment and erosion control plans for any near or in-water works under the guidance of a certified Professional in erosion and sediment control (CPESC or equivalent)."*

Further: *"Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity."*

The authorized works, undertakings, and activities, according to these FAAs, include:

1. *Construction of Whale Tail and Mammoth Dikes (complete);*
2. *Dewatering of the north basin of Whale Tail Lake (complete);*
3. *Construction of the freshwater jetty in Nemo Lake (complete);*
4. *Fish-out and dewatering of specified IVR area waterbodies and watercourses (complete);*
5. *Water withdrawal for the purposes of operations from A16;*
6. *Construction and operation of the IVR pit, waste rock storage facility, and attenuation pond (ongoing);*
7. *Construction of 2 groundwater storage ponds.*

The preparation and implementation of sediment and erosion control plans for these and any other construction works is described below in Sections 2.1.1 and 2.1.2.

2.1.1 Preparation of Site-Specific Sediment and Erosion Control Plans

Sediment and erosion control measures for any construction work, undertaking, or activity having the potential to impact waters frequented by fish (including but not limited to the DFO-Authorized works listed above) are described in design reports that are prepared by professionals and stamped by a Professional Engineer. These reports are sent to the NWB for review at least 60 days prior to the intended construction initiation. These reports are available for DFO comment during the NWB review period, and construction is not initiated until a positive response is received from NWB. Based on discussions with DFO in October 2021, these reports are now also provided directly to DFO, with 90 d notice. Reports are available on the NWB public registry.

In 2021, design reports were submitted to the NWB for the following construction activities. No comments from DFO regarding these design plans have been received to date. **None are identified as having potential to impact waters frequented by fish, and therefore none include sediment and erosion control measures for the protection of fish and fish habitat.**

2.1.1.1 Whale Tail Pit Landfarm – Design and Management Report (6129-696-132-REP-001)

- *Report Date*: August 27, 2021
- *Summary*: This report provides the design and management plan for a new landfarm at the Whale Tail site (Figure 1).
- *Sediment and erosion control strategy*: The landfarm is not in proximity to fish-bearing waterbodies or watercourses (note adjacent ponds A52 and A53 were fished out and dewatered in 2020 under DFO Authorization) so no sediment and erosion control strategies for construction are included in design plans.

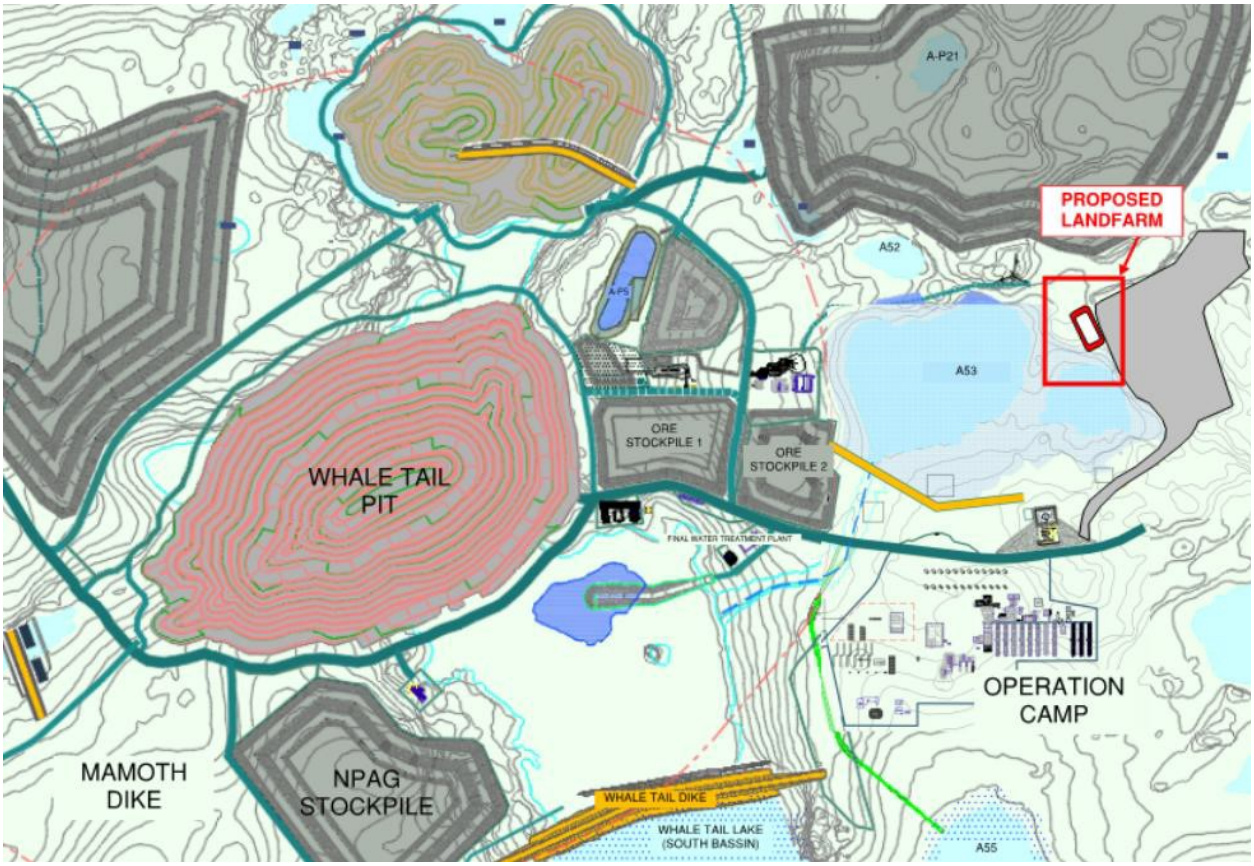

Figure 1. Proposed landfarm location (Note: figure is from the Landfarm Design and Management Report (6129-696-132-REP-001), and adjacent ponds A52 and A53 were fished out and dewatered in 2020 under DFO Authorization, as indicated in the sediment and erosion control strategy for this construction activity).

2.1.1.2 Amaruq Phase 2 IVR WRSF Pumping System Design Report (6127-695-132-REP-010)

- *Report Date*: January 27, 2021
- *Summary*: This report presented the pumping strategy and design of sumps that will be used to manage the surface runoff collected around the IVR WRSF.
- *Sediment and erosion control strategy*: To minimize TSS reporting to surrounding ponds during the construction of the sump access roads and pumping pads, all of the ponds in the IVR WRSF permitted footprint used to store waste materials shall be dewatered prior to construction (as described above, these fishouts and dewatering were complete in 2020).

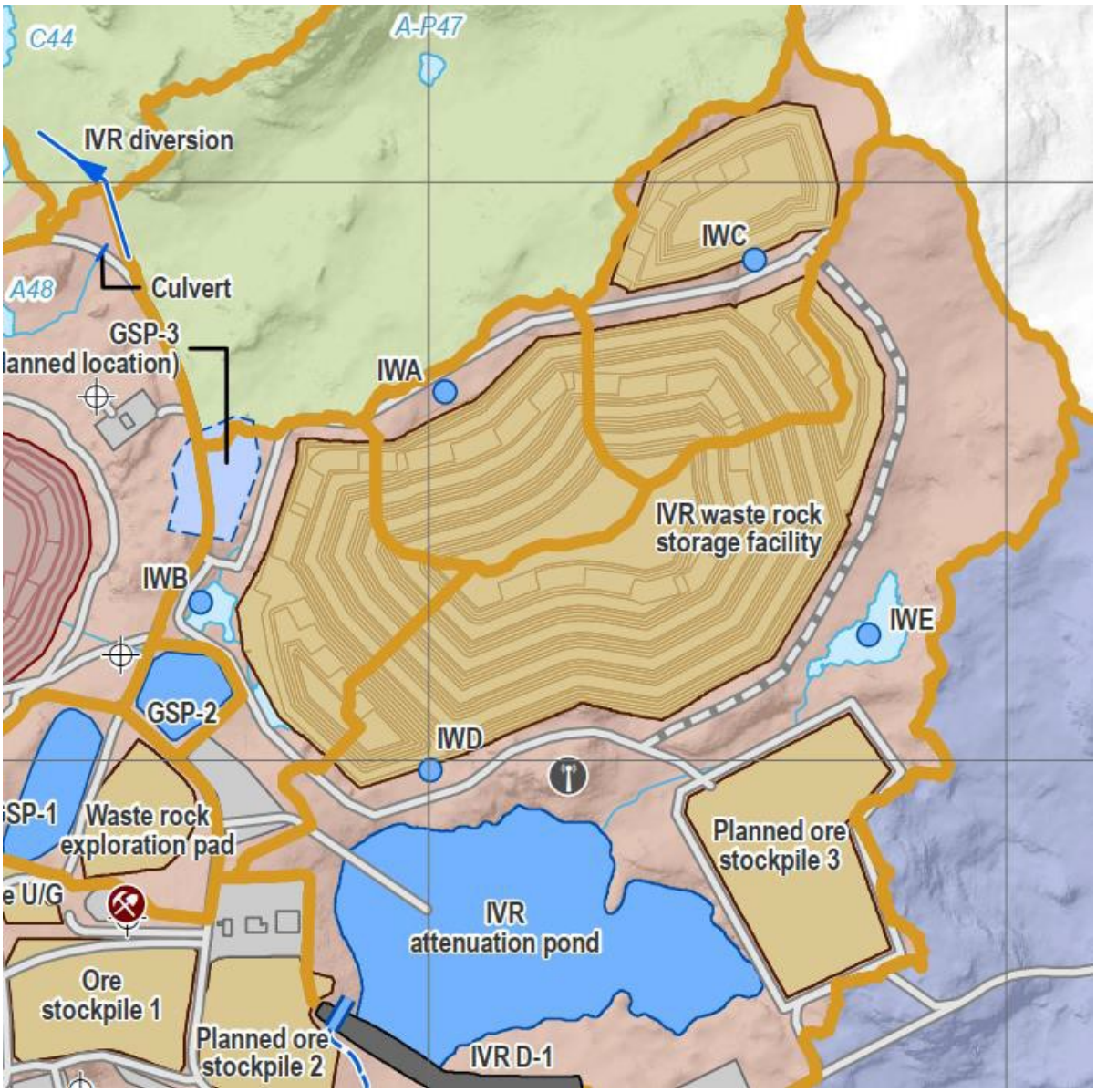

Figure 2. Planned location of IVR WRSF sumps (IWA, IWC, IWD, IWE).

2.1.1.3 60-d Notice – Whale Tail Emulsion Plant Construction

- *Report Date*: December 14, 2021
- *Summary*: A new emulsion plant will be built at the Whale Tail site. This plant will allow the mine to end the transportation of emulsion along the Whale Tail Haul Road from Meadowbank.

- *Sediment and erosion control strategy*: Emulsion plant is not in proximity to fish-bearing waterbodies or watercourses so no sediment and erosion control strategy is specified in construction design plans.

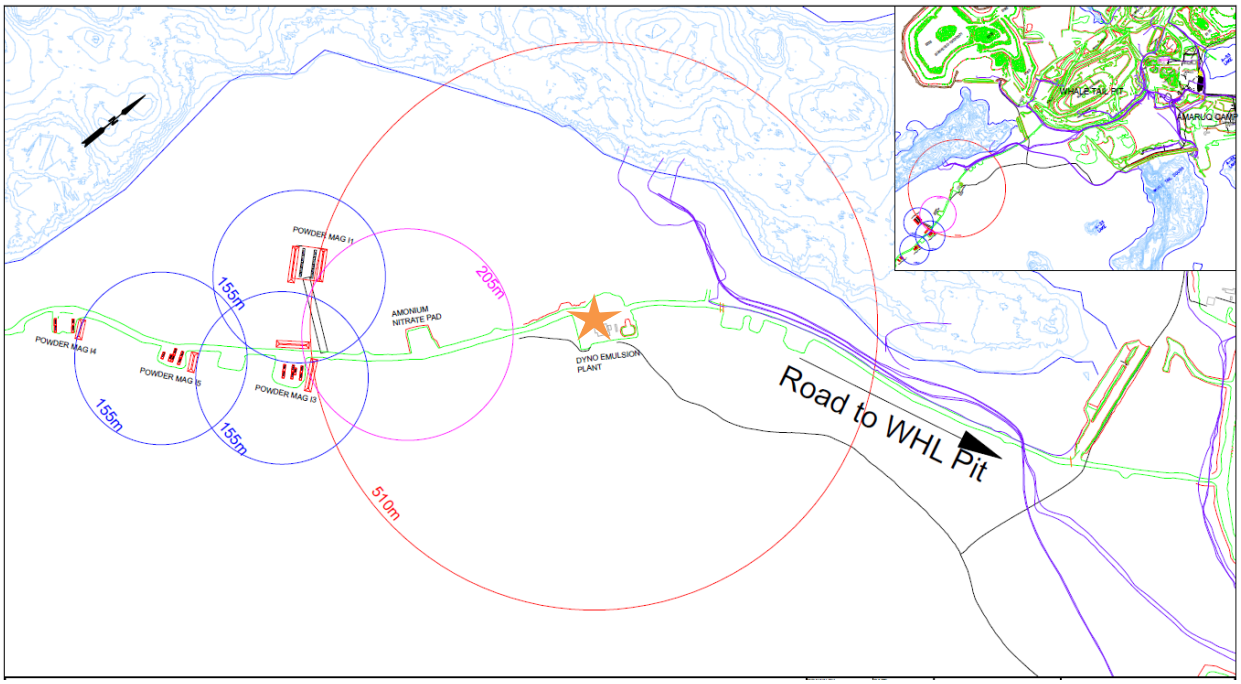

Figure 3. Proposed location of emulsion plant (orange star). Mammoth Lake to the north/northwest (>30 m).

2.1.2 Implementation of Site-Specific Sediment and Erosion Control Measures

Following the completion of construction activities, Construction Summary Reports are submitted to the NWB, and are available for DFO review. Construction Summary Reports fully describe the mitigation measures that were implemented (either according to design reports, or contingency measures as necessary) to reduce sedimentation and erosional concerns, along with as-built designs and photographic records (before, during, after construction). These reports are available from the NWB public registry.

All reports submitted in 2021 are described briefly below, along with a summary of any sediment/erosion control mitigation measures required for the protection of fish/fish habitat, select construction photographs, and a commentary on effectiveness of the mitigation according to relevant water quality monitoring (e.g. Freshet Action Plan, CREMP, Water Quality and Flow Monitoring Plan, Water Quality Monitoring and Management Plan for Dike Construction and Dewatering). Any contingency mitigation measures that were required are also described. Of the five project activities for which Construction Summary Reports were submitted in 2021, two were carried out in waters frequented by fish (Whale Tail South Basin Treated Water Diffuser (Section

2.1.2.3) and Whale Tail Dewatering Phase 2 (Section 2.1.2.4)). All five project activities are summarized briefly below.

2.1.2.1 IVR D-1 Dike (IVR Attenuation Pond Dike)

- *Report date*: August 30, 2021
- *Summary*: The IVR Dike is part of the IVR Attenuation Pond design (Figure 4). Construction occurred from February 20 – May 5, 2021.
- *Sediment and erosion control strategy*: Construction proceeded under frozen conditions and the site is not in proximity to fish-bearing waterbodies or watercourses. No sediment and erosion control measure were required for the protection of fish and fish habitat.

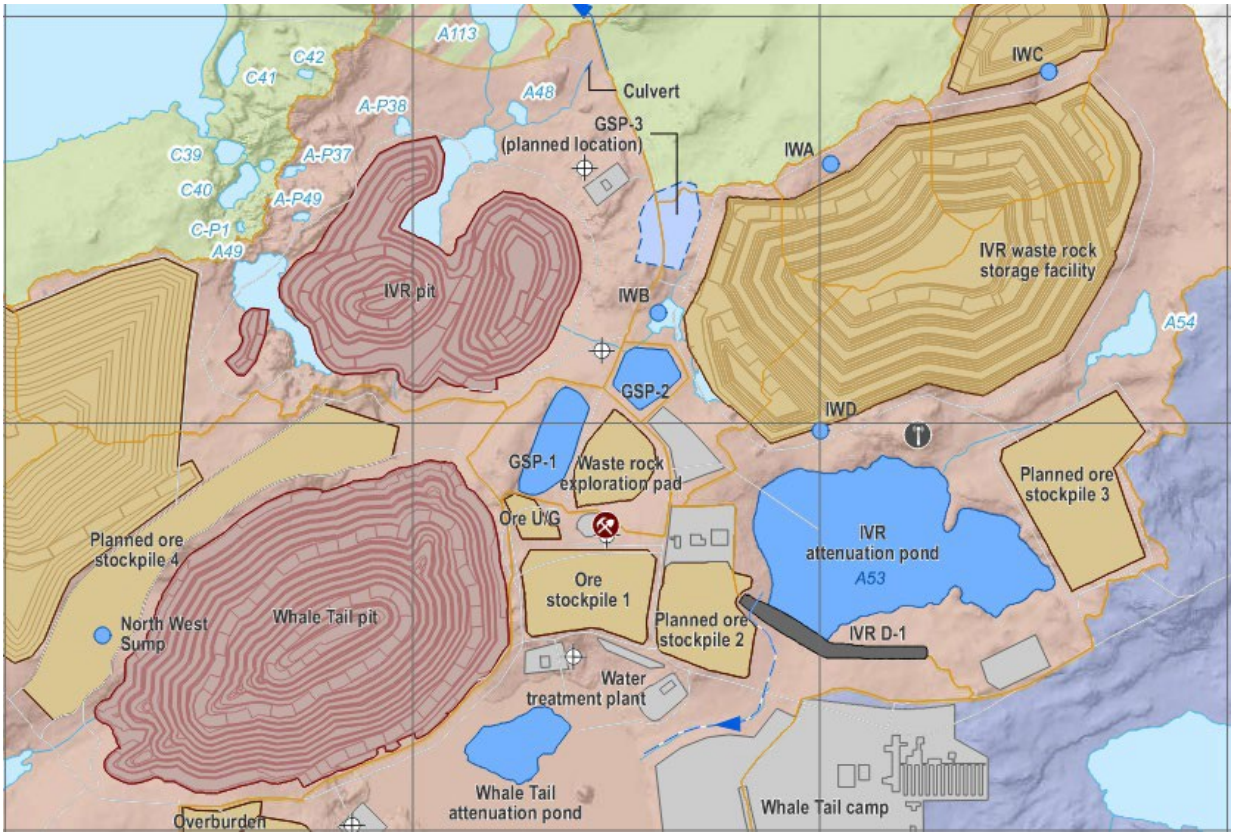

Figure 4. IVR D-1 Dike Location

Figure 5. IVR Dike Construction, March 15, 2021. Looking east from Sta. 0+170. Approved surface for liner placement.

Figure 6. IVR Dike Construction, April 25, 2021. Looking south from Sta. 0+080. CAT excavator placing Zone 2A(FF) over installed geotextile.

Figure 7. Final IVR D-1 Dike, looking east from Sta. 0+200.

2.1.2.2 Road 22 Culvert #22-2

- *Report Date: December 16, 2021*
- *Summary*: The purpose of the culvert is to direct non-contact water from the natural watershed through the Road 22 infrastructure. Construction occurred October 14 – 15, 2021.
- *Sediment and erosion control strategy*: Construction site was not in proximity to fish-bearing waterbodies or watercourses, and there was no observed overland flow at the time of construction. Construction occurred in mid-October, when the ground was beginning to freeze. No sediment and erosion control measures were therefore required for the protection of fish and fish habitat during construction. Daily visual inspections were performed to confirm. Monitoring and control of sediment release during 2022 spring freshet will be conducted under regular Freshet Action Plan procedures.

Figure 8. General location of the Road 22 Culvert 22-2. The site is more than 30 m from Mammoth Lake.

Figure 9. Culvert 22-2 construction - excavation phase. Looking west (Mammoth Lake on the right).

Figure 10. Installed Culvert 22-2, looking north towards Mammoth Lake.

2.1.2.3 Whale Tail South Basin Treated Water Winter/Summer Diffuser

- *Report Date:* January 22, 2021

- *Summary:* This report provides details of the diffusers installed in Whale Tail Lake South Basin (WTS) for the discharge of treated water from the Whale Tail Arsenic Water Treatment Plant (AsWTP) during the summer months (i.e. open water season) and when required, during the winter. The AsWTP treats water from the WT/IVR Attenuation Pond for TSS and arsenic prior to discharge to the receiving environment of WTS. Construction occurred from September 3 – November 4, 2020. Location shown in Figure 11.

- *Sediment and erosion control strategy:* To minimize TSS reporting to Whale Tail Lake South Basin (WTS) during the assembly and installation of the diffusers/pipelines, the location where the assembly work was carried out was selected to have easy access to the water (an existing ramp located along the shoreline of WTS). During construction, field observations were carried out in the waterbody where the diffusers/pipelines were being installed (WTS). If there was a TSS excursion, silt curtains would have been deployed around the disturbed area. No observations of elevated turbidity were recorded, so no silt curtains or further contingency measures were required to be implemented.

- *Monitoring results:* Results for water quality monitoring conducted in WTS under the CREMP were reviewed at the time of this report to confirm the above

observations. While construction occurred from September 3 – November 4, CREMP TSS samples were only collected in September. These measured concentrations of TSS were similar to baseline (Figure 14). As a surrogate for TSS, field-measured depth profiles for conductivity prior to, during, and after construction (August, September and November), were reviewed, and did not indicate any evidence of effects related to this construction activity (conductivity remained relatively constant across these months) (Figure 15).

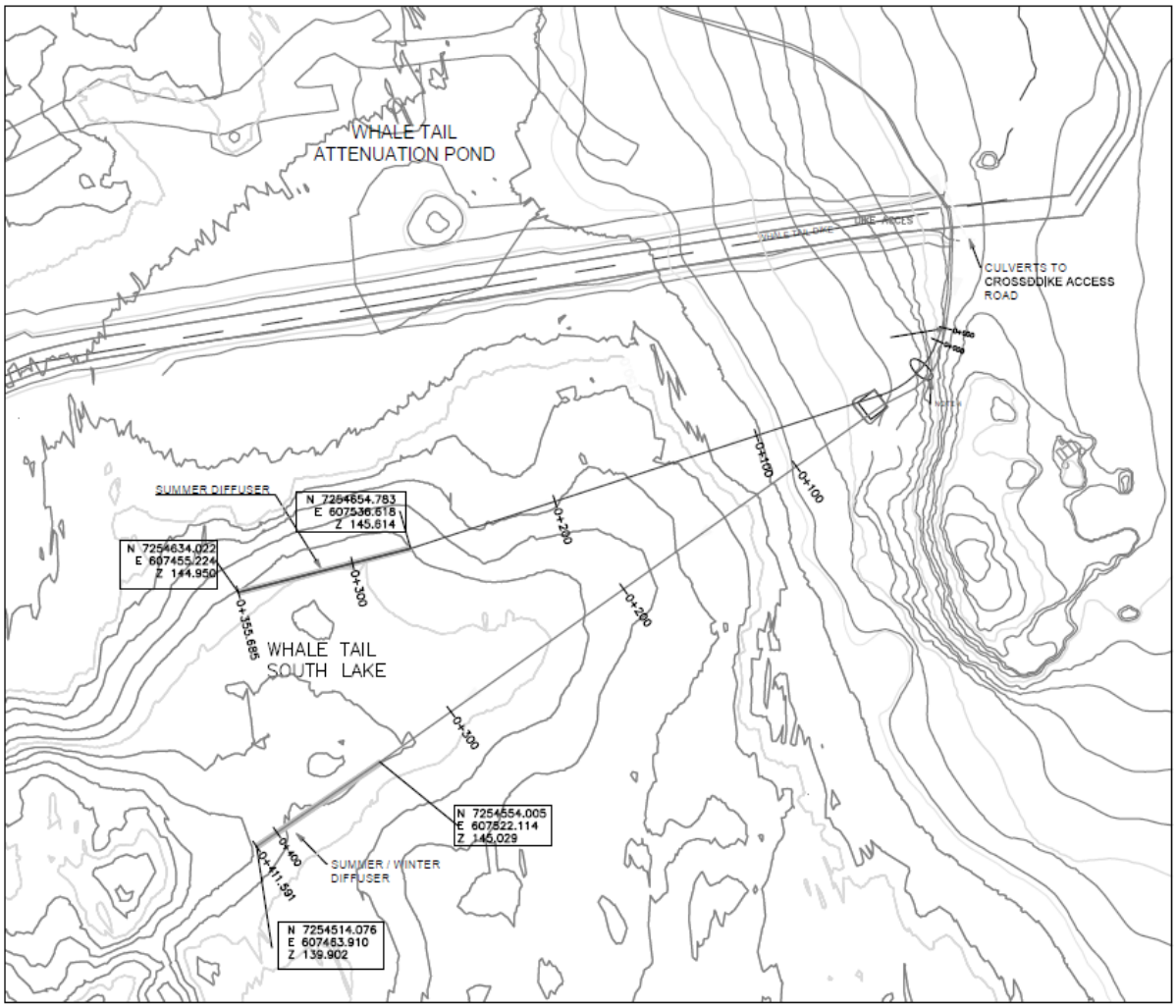

Figure 11. As-built location of the summer/winter diffusers installed in 2020.

Figure 12. Onshore diffuser assembly work in progress (pipe on the right is unrelated to the diffuser installation project).

Figure 13. Final alignment of the diffuser in WTS prior to sinking.

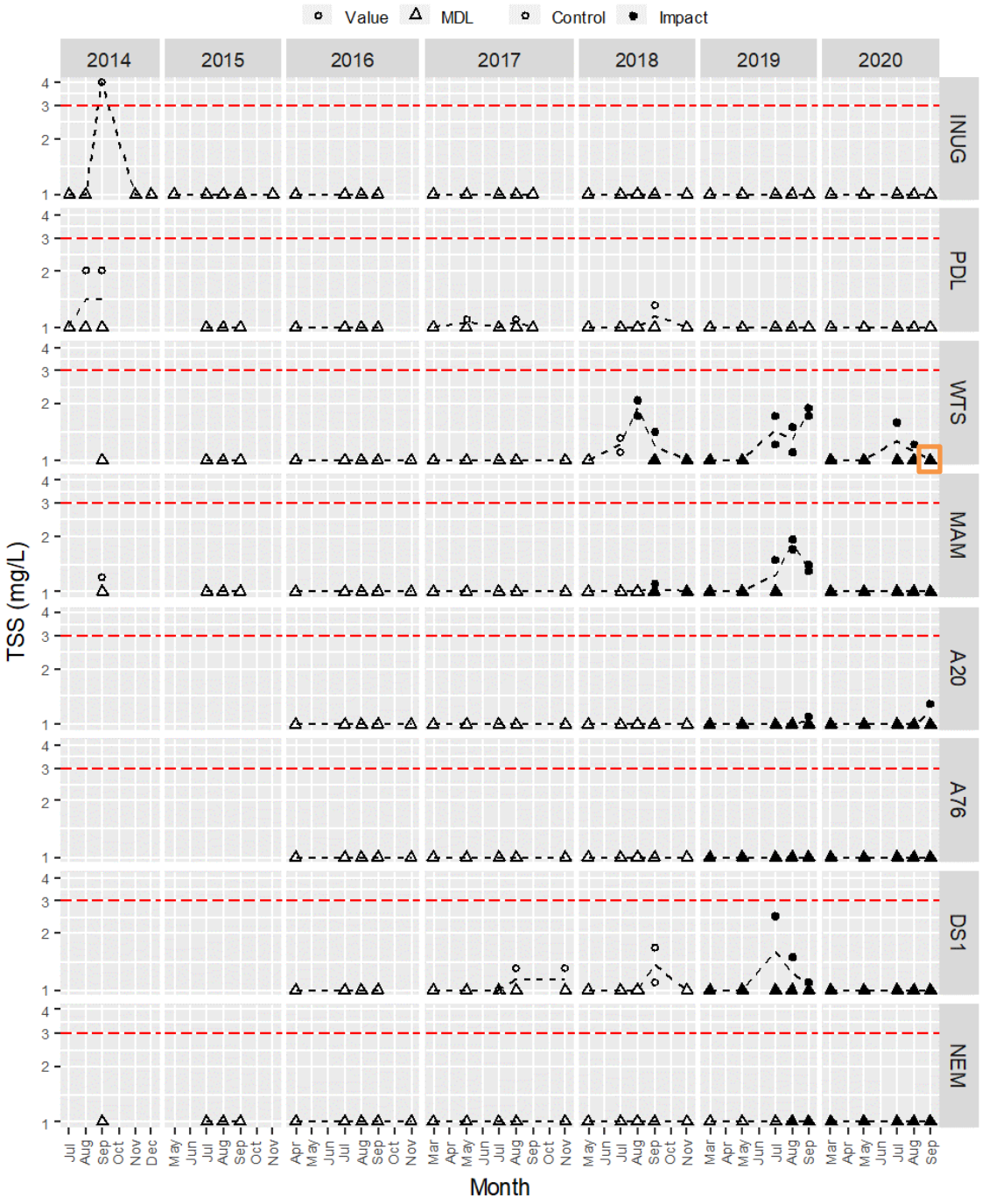

Figure 14. Measured concentrations of TSS in the CREMP study lakes, including WTS (2020 CREMP Report). TSS measurement in September (time of diffuser construction) highlighted in orange.

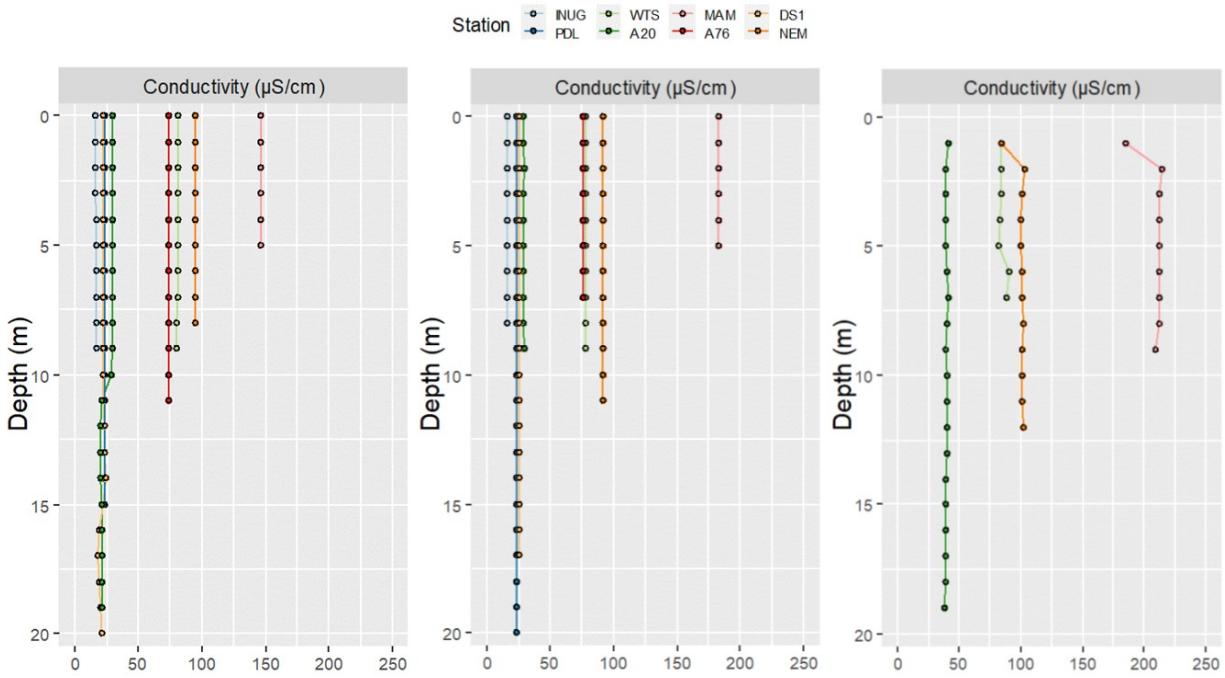

Figure 15. Field-measured conductivity profiles for Whale Tail site CREMP study lakes, including WTS, for August (left), September (centre), and November (right), 2021 (2020 CREMP Report).

2.1.2.4 Whale Tail Dewatering Phase 2 (Infrastructure) 6127-648-132-REP-002_R3

- *Report Date:* February 3, 2021

- *Summary:* This report describes the installation of infrastructure (e.g. waterlines, access roads, ramps) required for the dewatering of IVR area waterbodies shown in Figure 16. Dewatering occurred from July 11 – October 30, 2020. Any affected fish-bearing ponds were fished out prior to or concurrent with[1] dewatering, under DFO Authorization (reported in the 2020 *Whale Tail Pit Expansion Project Fish-Out Report*, as summarized in the 2020 *Report on the Implementation of Measures to Mitigate and Avoid Serious Harm to Fish*).

- *Sediment and erosion control strategy:* To minimize TSS reporting to the ponds during construction of access roads and pumping pads, ramp and pumping pad sections were built not to expand into waterbodies. In lieu, suction lines were extended to the deepest point, from shore. No quarrying activities took place to build the access road. During dewatering, turbid water caused by construction activities was pumped to the WT Attenuation pond for treatment in the WTP. TSS monitoring for dewatering discharge was conducted as required, under the *Water*

[1] Only ponds A47 and A53 saw some overlap of the fish-out final removal phase with initiation of dewatering.

Quality Monitoring and Management Plan for Dike Construction and Dewatering (May, 2020).

- *Monitoring Results:* Results of water quality monitoring for IVR waterbody dewatering and a summary of sediment and erosion control measures were provided in the 2020 *Water Quality Monitoring Report for Dike Construction and Dewatering* and were summarized in the 2020 *Report on the Implementation of Measures to Mitigate and Avoid Serious Harm to Fish*, so are not discussed in detail here. Briefly, no exceedances of monitoring thresholds or regulatory criteria occurred, so no contingency mitigation measures were required to be implemented.

Figure 16. Location of IVR area waterbodies dewatered in 2020 (before dewatering).

Figure 17. A49 after dewatering (2020).

Figure 18. A47 during dewatering (2020).

Figure 19. A53 after dewatering (2020).

2.1.2.5 IVR Diversion Channel Construction 6127-695-132-REP-012_R2

- *Report Date*: February 16, 2021

- *Summary:* The principal purpose of the IVR Diversion is to collect and divert the runoff (non-contact water) from the North East watershed into Nemo Lake. The watershed is located just north of the IVR WRSF and east of the IVR Pit, and it has an approximate area of 68.2 ha (with the IVR Diversion in place). The diversion system consists of a trapezoidal section channel in combination with a pervious perimeter berm delimits the west boundary of the channel. Channel and berm construction occurred from September 19 – October 6, 2020.

- *Sediment and erosion control strategy:*

  The channel is not located in proximity to fish-bearing waterways, so sediment and erosion control measures during construction were limited to reducing potential for TSS in runoff carried by this channel during construction and the subsequent (2021) freshet.

  i. Water management sumps – A number of temporary sumps were dug to intercept or control runoff during construction. Pumped water was discharged to IVR Pit water management infrastructure. After construction, sumps were appropriately filled to minimize TSS during subsequent runoff events.

  ii. Erosion management – The upstream end of the channel was improved (compared to designs) to limit risks of erosion. The natural ground was gently sloped with the back of the bucket (no material was removed) and a geotextile placed on top. It was not possible to have any kind of overlap with the channel geotextile because of the riprap already in place. For finishing, enough riprap has been placed to hold the geotextile in place and minimize potential superficial erosion in the area.

- *Monitoring Results*: No TSS monitoring was specifically required in association with this construction work. Nevertheless, results of CREMP water quality monitoring in Nemo Lake for the subsequent open-water season (2021) were reviewed at the time of this report. Measured concentrations of TSS did not exceed trigger values suggesting the measures taken to reduce sedimentation and erosion potential were appropriate.

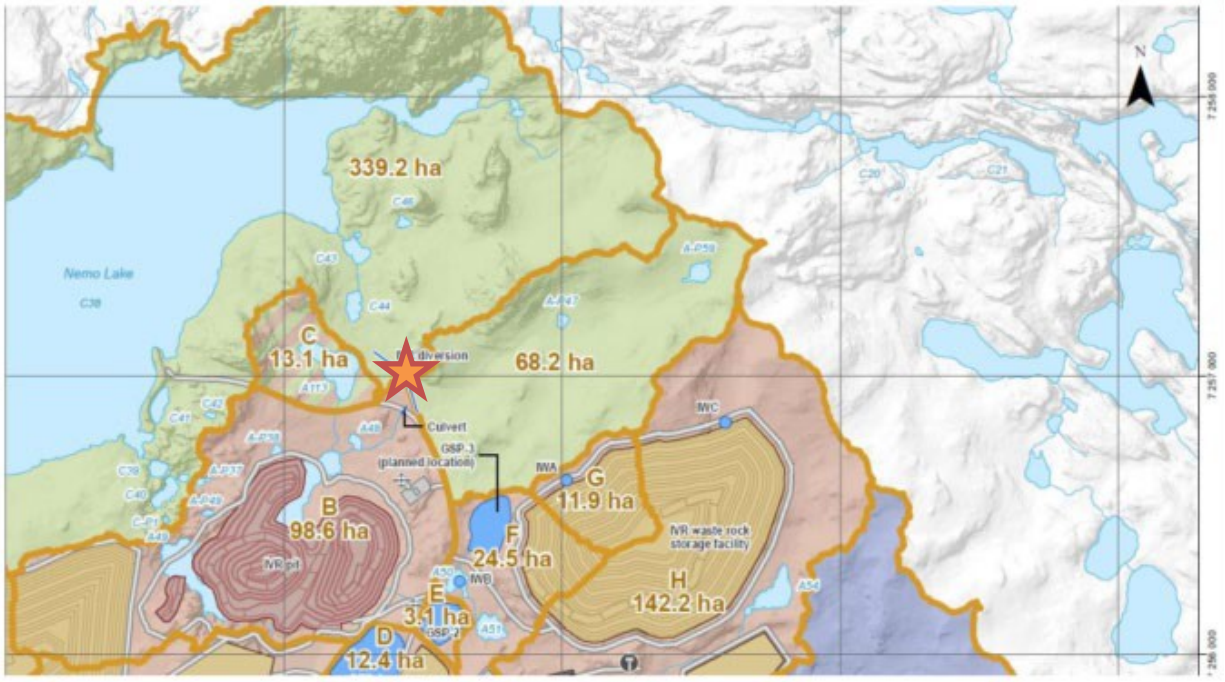

Figure 20. IVR Diversion Channel general location (red/orange star).

Figure 21. IVR Diversion Channel construction site, looking north (before construction).

Figure 22. First lift of the IVR Diversion Channel berm construction, looking south.

Figure 23. Excavation of a temporary sump, which was directed to mine site water management infrastructure.

Figure 24. Excavation of the IVR Diversion Channel.

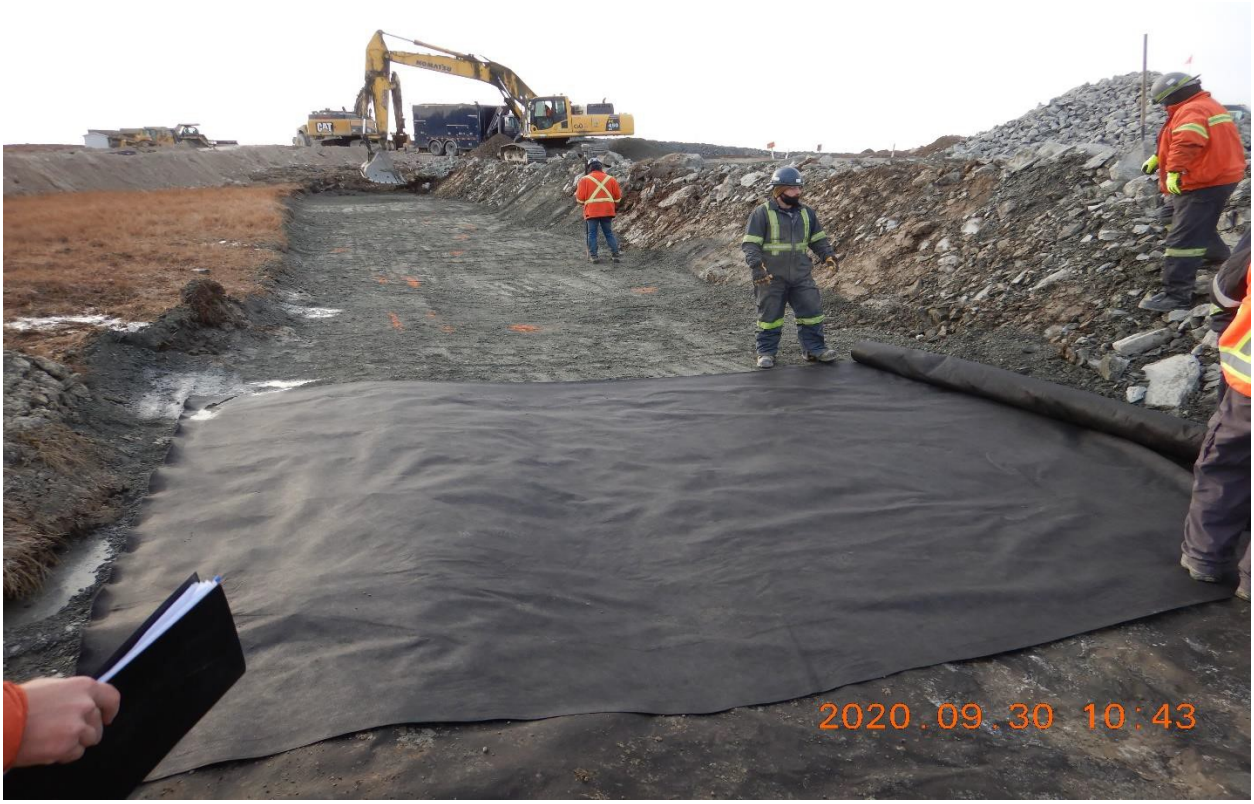

Figure 25. IVR Diversion Channel geotextile installation.

Figure 26. View of the final IVR Diversion Channel, looking north-west.

2.2 ADHERENCE TO THE GENERAL FISH-OUT PROTOCOL FOR LAKES AND IMPOUNDMENTS IN THE NORTHWEST TERRITORIES AND NUNAVUT (TYSON ET AL., 2011) AND APPROVED FISH-OUT WORK PLANS FOR THE WHALE TAIL PIT AND WHALE TAIL PIT EXPANSION PROJECTS

No fish-outs occurred at the Whale Tail site in 2021.

2.3 ADHERENCE TO THE FRESHWATER INTAKE END-OF-PIPE FISH SCREEN GUIDELINE (FISHERIES AND OCEANS CANADA, 1995) OR THE INTERIM CODE OF PRACTICE: END-OF-PIPE FISH PROTECTION SCREENS FOR SMALL WATER INTAKES IN FRESHWATER FOR ANY AND ALL INTAKE IN WATERBODIES THAT SUPPORT FISH

No new freshwater intakes in fish-bearing waterbodies were constructed in 2021. The only operating freshwater intake in a fish-bearing waterway was the Nemo Lake intake. Construction of this intake occurred in 2018 and has been previously reported.

2.4 DEVELOPMENT OF A BLASTING MITIGATION PLAN AND ADHERENCE TO "*MONITORING EXPLOSIVE-BASED WINTER SEISMIC EXPLORATION IN WATERBODIES, NWT 2000 – 2002*" (COTT AND HANNA, 2005).

In accordance with Condition 2.3.3 of FAA 16HCAA-00370 and Condition 2.2.3 of FAA 20HCAA-00275, Agnico has developed a Blast Monitoring Program (Version 6, March 2021) that adheres to the guidance in the document "*Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000 – 2002*" (Cott and Hanna, 2005) and Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by the DFO for use in the north.

A report on blast monitoring according to the Blast Monitoring Plan is provided every year in the Annual Report to the NIRB. Every blast is monitored with an Instantel Minimate Blaster to ensure that vibrations generated by blasting (peak particle velocity; PPV) are less than 13 mm/sec and the overpressure (instantaneous pressure change; IPC) is under 50 KPa at the nearest fish-bearing waterbody (on recommendation of DFO). The results of blast monitoring are systematically analyzed by the Engineering Department within 24 hours following the blasting operation. The blast monitoring results are interpreted and a blast mitigation plan is implemented immediately if the vibrations or the overpressure exceed guidelines. Further, Agnico regularly submits technical memorandums to DFO regarding blast monitoring and mitigation for various construction activities, as required (none were required in 2021).

In 2021, no exceedances of blast monitoring thresholds were recorded (Appendix of the 2021 Annual Report to the NIRB) and therefore no contingency mitigation measures were required to be implemented.

2.5 ADHERENCE TO THE PROTOCOL FOR WINTER WATER WITHDRAWAL FROM ICE-COVERED WATERBODIES IN THE NORTHWEST TERRITORIES AND NUNAVUT (FISHERIES AND OCEANS CANADA, 2010)

In 2021, winter water withdrawal occurred for the freshwater intake from Nemo Lake only. Withdrawal volumes conformed with the *Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut* (Fisheries and Oceans Canada, 2010) – i.e. total under-ice withdrawal did not exceed 10% of the available water volume.

As described in Agnico's response to DFO's Technical Comment 2.2.2 on the Whale Tail Pit Expansion Project Water License Amendment application (October 7, 2019), the available under-ice volume of Nemo Lake was calculated as 6,169,226 m^3. For calculating under-ice volumes, hydrological statistics were extracted from the elevation-volume table (Table A-19) provided in Appendix 6-M of the Final Environmental Impact Statement (FEIS) for the Whale Tail Pit Project. The calculations assumed a 2-m ice thickness during winter.

Estimated total under-ice water withdrawal from Nemo Lake for the winter of 2020-2021 (conservatively, September – June, inclusive) was 45,040 m^3, which is less than 10% of the available under-ice volume (10% of 6,169,226 m^3 = 616,923 m^3).

2.6 ENSURE THAT ALL PROJECT INFRASTRUCTURE IN WATERCOURSES IS DESIGNED AND CONSTRUCTED IN SUCH A MANNER THAT IT DOES NOT UNDULY PREVENT OR LIMIT THE MOVEMENT OF WATER OR FISH SPECIES IN FISH BEARING STREAMS AND RIVERS, UNLESS OTHERWISE AUTHORIZED BY FISHERIES AND OCEANS CANADA.

Further: The Proponent shall provide detailed engineering plans to DFO for review and approval for construction works that have the potential to impact fish and fish habitat, at least 90 days prior to the commencement of the works

As discussed in Section 2.1.1, Design Reports are provided to the NWB for review at least 60-d prior to any construction activity, and these reports are available for DFO comment. Reports are also now provided to DFO at least 90-d prior to any construction works that have the potential to impact fish and fish habitat. Following construction, Construction Summary Reports are provided to the NWB, providing details of the final construction methods. All Design Reports and Construction Summary Reports provided to the NWB/DFO in 2021 are summarized in Section 2.1.

No project infrastructure was designed or constructed in fish-bearing watercourses in 2021 (Section 2.1).

Further, no Design Reports submitted in 2021 are for construction works with the potential to impact fish and fish habitat. No comments from DFO have been received through the NWB review process to date for Design Reports submitted in 2021.

SECTION 3 • VALIDATION OF FEIS-PREDICTED IMPACTS

In accordance with Condition 3.1.1 of DFO Authorization 16HCAA-00370 and following Agnico's discussions with DFO and KivIA in October 2021 on the content of this report[2], a review of FEIS-predicted impacts to fish and fish habitat is provided in Section 12.5.1.3 of the 2021 Annual Report to the NIRB as a component of the Post-Environmental Assessment Monitoring Program. This approach was proposed in an effort to reduce redundancy in reporting and better focus this report on the implementation and effectiveness of the DFO-specified avoidance and mitigation measures, as listed in Section 2 of the FAAs. It is noted that validation of FEIS predictions is not a condition of the DFO FAA for the Whale Tail Pit

[2] A revised report format was provided to DFO in January, 2022 for review, which proposed referencing the PEAMP section of the Annual Report for the required validation of FEIS-predicted impacts. No comment has been received from DFO at this time.

Expansion Project (20HCAA-00275) but nevertheless the PEAMP evaluation includes the relevant assessment of predictions for that Project phase.

In line with Condition 3.1.1 of 16HCAA-00370, the purpose of the PEAMP evaluation is to:

1. Summarize predicted residual impacts to fish and fish habitat valued components (VCs).

2. For each prediction, present historical and current-year results from relevant monitoring programs.

3. When current monitoring results do not support an impact prediction (i.e. current-year measured impacts are outside of the range of predicted impacts), a trend analysis is conducted to review baseline and all monitoring data to date. A discussion of those results is provided.

4. Previously reported trend analyses are updated, regardless of current year monitoring results. In this way, discussions and trend analyses will be presented in the PEAMP moving forward for all instances where impact predictions have historically been exceeded on one or more occasions.

5. Effectiveness of the monitoring programs at assessing impact predictions is discussed. A summary of the FEIS-planned mitigation measures for each VC is provided, along with a description of implementation in the current monitoring year. Where monitoring results indicate that impact predictions can no longer be supported, a description will be provided of the proposed adaptive management approaches.

SECTION 4 • CONCLUSION

As described in **Section 2** of this report, all of the measures and standards to avoid and mitigate serious harm to fish identified in Section 2 of FAA 16HCAA-00370 and 20HCAA-00275 were implemented as required in 2021.

Based on the results of the associated monitoring programs (**Sections 2.1.2, 2.4, and 2.5**), no contingency mitigation measures were required in 2021 in relation to these specified measures for the protection of fish and fish habitat.

These and other mitigation measures (Appendix A) were therefore considered effective in limiting impacts of construction activities to fish and fish habitat to those authorized.

Further validation of all FEIS-predicted impacts is discussed in Section 12.5.1.3 of the 2021 Annual Report to the NIRB as a component of the Post-Environmental Assessment Monitoring Program, using current-year and historical monitoring results from all relevant programs.

APPENDIX A

Summary of FEIS-Designed Mitigation Measures

A complete list of the Project's mitigation measures related to fish and fish habitat, as designed in the FEIS is provided in Table A-1, along with a commentary on implementation in 2021.

Table A- 1. Mitigation measures described in the FEIS Addendum (Agnico Eagle, 2018; Table 3-C-7) to reduce impacts of the project to fish and fish habitat, and commentary on current implementation.

Project Activity	Planned Mitigation Measure (FEIS Addendum, Table 3-C-7)	Implementation (2021)
Mine infrastructure footprint	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Freshet Action Plan
Site water management (road infrastructure) and Whale Tail Haul Road operation	Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish.	**N/A** (no construction in fish-bearing watercourses in 2021)
	Mining staff will not be allowed to hunt or fish while on their work rotation; Agnico Eagle will develop and enforce "no hunting, trapping, harvesting or fishing policy" for employees and contractors, which will be consistent with the Meadowbank Mine.	**Yes**
	Watercourses will be inspected upstream and downstream of the crossings for, erosion, scour, and flow blockages	**Yes** – Road Inspection
	Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate risk, where required.	**Yes** – Road Inspection
	Rock aprons at culvert inlets and outlets will provide erosion protection and prevent localized erosion from concentrated high velocity flows above the peak 1:10 year rainfall event.	**Yes** – Road Inspection
	Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage and increased conveyance of flow during spring thaw and freshet.	**Yes** – Road Inspection
Earthworks: Drilling, blasting and excavation (includes Quarry/Borrow Pit) and Crushing activities	Only the required amount of explosive will be used as necessary for the amount of rock or borrow material to be blasted	**Yes** – Blast monitoring Plan
	Applicable guidelines for set-back distances and quantities of explosives will be followed.	**Yes** – Blast monitoring Plan
	Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses.	**Yes** - Mine Waste Rock Management Plan
	Borrow and rock quarry activity will be at least 31 m from the high water mark of any waterbody	**Yes** - Mine Waste Rock Management Plan
	Borrow pits and quarry will be excavated and sloped for positive drainage	**Yes** - Mine Waste Rock Management Plan
	Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt.	**Yes** - Mine Waste Rock Management Plan
	Drainage from borrow pits and quarry will not flow directly into any waterbodies or watercourses.	**Yes** - Mine Waste Rock Management Plan
	When there is ponded water in the rock quarry or borrow pits that could enter a waterbody or watercourse, a water quality sample will be collected and analyzed, and the	**Yes** - Mine Waste Rock Management Plan

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Table 3-C-7)	**Implementation (2021)**
	results used to determine appropriate mitigation measures (e.g., prevent runoff from entering waterbody or watercourse).	
	To avoid and mitigate Serious Harm to Fish, Agnico Eagle will continue to adhere to blasting requirements and will continue to use practices consistent with those used at the Meadowbank Mine. Agnico Eagle will engage with DFO, when required.	**Yes** – Blast monitoring Plan
	Use of non-acid generating material at watercourse crossings; testing will verify lack of acid rock drainage and metal leaching potential.	**Yes** - Mine Waste Rock Management Plan
	Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities.	**Yes** - Mine Waste Rock Management Plan
General Construction /Decommissioning Activities	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed to limit disturbance to lakes and streams.	**Yes** - Mine Waste Rock Management Plan
	In-stream works will be in winter, when possible, to avoid increased TSS and turbidity, and changes to water quality	**Yes**
	Where applicable, runoff from construction / decommissioning activities will be captured and managed to minimize suspended solids (e.g., discharged into an attenuation pond to settle out suspended sediments)	**Yes** – e.g. IVR Diversion Channel Construction, Section 2.1.2.5
	Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish.	**N/A -** no construction in fish-bearing watercourses in 2021
	Bridge abutment installation will span majority of the active channel (i.e., outside of the high-water mark), and if feasible, construction will occur in winter	**N/A** – no bridge installation in 2021
	Disturbed areas along the streambanks will be stabilized and allowed to revegetate upon completion of work	**Yes** – streambanks allowed to revegetate
Site Water Management	A Surface Water Management Plan will be implemented	**Yes** – Water Management Plan
Dike Construction / Decommissioning causing release of sediment	Use of the Dewatering Dikes, Operations, Maintenance and Surveillance Manual developed by Agnico Eagle.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	During summer construction, turbidity curtains will be installed near the portion of the alignment where dike construction will occur, which is an approach demonstrated at other northern mining projects	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Non- potentially acid generating, chemically inert material (i.e., granite) will be used to construct the dike to prevent leaching of metals into water.	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering
	Turbidity monitoring will be conducted at designated locations throughout open water and under-ice conditions, within and outside of the zone of the turbidity curtains. In the event that TSS concentrations approach monitoring	**Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Table 3-C-7)	**Implementation (2021)**
	thresholds, a review of local conditions and activities will be conducted.	
General mining activities and use of vehicles causing fugitive dust & other air emissions	Implement dust control measures, if needed on mine roads.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase	**Yes –** Air Quality and Dustfall Monitoring Plan
	Enforcing speed limits (maximum speed 50 km/h) to suppress dust production.	**Yes – Whale Tail Transportation Management Plan**
	If deemed necessary through monitoring, dust from roads will be managed through use of dust suppressant	**Yes –** Air Quality and Dustfall Monitoring Plan
	The running surface of the road will be maintained thereby reducing the generation of dust.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Adherence to the Air Quality and Dustfall Monitoring Plan	**Yes –** Air Quality and Dustfall Monitoring Plan
	Most personnel arriving at or leaving the site will be transported by bus, thereby reducing the amount of traffic (and dust).	**Yes**
	Adherence to water quality monitoring and adaptive management in the CREMP to detect changes in water quality	**Yes** - CREMP
	Construction equipment and trucks will be equipped with industry-standard emission control systems.	**Yes**
	Compliance with regulatory emission requirements will be met.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles	**Yes** – Maintenance logs
	SO_2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel.	**Yes**
Waste Rock Storage Areas and Stockpiles	A Water Management Plan has been developed and describes the containment and management of contact water on-site.	**Yes** – Water Management Plan
	Contact water will be monitored and managed through the Storage and Attenuation Ponds. The IVR Diversion will divert clean runoff from the upper watershed of the IVR Pit to the Nemo Lake watershed.	**Yes** – Water Management Plan
	Seepage will be captured at sumps and diverted to the Attenuation Pond.	**Yes** – Water Management Plan
	Facility discharge water will be monitored for water quality, and treated as required, prior to discharge	**Yes** – Water Management Plan
	Performance of the dikes will be monitored throughout their construction and operating life.	**Yes** – Water Management Plan
Site Water Management	Manage pumping rates so total annual discharge from Whale Tail and Nemo Lake does not drop below the 10-year dry condition	**Yes** – Water Management Plan
	Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s).	**Yes** – Water Management Plan
	Capture and reuse site water to reduce fresh water requirements	**Yes** – Water Management Plan
	Pumped water from the dewatered lakes will be directed through properly designed structures to prevent erosion in the receiving waterbodies	**Yes** – Water Management Plan

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Table 3-C-7)	**Implementation (2021)**
	Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes	**Yes** – Water Management Plan
	Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed	**Yes** – Water Management Plan
	Water Management Plan will be implemented	**Yes** – Water Management Plan
	A fish-out of the diked area of Whale Tail and Mammoth lakes, and smaller waterbodies in the northeast area for the Expansion Project, will be conducted before and during dewatering phase; the fish-out plan will be designed and implemented in consultation with DFO and local Inuit communities, and will consider recommendations in Tyson et al. (2011).	**Yes** – 2020 Fishout Plan
	Appropriately sized fish screens, which meet DFO guidelines, will be fitted to pumps to limit fish access and to limit fish entrained to the smaller species and life stages	**Yes** – Water Management Plan
	Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond (and treated if required) prior to release.	**Yes** – Water Management Plan
	Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits.	**Yes** – Water Management Plan
	Potential acid generating rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock locations	**Yes** - Mine Waste Rock Management Plan
Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area)	The Spill Contingency Plan will be implemented, including ready access to an emergency spill clean-up kit for cleaning up any spills	**Yes** - Spill Contingency Plan
	Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers and will be stored at the Meadowbank Mine.	**Yes** – Hazardous Management Plan
	Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas	**Yes** – Hazardous Management Plan
	Hazardous wastes will be temporarily stored at Whale Tail Pit site and then transported to the Meadowbank Mine in appropriate containers to prevent exposure until they are shipped off site to an approved facility	**Yes** – Hazardous Management Plan
	Individuals working on site and handling hazardous materials will have appropriate training (e.g. WHMIS)	**Yes** – Hazardous Management Plan
	Soils from petroleum spill areas will be deposited at the Meadowbank Mine Landfarm	**Yes** – Landfarm Management Plan
	Equipment will be re-fueled, serviced, or washed away from the watercourse crossings.	**Yes** – best practices
	Fuel, lubricants, hydraulic fluids, and other chemicals will be stored at least 31 m away from the high water mark of any waterbody.	**Yes – Weekly Inspection**
	Construction equipment will be regularly maintained	**Yes** – Maintenance Logs
	Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred	**Yes** – Spill Contingency Plan
	Enforced speed limits	**Yes**
Mining Activities and Water	Adherence to Water Management Plan	**Yes** – Water Management Plan

Project Activity	**Planned Mitigation Measure** (FEIS Addendum, Table 3-C-7)	**Implementation (2021)**
Management – effluent release	Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond	**Yes** – Water Management Plan
	Treated sewage will be piped to the attenuation pond	Completed
	Water quality in Attenuation Ponds will be monitored and managed such that the discharge entering Mammoth Lake, Whale Tail Lake, or the alternative discharge locations (Lake 1 or Lake 5) meets discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated.	**Yes** – Water Management Plan