



Crown-Indigenous Relations  
and Northern Affairs Canada

Relations Couronne-Autochton  
et Affaires du Nord Canada

# GIANT MINE REMEDICATION PROJECT

ANNUAL  
REPORT  
2022-23

2023



Government of  
Northwest Territories  
Gouvernement des  
Territoires du Nord-Ouest

Canada 

# LAND ACKNOWLEDGEMENT

We acknowledge that the Giant Mine site is located in Chief Drygeese Territory. From time immemorial, it has been and is the traditional land of the Yellowknives Dene First Nation. The Giant Mine site is also within Mq̃whì Gogha Dè Nl̓t̓l̓èè boundary as defined in the Tł̓chq̓ Land Claim and Self Government Agreement and on the traditional homelands of the North Slave Métis Alliance. The Giant Mine Remediation Project respects the histories, languages, and cultures of First Nations, Métis, Inuit, and all Indigenous Peoples of Canada.



# ABOUT THIS REPORT

Welcome to the eighth Annual Report of the Giant Mine Remediation Project (GMRP). The report provides an overview of the GMRP's key activities and performance for the 2022-23 reporting year<sup>1</sup>, focusing on environmental management, health and safety (H&S), and community involvement. The report's purpose is to verify that:

- defined project objectives are being met;
- the GMRP meets the requirements of the Environmental Agreement; and
- interested rights holders and stakeholders, members of nearby communities, and the broader public have accurate and timely information on the GMRP.

The report is provided to the Giant Mine Oversight Board (GMOB), the independent oversight body established through the Environmental Agreement, which is then responsible for posting on their website (for additional information, see [Environmental Agreement](#) – Report Alignment (Appendix A).

The report's content is largely shaped by the Environmental Agreement signed in June 2015, as well as GMOB's feedback on previous reports and input from the GMRP team. The report aligns with the GMRP reporting obligations out of the Environmental Agreement.

For additional information on the GMRP, please visit: [giant.gc.ca](https://giant.gc.ca).

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<sup>1</sup> April 1, 2021 – March 31, 2022

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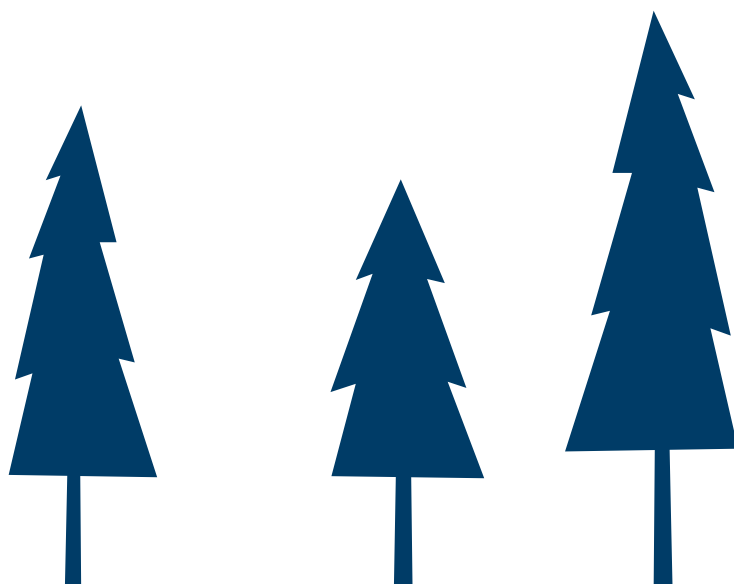
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# MESSAGE FROM THE ASSISTANT DEPUTY MINISTER

## ADM, Northern Affairs Organization



On behalf of the entire Giant Mine Remediation Project (GMRP) team, I am pleased to present the eighth Annual Progress Report to the Giant Mine Oversight Board (GMOB). This report provides rights holders, stakeholders, and the public

with a comprehensive record of our progress over the last year. We are committed to following the mandate given to us by the Government of Canada to maintain strong partnerships with provincial, territorial and municipal governments and Indigenous rights holders. Further, we will implement the United Nations Declaration on the Rights of Indigenous Peoples and work in partnership with First Nations, Inuit and Métis Peoples to advance their rights with the goal of moving forward on the path of reconciliation.

This eighth Annual Report builds on our prior submissions, with the benefit of input and advice from the GMOB, rights holders, and stakeholders. The GMRP reached several significant milestones in 2022-23 including the completion of the Project Implementation Plan, initiation of Townsite deconstruction, tender of the water treatment plant, and the receipt of the Treasury Board of Canada amended project and contract approval, and expenditure authorities for the next 15 years.

The remediation work completed to date has resulted in positive socio-economic results including, but not limited to, the following:

- From 2005 to July 2023, \$466 million out of approximately \$1.4 billion (or 34%) of contract values awarded went to Indigenous contractors.
- In the 2022–2023 fiscal year, \$2.9 million was provided through contribution agreements to the Yellowknives Dene First Nation, North Slave Métis Alliance, Tłıchǫ Government, Łutsel K'e Dene First Nation, City of Yellowknife, and Alternatives North for capacity building initiatives. Examples of initiatives funded include training programs, economic and business development, and salary for positions, supporting professional development, engagement activities.

It is anticipated that the planned remediation work in the years to come will continue to strengthen the socio-economic benefits and results for Indigenous Peoples and Northerners.

Emergency measures and activities on site have returned to pre-COVID health and safety management approaches and the Project transitioned to more in-person engagement sessions while still utilizing virtual or hybrid

meeting approaches. The team will continue leverage these flexible approaches to share information, hear feedback and seek new input in 2023-24 and beyond, as engagement is a core component of the Project.

We remain committed to transparently sharing our progress and enhancing our engagement with Indigenous Peoples, Northerners and all Canadians. Constructive feedback is encouraged as we advance the planning, operations and management of the GMRP. Our ultimate vision is to work together to address the legacy left by Giant Mine. Doing so will contribute to renewal of the relationship between Canada and Indigenous Peoples and will shape a brighter future for all.

**Georgina Lloyd**

Assistant Deputy Minister –  
Northern Affairs Organization  
Crown-Indigenous Relations and  
Northern Affairs Canada







# ACRONYMS

<b>AEMP</b>	Aquatic Effects Monitoring Program
<b>AQMP</b>	Air Quality Monitoring Plan
<b>C&amp;M</b>	Care and Maintenance
<b>CBA</b>	Community Benefits Agreement
<b>CIRNAC</b>	Crown-Indigenous Relations and Northern Affairs Canada
<b>CRP</b>	Closure and Reclamation Plan
<b>DFO</b>	Department of Fisheries and Oceans Canada
<b>ECCC</b>	Environment and Climate Change Canada
<b>EEM</b>	Environmental Effects Monitoring
<b>EHS</b>	Environmental Health and Safety
<b>FAA</b>	Fisheries Act Authorization
<b>FTE</b>	Full-Time Equivalency
<b>GHG</b>	Greenhouse Gas
<b>GMOB</b>	Giant Mine Oversight Board
<b>GMRP</b>	Giant Mine Remediation Project
<b>GNWT</b>	Government of the Northwest Territories
<b>H&amp;S</b>	Health and Safety
<b>IOC</b>	Indigenous Opportunities Considerations
<b>LKDFN</b>	Łutsel K'e Dene First Nation

<b>MCM</b>	Main Construction Manager
<b>MDMER</b>	Metal and Diamond Mining Effluent Regulations
<b>MVLWB</b>	Mackenzie Valley Land and Water Board
<b>NCSP</b>	Northern Contaminated Sites Program
<b>NSMA</b>	North Slave Métis Alliance
<b>OMP</b>	Operational Monitoring Program
<b>PCP</b>	Perpetual Care Plan
<b>PM</b>	Particulate Matter
<b>PSIB</b>	Procurement Strategy for Indigenous Business
<b>PSPC</b>	Public Services and Procurement Canada
<b>QRA</b>	Quantitative Risk Assessment
<b>SNP</b>	Surveillance Network Program
<b>RBAL</b>	Risk-Based Action Level
<b>RRP</b>	Research and Reclamation Plan
<b>TK</b>	Traditional Knowledge
<b>TSP</b>	Total Suspended Particulates
<b>WTP</b>	Water Treatment Plant
<b>YKDFN</b>	Yellowknives Dene First Nation
<b>YKHEMP</b>	Yellowknife Health Effects Monitoring Program

# SUMMARY OF PROGRESS IN 2022-23 & PLANS FOR 2023-24

The table below summarizes key activities planned for 2022-23 (as identified in the 2021-22 Annual Report), provides a brief description of progress made, and identifies activities planned for 2023-24. This summary enables readers to see at a high level whether the GMRP team achieved what it planned and, where it did not, to understand why not.

ADVANCEMENT OF REMEDIATION			
Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Freeze</b> [Section 3.1]	<p>Complete the construction of the AR1 Freeze Pad, which includes the placement of off-site borrow material for the “insulation layer” of the freeze pad.</p> <p>Initiate the B1 Pit (which includes AR4 and a portion of AR3 Freeze Pads) detailed design.</p>	<p><b>Completed:</b></p> <p>A revised kickoff meeting for B1 pit construction was completed in March 2023 due to additional scope added to accommodate the revised Project Implementation plan from the Main Construction Manager (MCM).</p> <p><b>Completed:</b></p> <p>AR1 freeze pad.</p>	<p>Continue with freeze pad design work for B1 Pit in 2023-24.</p> <p>Conduct field investigations to assist in detailed design of B1 pit.</p>
<b>Non-Hazardous Waste Landfill Construction</b> [Section 3.2]	<p>Finish construction of the first phase of the Non-Hazardous Waste Landfill as outlined in the Non-Hazardous Waste Landfill Design Plan.</p>	<p><b>Substantially Completed:</b></p> <p>Substantially completed construction of the Non-Hazardous Waste Landfill and commenced operations in August 2022, receiving waste from the Townsite deconstruction. Ceased annual operations in late October 2022. Additional work was identified to address some minor deficiencies.</p>	<p>The Non-Hazardous Waste Landfill will be scheduled to receive waste in accordance with the Waste MMP. Phase 1 construction is anticipated to be completed in Spring/ Summer 2023.</p>
<b>Underground Backfill</b> [Section 3.3]	<p>Continue early works backfilling program.</p>	<p><b>Ongoing:</b></p> <p>Progressed placement of cemented paste backfill, per underground stabilization design.</p>	<p>Continue underground stabilization in 2023-24. Plan to complete in 2024-25.</p>
<b>Townsite Deconstruction</b> [Section 3.4]	<p>Initiate Townsite deconstruction.</p>	<p><b>Ongoing:</b></p> <p>Progressed hazardous materials abatement and demolition of structures, focusing on those buildings that were located in the new Water Treatment Plant footprint</p>	<p>Complete hazardous materials abatement and demolition of Townsite structures.</p> <p>Complete structural and hazardous materials inspections of the Core Industrial Area buildings to support demolition scope and planning.</p>

## ADVANCEMENT OF REMEDIATION DESIGN AND PREPARATION

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Water Treatment Projects</b> <b>[Section 4.1]</b>	<p>Engage the Working Group on the Water Treatment Plant (WTP) design, finalize the WTP design (intake, plant &amp; outfall), and submit the WTP Design Plan in 2022 to the Mackenzie Valley Land and Water Board (MVLWB).</p> <p>Procure the construction contract for WTP (construction anticipated to start in 2023-24).</p> <p>Continue a redesign of the freshwater intake pipe.</p>	<p><b>Partially Completed:</b></p> <p>Submitted the WTP Design Plan to the MVLWB and responded to reviewer comments.</p> <p>Engaged the Working Group on the WTP design in May 2022.</p> <p>Nearly finalized the procurement for the WTP.</p> <p>Continued redesign for freshwater intake.</p>	<p>Finalize procurement and award WTP construction contract in April 2023. Initiate construction activities in late Spring 2023.</p> <p>Finalize freshwater intake design and add to the WTP contract.</p> <p>Anticipated approval of the WTP Design Plan in May 2023, prior to construction start.</p> <p>Prepare the scope for the WTP and Operations and Maintenance contract.</p>
	<p>Complete the passive treatment assessment.</p>	<p><b>Partially Completed:</b></p> <p>Prepared internal memo to summarize passive treatment research completed to date.</p>	<p>Prepare research summary for MVLWB.</p>
<b>Waste Disposal and Management</b> <b>[Section 4.2]</b>	<p>Continue the detailed design for contaminated soils.</p> <p>Continue the detailed design for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill.</p>	<p><b>Ongoing:</b></p> <p>Advanced detailed design for contaminated soils.</p> <p>Advanced detailed design for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill.</p>	<p>Further continue detailed design for contaminated soils.</p> <p>Further continue detailed design for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill.</p> <p>Submit the Contaminated Soils Design Plan to the MVLWB.</p>
<b>Tailing Containment Areas</b> <b>[Section 4.3]</b>	<p>Submit the draft Tailings Management and Monitoring Plan to the Working Group for pre-engagement prior to submittal to the MVLWB.</p> <p>Submit the Tailings Design Plan at a similar time with the Tailings Management and Monitoring Plan.</p> <p>Conduct a South Pond Dewatering Study</p>	<p><b>Completed:</b></p> <p>Completed the Tailings Design Plan and submitted it to the MVLWB.</p> <p>Conducted pre-engagement with Working Group on Tailings Management and Monitoring Plan. Revised and resubmitted to MVLWB.</p> <p>Completed the South Pond dewatering study.</p>	<p>Begin the development of procurement documents for the Original Tailings Containment Areas.</p>

## ADVANCEMENT OF REMEDIATION DESIGN AND PREPARATION

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Open Pits Closure</b> [Section 4.4]	<p>Refine open pit closure design by addressing some outstanding uncertainties.</p> <p>Complete engagement and inform on status of closure decisions.</p> <p>Complete a site visit to scope out field investigations for drilling.</p>	<p><b>Completed:</b></p> <p>Completed pit fill permafrost modeling and refined permafrost model using updated pit cover design.</p> <p>Completed open pit cover design changes to reduce water infiltration into the pits.</p> <p>Completed open pits surface water diversion assessment.</p> <p>Completed engagement with Working Group on the Open Pits design update and closure criteria update.</p> <p>Completed a site visit to scope out field investigations for drilling.</p>	<p>Commence field program to characterize existing pit fill in C1 in fall 2023.</p> <p>Commence field program to define and characterize overburden around the pits that will be used to store contaminated granular fill material.</p> <p>Complete further assessments of water flows within pits containing contaminated granular fill, using data obtained from field program.</p> <p>Progress Design Plan.</p> <p>Engagement with Working Group on Open Pits Closure Criteria planned for June 2023.</p>
<b>Other Design Works</b> [Section 4.5]	<p>Begin work relating to Site Infrastructure Design Plan – Part 2.</p> <p>Complete the implementation of the Phase Power Infrastructure Plan.</p>	<p><b>Partially Completed:</b></p> <p>The Site Infrastructure Design Plans were separated into two parts; Part 1 (demolition of site buildings) and Part 2 (deconstruction of remaining site infrastructure such as bridges and access roads and construction of new infrastructure such as fencing and bridges). Part 1 of the Site Infrastructure Design Plan was completed in 2021-22.</p> <p>Progressed the Phased Power Infrastructure Plan and the Power Line procurement documents.</p> <p>The Project received approval from MVLWB on the borrow geochemical acceptance criteria through the Borrow Materials and Explosives Management and Monitoring Plan.</p>	<p>Commence Part 2 of the Site Infrastructure Design Plan.</p> <p>Complete the Phased Power Infrastructure Plan and the Power Line procurement documents.</p> <p>Scope and complete the geotechnical investigation to support Baker Creek design.</p> <p>Complete site-wide investigative drilling program to provide geotechnical data to support several work packages.</p>



## OPERATIONS

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Care and Maintenance (C&amp;M)</b> <b>[Section 5.1]</b>	<p>Continue C&amp;M in accordance with contract, regulatory requirements, and site conditions.</p> <p>Continue to monitor air quality, conduct ongoing dust management activities, prepare for 2022 spring freshet, discharge treated effluent at Baker Pond, conduct maintenance of roads and site infrastructure, and provide site security.</p>	<p><b>Ongoing:</b></p> <p>Completed air quality monitoring, dust management, road and site infrastructure maintenance and the provision of site security. Treated effluent was discharged to Baker Pond.</p>	<p>Continue C&amp;M in accordance with contract, regulatory requirements, and site conditions.</p> <p>Continue to monitor air quality, conduct ongoing dust management activities, prepare for 2023 and 2024 spring freshets, discharge treated effluent at Baker Pond, conduct maintenance of roads and site infrastructure, and provide site security.</p>
	<p>Complete early works underground stabilization and close-out documentation.</p> <p>Continue work to gain access to ice-filled areas of the mine below A1 and A2 pits. Initiate ground support installations to make safe access to the Remainder Works mine stabilization.</p> <p>Decommission the 750-level pump station, remove hazardous material, conduct mine examination and prepare for the abandonment of the north end of the mine.</p>	<p><b>Partially Completed:</b></p> <p>Progressed melting of ice in the A1 and A2 areas.</p> <p>Progressed design work for safe access, electrification, and improved ice melting in the A1 and A2 areas.</p> <p>Completed a hazardous materials survey of the underground.</p> <p>Completed a design for the modifications to the high-test line (required before abandoning the underground).</p> <p>The 750L pump station was not decommissioned as it remains as a further back-up for pumping redundancy until the new system is built supplying the new water treatment plant.</p>	<p>Continue work to gain access to ice-filled areas of the mine below A1 and A2 pits. Initiate ground support installations to make safe access to the Remainder Works mine stabilization.</p> <p>Prepare for the abandonment of the north end of the mine, including decommissioning the 750-level pump station, removing hazardous materials, and completing the necessary modifications to the high-test line.</p>
	<p>Continue with the regular underground care and maintenance activities.</p> <p>Install the improved mine communication system and complete the C-Shaft ventilation system.</p>	<p><b>Completed:</b></p> <p>Installed the improved mine communication system (i.e., the leaky feeder system).</p> <p>Completed the construction of the C-shaft ventilation system.</p>	<p>Continue improvements to the stench gas emergency warning system and replacement of the propane mine air heater burner.</p>
	<p>Continue work by the surface C&amp;M contractor to maintain dams.</p>	<p><b>Ongoing:</b></p> <p>Continued work (as and when required) by the surface C&amp;M contractor to maintain dams.</p>	<p>Continue work by the surface C&amp;M contractor to maintain dams.</p>

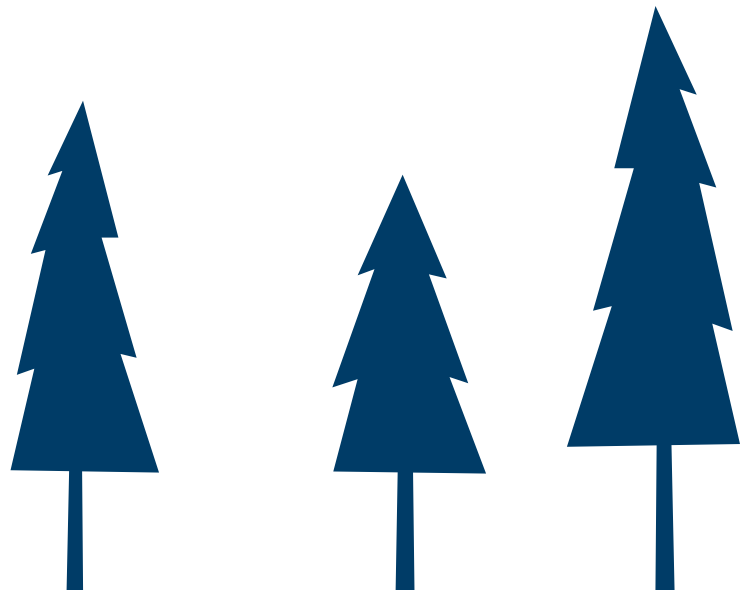
OPERATIONS			
Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Immediate Risk Mitigation</b> <b>[Section 5.1.1]</b>	Complete decontamination and demolition of select buildings, with remainder of Townsite buildings deferred until 2023-24.	Note: Building demolition is no longer managed by operations and is now considered part of remediation activities (see Townsite deconstruction details in Remediation section above)	Note: Building demolition is no longer managed by operations and is now considered part of remediation activities (see Townsite deconstruction details in Remediation section above)
	Conduct the annual geotechnical inspection and submit the report to the MVLWB.	<b>Completed:</b> Completed the 2022 annual geotechnical inspection (dams). Submitted report to the MVLWB.	Conduct the 2023 annual geotechnical inspection (dams) and submit the report to the MVLWB.
	Conduct ongoing monitoring of the high-risk dams as outlined in the Operations, Maintenance and Surveillance Manual.	<b>Completed:</b> Conducted ongoing monitoring of all dams in accordance with the Operations, Maintenance and Surveillance Manual.	Continue ongoing monitoring of all dams on site in accordance with the Operations, Maintenance and Surveillance Manual.
	Continue to implement dam safety recommendations on site where possible to minimize risks to dams and include updates in the Operations, Maintenance and Surveillance manual.	<b>Ongoing:</b> Continued to implement dam safety recommendations on site where possible, including vegetation removal on dam slopes, B2 dam slope stabilization, and instrumentation monitoring.	Continue to implement dam safety recommendations on site where possible to minimize risks to dams and include updates in the Operations, Maintenance and Surveillance manual.
	Continue monitoring of Dam 1 stabilization and construct the dam raise if warranted.	<b>Ongoing:</b> Conducted ongoing monitoring of Dam 1.  Raised crest of Dam 1 to restore storage capacity in the Polishing Pond.	Conduct ongoing monitoring of Dam 1.
	No further work was planned at the time of the previous report.	<b>Completed:</b> Ordered a spare pump for the Northwest Pumping System and commissioned a system-wide review of the Northwest Pumping System.	Implement corrective measures to the Northwest Pumping System resulting from the review of the system.

## ENVIRONMENT

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Air</b> <b>[Section 6.2]</b>	Continue air quality monitoring, including ongoing community monitoring and site perimeter monitoring, with activity-specific monitoring conducted as applicable.	<b>Ongoing:</b> Continued air quality monitoring activities in 2022-23, as outlined in the Air Quality Monitoring Plan.	Continue air quality monitoring, as outlined in the Air Quality Monitoring Plan.
	Continue to treat the Tailing Containment Areas and road network, as needed.	<b>Ongoing:</b> Continued ongoing dust management for Tailings Containment Areas, road network, and active work areas, as needed, with application of approved dust suppressants and water.	Continue ongoing dust management for Tailings Containment Areas, road network, and active work areas, as needed, with application of approved dust suppressants and water.
<b>Water</b> <b>[Section 6.3]</b>	Continue monitoring treated effluent prior to and during discharge.	<b>Ongoing:</b> Conducted monitoring of treated effluent prior to and during discharge.	The Effluent Treatment Plant will be replaced by a Water Treatment Plant in the coming years.  Construction of the Water Treatment Plant is scheduled to begin in Spring 2023. Until that time the current Effluent Treatment Plant is operational.
	Continue existing water quality monitoring: Surveillance Network Program (SNP), Aquatic Effects Monitoring Program (AEMP), Metal and Diamond Mining Effluent Regulations (MDMER)/ Environmental Effects Monitoring (EEM), Operational Monitoring Program (OMP).	<b>Ongoing:</b> Continued existing water quality monitoring (SNP, AEMP, MDMER/EEM, OMP).	Continue existing water quality monitoring (SNP, AEMP, MDMER/EEM, OMP).
	Carry out monitoring in accordance with the Phase 7 EEM Study Design.	<b>Completed:</b> Conducted monitoring out in accordance with the Phase 7 EEM Study Design.	Submit Phase 7 EEM report to Environment and Climate Change Canada (ECCC) in June 2023.
	Carry out monitoring in accordance with the AEMP Design Plan.	<b>Completed:</b> Conducted monitoring in accordance with the AEMP Design Plan.	Carry out monitoring in accordance with the AEMP Design Plan.
	Submit Annual Reports (on a calendar year).	<b>Completed:</b> Submitted the 2022 Annual Water Licence Report and the 2022 AEMP Annual Report to the MVLWB in April 2022.	Submit Annual Reports (on a calendar year).

## ENVIRONMENT

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
Land [Section 6.4]	Continue managing wastes on site.	<b>Ongoing:</b> Continued to manage wastes on site in accordance with the Waste Management and Monitoring Plan.	Continue managing waste in accordance with the Waste Management and Monitoring Plan.
	Commission and operate the Non-Hazardous Waste Landfill.  Continue operations of the Waste Transfer Station for operational waste.	<b>In Progress:</b> Commissioned the Non-Hazardous Waste Landfill, which began accepting waste.  Operational waste continued to be managed using the Waste Transfer Station.	Continue to accept waste at the Non-Hazardous Waste Landfill.  Continue operations of the Waste Transfer Station for operational waste.
	Prepare Version 3.0 of the Wildlife and Wildlife Habitat Management and Monitoring Plan with submission to the MVLWB anticipated for 2022-23.	<b>In Progress:</b> A revised Wildlife and Wildlife Habitat MMP was drafted.	A revised Wildlife and Wildlife Habitat MMP is anticipated to be submitted to the MVLWB for information in 2023-24.
	Continue to log and report wildlife sightings and interactions including the bird survey.	<b>Ongoing:</b> Continued to log and report wildlife sightings and interactions including the bird survey.	Continue to log and report wildlife sightings and interactions including the bird survey.





## HEALTH AND SAFETY

Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Occupational Health &amp; Safety (H&amp;S)</b> [Section 7.1]	Continue to track and report on occupational H&S through tracking of training and incidents.	<b>Ongoing:</b> Continued to track and report on occupational H&S incidents and training.	Continue to track and report on occupational H&S through tracking of training and incidents.
<b>Public H&amp;S</b> [Section 7.2]	Prepare for arsenic testing in children in Spring 2023; adult/children sampling to take place again in 2027-28.	<b>Completed:</b> Submitted the third progress report for the Yellowknife Health Effects Monitoring Program (YKHEMP).  Developed plain-language booklets that show the newest results from the 2017-18 baseline study, including results for health files and genetics.  Prepared for arsenic testing in children in Spring 2023.	Initiate the five-year follow up study for children and youth in Spring 2023.
	Implement the Stress Study (previously named the Hoëla Weteëts'eèdeè study) and engagement, led by University of Laurier's research team.	<b>Discontinued:</b> The Study was scheduled to begin implementation in Spring of 2022; however, in June 2022, the Yellowknives Dene First Nation (YKDFN) advised the Project team they were withdrawing from the study. As such, members of the Advisory Committee, including all Environmental Agreement Signatories, unanimously advised that the Project and research team should no longer proceed with the study, and it was discontinued in September 2022.	No work planned for FY 2023-24.

COMMUNITY			
Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
<b>Engagement [Section 8.1]</b>	<p>Continue engagement on Management Plans (Tailings Management and Monitoring Plan) and Closure Criteria (new criteria) with the Giant Mine Working Group.</p> <p>Engage the Working Group on the Water Treatment Plant Design.</p> <p>Continue the development of the Perpetual Care Plan (PCP) scope of work with the PCP Task Force and the contracting of a consultant.</p> <p>Continue Aquatics Advisory Committee engagement including a site tour and review of Fisheries Act Authorization (FAA).</p>	<p><b>Completed:</b></p> <p>The Project team engaged the Working Group on the Tailings Management and Monitoring Plan, Dust Management and Monitoring Plan Updates, and Borrow Materials and Explosives Management and Monitoring Plan. Held a workshop with the GMRP Working Group to review outstanding Closure Criteria.</p> <p>Engaged the GMRP Working Group on:</p> <p>Underground Design Plan, minewater management; Water Treatment Plant design; Greenhouse Gas Emissions Study update; Pit Design Plan</p> <p>Developed a Frequently Asked Questions Dust communications tool.</p>	<p>Continue engagement on the Management and Monitoring Plans and Design Plans for various site requirements. Engage on closure criteria.</p> <p>Continue engagement with the Aquatics Advisory Committee, with a focus on the AEMP and the FAA.</p> <p>Engage with the YKDFN broader community on borrow areas and plans for blasting, and aquatics including the FAA.</p> <p>Develop an internal revegetation task force to determine the next steps for engagement on revegetation.</p> <p>Revise the scope of work for the Perpetual Care Plan based on feedback received from the Request for Information (RFI).</p> <p>Issue the Request for Proposal and award contract for Perpetual Care Plan work and begin work.</p>
	<p>Continue to track employment, procurement, and training statistics.</p>	<p><b>Ongoing:</b></p> <p>Continued to track suppliers, employment, and workforce training on a quarterly and annual basis.</p>	<p>Continue to track employment, procurement and training statistics.</p>
	<p>Continue to work with the Socio-Economic Working Group and Advisory Body to advance and adjust actions identified within the Socio-Economic Implementation Plan.</p>	<p><b>Ongoing:</b></p> <p>Met with the Socio-Economic Working Group (6 times) and Advisory Body (2 times) to share information on the Project, gather input to inform the revised Socio-Economic Strategy, and discuss implementation activities.</p>	<p>Continue to work with the Socio-Economic Working Group and Advisory Body, including on the development of a revised Socio-Economic Implementation Plan.</p>
	<p>Update the Socio-Economic Strategy to reflect new forecasts presented in the Project Implementation Plan, including financial and labour estimates, as well as the updated timeline to complete Project remediation.</p>	<p><b>Completed:</b></p> <p>Completed the revised GMRP Socio-Economic Strategy through engagement with the Socio-Economic Working Group and Advisory Committee.</p>	<p>Hold implementation planning meetings with the Socio-Economic Working Group and others as needed.</p>

COMMUNITY			
Component	Plans for 2022-23	Progress in 2022-23	Plans for 2023-24
	Develop an online performance tracking and reporting tool.	<b>Deferred:</b> The development of the online performance tracking and reporting tool was deferred to June 2023 due to temporary staff shortages.	The development of the online performance tracking and reporting tool is scheduled to begin June 2023.
	Hold (through Parsons) Industry Day on November 1 and 2, 2022.	Completed: Parsons held a virtual Industry Day between November 1-2, 2022.	Parsons to hold Industry Day in the fall of 2023.



# 1.0 PROJECT OVERVIEW

The GMRP is more than a major construction project. The GMRP works to minimize health, safety, and environmental risks at the site, reduce Canada's liability associated with the contamination, and renew the relationship between Canada and the Indigenous people affected by the legacy of the mine.

## OVERALL GOALS OF THE GMRP

- Minimize public and worker health and safety risks.
- Minimize the release of contaminants from the site to the surrounding environment.
- Remediate the site in a manner that instills public confidence.
- Implement an approach that is cost effective and robust over the long term.

Successful remediation of the Giant Mine will yield the following outcomes:

- Safeguard the health and safety of northerners;
- Protection of water, soils, flora and fauna at, and adjacent to, the Giant Mine site;
- Reduction of the federal liability associated with the site by using industry best practices for remediation in a cost-effective manner;
- Improved relationships with local Indigenous groups;
- Demonstration of federal commitment, which illustrates how economic development can be carried out without adversely affecting the environment;

- Demonstration of federal leadership in complying with all applicable environmental Acts, Regulations, and standards;
- Demonstration of the government of Canada commitment to implement the United Nations declaration on the rights of Indigenous Peoples and to work in partnership with Indigenous Peoples to advance their rights and to create more economic opportunity and a higher quality of life in the north of Canada, by using public investments to spur economic growth and job creation for northern and indigenous peoples and businesses;
- Demonstration of the support of self-determination, improving service delivery, advancing reconciliation and the renewed relationship between Canada and Indigenous Peoples based on recognition, rights, respect, co-operation, and partnership;
- Strengthened local remediation capacity and transferable skills through support to Indigenous and local capacity development programs, provision of Project Information to training providers, and delivery of Project related training;
- Maximization of Indigenous and Northern participation through Northern Indigenous-centered procurement processes, proactive communication of opportunities, and collaboration; and,
- Ensure that the voices of rights holders are heard, through ongoing engagement, incorporation of traditional knowledge into the Project, and collaborative input into decision making with other stakeholders/affected parties and the GMRP team.



# PHASES OF THE GMRP

The past, current, and planned activities of the GMRP are illustrated in Figure 1 below. The Project has transitioned into the remediation phase, which was extended to 2038 (from an original end date of 2030) in response to logistical as well as Rights holder and stakeholder considerations.

Figure 1: GMRP Timeline



## GOVERNANCE OF THE GMRP

The GMRP is jointly managed through a Cooperation Agreement between the Government of Canada and the Government of the Northwest Territories (GNWT). The GMRP Team consists of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and the Government of the Northwest Territories – Environment and Climate Change (GNWT-ECC) acting as co-proponents with respect to the Environmental Assessment and other regulatory considerations. Public Services and Procurement Canada (PSPC) provides contracting services, contract management, and technical support services to CIRNAC. PSPC awarded the Main Construction Manager (MCM) contract to Parsons Incorporated. The MCM is responsible for care and maintenance and emerging risks on site and managing and implementing the Project Implementation Plan (PIP) for full remediation.

A joint CIRNAC – PSPC project governance structure has been established to provide oversight, direction, and advisory services to the Project team. The governance and management of the GMRP is also supported by external, independent, and technical reviews provided by multiple groups, such as GMOB, which was formed in 2015.

Figure 2 shows the governance structure of the GMRP.

### OTHER GOVERNANCE BODIES

Other governance bodies that provide advice and/or inputs to the GMRP on all topics include:

- Deputy Ministers Committee (Deputy Ministers of PSPC and CIRNAC)
- Senior Project Advisory Committee (CIRNAC Assistant Deputy Minister Northern Affairs Organization; PSPC Assistant Deputy Minister Real Property; PSPC Assistant Deputy Minister Acquisitions; PSPC Regional Director General Western Region)
- Senior Project Committee (CIRNAC Director General NCSP; GNWT Assistant Deputy Minister Environment and Natural Resources)
- GMOB (CIRNAC, GNWT, YKDFN, NSMA, City of Yellowknife, Alternatives North)
- Giant Mine Working Group (CIRNAC, GNWT, NSMA, YKDFN, City of Yellowknife, Alternatives North, Environment and Climate Change Canada (ECCC), Department of Fisheries and Oceans Canada, Health Canada)
- Giant Mine Advisory Committee (YKDFN representatives)

Figure 2: Governance Structure of the GMRP



# 2.0 2022–2023 YEAR IN REVIEW

## 2.1 OVERVIEW

The Project's second year of early works remediation was carried out in 2022-23. Major accomplishments and activities from the past year included:

- Completion of the Project Implementation Plan (by Parsons, the Site's Main Construction Manager) (Section 2.1.2);
- Installation of the AR1 Freeze Pad (Section 3.1);
- Construction of the Non-Hazardous Waste Landfill (Section 3.2);
- Initiation of Townsite deconstruction (Section 3.4);
- Completion of the South Pond Dewatering Study (Section 4.3);
- Receipt of approval from MVLWB on borrow geochemical acceptance criteria (Section 4.5);
- Tender of the Water Treatment Plant construction contract (Section 4.1.1);
- Submission of the Project's Fisheries Act Authorization (Section 6.3.3); and,
- Treasury Board of Canada amended project and contract approval and expenditure authorities for the next 15 years.

The Project also focused activities in these areas:

1. Ensured ongoing C&M of the site;
2. Undertook additional risk mitigation activities (Sections 5.1.1 and Appendix C)
3. Undertook environmental monitoring studies / baseline assessments (Section 5.2 and Appendix B)
4. Continued to advance the health monitoring studies (Section 7 and Appendix B); and,
5. Continued to implement the Socio-Economic Strategy (Section 8).

Engagement is a core component of the Project and is described in more detail in Section 8.1. In addition, the GMRP team maintained an active risk identification and management program (described in Appendix C) (CIRNAC, 2022b).

## COVID-19 MANAGEMENT

The GNWT lifted Public Health Emergency and associated public health orders on April 1, 2022. The Project also removed measures on site, and transitioned to more in-person engagement sessions, while still utilizing virtual or hybrid meeting approaches. The Project recognizes that the lack of in-person meetings and gatherings with local community members and other rights holders and stakeholders added challenges to relationship building. The Project team will continue to strengthen relationships and information sharing throughout 2023-24 and beyond. The GNWT lifted the emergency measures and activities on site have returned to pre-COVID health and safety management approaches. (Parsons, 2023a)

### 2.1.1. Revised Cost Estimate for the GMRP

As part of the Treasury Board approval process and implementation submission, the Project team was required to revise the cost estimate for the GMRP. The updated cost estimate is \$4.38 billion, which includes \$710 million of historical expenditures and \$1.3 billion in risk contingency. The prior cost estimate from 2010 was only for the construction-related costs and was based on the original remediation plan developed in 2007. However, the environmental assessment significantly changed the scope and scale of the remediation plan, resulting in the approved Closure and Reclamation Plan, which contributed to additional cost considerations. The updated cost estimate relates to the increased scope and is more holistic; it includes factors such as projected inflation, contingencies, and Canada's operational costs for managing the Project until 2038. The Project's scope, schedule, and cost have been affected by various factors, including an extended 15-year implementation schedule, changes to the remediation plan, and the creation of various programs and boards. There are also increased costs related to regulatory and reporting requirements, right-sizing work packaging, and pit filling (CIRNAC, 2022b).

### 2.1.2. Project Implementation Plan

The Main Construction Manager (MCM), Parsons, produced the Project Implementation Plan (PIP) for the GMRP in 2022. The PIP is the operational plan the Project will use for the duration of active remediation and includes the schedule and the sequencing of work packages for the implementation phase through to 2038.

The PIP outlines thirteen (13) major ongoing/upcoming projects as design work packages, which will be broken down further into approximately forty-three (43) individual construction work packages for procurement purposes. The thirteen design work packages are:

1. Tailings
2. Contaminated Surficial Materials
3. Water Treatment Plant
4. Baker Creek Realignment
5. Surface Water Management
6. Stabilization and Remediation of Underground
7. Demolition and Debris Removal
8. Open Pit Closures
9. Ground Freeze
10. Openings to Surface
11. Non-Hazardous Waste Landfill
12. Borrow
13. Common Site Services

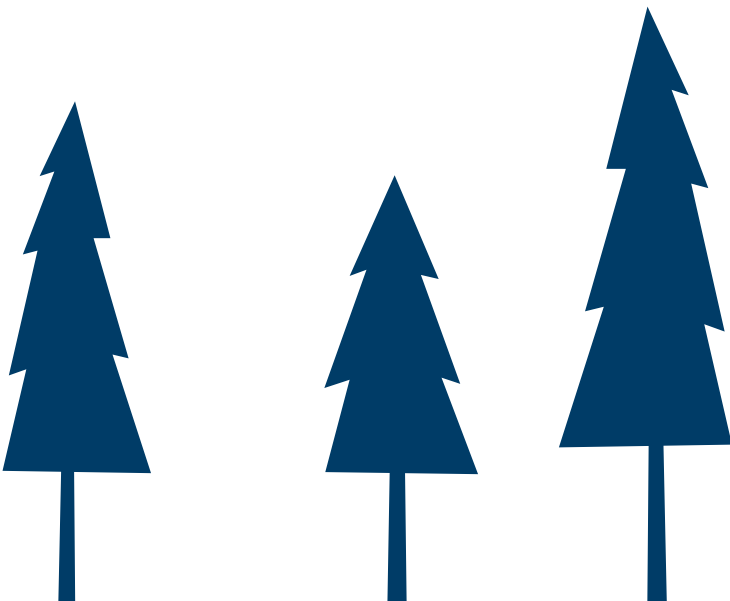
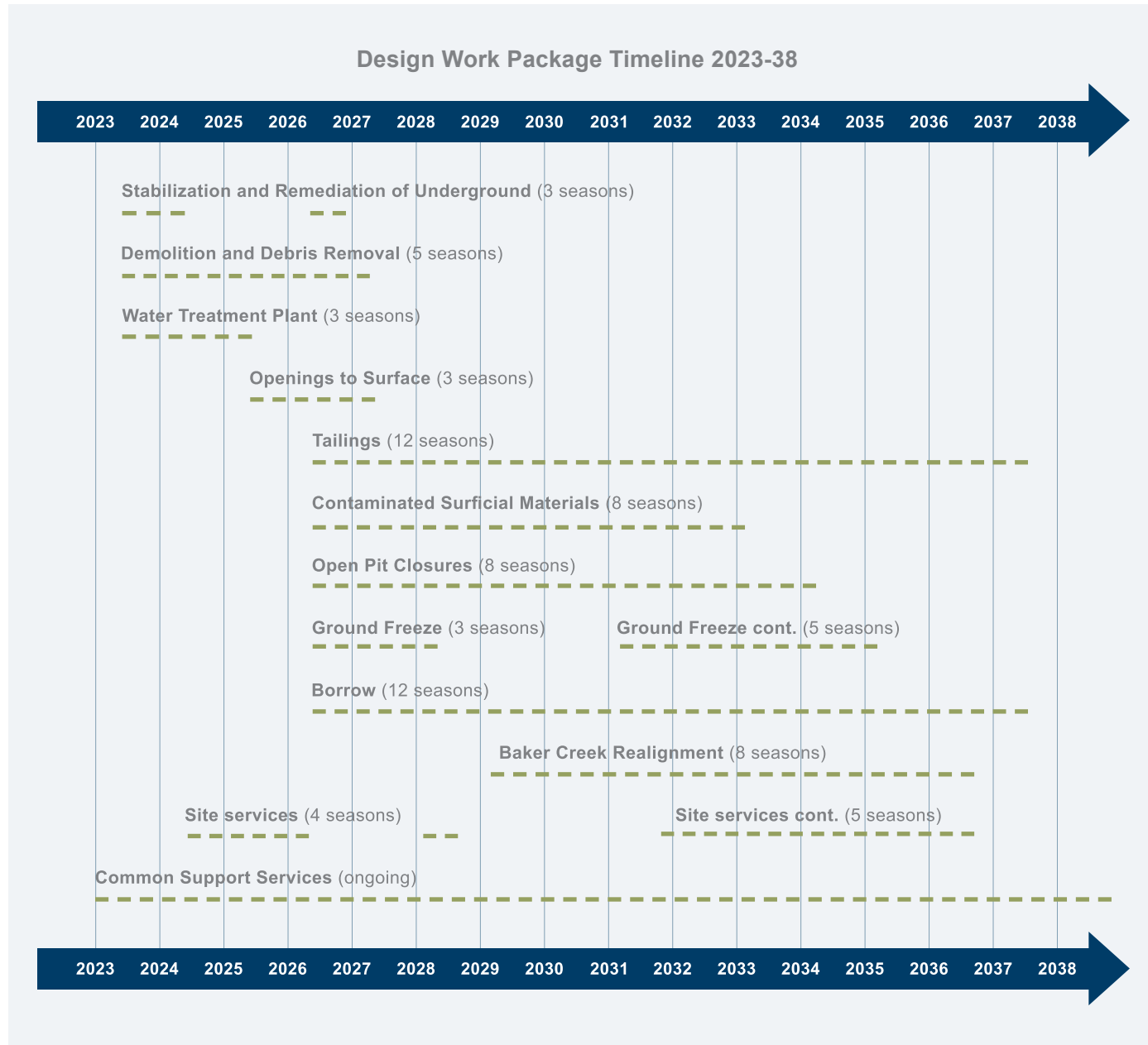




Figure 3, below, highlights the schedule and approximate duration of implementation of work packages

Figure 3: Schedule and duration of Design Work Packages in the PIP



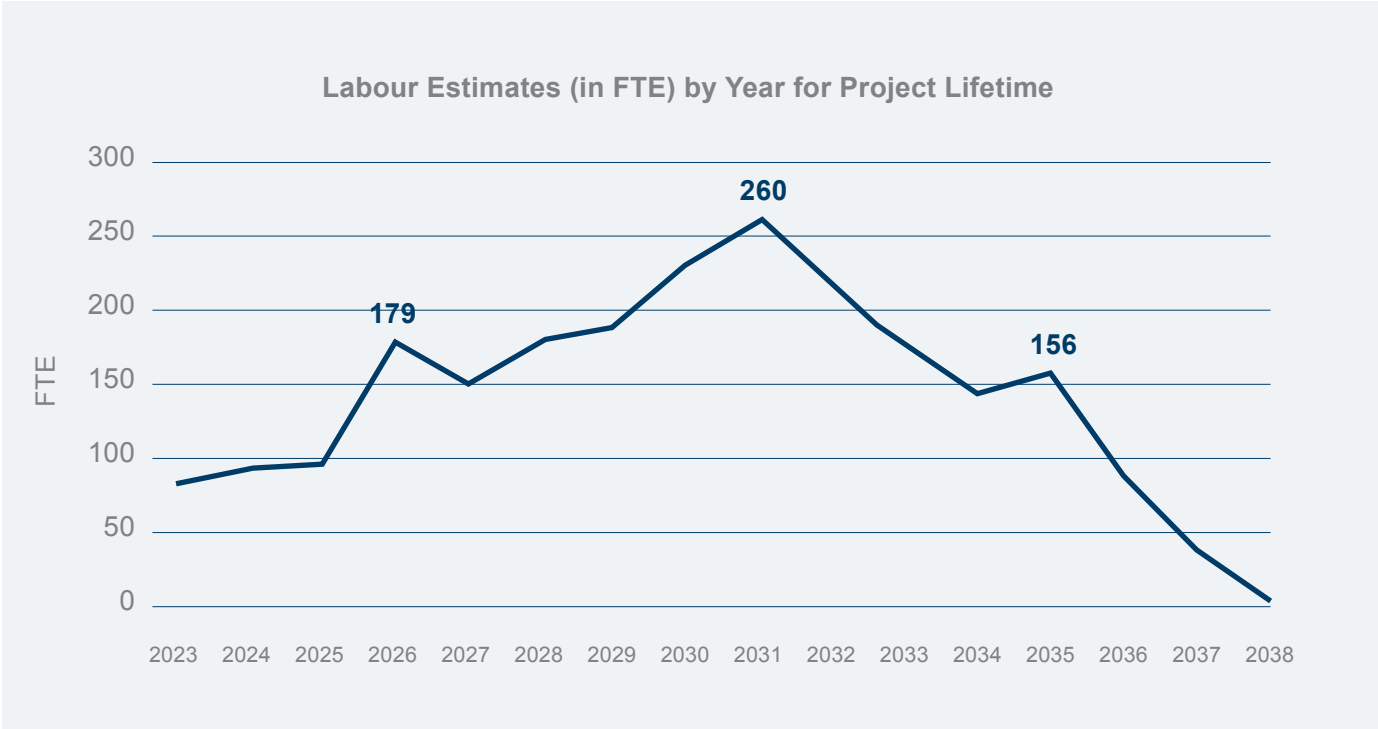
The revised cost estimate for the remediation phase is approximately \$3.5B dollars<sup>2</sup> over the next 14 years (2023-24 – 2037-38) and includes \$1.3B of risk contingency.

<sup>2</sup> The overall revised budget estimate for the GMRP is \$4.38B, including the portion spent to-date.

Labour Resource Estimates

The MCM also prepared labour resource estimates<sup>3</sup> for the PIP according to the design work packages. For the full 15-year implementation period, the Project on average estimates 142 FTE (full-time equivalency) (using 2,080 annual hour FTE count) in labour resource needs. Between 2026-35 (9-year period), the most active remediation period, the Project on average estimates 188 FTE in labour resource needs. Figure 4 presents the labour resource estimates by year.

Figure 4: Labour Estimates by year from 2023 – 2038



The PIP describes a Socio-Economic Framework for the Project (Section 7), with the aim to collaborate with Indigenous Communities and the Project parties to deliver socio-economic benefits in relation to the GMRP and the GMRP's Socio-Economic Strategy.

<sup>3</sup> Assumptions in estimating labour resource: Estimates are only for on-site positions and do not represent off-site support contracts (consultants, engagement, etc.); The work season is from May to October; The work schedule is 10 hour days, no holidays, and 7 days per week; Full Time Equivalent (FTE) are estimates based on person hours (2,080 hour per year standard) and not based on duration; Surface Water Management person hours are built into other work packages, such as Tailings; Care and Maintenance is based on actual average of past years' work. Estimates will continue to change as Implementation progresses.

## 2.2. PERPETUAL CARE PLAN

As part of the Environmental Agreement, the GMRP is required to develop a Perpetual Care Plan that must address improvements in records management, communication with future generations, long-term access to funds for the Project and analysis of different possible scenarios that might affect the perpetual care of the Project. In 2019, the GMRP conducted an initial desktop study to review the work that has been done to date on topics related to the perpetual care of the Giant Mine Site. Following the completion of this study, the GMRP retained a consultant to conduct a series of independent interviews with representatives of the signatories to the Environmental Agreement to better understand perpetual care needs at the Giant Mine Site. The results of the desktop study and independent interviews informed the development of a draft preliminary framework for the Giant Mine Perpetual Care Plan.

The Project held facilitated workshops with signatories of the Environmental Agreement, GMRP team members, and other interested members of the public to review and conduct an initial validation exercise of the draft preliminary framework. Following these workshops, a Perpetual Care Plan Advisory Task Force was formed with members of the signatories of the Environmental Agreement. During the 2020-21 fiscal year, the Perpetual Care Plan Advisory Task Force further refined the framework and established key assumptions for the Perpetual Care Plan. In November 2020, the GMRP submitted the preliminary framework to the Giant Mine Oversight Board. In 2022-23, the Perpetual Care Plan Advisory Task Force developed a statement of work for the GMRP team to onboard a consultant to support the next phase of work on the Perpetual Care Plan. A request for information will be released in 2023-24 to receive input on improvement and information that could improve the statement of work, and subsequent RFP.

## 2.3. PROGRESS ON ENVIRONMENTAL ASSESSMENT MEASURES

The Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013) listed 26 Measures that must be addressed, as well as 16 suggestions that may be implemented at the GMRP team's discretion. The Team's immediate focus is to address the Measures with set timelines, and those with the biggest impact on the Project scope. Table 1 provides a brief summary of progress, while Appendix D provides a complete summary of progress against all Environmental Assessment Measures and Suggestions in 2022-23, as well as plans for the 2023-24 year.

*Table 1: Status of Environmental Assessment Measures and Suggestions (as of March 2023)*

STATUS	MEASURES	SUGGESTIONS
<b>Completed</b>	3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 22	8, 13, 15
<b>Underway</b>	9, 17, 20, 23, 25, 26	1, 2, 3, 9, 10, 11, 12, 14, 16
<b>Future Action Required</b>	2, 21, 24	
<b>No Action Required / Outside Scope of Project</b>	1	4, 5, 6, 7

In 2022-23, the Project focused on advancing the following measures:

- **Measure 9:** In February 2023, the Health Effects Monitoring Program Advisory Committee completed the third progress report for the Yellowknife Health Effects Monitoring Program (YKHEMP). In March 2023, the Project team generated plain-language booklets that show the newest results from the 2017-18 baseline study, including results for health files and genetics. The five-year follow up resample for children and youth and sampling new groups of children and youth is scheduled to start in Spring 2023.
- **Measure 17:** In 2022-23, field work continued to collect baseline data in Yellowknife Bay, in advance of discharge from the Water Treatment Plant and outfall. Results of the baseline program were reported in the 2022 Annual AEMP Report, in the Yellowknife Bay Special Study section.
- **Measure 23:** In 2022-23, the Project team completed the draft Tailings Management and Monitoring Plan and Tailings Design Plan, which was a requirement under the Water Licence conditions. In September 2022, the GMRP submitted an updated version (2.0) of the Tailings Management and Monitoring Plan to the MVLWB. The Project team expects to submit a version 2.1 of the Tailings Management and Monitoring Plan (following an engagement process) in April 2023.
- **Measure 26:** In 2022-23, the Perpetual Care Plan Advisory Task Force developed a Statement of Work for the GMRP team to onboard a consultant to support the next phase of work on the Perpetual Care Plan. The GMRP will continue to work with its municipal, territorial and federal counterparts to communicate post-closure risks, and their consideration within the Perpetual Care Plan.





# 3.0 ADVANCEMENT OF SUBSTANTIVE DESIGN

## 3.1. FREEZE

The GMRP remediation includes freezing the chambers and stopes that contain the arsenic trioxide dust. The Project team will also freeze part of the B1 pit, as it will contain some arsenic-impacted materials. The frozen zone established around these areas will be maintained at -5°C or colder throughout the year. Temperatures will be monitored to make sure the areas remain frozen (CIRNAC, 2022a).

In 2022-23, the AR1 freeze pad was completed, requiring the removal of nearly 65,000m<sup>3</sup> of rock and the placement of approximately 12,000m<sup>3</sup> of aggregate to complete the pad. This pad will provide a level surface where thermosyphons can be installed as part of the overall freeze program and serve as the base for over 200 thermosyphons, which will freeze four of the arsenic chambers. Thermosyphons will maintain the temperature of the ground below the freeze pad and enhance the cooling process by providing a means of natural convection to circulate through the freeze pad (CIRNAC, 2022a).

### Next steps:

- Continue with freeze pad design work for B1 Pit in 2023-24.

## 3.2. NON-HAZARDOUS WASTE LANDFILL CONSTRUCTION

Under the Project's Closure and Reclamation Plan, the Project planned to develop a Non-Hazardous Waste Landfill to contain non-hazardous wastes produced on site during remediation. In 2021-22, the Project received approval from the MVLWB for the Non-Hazardous Waste Landfill Design Plan and updated Waste

Management and Monitoring Plan. Construction of the Non-Hazardous Waste Landfill began in summer 2021. (CIRNAC, 2022b). Continued work in 2022 included creating drainage, adding aggregate, constructing an access ramp, and grading contours. During past mining operations, approximately 2,500 legacy tires of varying sizes were left on the Giant Mine site. In spring 2022, a tire shredder was used on-site to shred them into small pieces. The shredded tires were then spread along the base of the Non-Hazardous Waste Landfill to create a drainage layer, which provided a benefit to the landfill design while allowing the Project to dispose of a waste product (CIRNAC, 2022a).

In 2022, the Non-Hazardous Waste Landfill began receiving waste from the townsite demolition, including asbestos waste that has been double-bagged following proper disposal protocols (CIRNAC, 2022b).

The annual operations of the Non-Hazardous Waste Landfill ceased in late October 2022.

Construction of the Non-Hazardous Waste Landfill is expected to be fully completed in Spring/Summer 2023 once a few minor deficiencies are addressed. The Non-Hazardous Waste Landfill will have a separate cell for holding process waste materials (process residuals) from the WTP.

### Next steps:

- Continue to receive waste in accordance with the Waste Management and Monitoring Plan; and,
- GMRP anticipates Phase 1 construction will be completed in Spring/Summer 2023 (Giant Mine Remediation Project, 2023b).



### 3.3. UNDERGROUND BACKFILL

An important element of the Giant Mine Closure and Reclamation Plan includes stabilizing stopes and other voids, which are underground areas that were excavated out during mining operations as ore and rock material was removed. As part of the GMRP's ongoing risk management process, the GMRP team identified underground areas that required immediate action to reduce risks to staff, the public, and the environment. Underground stabilization work started in 2013.

The Project's 2022 Early Works Paste Backfill program involved both underground and surface work. The underground work included the construction of barricades to contain the paste in the required areas and the installation of monitoring cameras to monitor the placement of the paste. Surface work involved drilling holes for paste fill delivery and monitoring, excavating, and processing tailings from the North Pond. A paste plant was also set up to produce the paste, which is a mixture of tailings, sand, cement, and water. The backfill program targeted multiple underground stopes by placing the paste into boreholes that connect the surface to the underground stopes. Placement of cemented paste backfill progressed as per Underground Stabilization Design. Approximately 104,000 of paste was delivered in 2022, and additional paste backfill is planned for 2023 and 2024.

#### Next steps:

- Continue underground stabilization in 2023-24 with anticipated completion of the program in 2024-25, including construction of barricades, installation of monitoring cameras and filling of select underground voids with paste backfill.

### 3.4. TOWNSITE DECONSTRUCTION

The Townsite was originally constructed to provide accommodation for workers and their families during the operational life of the Giant Mine. As part of the ongoing efforts to address concerns about potential risks to public health associated with the presence of hazardous materials, including asbestos, a comprehensive decontamination and deconstruction project is currently underway, which involves the systematic abatement of hazardous materials and the safe demolition of all structures within the Townsite. Decontamination and deconstruction is being carefully managed by the GMRP to ensure long-term safety of the site.

In 2022-23, hazardous materials, such as fire suppression chemicals and used oils, were removed and taken off-site for disposal. The remaining townsite buildings will be removed next field season. Patching of openings in buildings were completed to prevent birds from nesting in the buildings prior to deconstruction. Abatement and demolition of structures present on the Townsite and surrounding area also progressed. This included the Planar Shop, New Diesel Plant, C-Hoist Shed, Main Office, Old Diesel Plant, and CARD Building. In addition, the Northwest Territories Power Corporation (NTPC) building located south of the B2 pit was deconstructed.

#### Next steps:

- Complete hazardous materials abatement and demolition of remaining Townsite structures.

# 4.0 ADVANCEMENT OF REMEDIATION DESIGN & PREPARATION

## 4.1. WATER TREATMENT PROJECTS

### 4.1.1. New Water Treatment Plant (WTP)

Management of contaminated water within the site boundary is a key activity to reduce its impact on the environment. Over the past several years, the Project has explored Effluent Treatment Plant upgrade options, finalized the preliminary design for the new WTP, completed a siting assessment of the new WTP, and updated the three-dimensional groundwater model to provide predictions for potential future conditions in the Water Licence period from 2020 to 2040 (AECOM Canada Ltd., 2019b; AECOM Canada Ltd., 2019c; AECOM Canada Ltd., 2019d; AECOM Canada Ltd., 2020b; Golder Associates Ltd., 2020d).

In 2022-23, the Project team continued to develop the WTP work package, and completed and submitted the Design Plan to the MVLWB. The GMRP Working Group was engaged on the WTP design and Greenhouse Gas (GHG) reduction measures in 2022, prior to submission of the WTP Design Plan to the MVLWB. The MVLWB directed the Project team to revise the Design Plan prior to approval. The Project released the WTP Request for Proposal to four pre-qualified bidders in November 2022 and is scheduled to award the WTP construction work package to a subcontractor in April 2023.

The Project also progressed the redesign for the freshwater intake and intends to include it in the WTP contract once complete.

The Water Treatment Plant is expected to be operational in 2026, and will commence operations to

treat contaminated water, ensuring year-round release to Yellowknife Bay. Arsenic levels will be treated to meet drinking water standards, while all other parameters will adhere to the Type A Water Licence effluent quality criteria (CIRNAC, 2022c).

#### Next steps:

- Award WTP construction package and begin WTP construction activities in Spring 2023;
- Remove existing structure and utilities at the future site of the new WTP; and,
- Prepare scope for WTP Operations and Maintenance contract.

### 4.1.2. Site-Specific Passive Treatment System

The GMRP team assessed the feasibility of treating wetlands or other applicable passive and semi-passive surface water treatment technologies. At the Giant Mine site, a Passive Treatment System could remove arsenic as well as other parameters of potential concern such as antimony, copper, lead, nickel, zinc, chloride, nitrate, and nitrite from the aquatic environment of Baker Creek.

In 2019-20, the GMRP completed an off-site pilot-scale Passive Treatment System study to inform full-scale system design (Contango, 2019). The study concluded that removal of arsenic from water of similar composition to that at the site is possible through passive or semi-passive wetland applications. All parameters of potential concern exhibited some treatment. The study also identified potential risks for arsenic treatment, to be further assessed and addressed. The GMRP team analyzed the results from the pilot-scale testing (i.e., Phase 3) to

determine possible locations and requirements for the maintenance of the treatment structure (Giant Mine Remediation Project, 2021a).

**Next Steps:**

- Submit summary of the Research and Reclamation Plan (RRP) to MVLWB in 2024-25.

## 4.2. WASTE DISPOSAL AND MANAGEMENT

### 4.2.1. Remedial Strategy for Contaminated Soil and Sediment

The GMRP team has continued refining the Project's Closure and Reclamation Plan related to contaminated soils by evaluating and selecting strategies for managing contaminated soil and sediment at the Site. This work has involved:

- An options analysis workshop;
- The selection of preferred remedial/risk management options for areas of deep contaminated materials based on (i) technical feasibility, (ii) project objectives, and (iii) long-term performance; and,
- The production of a report on a closure option for pond-water impacted areas downstream of Dam 3. (Golder Associates Ltd., 2019a; Golder Associates Ltd., 2019b; AECOM Canada Ltd., 2020a; Giant Mine Remediation Project, 2021a).

In 2022-23, the Project team continued the detailed design for contaminated soils and design for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill.

**Next steps:**

- Continue the detailed design for contaminated soils and for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill;
- Submit Design Plan for soils to the MVLWB; and,
- Engagement with the YKDFN- Giant Mine Advisory Committee on the Dam 3 Reclamation Research Plan.

## 4.3. TAILING CONTAINMENT AREAS

Over the operating life of the mine, most tailings were deposited into Tailing Containment Areas. In previous years, the Project developed a Tailing Management and Monitoring Plan to define an approach to managing the Tailing Containment Areas after completion of closure activities (Giant Mine Remediation Project, 2019b), and also reviewed and updated the Operations, Maintenance and Surveillance Manual (Golder Associates Ltd., 2019d), and confirmed Design Plans through investigative drilling on the tailings areas (CIRNAC, 2019b).

In 2022-23, the Project team completed the draft Tailings Management and Monitoring Plan and Tailings Design Plan, which was a requirement under the Water Licence conditions. The scope of work also included the Foreshore and Nearshore Sediment areas, as well as post-closure dams. To ensure transparency and stakeholder engagement, the Project held pre-engagement on the Management and Monitoring Plan (GNWT, CIRNAC, 2022).

The Project team also completed the South Pond Dewatering Study in 2022. The purpose of the study was to test different methods to reduce the water content in the tailings so that they would be easier to move from the South Pond to the North and Central Pond areas. Results supported the plan to dewater and excavate the tailings.

**Next steps:**

- Begin developing procurement documents for the original Tailings Containment Areas (South, Central and North Ponds) as well as the Northwest Tailing Containment Area in 2023-24; and,
- Continue monthly elevation measurements of water in the Tailings Containment Areas.

## 4.4. OPEN PIT CLOSURE

Open pit closure is another component of the overall Giant Mine Closure and Reclamation Plan. There are eight open pits on the Giant Mine site. These open pits pose potential safety risks to workers and the public and risks to the environment from future flooding in Baker Creek and the subsequent potential flow into the pits. Floods may also compromise underground stability. To address this risk, the Project has decided to fill or partially fill the pits. To support this work, the Project conducted studies to identify potential options and suitable on-site<sup>4</sup> material for pit fill with some recommendations for additional investigations (sampling, testing, and modeling) for consideration (AECOM Canada Ltd., 2019a; Giant Mine Remediation Project, 2020; Golder Associates Ltd., 2019c; Golder Associates Ltd., 2020a; Golder Associates Ltd., 2020b; Golder Associates Ltd., 2020c).

In 2022-23, the Project team completed pit fill permafrost modeling and refined the permafrost model using updated pit cover design. The Project team incorporated pit cover design changes to reduce water infiltration into the pits and completed the open pits surface water diversion assessment.

### Next steps:

- Conduct field programs to characterize the existing pit fill in C1 and to define and characterize overburden around the pits that will be used to store contaminated granular fill material;
- Assess water flows within pits containing coarse granular fill, using data obtained from field program;
- Progress Design Plan; and,
- Commence development of procurement documents for open pits.

## 4.5. OTHER DESIGN WORKS

In 2022-23, the Project team received approval from the Mackenzie Valley Land and Water Board for the Site Infrastructure Design Plan – Part 1. Part 2 of the Site Infrastructure Design Plan is anticipated for submission to the Mackenzie Valley Land and Water Board in 2024-25. Progress was made on the Phased Power Infrastructure Plan and the Power Line Detailed Design.

The Project also received approval from MVLWB on the borrow geo-chemical acceptance criteria through the Borrow and Explosive Management and Monitoring Plan. These criteria define the characteristics of rock used on site for borrow. Approval of criteria is the culmination of more than three years of work, including lab testing and modelling.

### Next Steps:

- Start work on the Site Infrastructure Design Plan – Part 2;
- Complete the Phase Power Infrastructure Plan and the Power Line Design;
- Complete geotechnical investigation in 2023-24 to support Baker Creek design; and,
- Complete site-wide subsurface drilling program in 2023. This program will provide geotechnical data necessary to support several work packages.

<sup>4</sup> Borrow is material (such as granular rock or soil) removed from a location for use in another location.







# 5.0 OPERATIONAL SUMMARY

## 5.1. CARE AND MAINTENANCE (C&M)

Ongoing C&M at the Giant Mine site is critical to ensure current hazards at the site are managed to prevent harm to staff, surrounding communities, and the environment. In 2022-23, the Project continued C&M activities to keep the site stable and safe during remediation.

### Completed / progressed activities in 2022:

- Conducted ongoing air quality monitoring, dust management, road and site infrastructure maintenance and the provision of site security;
- Prepared for the 2023 spring freshet; the 2022 spring freshet required that a risk-based approach be employed to determine where to store water on site due to the quantity of water reporting to the underground;
- Started the Effluent Treatment Plant operations earlier than is typically carried out, due to the greater inflows of water to the underground over the winter months; discharged 574,118m<sup>3</sup> of effluent during the 2022 discharge season (June-September);
- Maintained the underground travel ways, including repairing existing chutes and head covers to reduce hazards to workers. These travel ways lead to the future construction areas that will contain the paste backfill in openings leading into the slopes;
- Progressed design work for safe access, electrification, and improved ice melting in the A1 and A2 areas;
- Progressed melting of ice in the A1 and A2 areas;
- Completed a hazardous materials survey of the underground;

- Completed a design for the modifications to the high-test line (required before abandoning the underground). This helps ensure that any water getting underground will drain to a separate location and not overwhelm the Water Treatment Plant;
- Installed the improved mine communication system (i.e., the leaky feeder system),
- Completed construction of the C-shaft ventilation system; and,
- Completed pilot hole program to confirm assumptions regarding target locations for the WTP pumps.

### Next Steps / Ongoing Activities:

- Continue C&M in accordance with contract, regulatory requirements, and site conditions, including:
  - conducting ongoing monitoring and sampling of air quality;
  - conducting dust management activities;
  - treating water and discharging treated effluent;
  - preparing for 2023 and 2024 spring freshets;
  - maintaining site infrastructure and roads;
  - providing fulltime on-site emergency medical services, and site security activities including new signage and security fencing upgrades; and,
  - conducting underground C&M activities with sumps, pumps, ventilation, and refuge chambers.

- Continue the melting of ice in the A1 and A2 areas, which have underground workings that are connected to the pits; ice needs to be removed to gain access for inspection and evaluation to support design and stabilization;
- Prepare for the abandonment of the north end of the mine, including decommissioning the 750-level pump station, removing hazardous materials, and completing the necessary modifications to the high-test line;
- Continue work on improvements to the stench gas emergency warning system and replacement of the propane mine air heater burner;
- Conduct ongoing monitoring of the dams and the water elevations at the original Tailings Containment Areas and Baker Creek; and,
- Continue weekly monitoring of beaver activity, ponding, ice dam development, and potential for surface water flooding at Baker Creek and Trapper Creek.

## 5.1.1. Immediate Risk Mitigation

### 5.1.1.1. Infrastructure Review

The GMRP conducts structural reviews of buildings at the Giant Mine site to assess risks and determine whether immediate action is required to mitigate those risks. Structural reviews occurred in 2019, and 2021. The Project has implemented the recommendations from these reviews.

#### Next Steps:

- Complete a structural and hazardous materials inspections of the Core Industrial Area buildings in 2023 to support demolition scope and planning.

### 5.1.1.2. Upgrades to the Northwest Deep Well Pumping Station

In 2017, the Project team completed pumping station upgrades using two deep well submersible pumps located near the Northwest shaft (AECOM Canada Ltd., 2017). In 2019-20, the new deep well pump station came into operation and was used to pump minewater during freshet. The new pumping system, the Northwest Deep Well Pumping System, consists of two Baker Hughes submersible

pumps installed in steel-cased boreholes drilled from the surface into the mine pool. One pump stopped operating after a brown-out situation in August 2019. In 2020-21, the Project team investigated the system to understand how the issue emerged and re-installed the pump, which then worked as designed. The pump stopped operating again following a power outage on August 20, 2022. The Project team then commissioned an additional system-wide review to understand how the issue emerged. The investigation is continuing into 2023-24.

In 2022-23 a spare pump for the Northwest Deep Well Pumping Station was ordered from the manufacturer.

#### Next Steps:

- Implement corrective measures recommended by the system's designer to the Northwest Deep Well Pumping Station resulting from the ongoing review of the system.

### 5.1.1.3. Geotechnical Inspection of Dams

At the Giant Mine site, dams are used for minewater management, surface water management, and tailings solids retention. Dams are inspected annually to assess water level restrictions and geotechnical integrity to comply with the Canadian Dam Association Guidelines. In 2021, the Project team continued work on the previous years' recommendations for the ongoing maintenance and monitoring of the dam areas (Golder Associates Ltd, 2022a). Many of the recommendations from the 2021 geotechnical inspection have been completed, addressed, or have been part of the ongoing operation, maintenance, and surveillance activities of the site. Some of these works included:

- Updating the dam slope stability analysis for seismic conditions;
- Restoring the Polishing Pond's storage capacity by raising the crest of Dam 1;
- Remediating Dam B2 slope at the west abutment;
- Completing the Dam Break Analysis for B2 Dam and Splitter Dyke;

- Completing the preliminary classification of the Mill Pond Structure;
- Installing barriers and signage around Dam 21D to prevent vehicle access;
- Completing the survey of erosion locations for Dam 22; and,
- Restoring surface drainage for Dam 22.

In 2022-23, the geotechnical inspection of dams and dykes included all dams associated with the original Tailings Containment Areas, the Northwest Tailings Containment Area and surface water dams. It was found that, in general, the structures appeared to be performing in a satisfactory manner and the dams appeared to be in similar condition since the last geotechnical inspection in 2021. There was observed surface erosion on some of the structures inspected, which does not constitute a hazard to the integrity of the structures (Golder Associates Ltd, 2022a). As reported in the GMRP 2022 Annual Water Licence Report, construction of the Dam 1 crest raise was carried out in July 2022 to restore the storage capacity in the Polishing Pond. This work is the second of two phases to mitigate and rehabilitate the effects of ongoing settlement at the dam. The first phase, carried out in 2020, involved the installation of thermosyphons to mitigate the thawing permafrost in the foundation soils. The earthworks for the Dam 1 Crest Raise included placing a downstream granular fill berm, a low-permeability clay core, and upstream riprap armor. Following construction, five new survey monuments were installed on the crest of the raise for future settlement monitoring. The B2 Dam Slope stabilization project was carried out in July 2022. The project consisted of construction of a rockfill buttress on the downstream slope of the B2 Dam to improve the slope stability.

The Project team will continue to inspect and maintain the dam and dyke structures and implement remedial action in the future if the erosion continues.

#### Next Steps:

- Conduct ongoing monitoring of Dam 1;
- Conduct the 2023 annual geotechnical inspection and submit the report to the MVLWB;
- Conduct ongoing monitoring of all dams on Site in accordance with the Operations, Maintenance and Surveillance Manual; and,
- Continue to implement dam safety recommendations on site where possible to minimize risks to dams and include updates in the Operations, Maintenance and Surveillance manual.

## 5.2. INSPECTIONS AND AUDITS IN 2022

In 2022-23, external regulators conducted 4 inspections. In 2021-22, 13 inspections were completed by external regulators and 6 in 2020-21. The number of inspections per year is determined by the regulator, based on a variety of factors including the nature of work being undertaken at the site. (GNWT, CIRNAC, 2023)

There were no non-compliances identified during the external inspections in 2022-2023.

In addition to these external inspections, the MCM and their subcontractors conduct their own internal inspections on a regular basis to ensure safe operation at the site and compliance with various regulatory and contractual documents, including the Water Licence, Land Use Permit, and Management and Monitoring Plans. These internal inspections include daily site inspections by C&M staff and regular engineering inspections of major structures (e.g., dams, arsenic chamber bulkheads) and equipment. There were no non-compliances identified during the internal inspections in 2022-23 (Parsons, 2023a).

In 2022-23, CIRNAC initiated an Environmental Health and Safety (EHS) underground audit, which included 37 above ground activities that might impact underground work. In total, there were 5 findings related to environmental aspects, 22 findings related to occupational health and safety (OHS), and 10 findings related to the Environmental, Health, Safety and Community Management System

(EHSC MS). Each finding was ranked by priority (BluMetric Environmental, 2022). Table 2 provides the breakdown, by priority. The GMRP has since addressed all high priority findings (Priority 1 and 2) and most low priority findings (Priority 3, 4, and 5) in a draft Corrective and Preventative Action Plan (CPAP). A final CPAP will be submitted in the summer of 2023, once all findings have been closed.

Table 2: GMRP Environmental Health and Safety (EHS) underground audit results, by priority

PRIORITY	DEFINITION	# OF FINDINGS FOR 2022-23
1	Major regulatory violation that could result in legal action. A situation where immediate remedy is required in order to prevent an emergency or threat to human health and safety or the environment.	0
2	Regulatory violation that could result in legal action for the department. A situation where remedy is required as soon as is possible in order to prevent further environmental or health and safety impacts.	5
3	Minor regulatory or policy breach that could result in a breach of commitment by the department as a member of the federal community. A situation where remedy is required as soon as program funding and time permits in order to prevent further environmental or health and safety impacts.	9
4	A situation, although not a regulatory breach, that has the potential, if implemented, to have significant benefit/savings for the department. This issue also has the potential to demonstrate a proactive approach to EHS management.	12
5	A situation that has the potential, if implemented, to maintain EHS compliance and demonstrate a proactive approach to EHS management, pollution prevention and continuous process simplification and improvement.	11

There were also 128 Waste Segregation Audits completed in 2022.

## 5.3. SUMMARY OF FISCAL YEAR 2022-23 EXPENDITURES

Table 3 outlines the planned (i.e., expenditure totals by categories) versus actual expenditures for 2022-23 while Table 4 outlines the planned expenditures in 2023-24.

Table 3: Planned Versus Actual Expenditures in 2022-23

CATEGORY	PLANNED	ACTUALS	% DIFFERENCE
C&M	\$31,906,365	\$28,919,581	9.36%
Regulatory	\$637,390	\$608,230	4.57%
Engagement and Consultation <sup>5</sup>	\$5,075,957	\$3,294,542	35.10%
Investigation and Assessment	\$35,100	\$23,370	33.42%
Remediation	\$87,610,422	\$64,683,491	26.17%
Monitoring	\$6,432,716	\$5,623,059	12.59%
Program Management	\$11,532,339	\$12,378,007	7.33%
<b>Totals</b>	<b>\$143,230,289</b>	<b>\$115,530,280</b>	<b>19.33%</b>

Table 4: Planned Expenditures in 2023-24

CATEGORY	OPERATING EXPENDITURES	GRANTS AND CONTRIBUTIONS	SALARY AND EBP	TOTALS
C&M	\$25,936,965	-	-	\$25,936,965
Regulatory	\$613,800	-	-	\$613,800
Engagement and Consultation	\$252,601	\$5,037,349	-	\$5,289,950
Investigation and Assessment	\$1,610,461	-	-	\$1,610,461
Remediation	\$170,414,377	\$1,441,879	-	\$171,856,256
Monitoring	\$6,702,404	-	-	\$6,702,404
Program Management	\$8,762,280	-	\$4,341,136	\$13,103,415
<b>Totals</b>	<b>\$214,292,887</b>	<b>\$6,479,227</b>	<b>\$4,341,136</b>	<b>\$225,113,250</b>

<sup>5</sup> Engagement and consultation refer to all engagements and consultations with rights- and stakeholders, as well as funding to Alternatives North, the City of Yellowknife and Indigenous partners.



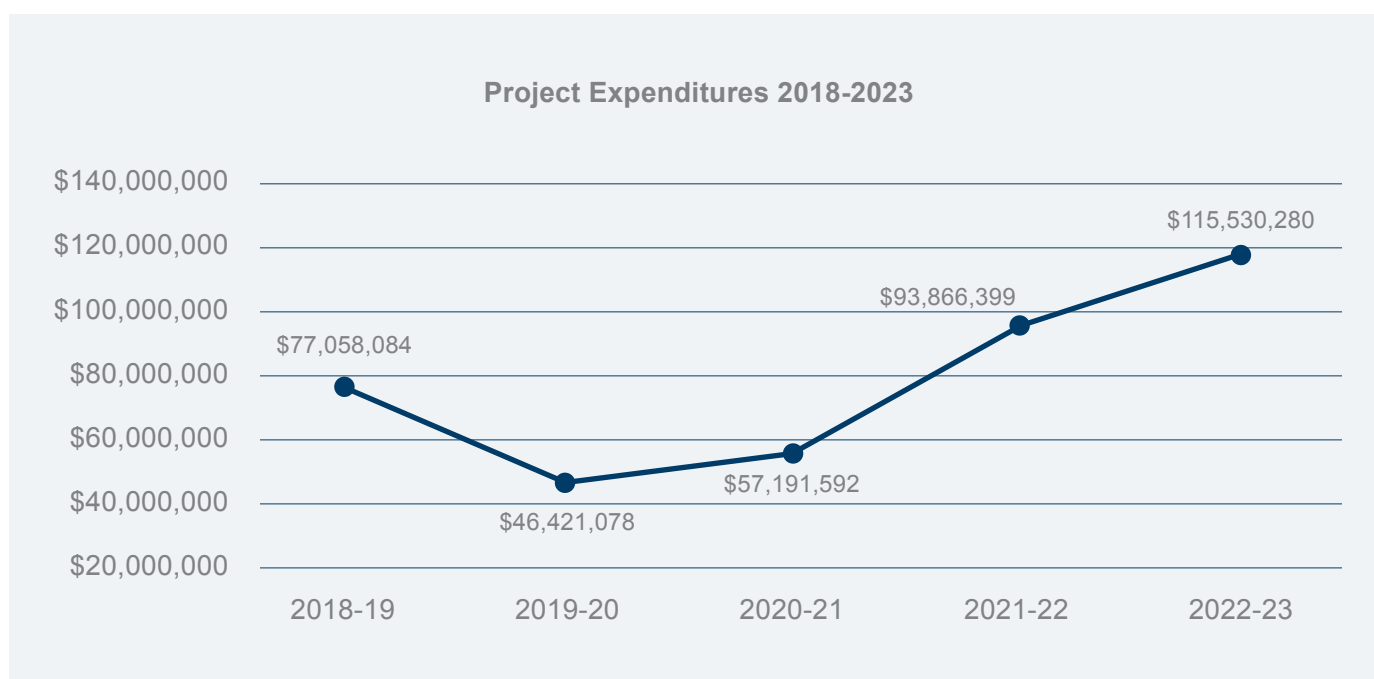
## 5.4. SUMMARY OF EXPENDITURES TREND 2018–2023

Table 5 and Figure 5 outline the Project's expenditures trend from fiscal years 2018-19 to 2022-23.

Table 5: Project Expenditures 2018-23

CATEGORY	2018-19	2019-20	2020-21	2021-22	2022-23
C&M	\$20,340,033	\$18,808,143	\$22,166,327	\$27,095,659	\$28,919,581
Regulatory	\$50,005	\$1,214,925	\$1,134,420	\$730,733	\$608,230
Consultation	\$3,100,633	\$1,747,380	\$1,345,500	\$3,210,463	\$3,294,542
Investigation & Assessment	\$35,707	-	-	-	\$23,370
Remediation	\$43,657,669	\$11,047,596	\$14,941,948	\$46,328,945	\$64,683,491
Monitoring	-	\$2,905,555	\$3,727,700	\$5,395,981	\$5,623,059
Program Management	\$9,874,037	\$10,697,479	\$13,875,697	\$11,104,618	\$12,378,007
<b>Totals</b>	<b>\$77,058,084</b>	<b>\$46,421,078</b>	<b>\$57,191,591</b>	<b>\$93,866,400</b>	<b>\$115,530,280</b>

Figure 5: Project Expenditures 2018-23



# 6.0 ENVIRONMENT

## 6.1. ENVIRONMENTAL MANAGEMENT

The following report sub-sections (**Air, Water, and Land**) describe key activities and results of existing environmental management programs, additional assessments and monitoring programs (as described in the Site-Wide Monitoring summary below).

### SITE-WIDE MONITORING PROGRAM

The Site-Wide Monitoring Program is a combination of all monitoring components currently ongoing or that will be required at Giant Mine. This monitoring includes environmental components and structural monitoring required on site. This monitoring is used to determine baseline conditions, monitor existing performance, and inform the design process for remediation activities.

The components of the Site-Wide Monitoring Program include regulatory and due diligence monitoring and can be grouped into the following components:

#### ENVIRONMENTAL

- Surveillance Network Program (SNP)
- Metal and Diamond Mining Effluent Regulations (MDMER) including Environmental Effects Monitoring (EEM) Program
- Operational Monitoring Program (OMP) (Effluent Treatment Plant, underground, annual site-wide bird survey)
- AEMP
- Wildlife and Wildlife Habitat management and Monitoring Plan

- Air quality – site perimeter & community
- Noise

#### STRUCTURAL

- Freeze
- Dams and seeps
- Landfill
- Pit stability
- Tailings covers
- Underground structures
- Baker Creek (icing)

The Site-Wide Monitoring Program is structured in three phases: pre-remediation, remediation, and post-remediation. The intent is for the Program to be operational for the lifetime of the project (100 years). Appendix E provides additional information on the individual components of the monitoring program. **The new Type A Water Licence includes conditions related to monitoring and reporting for many of the above components.**

## SPILLS AND ENVIRONMENTAL TRAINING

### Spills, Accidents, & Significant

**Malfunctions:** There were a total of twenty-eight (28) environmental spills, including 2 reportable spills<sup>6</sup> in 2022 (reportable spills consisted of paste from concrete trucks). Minor spills that were non-reportable consisted of small amounts of antifreeze, diesel, oil, sewage, and hydraulic fluid. The number of **reportable** environmental spills and incidents remained constant over the past three years (Parsons, 2023b).

**Environmental Training:** Employees received a total of 30,127 H&S training hours were provided [including 880 hours of EHS Awareness Training (including policy and procedures)].

## 6.2. AIR

Activities undertaken at the Giant Mine site have the potential to release contaminants from the site into the air. Of primary interest are particulates carrying arsenic, antimony, iron, lead, or nickel. If these contaminants become airborne, they may be transported off-site and deposited elsewhere. To monitor and minimize air quality impacts, the Project team has established an ambient air quality monitoring program, as outlined in the GMRP Air Quality Monitoring Plan (AQMP) – including ongoing air quality monitoring on-site and in nearby communities – and actively manages air quality through dust suppression.

## 2022-23 HIGHLIGHTS

- Results of the ambient air quality monitoring indicated the air quality of the airshed was not significantly impacted by activities associated with the Project in 2022 and was representative of regional and local air quality.
- The GMRP team applied Soiltec, used for soil stabilization and used as a dust suppressant at the Tailing Containment Areas, throughout spring and summer as needed.

### 6.2.1. Air Quality Monitoring

The GMRP team conducts ambient air quality monitoring throughout the year at nine locations as part of the site perimeter air quality monitoring network. The nine monitoring locations have two co-located monitors to measure real-time total suspended particulate (TSP) and particulate matter (PM) measuring less than 10 microns in diameter (PM<sub>10</sub>). Additionally, TSP, PM<sub>10</sub>, total inorganic trace metals and PM<sub>10</sub> arsenic are measured from filters collected at the nine locations and submitted for analytical analysis.

Three community stations are located off-site in the community of Ndilq (NDL), Niven Lake (NVN), and at Yellowknife Bay (YKB) in the vicinity of the marina. The community stations measure continuous PM<sub>10</sub> and particulate matter measuring less than 2.5 microns in diameter (PM<sub>2.5</sub>). Integrated TSP, PM<sub>10</sub>, total inorganic trace metals, and PM<sub>10</sub> arsenic are measured from filters collected at the community stations. Nitrogen dioxide is also measured at the NVN community station. In addition, asbestos concentrations are measured when deemed warranted based on site activities. The monitoring stations provide data to monitor

<sup>6</sup> A reportable spill is any spill that is above the [reportable limit](#) in the NWT.

potential adverse effects to the local airshed during remediation activities. This data also helps the Project team to determine whether additional mitigation measures are required if air quality results exceed established Action Levels in the Dust Management and Monitoring Plan and ambient air quality criteria (summarized in Appendix E).

In 2022-23, the results of the ambient air quality monitoring program indicated that the air quality of the local airshed was not significantly impacted by activities associated with the GMRP and was representative of regional and local air quality (GNWT, CIRNAC, 2023) (SLR Consulting (Canada) Ltd, 2023). There were four days during 2022 where the PM<sub>10</sub> 15-minute average risk-based action levels (RBAL) was exceeded at the site perimeter. All were attributed to regional wildfire smoke. The TSP 15-minute average RBAL was exceeded on 27 days, most frequently in January, February, and December. All TSP RBAL exceedances were attributed to heavy fog except for a vehicle exhaust related exceedance and a windblown dust exceedance from the South Tailings Pond.

There were three days (1 July, 24 August, and 12 October) where the 24-hour integrated filter samples collected from the Site Perimeter Monitoring Stations exceeded the program Ambient Air Quality Criteria for PM<sub>10</sub>, one day (12 October) for TSP, and one day (12 October) for arsenic and iron concentrations. On two of these days (1 July and 24 August), smoke from regional wildfires was observed on site. The 12 October exceedances were likely due to wind-blown dust from the South Tailings Pond.

There were no measured concentrations of TSP, PM<sub>10</sub>, or trace metals above their respective Ambient Air Quality Criteria in 24-hour integrated samples during 2022 at Community Monitoring Stations. There were six days with continuous 24-hour average PM<sub>2.5</sub> concentrations above the Ontario Ministry of the Environment Ambient Air Quality Criteria, all due to smoke from regional

wildfires. There were five days with continuous 24-hour average PM<sub>10</sub> concentrations above the Ontario Ministry of the Environment Ambient Air Quality Criteria, three of which were due to smoke from regional wildfires and two which were due to road dust generated by municipal street sweeping in April.

#### Next Steps:

- Continue air quality monitoring, including ongoing community monitoring and site perimeter monitoring, with activity-specific monitoring conducted as applicable.

More details on the air monitoring program, including real-time data and weekly reports, are available on the [NWT Air Quality Monitoring Network](#). You can also receive the weekly reports via email by requesting to be added to the distribution list by writing to [giantmine@rcaanc-cirnac.gc.ca](mailto:giantmine@rcaanc-cirnac.gc.ca)

### 6.2.2. Dust Suppression

The Project team takes active measures to reduce dust from the site's tailings ponds and roads. These measures include communicating daily wind forecasts to team members each morning, applying dust control products to the tailings ponds and road network, reducing road speeds when wind speeds are elevated, and wetting the tailings ponds as needed. In 2022, a total of 71m<sup>3</sup> of Soil Tac and 29 of Eco Soil were utilized (GNWT, CIRNAC, 2023). Additionally, for the purpose of dust suppression on roads and Tailings Containment Areas, water was extracted from the Polishing Pond between June and October 2022, amounting to a total withdrawal of 9,650m<sup>3</sup> (GNWT, CIRNAC, 2023).

In the 2022-23 period, the Project team diligently continued their efforts in managing dust for the Tailings Containment Areas and road network, as well as active work areas. The Project team:

- Conducted regular air quality monitoring at the site perimeter and community stations;
- Held daily planning and safety meetings to discuss wind conditions, weather forecasts, and dust suppression strategies;

- Implemented dust mitigation techniques, such as using water trucks, water cannons, and approved dust suppressant to suppress dust on roads and Tailings Containment Areas;
- Engaged subcontractors who utilized mats during blasting operations to effectively control dust;
- Conducted visual inspections during routine security patrols;
- Discussed wind speed forecasts with subcontractors on-site (e.g., during tailgate meetings);
- Used best management practices to minimize dust generation during site activities;
- Stationed 2 full water trucks on site for emergency use when wind forecasts were high; and,
- Minimized or paused any work that would release dust on high-wind days. (CIRNAC, 2022a).

The Air Quality Monitoring Program continued to measure what is in the dust, both from stations on-site and at community stations located in Yellowknife and Ndilo. The Project team uses conservative criteria, that is, a strict level that is lower than what would cause harm. If real-time monitors detect dust levels are above criteria, more actions are taken to control the dust. Monitoring helps to ensure residents are not exposed to unacceptable levels of contaminants from the activities occurring at the Giant Mine site (Giant Mine Remediation Project, 2023b). The Project team will continue to develop positive and proactive approaches to community concerns. To this end, a Frequently Asked Questions handout on dust and air quality was developed as a communication and engagement tool.

#### Next Steps:

- Continue ongoing dust management for Tailings Containment Areas and road network, as needed, with application of approved dust suppressants and water (CIRNAC, 2022a).

### 6.2.3. Greenhouse Gas Emissions

The GMRP is taking several steps to proactively reduce Greenhouse Gas (GHG) emissions and implement federal climate action policies. The GMRP is fully committed to finding opportunities to reduce its GHG emissions during implementation. The principal source of GHG emissions from implementation activities will be through the operation of heavy construction equipment. Given that heavy construction equipment must be used for a remediation project of this nature, the principal tool available to minimize GHG emissions will be to minimize fuel use and reduce haul distances where possible.

As required for all new federal buildings, the GMRP has been undertaking a GHG assessment of the design of the new WTP to be constructed onsite. This includes a life cycle analysis of the heating system and all supporting equipment. In 2022, the Project team engaged the GMRP Working Group on the Water Treatment Plant Design Plan, with a focus on providing an update on the Greenhouse Gas Emissions Study. GHG emissions will be calculated for each option over the 40-year lifespan of the facility to demonstrate the reduction in emissions. Results of this assessment will be considered in the final design of the new WTP (CIRNAC, 2022a) (CIRNAC, 2022b) (CIRNAC, 2022c).

The MCM Tracks and reports on the Project's GHG emissions monthly. The indirect emissions emitted on site in 2022-23 (April 2022 to March 2023) were 2.12M Kg CO<sub>2</sub>e<sup>7</sup> and the direct emissions emitted on site were 2.04 Kg CO<sub>2</sub>e. These emissions are lower than emissions in 2021-22, the baseline year for emissions tracking. Future reports will provide trend information and will include explanations for the observed trends, where available. See Appendix F – Greenhouse Gas Emissions for additional data, including the monthly breakdown.

<sup>7</sup> Carbon dioxide equivalent or CO<sub>2</sub>e is defined by the US Environmental Protection Act as the number of metric tons of CO<sub>2</sub> emissions with the same global warming potential as one metric ton of another greenhouse gas.



## 6.3. WATER

To monitor and minimize water quality impacts, the GMRP undertakes ongoing effluent and water quality monitoring on-site.

### 2022-23 HIGHLIGHTS

- Carried out monitoring in accordance with the Phase 7 EEM Design Plan and the AEMP Design Plan.
- GMRP submitted its Intent to Become a Recognized Closed Mine in 2021. It is anticipated that the Phase 7 EEM will be the final EEM report.
- MDMER/EEM results were consistent with results from previous years.
- Water quality results in treated effluent were below the limits (and within required pH range).
- Submitted the 2022 Annual Water License Report and the 2022 AEMP Annual Report to the MVWLB.
- Pumped minewater from the underground to the Northwest Pond to manage minewater levels.
- Conducted water management post-construction at Soil Pile 1.
- Installed groundwater monitoring wells at various locations.

### 6.3.1. Effluent, Surface Water and Groundwater Quality Monitoring

To protect the health and safety of workers, the public, and the environment, water from the Giant Mine site is treated at the on-site Effluent Treatment Plant before being seasonally discharged to the environment. The Effluent Treatment Plant system consists of various components including reaction tanks, a settling pond, and a polishing pond that are used – in this order – to treat the minewater. Discharged effluent water must meet standards set by the Metal and Diamond Mining Effluent Regulations (MDMER) under the Fisheries Act and the GMRP Type A Water Licence (MV2007L8-0031). Part of the water quality monitoring program includes testing of effluent chemistry. Arsenic and other parameters must meet regulated concentrations prior to, and during, discharge.

Minewater is pumped to surface throughout the year and stored on-site in the Northwest Pond. Treatment of this water typically begins in June of each year, with discharge to the environment typically occurring between July and September once the Arctic Grayling have left Baker Creek.

The Project team undertakes effluent and water quality monitoring in and around the Giant Mine site via different programs to report on surface water, groundwater and underground minewater. These programs track parameters such as the volume of water pumped or discharged, water quality and the performance of the Effluent Treatment Plant. The effluent and surface water quality monitoring encompass the programs outlined below. These programs are used to monitor existing performance and to inform the design process for remediation activities:

- Surveillance Network Program (SNP);
- Aquatic Effects Monitoring Program (AEMP);
- MDMER including the EEM Program;
- Operational Monitoring Program (OMP); and,
- Supplemental surface water and groundwater baseline data collection such as the surface water quality and Yellowknife Bay models and the AEMP.

Parameters tested at all stations include standard general parameters (e.g., temperature, pH, conductivity, hardness), major ions, nutrients, and total and dissolved metals. There are also specific station requirements for other tests such as total cyanide, sulphide, hydrocarbons, and radium-226.

Samples collected at sampling location SNP 43-1, the regulated discharge location, must meet federal requirements under MDMER as well as the discharge criteria defined in the GMRP Water Licence (MV2007L8-0031).

### Annual Water Monitoring

The section below summarizes the monitoring activities conducted in 2022-23 (Table 6). Appendix E provides maps detailing surface water quality and ground water monitoring locations (Figures 20 and 21). In 2022-23, water quality monitoring was conducted alongside remediation activities. The primary goal was to minimize any negative impacts on the public, workers, and the receiving environment, while meeting regulatory requirements and water-related closure objectives.

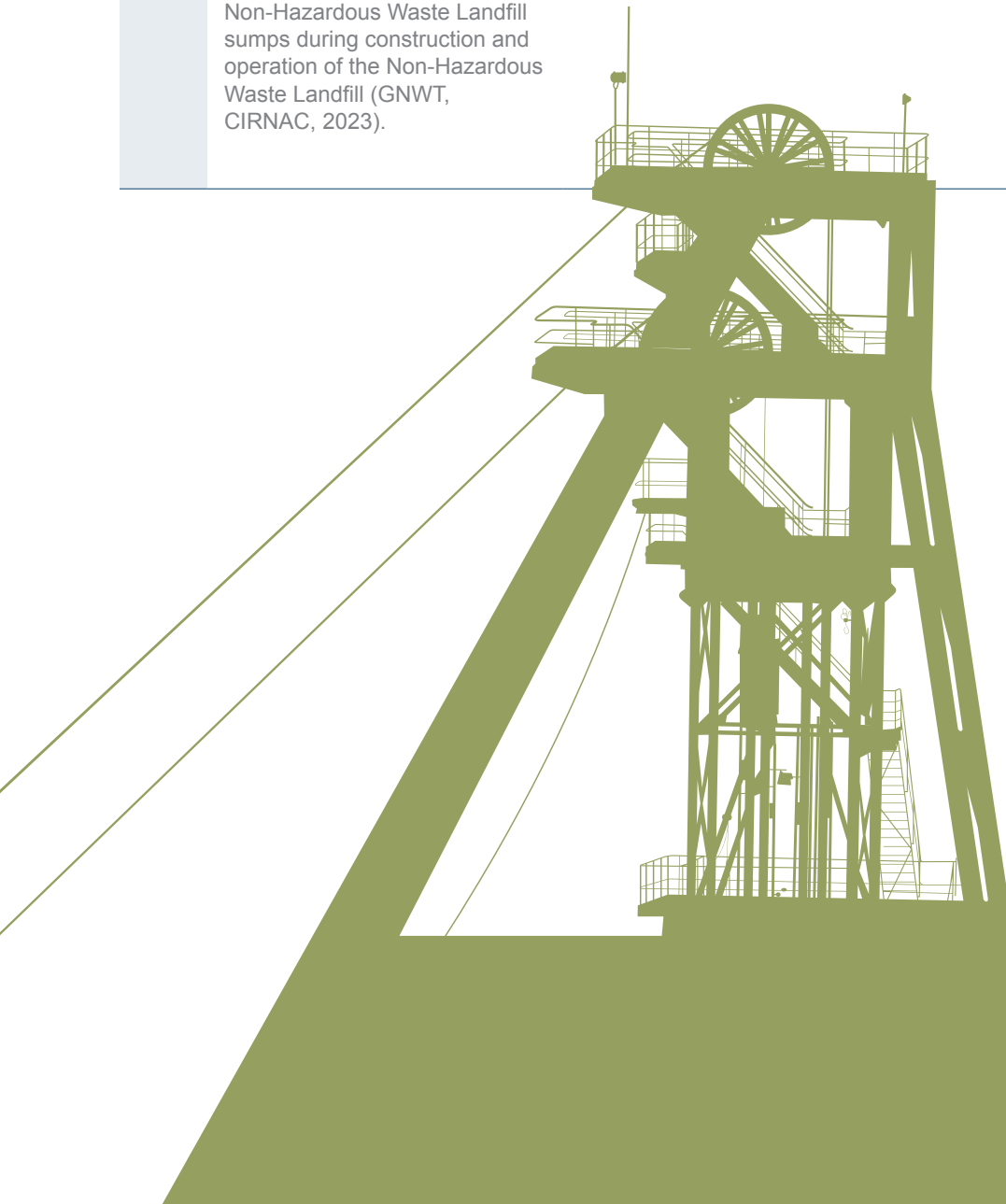
The volume of minewater pumped to surface and seasonally treated and discharged depends on several factors including available surface storage volumes, runoff, and precipitation events. In total, 547,118m<sup>3</sup> of treated effluent was discharged from the Effluent Treatment Plant to Baker Creek in 2022. This discharge is slightly lower than the previous year (589,700m<sup>3</sup> in 2021), and considerably lower than that of 2020 (692,785m<sup>3</sup>) (Giant Mine Remediation Project, 2023b).



Table 6: Annual Water Quality Monitoring 2022-23

	ACTIVITIES	RESULTS	RECOMMENDATIONS / NEXT STEPS
Hydrology (water quantity)	<p>Water level surveys and flow measurements to establish a time series of seasonal streamflow.</p> <p>Comparison of modelled and measured streamflow for Baker Creek, Northwest Pond, and Polishing Pond.</p> <p>Streamflow data was collected at five hydrometric stations between May 11 and October 3, 2022.</p> <p>Operation of hydrometric stations for continuous water level measurements through the open water season (May/June-September).</p> <p>Water surveys, including minewater levels, contact water, water elevations at tailing containment areas and wastewater management ponds, toxicology.</p>	<p>In 2022, the amount of water flowing in Baker Creek was mostly in the middle range compared to previous years during the freshet period (when the water level rises due to melting snow or heavy rainfall). However, in late summer and fall, the streamflow was a bit higher than the average amount.</p> <p>The estimated water yield from the water balance method for Baker Creek is slightly lower than the yield derived from monitoring at Baker Pond outlet, which was based on a combination of continuous stream measurements and estimated flows due to beaver activity.</p> <p>However, the water balance closely matches the derived hydrograph from monitoring, indicating that it is a suitable representation of runoff quantities and timing. For Northwest Pond and Polishing Pond, the water balance successfully matched the measured pumped quantities, suggesting that it estimates sufficient runoff to meet the demand.</p> <p>Water balance scenarios have been successful in predicting measurable water quantities at the site.</p>	<p>Continue hydrology monitoring program to support operational and regulatory requirements.</p>
Surface water and minewater quality	<p>Surface water sampling to meet regulatory and operational requirements.</p> <p>Surface water stations that were sampled included lakes, creeks, sumps, ponds, and Tailing Containment Areas, along with minewater that is sampled from the surface at the Northwest Pumping System.</p> <p>Treated effluent was sampled weekly at SNP 43-1 per Water Licence and MDMER requirements during the discharge period (June 3 to September 23).</p> <p>Underground minewater sampling as part of the OMP.</p> <p>Minewater sampling from the Northwest Pumping System.</p> <p>Withdrawal of water from the Polishing Pond and Yellowknife Bay in 2022 for dust suppression.</p> <p>North Pond water used in paste production.</p>	<p>Water quality results for sumps, minewater, and groundwater wells were generally consistent with previous years. Average concentrations from 2022 at SNP 43-1 (discharge location to Baker Creek) were below the required maximum average concentrations in the Water Licence and MDMER.</p> <p>Seasonal variations in effluent discharge timing from June to September affected select parameters in the monitoring stations of Baker Creek. In lower Baker Creek, higher concentrations of chloride, sulphate, total arsenic, and total nickel were observed during the late open water season (August to October), coinciding with decreased water flows in the creek. Additionally, these parameters showed higher concentrations in lower Baker Creek compared to the upstream reference area station.</p> <p>Water quality in lower Baker Creek during 2022 exhibited seasonal and spatial variations linked to effluent discharge, ranging from upstream (SNP 43-11) to downstream (SNP 43-23 and SNP 43-5). Despite these changes, the concentrations remained within expected levels during the discharge season, except for total nickel, lead, and zinc, which exceeded historical ranges. For more information on the spatial and temporal trends of water quality in Baker Creek, refer to the 2022 AEMP report by WSP (WSP 2023a).</p>	<p>Continue sampling minewater from surface, groundwater, and surface water as per operational and regulatory requirements.</p> <p>Continue the Yellowknife Bay Special Study in 2023 as outlined in the AEMP Design Plan.</p>

	ACTIVITIES	RESULTS	RECOMMENDATIONS / NEXT STEPS
Groundwater	<p>Development and monitoring of groundwater monitoring wells at various locations around the Site.</p> <p>Monitoring of ten shallow groundwater wells around the Non-Hazardous Waste Landfill Design Plan as part of the OMP.</p> <p>Installation of a drainage pipe beneath the liner of the Non-Hazardous Waste Landfill process residual cell and run-on pond as a result of water infiltration.</p> <p>Monitoring of water levels in the Non-Hazardous Waste Landfill sumps during construction and operation of the Non-Hazardous Waste Landfill (GNWT, CIRNAC, 2023).</p>	<p>Groundwater flow directions estimated from hydraulic head monitoring were consistent with previous years, showing a downwards gradient suggesting drainage toward the underground development.</p> <p>Water quality results from groundwater wells were generally consistent with previous years.</p> <p>Hydraulic heads for the wells in 2022 were generally consistent with the last few years of monitoring. Generally, lower hydraulic heads are observed in spring and higher hydraulic heads are observed in the fall.</p> <p>Groundwater samples were generally consistent with historical patterns.</p>	<p>Continue operational and regulatory groundwater well sampling.</p>



### 6.3.2. Metal and Diamond Mining Effluent Regulations (MDMER) / Environmental Effects Monitoring

The MDMER under the Fisheries Act requires metal mines to conduct environmental effects monitoring. This monitoring includes monitoring of effluent and surface water quality, toxicological testing of the treated effluent, and biological monitoring. These results are used to assess and identify any effects that may be caused by the treated effluent. The overall objective of these studies is to protect fish and fish habitat and maintain the safe use of fish by people. Effluent and water quality are monitored during periods of effluent discharge and these data are used to interpret the effects observed in the fish and benthic invertebrates from Baker Creek (i.e., the results from the biological program that is completed every three years). An EEM program has been conducted since 2003, with six phases of monitoring completed to date. In 2021, GMRP submitted its intention to become recognized as a closed mine. The Phase 7 EEM report is expected to be the last report in this series. In 2022, sampling was conducted in accordance with the Phase 7 EEM Study Design (Golder 2021). Results from this sampling program are presented in Sections 6.3.1 and 6.3.3. (Giant Mine Remediation Project, 2023b).

#### Next Steps:

- Submit Phase 7 Environmental Effect Monitoring report to ECCC in June 2023. As the GMRP submitted its Intent to Become a Closed Mine to ECCC in 2021, it is anticipated the Phase 7 EEM program will be the final phase for the GMRP.

### 6.3.3. Aquatic Effects Monitoring Program (AEMP)

The GMRP submitted the completed Baker Creek AEMP Design Plan and the Draft Yellowknife Bay Conceptual AEMP Design Plan as part of the Water Licence application package in 2020. Four different types of documents are required under the AEMP: Design Plan, Annual Report, Re-evaluation Report, and Response Plan (as applicable).

Until the new Water Treatment Plant is operational, the existing Effluent Treatment Plant will be used. The two different treatment plants will discharge to different locations, with the AEMP shifting focus from the current discharge into Baker Creek to the future discharge location in Yellowknife Bay with the Water Treatment Plant.

In 2022-23, the Project completed monitoring for the AEMP in accordance with the approved AEMP Design Plan. The main site activities related to the AEMP in 2022-23 included the collection, treatment, and subsequent release of water as treated effluent into Baker Creek (GNWT, CIRNAC, 2023).

In April 2022, the Project team submitted to the MVLWB the 2022 AEMP Annual Report. (Giant Mine Remediation Project, 2023b). The 2022 AEMP Report highlights include (Giant Mine Remediation Project, 2022b):

- Treated effluent that was released from the site met the Water Licence and federal government regulatory MDMER limits;
- Elevated metal concentrations in the water, with a rising trend, were observed in 2022 and triggered the AEMP water quality Low Action Level, as potentially linked to the GMRP;
- A Low Action Level for fish was triggered for female Slimy Sculpin based on differences in relative liver size in the reference and exposure areas. A Moderate Action Level was triggered for male Slimy Sculpin based on relative liver size. These are similar results as documented in previous phases of the EEM program;
- The Plume Delineation Study was completed in Yellowknife Bay to assess how far into the bay effluent discharge can be detected;
- No acute toxicity was observed in Rainbow Trout or water fleas exposed to treated effluent samples, which resulted in reduced growth in algae and aquatic plants, as well as decreased reproduction in water fleas; and,



- The effects of treated effluent on trout, minnows, water fleas, algae, and aquatic plants in the 2022 laboratory tests were comparable to or less than previous years.

#### Next Steps:

- Continue AEMP monitoring as per the approved Design Plan;
- Submit Annual Report on the calendar year; and,
- Submit a Response Plan for the 2022 AEMP due to the Moderate Action Level exceedance.

## 6.4. LAND

The GMRP team undertook several activities to monitor and minimize impacts to land and protect the health and safety of the public, on-site workers, and wildlife. These activities included monitoring and management of arsenic impacted waste, and monitoring of wildlife, as described below.

#### 2022-23 HIGHLIGHTS

- Continued to manage wastes on site in accordance with the Waste Management and Monitoring Plan.
- Operated the non-hazardous waste landfill.
- Relocated the on-site Waste Transfer Station.
- Acquired General Wildlife Permits from the GNWT in 2022.
- Reviewed the Wildlife and Wildlife Habitat Management and Monitoring Plan (Version 2.0) with no changes necessary.
- Maintained the wildlife log on site.

### 6.4.1. Waste Management

In 2014, the decontamination and deconstruction of the Roaster Complex as part of the Site Stabilization Plan produced hazardous waste, primarily arsenic- and asbestos-containing materials. The wastes were safely packaged in lined Transportation of Dangerous Goods bags and stored on site, held in shipping containers within an area secured by a chain-link fence (Material Storage Area). Runoff water from the storage area is collected and subsequently treated in the Project's Effluent Treatment Plant. Until the material can be appropriately disposed of, it will be stored on-site, in a safe area where water and people will not be exposed (GNWT, CIRNAC, 2023) (CIRNAC, 2022a) (CIRNAC, 2022b) (CIRNAC, 2022c).

In summer 2021, construction of the Non-Hazardous Waste Landfill (NHWL) began, as mentioned in Section 3.2. It began receiving waste, in accordance with the Waste Management and Monitoring Plan, in 2022. The Project team relocated the on-site Waste Transfer Station and continued to receive non-legacy operational waste. The Project team continued to manage wastes on site in accordance with the Waste Management and Monitoring Plan. In 2022, as part of the Operational Monitoring Program, the Project team monitored ten shallow groundwater wells identified in the Non-Hazardous Waste Landfill Design Plan (Giant Mine Remediation Project, 2023b). As 2022 was the first year of monitoring these wells, continued monitoring in spring and fall will allow analysis of temporal and seasonal trends.

#### Next steps:

- Finalize construction of the Non-Hazardous Waste Landfill in Spring 2023;
- Continue to operate the Non-Hazardous Waste Landfill;
- Continue managing waste in accordance with the Waste Management and Monitoring Plan; and,
- Continue implementing operations of the operational Waste Transfer Station.

### 6.4.2. Wildlife Monitoring and Research

The Wildlife and Wildlife Habitat Management and Monitoring Plan was submitted as part of the Water Licence package in April 2019. In 2022-23, no further changes were necessary to the plan, and all activities and interactions with wildlife were conducted in accordance with it. The Project team maintained all wildlife logs on-site, which are available to Inspectors upon request.

#### Activities in 2022-23 included:

- Attainment of individual General Wildlife Permits from the GNWT where nests required removal or relocation;
- Implementation of enhanced inspections at the Effluent Treatment Plant as a preventive measure against nesting;
- Implementation of wildlife-proof waste containers on-site;
- Partial removal of a beaver dam in August and September 2022 at the outlet of Baker Pond, in accordance with the Department of Fisheries and Oceans Canada (DFO) Code of Practice for Beaver Dam Removal;
- Vegetation clearing for building deconstruction purposes;
- Completion of bear monitoring and bird surveys; and,
- Conduct of wildlife surveys prior to any blasting activities.

In preparation for the deconstruction of the townsite buildings, the GMRP team deployed propane noise cannons and bird kites to deter birds from nesting on site in Spring 2022. The Project placed six (6) propane noise cannons around the townsite area, which were operational approximately every 30 minutes beginning in April until early September, to cover the migratory bird nesting season in Yellowknife. Preventing birds from nesting on site where deconstruction work is planned will help ensure that birds and their nests are not harmed (CIRNAC, 2022a).

#### Next steps:

- Prepare Version 3.0 of the Wildlife and Wildlife Habitat Management and Monitoring Plan to submit to the MVLWB; and,
- Continue to log and report wildlife sighting and interactions (including the bird survey).

### 6.4.3 Post Closure Land Use Constraints Map

The Project has worked with GNWT to advance a constraints map to support future land use planning/considerations. The Project agreed to develop a 'constraints map' to describe aspects of the site that will be important to know post closure – including location of underground workings and the expected end state of the environment after remediation (e.g., soil will meet specific criterion). The Project completed the map and shared it with GNWT, Working Group and City of Yellowknife staff members in 2022.



# 7.0 HEALTH & SAFETY

## 7.1. OCCUPATIONAL HEALTH AND SAFETY (H&S)

CIRNAC provides oversight for occupational H&S, while PSPC provides oversight and manages engineering design consultants to ensure that they have in place a H&S plan, H&S procedures, and emergency response plans, and that they follow the procedures and report any H&S incidents.

The Main Construction Manager maintains overall H&S responsibility as the Mine Manager at the Giant Mine Site. To ensure that on-site safety plans are implemented, there is a designated MCM occupational H&S manager who organizes ongoing training and occupational H&S support for managers, supervisors and other employees and subcontractors.

### 2022-23 HIGHLIGHTS

- There were 0 major safety incidents, 1 moderate safety incidents, and 10 minor incidents in 2022-23.
- The number of reported near misses decreased to 29 in 2022-23 from 71 in 2021-22 and 56 in 2020-21.
- 3.35% of urinalysis samples were above the action level of 35 micrograms of arsenic per litre of urine (µg/L) in 2022-23.

### 7.1.1. Health & Safety Incidents

The GMRP tracks the number of major incidents, moderate incidents, minor incidents, and near misses on a monthly basis. Table 7 summarizes the number of H&S incidents and near misses in 2022-23.

Consistent with previous years, there were no major safety incidents on site. There was 1 moderate incident, which is lower than the previous three years (3 in 2021-22, 7 in 2020-21, and 3 in 2019-20). The number of minor incidents in 2022-23 (10) is similar or increased from previous years (9 in 2021-22, 3 in 2020-21 and 5 in 2019-20).

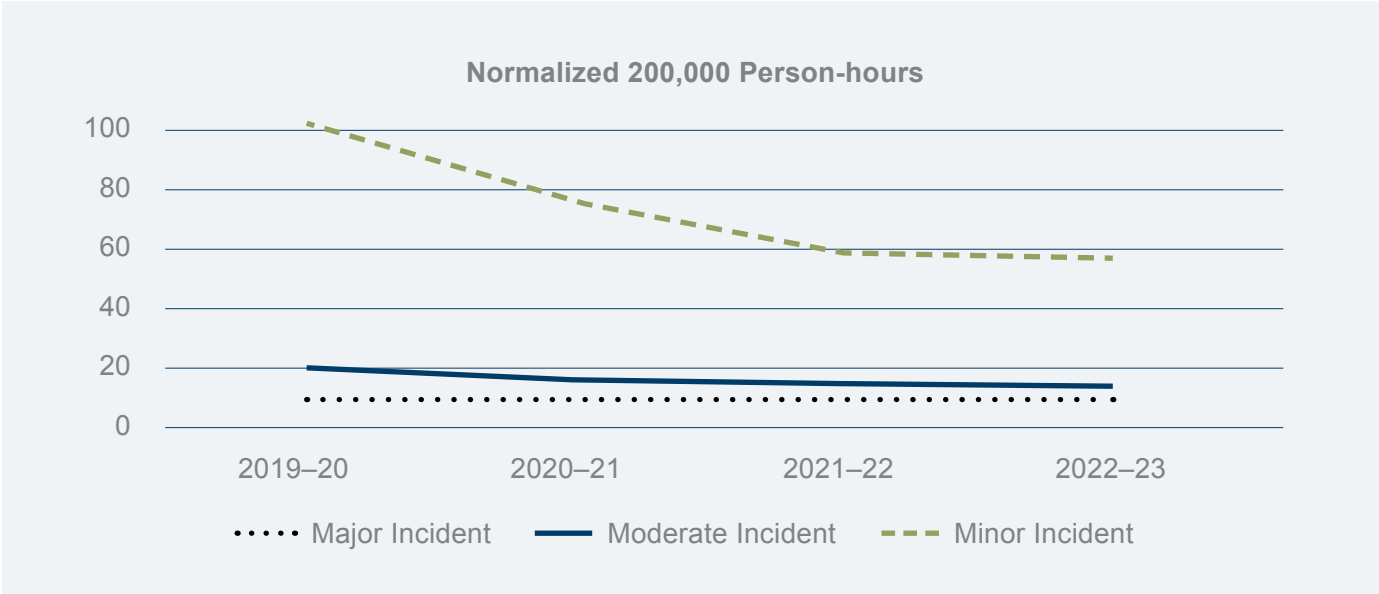
Table 7: H&S Incidents and Near Misses in 2022-23.

INCIDENTS AND NEAR MISSES	2022-23 TOTAL
<b>Major Incident:</b> An incident resulting from activities performed at the site that results in a severe and irreversible disability, impairment, injury, illness or fatality to an individual or individuals.	0
<b>Moderate Incident:</b> An incident resulting from activities performed at the site that results in a reversible disability, impairment, injury or illness that temporarily alters the lives of an individual or individuals.	1
<b>Minor Incident:</b> An incident resulting from activities performed at the site that results in injury or illness that inconveniences an individual or individuals.	10
<b>Near Misses:</b> An unplanned incident resulting from activities performed at the site that did not result in any disability, impairment, injury, illness or fatality, but had the potential to do so.	29



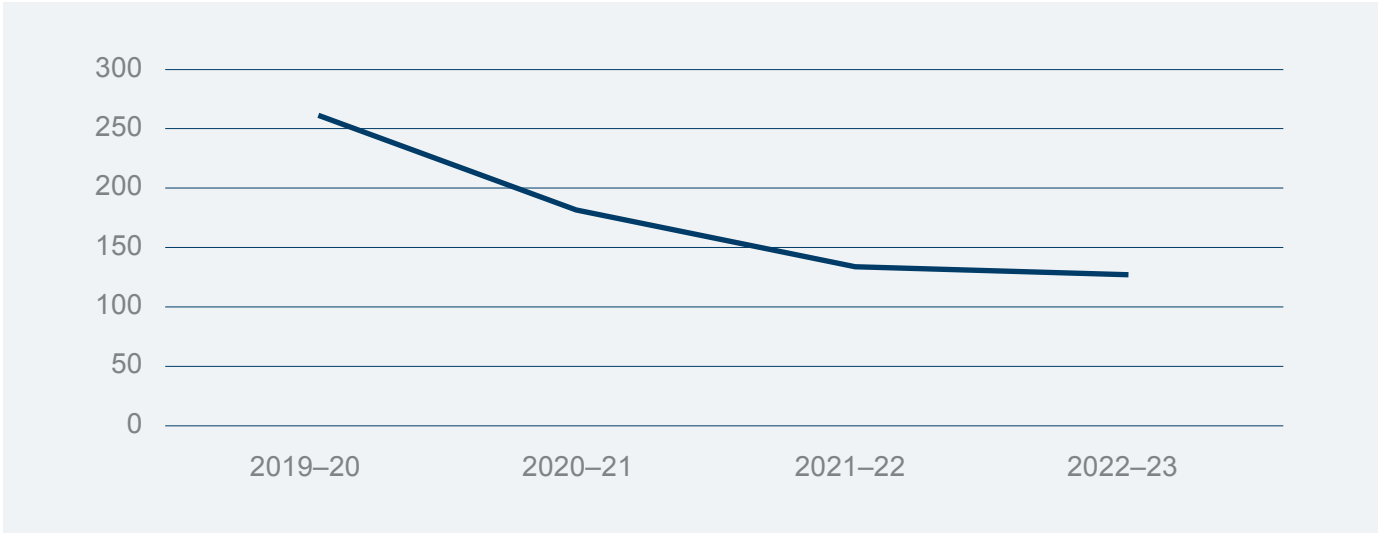
Figure 6 below illustrates the number of incidents normalized by person-hours worked to enable comparison across years, when the amount of activity on site may differ. When normalized, the number of minor incidents has trended down since 2019-20. Moderate incidents have also trended down but at a less pronounced rate. The normalization does not account for differences in the nature of activities undertaken from one year to another.

Figure 6: H&S Incidents per 200,000 Person-hours Worked, by year 2019-20 to 2022-23



There was a decrease in the number of reported near misses in 2022-23, 29, when compared with previous years: 71 in 2021-22, 56 in 2020-21, and 41 in 2019-20 (Figure 7). When normalized by person-hours worked, there is a clear downward trend. Incidents and near misses are discussed at daily safety meetings to review lessons learned, root causes, and corrective measures.

Figure 7: H&S Near Misses per 200,000 Person-hours Worked from 2019-20 to 2022-23



**Next Steps:**

- The GMRP team will continue to track and report H&S incidents.



## 7.1.2. Monitoring of Arsenic Levels in Workers

In 2013, the Roaster demolition Project team (Parsons, AECOM, Golder, PSPC and CIRNAC) developed a medical monitoring framework to monitor arsenic levels in workers. This framework was accepted by the Workers' Safety & Compensation Commission.<sup>8</sup> Monitoring includes baseline urinalysis sampling when workers start on site and then subsequent regular urinalysis sampling depending on frequency on site and activities performed (e.g., weekly samples if on-site full-time). Samples are compared against the Action Level of 35 micrograms of arsenic per litre of urine ( $\mu\text{g/L}$ ). The Project has monitored and reported on arsenic levels in workers since 2014-15.

In the 2022-23 reporting year, the GMRP team continued to monitor arsenic levels in workers. Table 8 shows the total number of samples and the number of samples above the Action Level of 35 micrograms of arsenic per litre of blood. The percentage of samples above the action level (3.35%) is higher than last year (1.92% in 2021-22). The increase in the number of samples above the Action Level could be due to an increase in workers on site with more exposure to underground activities and sludge transportation.

Table 8: Summary of Urinalysis Sampling and Results between 2018-19 and 2022-23

Year	Total samples	Number of samples above the action level (35 $\mu\text{g/l}$ )	Percentage of samples above the action level (35 $\mu\text{g/l}$ )
2022-23	2181	73	3.35%
2021-22	1305	25	1.92%
2020-21	728	9	1.24%
2019-20	682	15	2.20%
2018-19	1938	63	3.25%

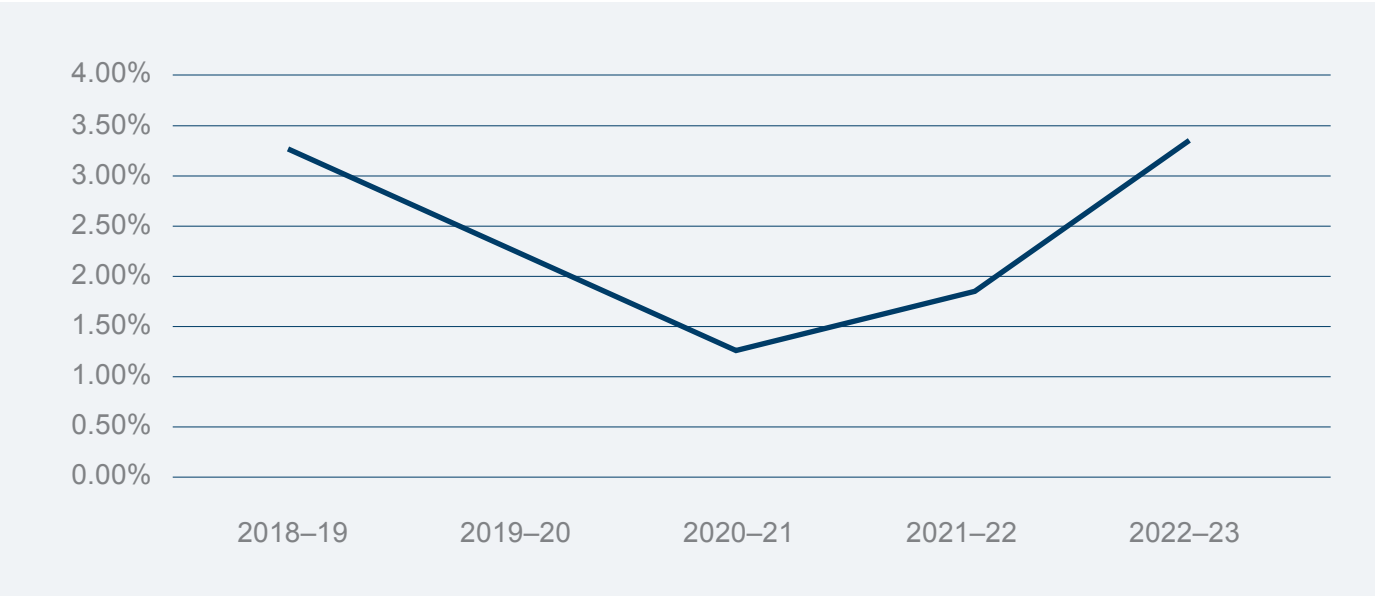
<sup>8</sup> The analytical approach, the analytes, and the action level (i.e., the exposure limit) were documented by Senes & Arcadis and peer-reviewed by Stantec in 2014.

For any urinalysis sample above the Action Level, the MCM notified Workers’ Safety & Compensation Commission, CIRNAC, and PSPC and investigated the root cause (e.g., diet, poor hygiene practices, inadequate procedures). The MCM then took immediate actions to reduce exposure to workers, such as improvement of dust control measures, adoption of more rigorous Personal Protective Equipment procedures, re-training of staff on proper procedures, placing affected workers on limited duty to limit exposure to higher risk activities, or reassigning personnel to other duties (in the rare case of continued / recurring high levels of arsenic).

Tracking of results that are below but nearing the Action Level also allows for identification of those workers who could benefit from preventive interventions, to avoid reaching the Action Level.

Figure 8 below highlights the key trends in the percentage of samples above the action level from 2018-19 to 2022-23.

Figure 8. Percentage of samples above the Action Level (35 µg/L) from 2018-19 to 2022-23



**Next Steps:**

- The GMRP team will continue to provide oversight for the H&S of its employees and contractors through the established management system and associated H&S procedures, including urinalysis for on-site workers.

### 7.1.3. Health and Safety Training

The MCM's Occupational H&S manager ensures that employees and sub-contractors receive relevant H&S training, including first aid, wildlife safety, water safety, and fire response, as required by applicable regulations. Each year, all new employees are assessed to ensure they have the required training to complete their jobs safely and effectively.

PSPC/CIRNAC and the MCM track the number of person-hours that employees and sub-contractors receive in training. In 2022-23, a total of 30,127 H&S training hours were provided including general Environment, Health and Safety awareness training on policy and procedures.

#### Next Steps:

- The GMRP team will continue to track the type and amount of training received by employees and contractors to ensure that all employees receive the required training;
- The GMRP team shares this information with interested parties and stakeholders – such as GMOB, Socio-Economic Working Group and Socio-Economic Advisory Body and the community – to assure them that on-site personnel are appropriately trained to do their job safely and effectively and are getting training that is potentially transferable to other employment; and,
- The GMRP team tracks training provided to community members to prepare them for employment at the site.

## 7.2. PUBLIC HEALTH AND SAFETY

Since the Government of Canada took over responsibility in 1999, the GMRP team has monitored the site and ensured it is kept safe and secure through 24-hours-a-day C&M work. This work involves ensuring public safety through site security, dust suppression, and minewater and effluent management.

In response to Measure 9 of the Report of Environmental Assessment, the GMRP commits to working with other federal and territorial departments to design and implement a broad Health Effects Monitoring Program. In response to Measure 10 of the Environmental Assessment, the GMRP committed to evaluate the indirect effects of the Project through the Stress Study, previously called Hoèla Weteèts'eèdeè: Understanding Community Wellbeing Around Giant Mine, which was discontinued in Fall 2022.

#### 2022-23 HIGHLIGHTS

- Continue to prepare for child and youth re-sampling and new group sampling in Spring 2023.
- Continued ongoing Advisory Committee meetings to provide updates on relevant publications, genetic analysis, and communication strategies for the revised website.
- Hoèla Weteèts'eèdeè: Understanding Community Wellbeing Around Giant Mine study was discontinued after YKDFN withdrew and after careful deliberation from the study's advisory committee.

### 7.2.1. Health Effects Monitoring Program

The Health Effects Monitoring Program in Ndilo, Dettah and Yellowknife focuses on effects in people related to arsenic and other contaminants<sup>9</sup> that might result from monitoring effects of the site and/or from the remediation activities. The monitoring includes studies of baseline health and ongoing periodic monitoring, in accordance with Measure 9 of The Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013). Dr. Laurie Chan, based at the University of Ottawa, is leading the monitoring program. A Health Effects Monitoring Program Advisory Committee was established for the program with representatives from GNWT Health and Social Services, Health Canada, the City of Yellowknife, YKDFN, NSMA, GMOB and the Project team. The committee meets monthly and provides advice to the program (Health Effect Monitoring Program, 2022).

The timeline for the monitoring program is as follows:

- **2017-2018:** Baseline sample collection in 2018. There was a total of 2037 participants between Fall 2017 and Spring 2018. Individual results were reported back to all the participants by mail, and a progress report summarized key results.
- **2019-2020:** Public engagement was undertaken in May 2019 to report back on the initial results of the study.
- **2021-2022:** The committee continued to provide updates on relevant publications, genetic analysis, and communication strategies for the revised website.
- **2022-2023:** Conduct sampling of children aged 5-18 at the five-year interval. The next round of sampling will occur 2027-2028 with both adults and children being sampled.

In February 2023, the Health Effects Monitoring Program Advisory Committee completed the third progress report for the Yellowknife Health Effects Monitoring Program (YKHEMP). It examined the relationships between diet and lifestyle variables, genetic information, the concentrations of metals in urine and the arsenic concentrations in the toenail, and results of the medical history and medical file analysis. The published 2023 Progress Report can be found here: [Progress Report 2023 | Health Effects Monitoring Program \(ykhemp.ca\)](https://ykhemp.ca/Progress-Report-2023-Health-Effects-Monitoring-Program)

In March 2023, the Project team generated plain-language booklets that show the newest results from the 2017-18 baseline study, including results for health files and genetics. The published 2023 plain-language booklet can be found here: [Results Booklets \(2023\) | Health Effects Monitoring Program \(ykhemp.ca\)](https://ykhemp.ca/Results-Booklets-2023-Health-Effects-Monitoring-Program)

The five-year follow up resample for children and youth and sampling new groups of children and youth is scheduled to start in Spring 2023. In 2028, the re-sampling will occur for adults, children and youth, when remediation is occurring.

#### Next Steps:

- Conduct child and youth re-sampling and new group sampling in Spring 2023; and,
- Complete adult, children, and youth re-sampling in 2028.

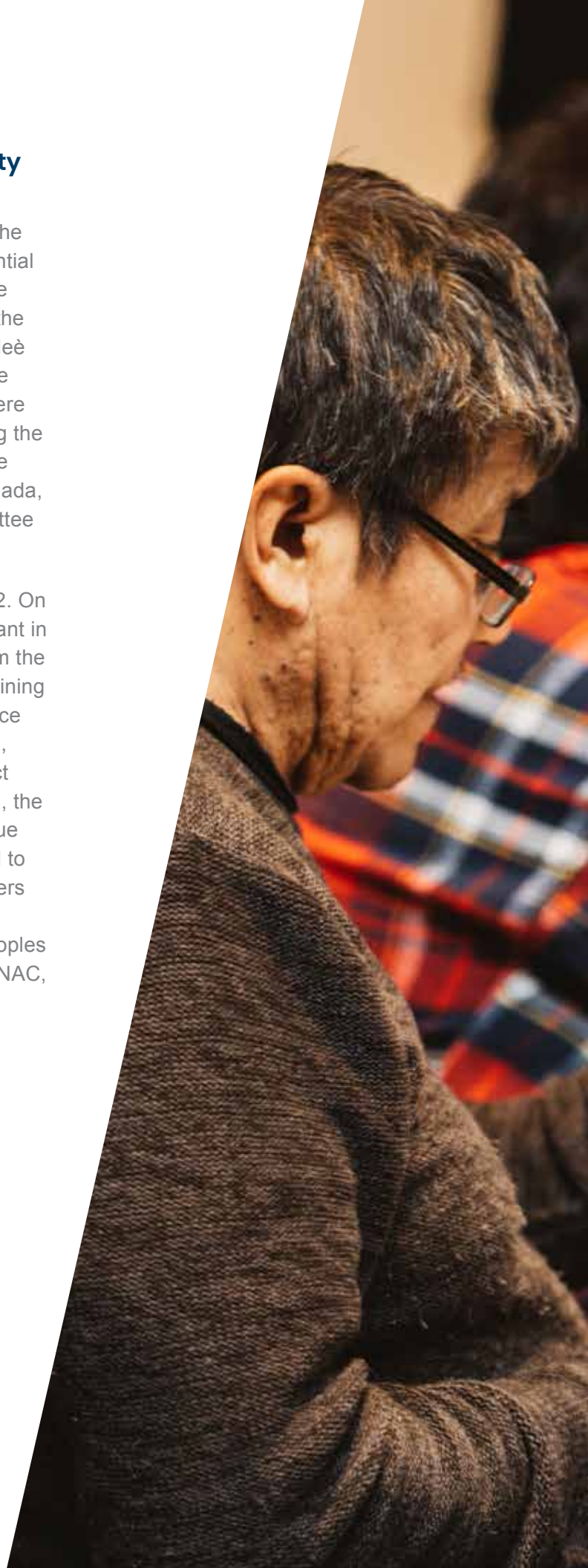
For more information on the Health Effects Monitoring Program, please refer to the Frequently Asked Questions on the program's public-facing website: [Health Effects Monitoring Program \(ykhemp.ca\)](https://ykhemp.ca/Health-Effects-Monitoring-Program)

<sup>9</sup> Including antimony, cadmium, lead, manganese, and vanadium, which are being measured because other research and studies have shown that they are present at the Giant Mine site.

### 7.2.2. Stress Study: Understanding Community Wellbeing Around Giant Mine

Measure 10 of the Environmental Assessment requires the Project team to also evaluate the indirect effects of potential exposures to arsenic on wellness, including stress. Since 2017, Wilfred Laurier University led the development of the Stress Study, formerly known as the “Hoèla Weteèts’eèdeè Understanding Community Well-being around Giant Mine Study”, with various rights holders and stakeholders. There were two committees associated with this study including the Advisory Committee made up of representatives from the signatories to the Environmental Agreement, Health Canada, and Wilfred Laurier University, and the Technical Committee made up of technical experts.

The study was to begin implementation in Spring of 2022. On June 6, 2022, the YKDFN, the main partner and participant in the study, advised the GMRP they were withdrawing from the study. In September, the Project team met with the remaining members of the study’s advisory committee to seek advice with respect to how to proceed. After careful deliberation, the committee unanimously decided to advise the Project team it should no longer proceed with the study. As such, the Project team has made the difficult decision to discontinue the wellness study. The Project team remains committed to continued engagement and consultation with rights holders and stakeholders, and to the ongoing protection of the environment and the health and safety of Indigenous peoples and Northerners as it relates to the Giant Mine site (CIRNAC, 2022b).







# 8.0 COMMUNITY

This section provides an overview of the relevant management and performance information that applies to the community engagement and socio-economic elements of Giant Mine.

## 8.1. ENGAGEMENT

Project engagement is guided by an Engagement Plan, submitted to the Mackenzie Valley Land and Water Board in March 2021 ([GMRP Engagement Plan link](#)). The overall GMRP engagement goals are:

- Affected parties have increased trust in the Project, the Project team, the overall project management, and are confident in the direction the Project is taking moving forward.
- The GMRP is operating in an open, inclusive and transparent manner.
- Affected parties feel increased ownership and optimism with respect to the future remediation of the mine site, as the result of collaborative input into decision making with stakeholders/affected parties and the GMRP team.

The Project team developed a new plan for evaluating engagement in 2022, which incorporates feedback from the Giant Mine Working Group. The Project team will implement planned evaluation activities going forward, including asking standard questions to gather feedback at meetings. The Project team continues to maintain a media log to track inquiries and topics and an engagement log to track the number and type of engagement activities planned and achieved.

Working groups are an important way for the GMRP team to engage with key affected parties in a meaningful way, both to provide information and to solicit input. There are numerous working groups, with those focused on specific areas, such as socio-economic issues, to those focused on the Project as a whole (e.g., the Giant Mine Working Group). The full list of committees/working groups and regular meetings with rights holders/stakeholders is summarized in the Engagement Plan.

### 2022-23 HIGHLIGHTS

- Continued virtual meetings and held hybrid and in-person meetings if there was interest from engaged groups.
- Continued engagement of key affected parties through the established working groups.
- Conducted public outreach via in-person and online Annual Public Forums held in March 2023. Additional outreach activities (e.g., school visits), were held.
- Continued regular communications (e.g., e-newsletter, website, X (formerly known as Twitter) account, public service announcements, media briefings and responses to inquiries).

### 8.1.1. Engagement and Events

In 2022-23, the GMRP team undertook or participated in 78 engagement activities and events, aligned with and in support of the Project or related activities. This represents a fewer number of events compared to 2020-21 (87) and is higher than in 2019-20 (67 engagement events) and 2018-19 (43).

Key GMRP engagement activities in 2022-23 included:

### **Quantitative Risk Assessment (QRA) (Environmental Assessments)**

The QRA engagement has been a phased approach, beginning in 2018. The process has involved the Giant Mine Working Group, the Giant Mine Advisory Committee, the YKDFN, the NSMA, the City of Yellowknife, Alternatives North, and Yellowknife residents (CIRNAC, 2019c; CIRNAC, 2019a). (CIRNAC, 2019c; CIRNAC, 2019a) In 2022, the Project team completed the draft Acute Health Risk Assessment and presented the findings to the Giant Mine Working Group. The Project team will complete the second draft version of the Acute Health Risk Assessment in 2023-24, which will address review comments.

### **Perpetual Care Plan**

As part of the Environmental Agreement, the GMRP is required to develop a Perpetual Care Plan that must address improvements in records management, communication with future generations, long-term access to funds for the Project, and analysis of different possible scenarios that might affect the perpetual care of the Project. The GMRP established a Perpetual Care Plan Advisory Task Force in October 2019 to provide support and recommendations to the Giant Mine Working Group about the development of a comprehensive Perpetual Care Plan. The Task Force includes representatives from all signatories to the Environmental Agreement (Giant Mine Remediation Project, 2023b).

In 2020, the Project submitted to GMOB a preliminary framework for the Perpetual Care Plan and, in 2021, the GMRP team met with the Perpetual Care Plan Task Force to present the proposed process for procuring a consultant to develop the Plan (Giant Mine Remediation Project, 2023b).

In Winter 2022, the Project held a series of workshops with the Task Force to scope the Statement of Work for the Perpetual Care Plan work package. The Task Force worked through various Perpetual Care Plan components (e.g., governance, communicating with future generations) to identify the specific goals, tasks, deliverables, and subsequent experience required. The Task Force met in October 2022 to finalize the Statement of Work. Comments were discussed and incorporated into the Statement of Work, which has provided a guide for the development of the Request for Proposals. The Final Statement of Work was prepared at the end of March 2023. The Request for Information release is planned to be completed in late spring 2023.

### **Socio-Economic Engagements**

In 2022-23, the GMRP continued socio-economic engagement efforts, including two (2) meetings with the Socio-Economic Advisory Body and six (6) meetings with the Socio-Economic Working Group, as well as bilateral meetings with YKDFN, Tłıchǫ and NSMA. The purpose and outcomes of these meetings are further discussed in Section 8.2.

In addition, Parsons hosted an Industry Day in November 2022 to provide information on upcoming work for 2023.

### **Aquatic Engagement**

In 2020, the Project established an Aquatics Advisory Committee that includes all signatories to the Environmental Agreement along with additional members from the YKDFN and the NSMA. The Committee was established to allow for participants with a keen interest in the GMRP aquatics environment to actively participate in meaningful conversations and exploration of concepts. The objective of the Committee is for participants to develop a deeper knowledge of the Project, the regulatory framework, the aquatic environment, and environmental monitoring

concepts. Furthermore, the Aquatics Advisory Committee and associated engagement was designed to meet the engagement requirements of Fisheries and Oceans Canada Fisheries Act Authorization for the GMRP.

In 2022-23, the Project team met several times with the Aquatics Advisory Committee to discuss the Fisheries Act Authorization and future AEMP reference area locations. Committee members also took part in a tour of site. In November of 2022, the Aquatics Advisory Committee was provided with the Fisheries Act Authorization Application and informed of the application sections and purpose.

### Site-Wide Revegetation Plan

In early July 2022, the GMRP engagement team held separate sessions with YKDFN Elders and youth, and NSMA to gather their perspectives on revegetation as part of the remediation process. The team actively engaged participants and encouraged open dialogue while demonstrating a genuine interest in understanding and respecting unique cultural practices. The engagement sessions were successful in building trust and understanding, providing valuable insights into the communities' needs and preferences for future revegetation planning.

### Management and Monitoring Plan, Design Plans, and Closure Criteria

The Project team worked with the Giant Mine Working Group to develop a staggered approach to sharing revised Management and Monitoring Plans. In 2022, the Project team engaged the Giant Mine Working Group on the Tailings Management and Monitoring Plan, Dust Management and Monitoring Plans updates, and Borrow Materials and Explosives Management and Monitoring Plan. In November of 2022, the Project team held a two-day workshop with the Working Group to review outstanding Closure Criteria. The Project team also engaged the Giant Mine Working Group on elements of the

Underground Design Plan (minewater), the Water Treatment Plant and Greenhouse Gas Emissions Study update, and the Open Pits Design Plan.

The Closure Remediation Plan has 125 proposed closure criteria, a subset of which were identified as under development. In 2022, the Project team engaged the Giant Mine Working Group on closure criterion for contaminated soils and open pits. The Project team will integrate the results of this workshop into the respective Design Plans for submission to the MVLWB in 2023. The Project team will also engage on the final closure criteria (Borrow) and submit to the MVLWB.

### Townsite and Marina Area

In the summer of 2022, the GMRP team engaged rights holders and stakeholders, including the Giant Mine Working Group, the Yellowknife Historical Society, and the Great Slave Sailing Club, with respect to how the townsite and marina area might look in the future. The engagement allowed participants to review the conceptual drawings of the design and provide feedback into what the townsite and marina area will look like during each phase of the remediation as well as after remediation is complete. The objectives were for the Project team to:

- Identify potential conflicts between how various parties use the townsite and marina area;
- Provide information about how access will be constrained or altered by future changes;
- Get feedback on the size, shape, and locations of areas that will be used for parking and storage; and,
- Inform participants of how the area will look and function over the next 10 to 20 years.

The Project has committed to ensuring access will remain available to both the Yellowknife Historical Society's museum building and the lake at all times during remediation activities (CIRNAC, 2022c).



## Site Visits

In September 2022, the GMRP team invited local media representatives to tour the Giant Mine site. The team also extended invitations to a few reporters from Southern Canada who had requested tours in the past. Eleven (11) members of the media attended. The Project team began with a technical briefing to provide background information to inform the tour of the site. Following the briefing, the group was outfitted in personal protective equipment and toured the site (above ground), capturing photos and videos to share with their audiences (CIRNAC, 2022b).

In the summer of 2022, the Giant Mine Remediation Project held engagement sessions and site tours for various rights holders and stakeholders, including the YKDFN, NSMA, local legislators, the Aquatics Advisory Committee, and Giant Mine Working Group to observe remediation work and receive progress updates.

YKDFN students visited the Project's Effluent Treatment Plant to observe environmental monitoring in action in July 2022. The visit was a part of the students' Eco Canada BEAHR course, "Environmental Core". This course is an introductory training program for adults interested in the green economy or learning about the environment and environmental industry practices (CIRNAC, 2022d). Meetings will continue to take place with rights holders in 2023 to include community consultation and engagement to develop curriculum resources. The Project team will continue classroom visits and student site tours as requested.

## Annual Public Forum

Since 2010-11, the GMRP team has held Annual Public Forums to discuss general Project updates and key studies or initiatives for that respective year. The 2023 Annual Public Forum was held, in-person and online, on March 8, 2023. The Project officials provided an update on:

- Work completed to date;
- Status of Environment Report;
- Socio-economic achievements;
- Work expected in the upcoming field season; and,
- Work forecasted over the next 5 years.

The Project team will continue to hold the annual public forums for the general community, NSMA, and YKDFN.

## Other Engagements

In addition to the regularly scheduled meetings listed above, the Team provides updates on GMRP activities and progress through multiple communication techniques (Giant Mine Remediation Project, 2019a), including:

- E-newsletter: Sent regularly to more than 305 email addresses and posted on the GMRP website;
- Website ([www.giant.gc.ca](http://www.giant.gc.ca));
- X account ([@GiantMine](https://twitter.com/GiantMine) and [@MineGiant](https://twitter.com/MineGiant));
- Media briefings and responses to media requests;
  - There were 39 media interactions (media requests for interview, information/responses) in fiscal year 2022-23.
- Responses to unforeseen events;
- Topic-specific public service announcements, as required; and,
- Topic-specific engagements, as appropriate

The Yellowknife Spring Trade Show took place as an in-person event on May 7 and 8, 2022. This was the first trade show since 2019 and aimed to inform the local community about the new active remediation work being carried out on site. The next Tradeshow will take place in May 2023 (CIRNAC, 2022a). The Project team (lead by the MCM) also held Industry Day on November 1 and 2, 2022 (virtually). The next Industry Day is set to occur in the Fall of 2023.



## Key Stakeholder Concerns

The GMRP team captures stakeholder concerns through their meeting minutes, the GMRP's Consultation Log, emails, and other correspondence. The GMRP team endeavours to respond in a timely manner. Key concerns raised in 2022-23 were as follows:

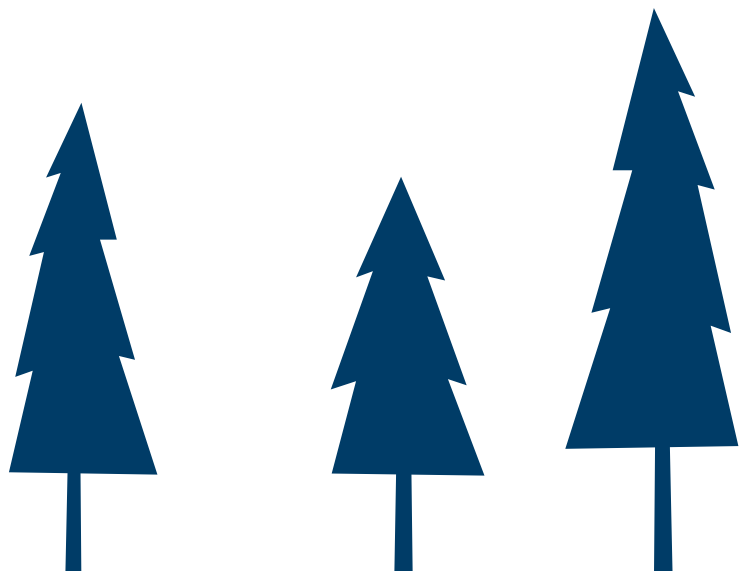
CONCERN	GMRP RESPONSE
<b>Bird Deterrents</b> Rights holders and stakeholders have expressed concern over the bird deterrents, specifically the timing and noise from the cannons.	GMRP was able to successfully deter bird nesting activity in the Townsite work areas through the use of bird deterrents. But there were some concerns regarding the timing, operations, and noise of the bird cannons. As a result, GMRP has successfully installed visual bird deterrents (false birds of prey) and continues to do frequent bird sweeps in areas around the site. GMRP also evaluated other types of deterrents in addition to the cannons and will inform the community prior to use, whenever the cannons are required.
<b>Dust Management</b> Rights holders and stakeholders have expressed concerns over the tailings dust and the management of the dust.	<p>As per the MVLWB directive, the GMRP developed a Dust Communications Strategy, submitted with the updated Engagement Plan in August 2022. The GMRP engaged with rights holders and stakeholders on the draft strategy to ensure that concerns were being addressed.</p> <p>The GMRP also developed Frequently Asked Questions (FAQs) that were sent out for review to the rights holders and stakeholders.</p> <p>Water cannons were added to the site and have been used as a pre-emptive measure in times of high wind expectancy.</p>
<b>Apology and Compensation</b> The YKDFN have requested an apology and compensation regarding the historical operation of the Giant Mine site.	CIRNAC worked on the apology and compensation file in coordination with the YKDFN. Two agreements were signed in 2021: The Collaborative Process Protocol Agreement and the Community Benefits Agreement. CIRNAC has committed to providing \$2.2 million over two years (2022-23 and 2023-24) to support the YKDFN's continued participation in the collaborative process.
<b>Minewater Elevation</b> Rights holders and stakeholders have expressed concern about the potential impacts of water rising in the mine and how the Project will control the minewater.	The GMRP provided detailed information including a plain language video to help rights holders and stakeholders understand the minewater management and associated risks. The GMRP decided to maintain a full backup pump on-site as a contingency in the event of a pump failure. The GMRP established minewater elevation action levels for the existing Water Management and Monitoring Plan and will continue to develop minewater elevation action levels acceptable to the MVLWB for future-case water management.

CONCERN	GMRP RESPONSE
<p><b>Local jobs and contracts not staying in the North</b></p> <p>An ongoing concern that contracts issued by the Main Construction Manager for on-site work and associated employment will not remain predominantly in the NWT.</p>	<p>There are several activities consistently applied by the MCM to try to maximize Northern employment and procurement. In advance of tendering, the MCM always assesses existing local-area business capacity. To increase awareness of contract opportunities, the MCM holds an annual Industry Day in Yellowknife (or virtually when in-person restrictions are in effect) and informs the local business community of upcoming opportunities. The MCM also meets with Indigenous business development corporations to determine future interests / capacities and to encourage them to prepare for upcoming contracting opportunities either on their own or via Joint Ventures. If there are two or more Indigenous businesses in the local area that can do the work, Parsons releases work packages via the Procurement Strategy for Indigenous Business (PSIB information provided below on recent PSIB changes (section 8.2)), which restricts bidding on the contract only to Indigenous businesses across Canada.</p> <p>Though the MCM cannot tell its contractors who to hire, they do establish mandatory local Indigenous training, employment, and procurement requirements for each contract, called Indigenous Opportunity Considerations (IOC). IOCs are local because they are geographically restricted to the GMRP's contract area, which is within the combined territories of Mōwhi Gogha Dè Nīṭāèè, as defined in the Tłıchǫ Land Claims and Self-Government Agreement, and the Akaitcho Asserted Territory, as defined in the Akaitcho Interim Measures Agreement. When bids are evaluated, bidders receive points for committing to train and employ local Indigenous persons. Prior to starting work and throughout the contract's length, the MCM works closely with each contractor to make sure that they meet or exceed their commitments.</p>
<p><b>Safety of Workers on Site</b></p> <p>Members of the public along with rights holders and stakeholders have raised questions about how safe they and their loved ones will be should they be hired on site. The Project has determined this concern is in regards to both exposure to arsenic trioxide, as well as general construction/mine workplace safety.</p>	<p><b>Arsenic:</b></p> <p>Workers on site are required to participate in routine urinalysis for the purpose of screening arsenic levels. Mitigation measures are in place and enforced by the MCM should a worker's levels start trending higher. The MCM has implemented an "Arsenic Awareness Week" annually to provide workers with more information.</p> <p><b>Operational Health &amp; Safety:</b></p> <p>The MCM is responsible for setting the site standards that all subcontractors on site are expected to achieve. A Daily Mine Manager's meeting is held for all subcontractor leadership to discuss workflow for the day, including sharing of incidents/near miss/ hazard identification learnings and generally ensure there is open communication site-wide.</p> <p>All subcontractors hold their own daily and weekly safety meetings that are mandatory for all personnel on site. A large television was installed in the C-Dry building foyer, above the safety board, with rotating site notifications and safety messages.</p> <p>The GMRP has a joint Health and Safety Committee with representatives from all contractors (employees and management) to address any safety concerns and bring ownership to the field, encouraging a proactive safety culture.</p> <p>The Site Safety Manager for the MCM is currently drafting a PPE and Site Safety presentation that will be brought to rights holders who have expressed concern. A community meeting for the YKDFN and Łutsel K'e Dene First Nation (LKDFN) is being planned in 2023-24 for this presentation and an opportunity to ask questions.</p>

## Next Steps

The GMRP will continue to host community forums for YKDFN, NSMA, and residents of Yellowknife to engage with the external advisory bodies, and to communicate in a frequent and transparent manner via the established channels (e.g., e-newsletter, website, X, radio, school outreach). Some meetings will continue to be held virtually (e.g., Giant Mine Working Group meetings), while some meetings will be in-person (e.g., YKDFN Community Meeting). Engagement activities for 2023-24 will focus on:

- **Borrow Engagement:** the YKDFN Aquatic Advisory Committee members requested that the borrow areas and the plans for blasting be discussed with the community. This is planned for 2023.
- **Aquatic Engagement:** engagement with the Aquatic Advisory Committee planned for 2023 includes a meeting on the AEMP, and discussions on the Fisheries Authorization Application.
- **Management and Monitoring Plan, Design Plans, and Closure Criteria:** engagement will continue on these items for various site requirements.
- **Site-Wide Revegetation:** the Project team plans to develop an internal Revegetation Task Force. The purpose of this Task Force is to determine the next steps for engagement on revegetation. Future engagement will take place and will be decided on by the internal task force.
- **Dust Communications Strategy:** the Dust FAQs will be used to develop communications products for future engagement meetings.
- **Education Initiatives:** meetings will continue to take place with rights holders in 2023 to include community consultation and engagement to develop curriculum resources. The Project team will continue classroom visits and student site tours as requested.
- **Community Events:** the Project team will have a booth set up at the Yellowknife Spring Tradeshow in May 2023 and will hold the annual public forums for the general community, NSMA, and YKDFN.



### 8.1.2. Incorporation of Traditional Knowledge (TK)

The YKDFN and the NSMA have developed and shared extensive knowledge of the Giant Mine site and surrounding area. Engagement with Indigenous Organizations (rights holders) is part of the 26 measures listed in the Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013) to mitigate negative environmental impacts, and address public concerns. As a result, incorporating TK into planning and work on-site was a requirement for obtaining the Water Licence. While some TK has been incorporated in GMRP activities to date (e.g., to help determine the best time of year to deconstruct buildings), the Team acknowledges that there is always a need for continual improvement for the incorporation of TK and community perspectives within Project initiatives.

- **In 2018-19**, YKDFN Lands and Environment completed TK Study, which aimed at documenting YKDFN knowledge, values, priorities, concerns, perceptions of risk, and understanding of impacts to past and current land use (Yellowknives Dene First Nation & Trailmark Systems, 2019).
- **In 2019-20**, the NSMA completed a TK study “Summary of Traditional Land-Use by the Indigenous Métis People in the Yellowknife Bay Area” (Shin Shiga Consulting, 2020).
- **In 2020-21**, the Project team completed an Archaeological Impact Assessment. The YKDFN participated in a multi-day walkthrough of the site, providing TK on areas of Traditional Land Use. An NSMA elder provided TK via telephone and an NSMA member did a one-day visit to key areas. In addition, the GMRP gathered traditional and local knowledge through the Aquatic Advisory Committee, which has influenced Project remediation activities.
- **In 2021-22**, the Project team collaborated with the YKDFN to develop and finalize the YKDFN TK brochure that depicts history of the YKDFN around the Giant Mine, as well as Yellowknife Bay. With permission from the YKDFN, the TK brochure is now being utilized as a cultural awareness component of the Giant Mine site orientation and in various locations around the communities.
- **In 2022-23**, the Project team began discussions with YKDFN members to support the creation of a Traditional Knowledge video which will discuss the way the land at site was used prior to mining activities. This video will be used in orientations for new members at the GMRP site.
- A Traditional Knowledge Study for the Tłıchǫ was funded by GMRP and completed in early 2023. The findings of the study were presented to elders and youth on April 6th, 2023, by Two Worlds Consulting.

#### Ultimately, the goal of this information is to:

- Enable the inclusion of YKDFN and NSMA knowledge and perspectives into the Giant Mine Remediation Project and its risk assessment;
- Support to develop a cultural video to reflect the outcomes of the TK study;
- Support YKDFN and NSMA values and future land use aspirations; and,
- Recognize the history of the YKDFN and NSMA within Project presentations and materials where relevant.

## 8.2. SOCIO-ECONOMIC

The Project team has been guided by a Socio-Economic Strategy (the Strategy) since 2016. The purpose of the Strategy is to provide guidance to the GMRP team for identifying and delivering socio-economic benefits to the region, while minimizing and mitigating potential negative social impacts associated with the Project. The Project team led a comprehensive update to the Strategy in 2022-23, integrating feedback from rights holders and stakeholders from the past five years. The overall aim of the updated 5-year (2023-2028) Strategy is to maximize socio-economic benefits for Northerners and Indigenous Peoples and to deliver on regional socio-economic commitments and requirements. This socio-economic aim is supported by three pillars:

### EMPLOYMENT & PROCUREMENT

### TRAINING & CAPACITY DEVELOPMENT

### SOCIAL IMPACT MANAGEMENT

The Strategy describes the objectives, focus areas, desired outcomes, indicators, and targets under each pillar. A Plain Language Summary of the Strategy can be found here: <https://www.rcaanc-cirnac.gc.ca/eng/1566487546150/1618357081011>.

The Strategy is dynamic and will continue to evolve as the Project changes over time and responds to successes and challenges. The Project anticipates a full Strategy review and revision leading up to March 2028. The Project may also make additional revisions part-way through the five-year timeline as part of its adaptive management approach.

## 2022-23 HIGHLIGHTS

- The Project team finalized a revised five-year Socio-Economic Strategy through engagement with the Socio-Economic Working Group and the Socio-Economic Advisory Body.
- The Socio-Economic Working Group and the Socio-Economic Advisory Body continued to provide expertise and support to advance implementation of the Socio-Economic Strategy.
- The Project team met with the Giant Mine Oversight Board once to discuss their recommendations on socio-economic analysis and reporting and continues to keep open communication with GMOB to provide requested statistics. GMOB also attended all of the Socio-Economic Working Group and Socio-Economic Advisory Body meetings.
- The Project team and the NSMA signed a Community Benefit Agreement on March 6, 2023.
- Funding for training has been committed by the Project as part of the Community Benefit Agreement for YKDFN's Dechłta Nàowo program and most recently for the NSMA. Project provides annual funding to Tłıchq for training and long-term training plans will form part of an Economic Benefits Agreement that is currently in negotiations with the First Nation.
- Female employment increased from 20% in 2021-22 to 22% in 2022-23 which remains within the target range of 15-30%.
- The proportion of expenditures with Northern suppliers reached 61% of all the Projects expenses. The results are also



higher than previous reported years (59% in 2021-22, 44% in 2019-20, 56% in 2018-2019).

- In 2022-23, GMRP obtained the highest training numbers registered. The total number of people trained (377) is 11% greater than the previous year (335 in 2021-22, 228 in 2022-21, and 230 in 2019-20).

## 8.2.1. Socio-Economic Governance

To enhance coordination and preparedness for socio-economic benefits, the Project team established the following advisory and coordinating bodies in 2018-19:

- **Socio-Economic Advisory Body:** The Socio-Economic Advisory Body provides strategic advice to the Socio-Economic Working Group and acts as senior government champions for the implementation of the Socio-Economic Working Group's approach. The Advisory Body is chaired by the Northern Contaminated Sites Program Director General and is comprised of senior level representatives from Alternatives North, Canadian Northern Economic Development Agency, CIRNAC, City of Yellowknife, GNWT (Environment and Climate Change, Industry Tourism and Investment, and Education, Culture and Employment), PSPC, Service Canada, NSMA, YKDFN, and Tłıchq. The Giant Mine Oversight Board acts as an observer.
- **Socio-Economic Working Group:** The Socio-Economic Working Group coordinates and integrates socio-economic activities for the Project. This working group shares information and seeks opportunities to improve collaboration, as well as reports to and seeks advice from the Socio-Economic Advisory Body on the implementation approach. It usually meets every two months. Its membership includes representatives of, CIRNAC, City of Yellowknife, GNWT (Environment and Climate Change, Industry Tourism and Investment, and Education,

Culture and Employment), Parsons (MCM), PSPC, NSMA, Tłıchq, and YKDFN. The Project engages representatives of the Canadian Northern Economic Development Agency, and GNWT Health and Social Services on a case-by-case basis. The Giant Mine Oversight Board continues to act as an observer to the Socio-Economic Working Group.

In 2022-23, the Socio-Economic Working Group met virtually, via Teams, every 2-3 months. The Advisory Body met twice (August 2022, a virtual meeting, and February 2023, a hybrid meeting). Both committees are managed by external facilitators.

### 8.2.1.1. Community Benefits Agreements (CBA)

The GMRP worked with the YKDFN to develop a Community Benefits Agreement. This Agreement was signed in August 2021 and outlines how the Project team and the Yellowknives Dene are working together to help the First Nation achieve socio-economic benefits from the Project, including a commitment to negotiate a future Procurement Framework Agreement. The CBA also details how the Project team and the YKDFN will work together to enable training and capacity building activities; health studies; socio-economic planning and reporting; socio-economic development; environmental monitoring; and, perpetual care planning.

In March 2023, a CBA was also signed with the NSMA and GMRP. This agreement outlines how the Project team and the NSMA are working together to help them achieve socio-economic benefits from the Project. The CBA also details how the Project team and the NSMA will work together to enable training and capacity building activities.

In 2022-23, negotiations were happening for YKDFN's and Tłıchq's Procurement Framework Agreements. The Procurement Framework Agreement with YKDFN is scheduled to be signed 2023-24.

## 8.2.2. Employment and Procurement

Providing access to employment and procurement opportunities is one of the Projects' key approaches to maximize Northern and Indigenous benefits. Table 9 below summarizes the employment and procurement activities that the Project advanced and/or completed in 2022-23.

Table 9: Key Actions and Deliverables Advanced in 2022-23 – Employment and Procurement

	Action	Deliverable
Employment	<b>Monitor projected labour demand to inform risks and opportunities associated with the GMRP schedule</b>	<p><b>Labour Demand Forecasts:</b> Parsons' Constructability Review Team completed the Labour Demand Forecasts for the Project's Implementation Phase; Project team has been sharing these forecasts with the public since Summer of 2022.</p> <p><b>Recruitment Support:</b> The Project team and Parsons attended the Yellowknife Spring Trade Show. Parsons attended YKDFN's Annual Career Fair and the NWT Chamber of Commerce Trade Show in 2022-23.</p> <p><b>Link with Other Large Infrastructure Projects:</b> The Project updated and summarized a list of existing and anticipated major projects, based on information provided by the City of Yellowknife and light research. Project team members met with the City of Yellowknife to discuss the summary.</p>
	<b>Enhance Apprenticeship / Trainee uptake</b>	The Project team continually works with GNWT's department of Employment, Culture and Education and training institutions to stay up to date on availability of apprentices in the Territory. Parsons continues to review this information and make calculated recommendations on inclusion of apprentices in upcoming contracts. Parsons does this for every single contract and adjusts based on most recent information available.
Procurement	<b>Modify Procurement Tools to maximize local and Indigenous participation</b>	The GMRP adjusted the Procurement Strategy for Indigenous Businesses (PSIB) by adding a regional component to it. In the past, contracts issued as PSIB were open only to Indigenous businesses across Canada. However, a regionally restricted PSIB will be open only to Indigenous businesses within the Project's Area of the Contract, which is a combination of Mōwhi Gogha Dè Nīitāèè area, as defined in the Tłıchq Land Claims and Self Government Agreement, and the Akaitcho Asserted Territory, as defined in the Akaitcho Interim Measures Agreement.
	<b>Determine best approach to right-size contracts and timing to maximize local Northern and Indigenous procurement</b>	<p><b>Right-size contracts:</b> The Project carefully considers the size of each of its contracts to ensure it is 'right-sized'; for example, the bear monitoring contract continued to remain as a separate wildlife monitoring contract from other security/C&amp;M contracts. The contract was awarded to Ek'edia Services (YKDFN family-owned business) and was originally established on May 12, 2021, but was extended to March 31, 2027. The size of contract is one important consideration that the MCM integrated into the development of the Project Implementation Plan's design and construction work packages.</p> <p><b>Procurement Strategy for Indigenous Business (PSIB):</b> The Project team released one work package that was set aside as PSIB in 2022-23 (Townsite Deconstruction - \$6.7M) and extended two contracts that had previously been awarded under PSIB (Early Works Backfill - \$39.7M total contract value; Surface Care and Maintenance - \$15.3M total contract value).</p>
	<b>Engage with Northern and Indigenous businesses ahead of formal procurement processes to improve their preparedness for upcoming contracts</b>	<p><b>Industry Day:</b> Parsons held a multi-day in-person Business Preparedness Conference (Industry Day) in November 2022 in Yellowknife; the session focused on upcoming work packages, including scope, labour &amp; equipment requirements, and tentative schedule.</p> <p><b>Bilateral meetings:</b> Parsons' Economic Development Manager met with a variety of rights holders and stakeholders, including Indigenous business development arms, throughout 2022-23.</p>

## 2022-23 Employment Results and Results Compared to Target Ranges

The GMRP tracks several employment statistics, including total employment and employment by certain categories, namely Northern, Indigenous, IOC, and Female employees. The tracking of employment statistics has evolved over time, informed by input from GMOB and engagement with the Socio-Economic Working Group and Advisory Body on the development of key performance indicators.

The Project reports the employment statistics for Parsons (the Main Construction Manager) and its contractors, CIRNAC contractors, and combined data. Parsons and its contractors provide on-site/ local employment, while CIRNAC contractors tend to be large engineering and consulting firms that provide Project design support.

In 2019-20, the Project approved a set of employment target ranges for the Implementation Phase of the Project, through extensive engagement with the Socio-Economic Working Group and the Socio-Economic Advisory Body. In response to a request made by GMOB and other stakeholders, the annual report continues to compare target ranges to actual employment performance.

Table 10 shows the combined statistics for the project's employment with target ranges set for Northerners, Northern Indigenous and female employees. In addition, Figure 9 and Figure 10 provide information on key trends of the Total Number of Persons and Total Person Hours, by Category, since 2018-19. These results represent the combined data reported by both CIRNAC and Parsons.

*Table 10. Total Number of Persons and Total Person Hours and target ranges (Parsons and CIRNAC and their contractors) for 2022-23, by Category*

Employee type*	Total # persons (incl. contractors)	Total person-hours	Persons as % of all employees	Person-hours as % of all person-hours	Person-hours Target Ranges for the Implementation Phase	Results Gap compared to targets
<b>Total</b>	<b>1306</b>	<b>378,341</b>	<b>100%</b>	<b>100%</b>	<b>-</b>	<b>-</b>
Northern employees	307	135,993	24%	36%	55-70%	19-34%
Southern employees	999	242,348	76%	64%		
Indigenous employees (Northern and Southern)	148	67,676	11%	18%	-	-
- Northern Indigenous	130	59,951	10%	16%	25-35%	9-19%
IOC employees	107	55,272	8%	15%	-	-
Female employees	373	85,025	29%	22%	15-30%	Within range

\*Employee categories might overlap – each category is a subset of Total employees (e.g., the same person may be represented here twice if they are an Indigenous female employee).

Figure 9: Persons as % of all Employees by Category from 2018-19 to 2022-23

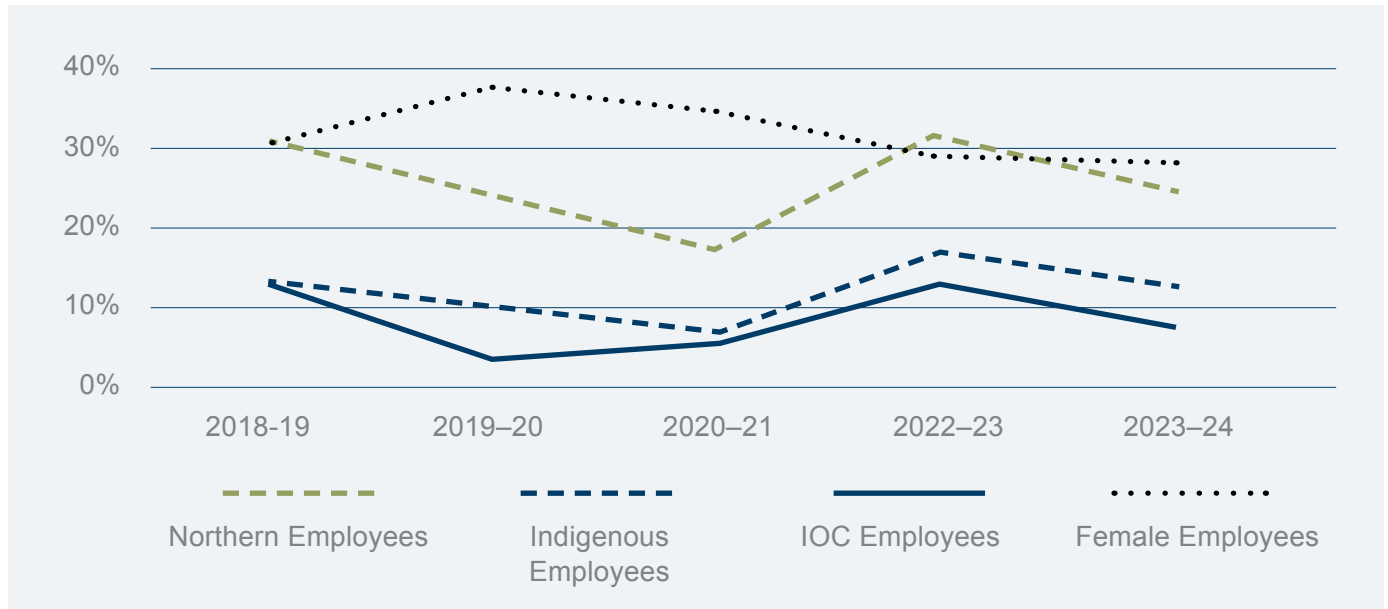
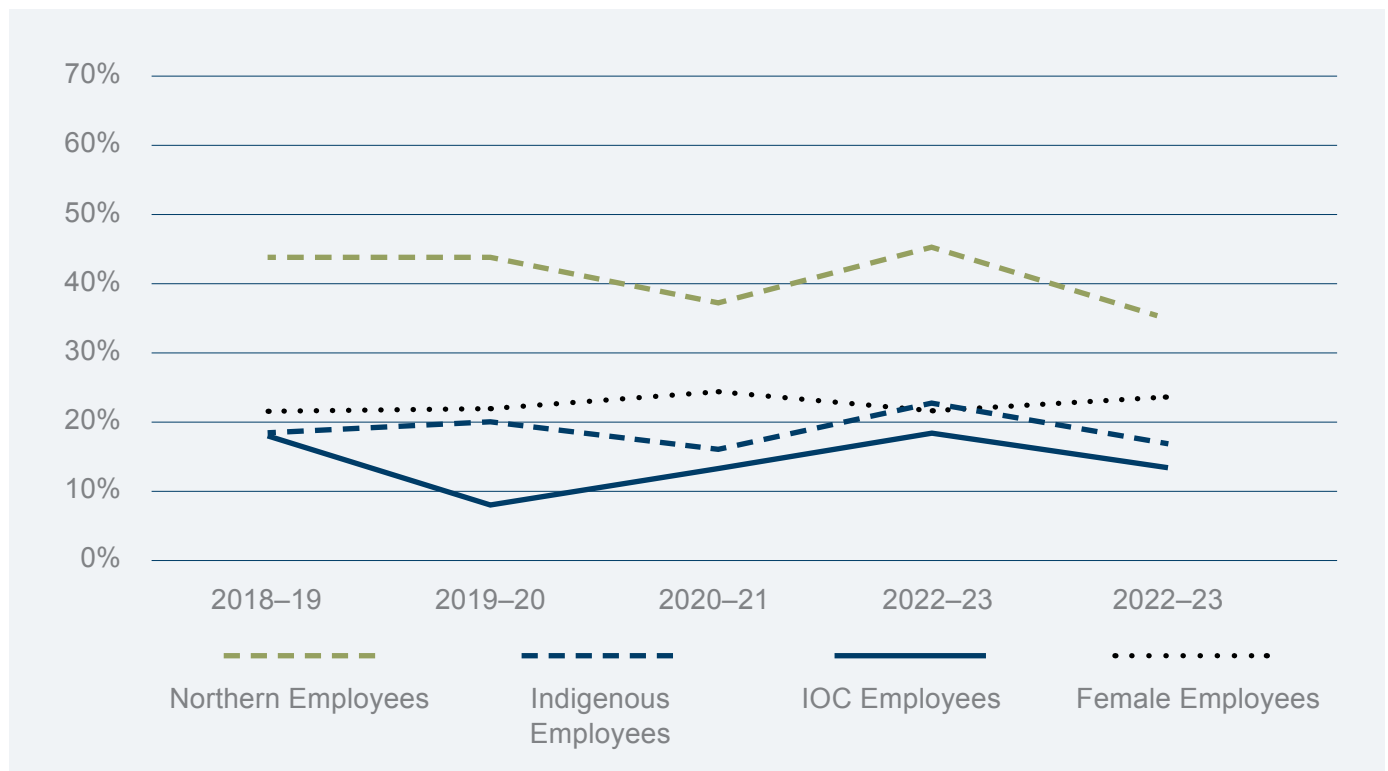


Figure 10: Percentage of Person Hours by Category from 2018-19 to 2022-23



As indicated in Figure 10 above, in 2022-23, the percentage of person-hours worked for Northern employment reached 36%, which is lower than the 2021-22 percentage (46%). The results are still below the lower end of the target range (55-70%).

Indigenous employment decreased slightly from 2021-22 (77,103) to 2022-23 (67,676). Indigenous employment accounted for 18% of total person-hours worked in 2022-23, a 3% decrease compared with the 2021-22 results (21%). IOC employment decreased slightly from 18% in 2021-22 to 15% in 2022-23. Northern Indigenous Employees, included in Table 10 but not in the figures above, represented 16% of all employees (in person hours). Results are still below the end target set for Northern Indigenous Employment (25%).

Female employment increased from 20% in 2021-22 to 22% in 2022-23. Employment of women is within the target range of 15-30%.

Table 11 presents the employment statistics for Parsons and its contractors for 2022-23 and Table 12 shows the employment statistics for CIRNAC and its contractors.

*Table 11: Total Number of Persons and Total Person Hours and target ranges (Parsons and Parsons' contractors only) for 2022-23, by Category*

Employee type*	Total # persons (incl. contractors)	Total person-hours	Persons as % of all employees	Person-hours as % of all person-hours
<b>Total</b>	<b>678</b>	<b>256,259</b>	<b>100%</b>	<b>100%</b>
Northern employees	273	128,447	40%	50%
Southern employees	405	127,812	60%	50%
Indigenous employees (Northern and Southern)	142	66,490	21%	26%
- Northern Indigenous	128	59,503	19%	23%
IOC employees	107	55,272	16%	22%
Female employees	114	45,693	17%	18%

\*Employee categories might overlap – each category is a subset of Total employees (e.g., the same person may be represented here twice if they are an Indigenous female employee).

*Table 12: Total Number of Persons and Total Person Hours and target ranges (CIRNAC contractors only) for 2022-23, by Category*

Employee type*	Total # persons (incl. contractors)	Total person-hours	Persons as % of all employees	Person-hours as % of all person-hours
<b>Total</b>	<b>628</b>	<b>122,082</b>	<b>100%</b>	<b>100%</b>
Northern employees	34	7,546	5%	6%
Southern employees	394	114,536	95%	94%
Indigenous employees (Northern and Southern)	6	1,185	1%	1%
- Northern Indigenous	2	448	0%	0%
IOC employees	0	0	0%	0%
Female employees	259	39,332	41%	32%

\*Employee categories might overlap – each category is a subset of Total employees (e.g., the same person may be represented here twice if they are an Indigenous female employee).



Employment metrics are influenced by the type of contract and by the phase of the Project. While Parsons and their contractors focus on operations and on-site work, CIRNAC contractors are largely off-site engineering design work. The Project anticipates that the Northern and Northern Indigenous employee statistics will continue to improve during the Implementation Phase of the Project as the demand for on-site work will increase. The Project team is also committed to continue to work with its partners to identify and implement actions within the Implementation Plan to further increase employment of Northerners, Indigenous peoples, and women overall.

Table 13 highlights employment statistics broken down by Northern sub-category, including Indigenous status (Indigenous and non-Indigenous) and whether they represent female or male employees. Figure 11 presents key trends for employment across Indigenous/non-Indigenous women and men working on the Project for the past three years.

Table 13: Employment – total number of persons and person-hours, by Northern sub-category (Parsons and their contractors), in 2022-23.

Category	Metrics	2022-23 Data	% of Total
Total Employment	# persons	678	100%
	p-hrs	256,259	100%
Northern Indigenous Women	# persons	19	3%
	p-hrs	7,816	3%
Northern non-Indigenous Women	# persons	29	4%
	p-hrs	13,322	5%
Northern Indigenous Men	# persons	109	16%
	p-hrs	51,688	20%
Northern non-Indigenous Men	# persons	116	17%
	p-hrs	55,622	22%

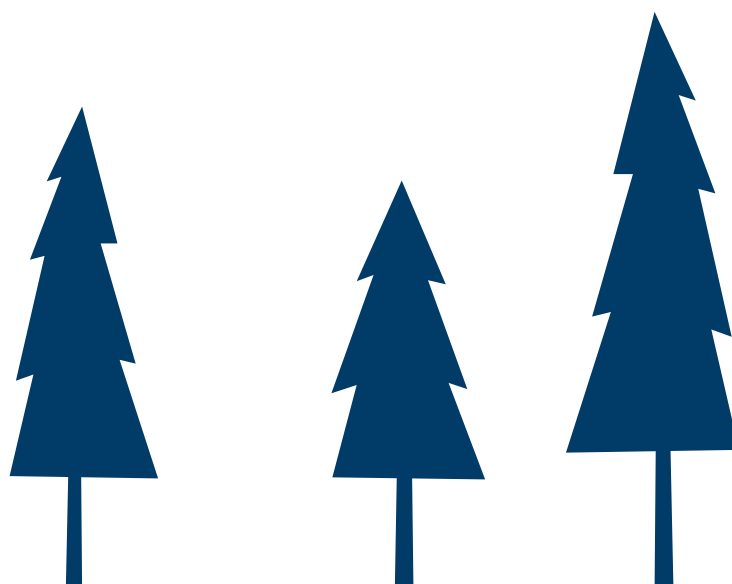


Figure 11. Percentage of employment by Northern sub-category (Parsons and its contractors), from 2020-21 to 2022-23.

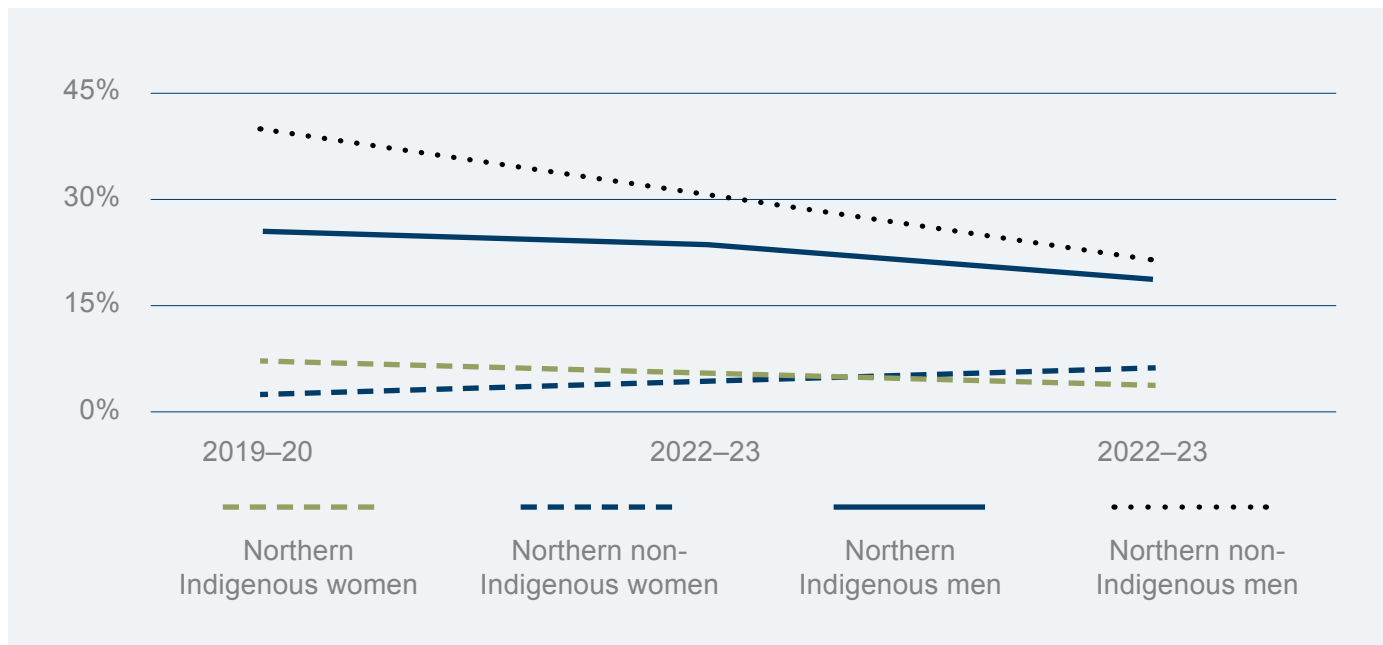


Table 14 highlights the employment statistics broken down by skill level for total employment, Northern Indigenous/non-Indigenous, Indigenous, and female employees for Parsons and its contractors only (i.e., the percentages are the percentage of employment from the Parsons' totals, not the combined totals).

Table 14. Number of employees and skill level by category in 2022-23 (Parsons and its contractors)

Skill level	Total Employment (% of total)	Northern	Indigenous (Northern and Southern)	Women
<b>TOTAL Parsons</b>	<b>678 (100%)</b>	<b>273 (40%)</b>	<b>142 (21%)</b>	<b>114 (17%)</b>
Entry-level	53 (8%)	40 (15%)	35 (25%)	10 (9%)
Semi-skilled	104 (15%)	74 (27%)	37 (26%)	21 (18%)
Skilled	364 (54%)	111 (41%)	57 (40%)	29 (25%)
Professional	157 (23%)	48 (18%)	13 (9%)	54 (47%)

In previous years, the NWT Residential status only included data from Parsons and its contractors. In 2021-22 there were 319 (50%) NWT resident employees and 319 (50%) non-NWT resident employees.

In 2022-23 the NWT Residential status information includes CIRNAC contractors, Parsons employees and Parsons' contractors. In 2022-23, the number of NWT residents accounted for 22% of employees (252 individuals from Parsons and its contractors plus 33 individuals from CIRNAC contractors) and non-NWT residents accounted for 78% of employees (426 individuals from Parsons and its contractors plus 589 individuals from CIRNAC contractors; Table 15).

Table 15: NWT Resident status (total # and %) (Combined Parsons and CIRNAC and its contractors) in 2022-23

Status	Total # persons	Persons as % of all employees
NWT Resident	285	22%
Non-resident	1,015	78%

## 2022-2023 Procurement Results and Results Compared to Targets

### 8.2.2.1. Suppliers Statistics

The GMRP tracks the total number of suppliers and the total value of contracts by four categories: Northern, Southern, Indigenous and IOC. It is important to note that these categories might overlap in some instances. For example, a single supplier may simultaneously be counted as Northern, Indigenous, and IOC – or a combination thereof, and that category information was not available for all suppliers. For these reasons, the totals indicated in the top row of the table do not represent the sum of the proceeding rows. Table 16 shows the combined procurement statistics for Parsons and CIRNAC and compares the actual contract values (%) to the targets.

Table 16. Total Number of Suppliers and Total Value of Contracts (Combined Parsons and CIRNAC and its contractors), in 2022-23, by Category

Supplier type	# suppliers	\$ spent	% of total \$ spent	Target for procurement expenditures	Gap
<b>Total</b>	<b>830</b>	<b>\$96,328,125</b>	<b>100%</b>	-	-
Northern suppliers	308	\$58,306,624	61%	65-75%	4-14%
Southern suppliers	522	\$38,021,500	39%	-	-
Indigenous suppliers	59	\$50,714,487	53%	-	-
IOC suppliers	40	\$50,361,215	52%	-	-

Figure 12 and Figure 13 summarize the total number of suppliers and percent of total value of contracts, by Category, for 2018-19 to 2022-23. These results represent the combined data reported by both CIRNAC and the MCM.

Figure 12: Total Number of Suppliers from 2018-19 to 2022-23

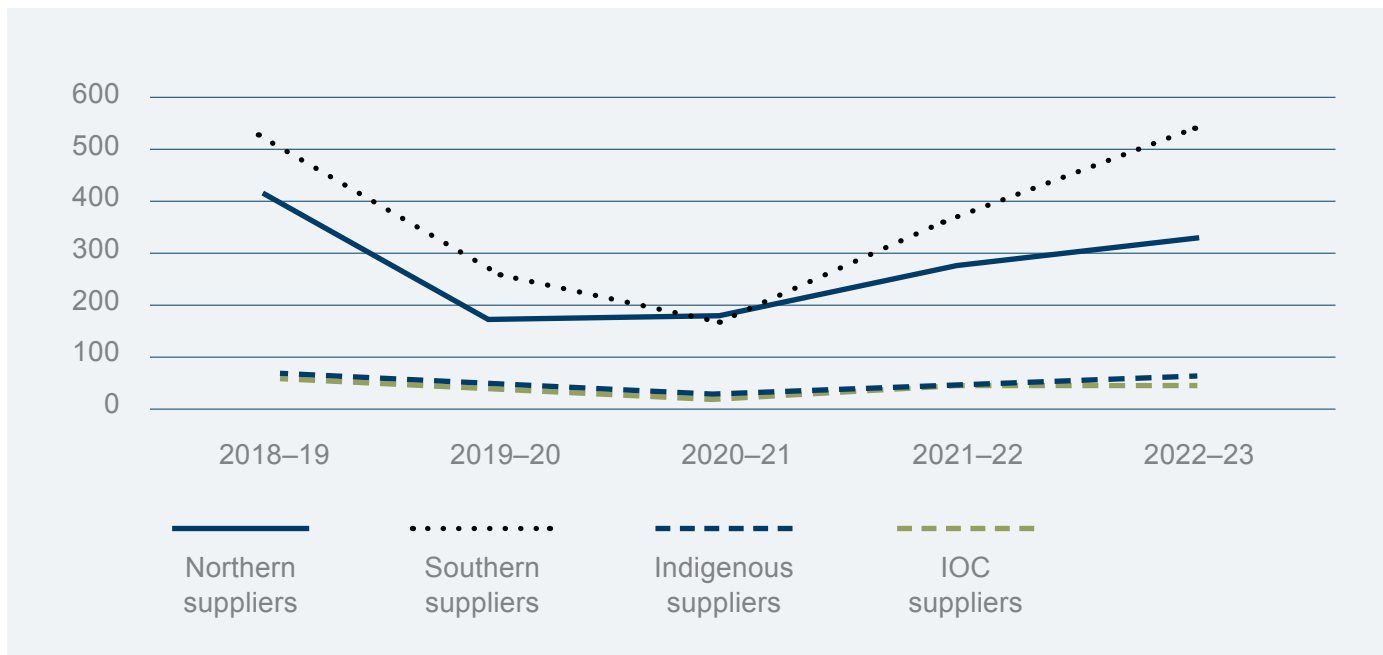
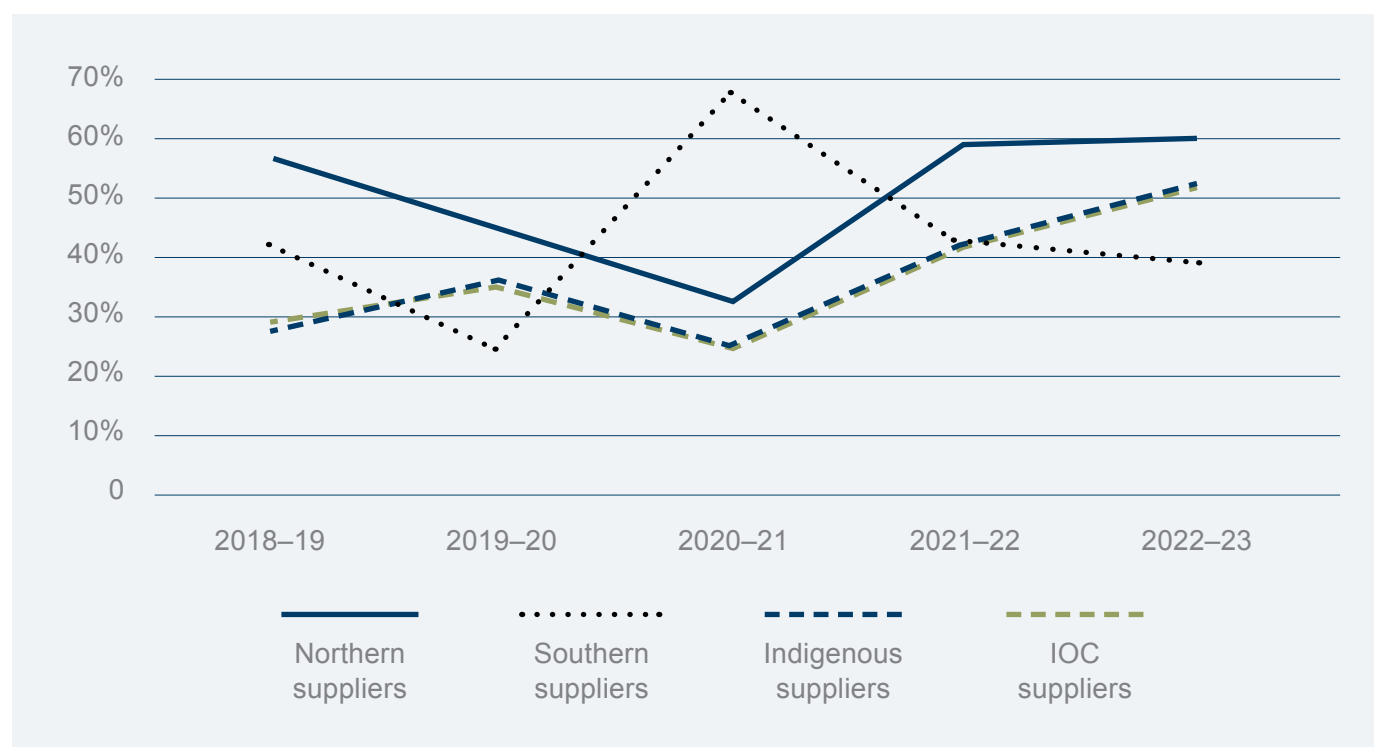


Figure 13: Percent of Total \$ Value Spent from 2018-19 to 2022-23



The proportion of expenditures with Northern suppliers reached 61% of all the Projects expenses. The results are also higher than previous reported years (59% in 2021-22, 44% in 2019-20, 56% in 2018-2019). Despite the significant increase in procurement through northerner suppliers observed in 2022-23, values are still below the target range (65-75%).

The proportion spent with Indigenous suppliers increased to 53% in 2022-23, and expenditures increased to \$50,714,487 in 2022-23 compared to \$30,564,330 in 2021-22. The proportion spent with IOC suppliers followed a similar trend, from 41% in 2021-22 to 52% in 2022-23, which is the highest result achieved compared to previous years (24% in 2020-21, 35% in 2019-20, 28% in 2018-19). There are no targets set for expenditure with IOC suppliers.

Table 17 and Table 18 provide separated statistics for Parsons and its contractors and CIRNAC contractors.

Table 17: Total Number of Suppliers and Total Value of Contracts (Parsons and its contractors), in 2022-23, by Category

Supplier type	# suppliers	\$ spent	% of total \$ spent
<b>Total</b>	<b>456</b>	<b>\$72,713,718</b>	<b>100%</b>
Northern suppliers	201	\$57,211,579	79%
Southern suppliers	255	\$15,502,138	21%
Indigenous suppliers	47	\$50,525,488	69%
IOC suppliers	39	\$50,195,317	69%

Table 18: Total Number of Suppliers and Total Value of Contracts (CIRNAC contractors), in 2022-23, by Category

Supplier type	# suppliers	\$ spent	% of total \$ spent
<b>Total</b>	<b>374</b>	<b>\$23,614,407</b>	<b>100%</b>
Northern suppliers	107	\$1,095,045	5%
Southern suppliers	267	\$22,519,362	95%
Indigenous suppliers	12	\$188,999	1%
IOC suppliers	1	\$165,898	1%

As highlighted above under the Employment section, it is important to note the distinction between the results of Parsons and their contractors (i.e., on-site work) and CIRNAC contractors (largely engineering design work) when considering these results.

### 8.2.2.2. Major Procurements

The major procurements awarded between April 1, 2022, and March 31, 2023, are included in Table 19 below. Some of the values are contract extension amounts (i.e., a contract had been awarded in a previous fiscal year, and it includes the value and duration of extension), while others are for single or multi-year contracts starting in 2022-23.

Table 19: Major work packages awarded by Parsons in 2022-23

Value	Scope of work	Awarded to:
\$82,657,660	<b>Early Works Backfill:</b> From July 31 2021 to November 2024*	Nahanni Construction Ltd.
\$6,707,061	<b>Townsite Deconstruction:</b> From June 6, 2022 to September 6, 2023*	Metcor/QM Environnemental Joint-Venture
\$1,774,350	<b>South Pond Dewatering Trial:</b> From August 22, 2022 to September 30, 2022	Nahanni Construction Ltd.
\$1,686,590	<b>Landfill Operation:</b> From June 6, 2022 to October 31, 2022	True North Environmental Ltd.

\*Note: PSIB awarded



### 8.2.2.3. Additional Procurement Key Performance Indicators

Additional procurement Key Performance Indicators include:

- Procurement accounted for by:
  - Northern Indigenous suppliers and amount spent (#,\$,%)
  - Northern Non-Indigenous suppliers and amount spent (#,\$,%)
- New Northern joint ventures or partnerships established to provide services to the Project (#):
  - A joint-venture was formed – Metcor & QM Environmental Joint Venture, which won the Townsite Deconstruction package in June 2022.

Table 20 highlights the procurement accounted for by Northern Indigenous and by Northern non-Indigenous suppliers for 2022-23.

*Table 20: Procurement accounted for by Northern Indigenous and Northern Non-Indigenous suppliers (Total number, \$ spent and % of total value spent) (Parsons and CIRNAC) for 2022-23*

Supplier type <sup>10</sup>	# suppliers	\$ spent	% of total \$ spent
Northern Indigenous suppliers	54	\$50,707,605.00	87%
Northern non-Indigenous suppliers	254	\$7,599,019.00	13%

In addition, the Project has committed to report on the total IOC bonuses issued for surpassing IOC commitments and total IOC deductions issued for not meeting IOC commitments, as specified in contracts. 2021-22 is the first year of reporting. Results for the 2022-23 reporting year are:

- **Total bonuses issued:** \$46,556.43
- **Total deductions issued:** \$53,203.73

Overall, contractors paid a total of **\$6,647.30 in deductions** (bonuses subtracted).

#### Next Steps: Employment and Procurement

The revised Socio-Economic Strategy has identified four focus areas to advance Employment and Procurement, which include:

- **Procurement approaches and tools –** identifying, using, and modifying procurement approaches and tools to increase Indigenous and local participation in the Project,

- **Labour updates and communication –** assessing labour capacity to determine capacity for regional businesses and communities to support Project activities,
- **Outreach and engagement with communities and businesses –** holding regular and ad hoc meetings with communities and businesses to raise awareness of procurement processes and upcoming opportunities, and
- **Participation in major projects coordination –** participating in and supporting collaborative approaches to major project coordination.

The Project will identify, with the Socio-Economic Working Group, specific actions to support the above focus areas through implementation planning in fall 2023.

<sup>10</sup>Note that these categories may overlap.

### 8.2.3. Training and Capacity Building

In addition to the occupational H&S training, GMRP contractors are required to ensure that employees are properly trained to perform their responsibilities. Contractors deliver workforce training, including site orientations. The inclusion of IOC in contracts ensures Indigenous employment and capacity building is considered and implemented where possible by all GMRP contractors.

The table below summarizes the training activities from the Implementation Plan that the Project advanced and/or completed in 2022-23.

Table 21: Key Actions and Deliverables Advanced in 2022-23 – Training

Action	Deliverable
<b>Establish a group dedicated to training coordination</b>	Participants at the February 2020 implementation planning meeting identified the need for a coordinated Training Hub in the North Slave region. The GMRP collaborated with GNWT Education, Culture and Employment to identify the purpose and format of the Hub, with input from the Socio-Economic Working Group. In 2022-23, GNWT continued to work with a third-party organization to establish a virtual platform. Once the platform is up and running, the GMRP will provide information to the coordinators and will stay engaged in the initiative.
<b>Contribute towards strengthening local remediation capacity</b>	Funding for training has been committed by the Project as part of the CBA for YKDFN's Dechjta Nàowo program and most recently for the NSMA. Project provides annual funding to Tłıchq for training and long-term training plans will form part of an Economic Benefits Agreement that is currently in negotiations with the First Nation.
<b>Develop links between training providers, contractors, and the Project</b>	Parsons meets regularly with training providers to receive updates on the training provided and recent graduates. Parsons includes in all Request for Proposals a list of local training institutions, the training they provide, and their contact information. Parsons also meets with contractors prior to and when issuing contracts to ensure they are aware of training providers and what is offered.

## 2022-23 Training Results

The GMRP tracks its workforce training by number of people who have participated in training exercises, as well as the number of person hours. Based on statistics reported by both CIRNAC and the MCM, workforce training for 2022-23 is summarized in Table 22, organized by categories of Northern, Northern Indigenous, Indigenous employees, IOC employees, Women and Total. It is important to note that the total presented in Table 22 does not reflect the sum of the other categories due to overlaps between the categories.

In 2022-23, GMRP obtained the highest training numbers registered. The total number of people trained (377) is 11% greater than the previous year (335 in 2021-22, 228 in 2022-21, and 230 in 2019-20). Workforce training provided to Northern employees (191 people) was a slight decrease from the previous year (250 in 2021-22). Workforce training for IOC employees decreased from 127 in 2021-22 to 71 in 2022-23. Female employees decreased slightly from the previous year to 68 (74 in 2021-22).

Table 22: Total Number of People Trained and Total Person Hours of Training in 2022-23, by Category

Workforce training	Total # persons	Total person-hours	Persons as % of all employees	Person-hours as % of all person-hours
<b>Total</b>	<b>377</b>	<b>30,127</b>	<b>100%</b>	<b>100%</b>
Northern employees	191	22,413	51%	74%
Southern employees	186	7,714	49%	26%
Indigenous employees (Northern and southern)	145	22,032	38%	73%
- Northern Indigenous	135	20,922	36%	69%
IOC employees	71	9,227	19%	31%
Female employees	68	5,040	18%	17%

Note: these categories may overlap

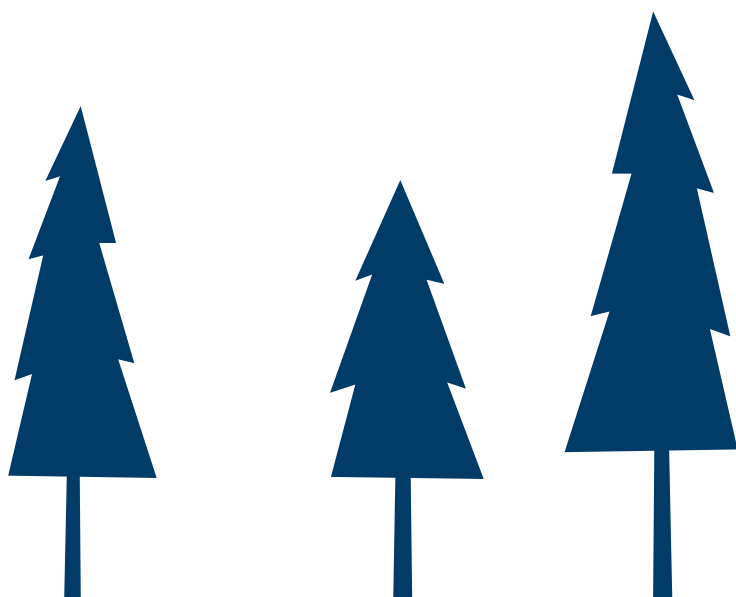


Figure 14 provides trend information on the percentage of people trained by sub-category since 2018-19. There was a notable decrease in the percentage of people trained compared with last year, but fairly consistent percentages from the previous three years (2018-19 to 2020-21). It is unclear why there was an increase across three categories (Northern, Indigenous and IOC) last year. The percentage of trained female employees has trended downward since 2020-21. However, when considering the amount of person-hours of training (as shown in the righthand column of Table 22 above), all categories but female employees are higher/significantly higher than the Southern employees category. These results are consistent with previous years' results (i.e., the amount of training is higher for Northern, Indigenous and IOC employees).

Figure 14: Percentage of People Trained by Employee Group from 2018-19 to 2022-23

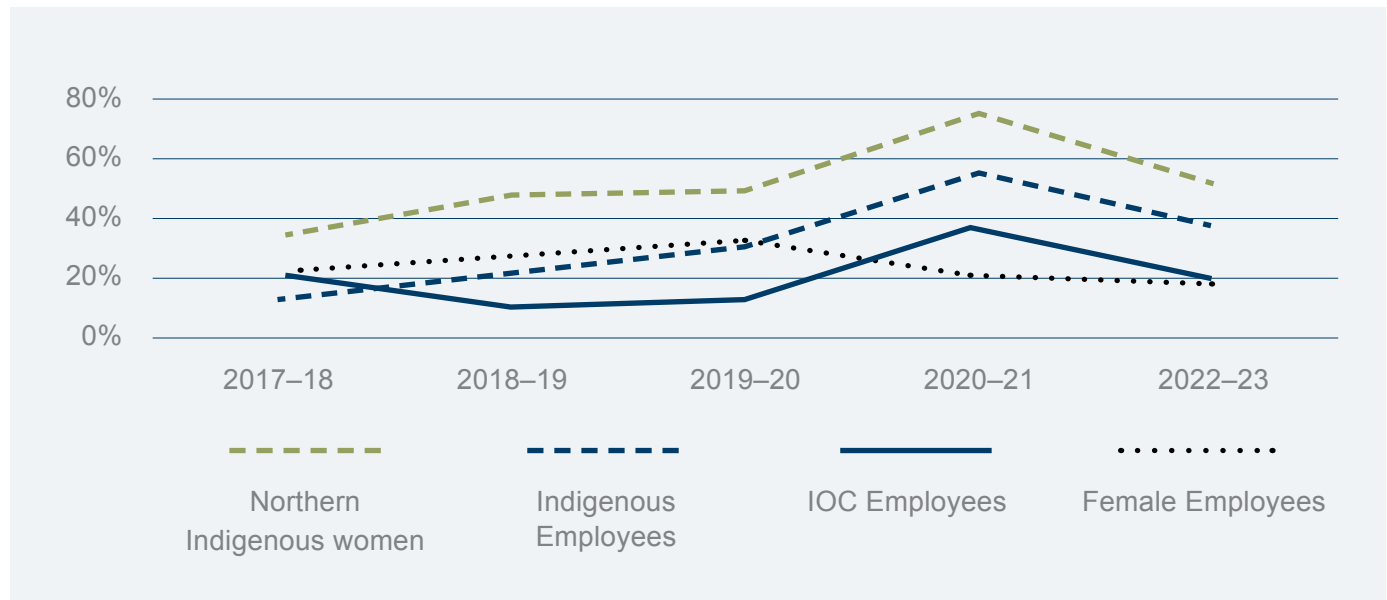
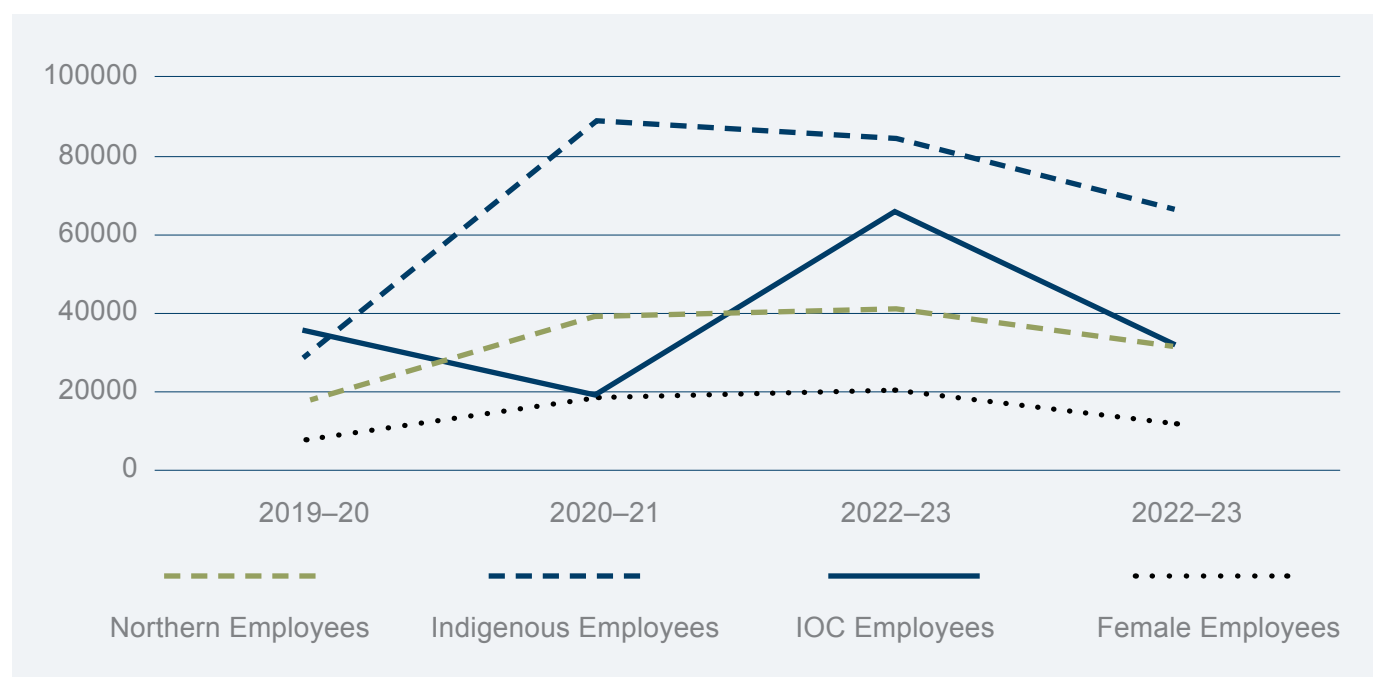


Figure 15 below highlights the number of normalized person-hours of training by employee group from 2019-20 to 2022-23. The number of person-hours of training is normalized by person-hours worked to enable comparison across years, since the total number of training hours may significantly differ over the years. In the past, mandatory training (e.g., first aid, WHIMIS) were excluded from overall calculations of training statistics. To streamline the process, as of 2019-20, all training is now included in calculations of training statistics. Similar to the trends seen in Figure 14 above, there is a decrease across all categories in 2022-23 compared with last year (i.e., more training was provided to Southerners proportionally compared with last year). There are no clear trends across the categories since 2019-20.

Figure 15: Number of Person Hours of Training per 200,000 Person-hours Worked by Employee Group from 2019-20 to 2022-23



### 8.2.3.1. Additional Training Key Performance Indicators

Additional training Key Performance Indicators include:

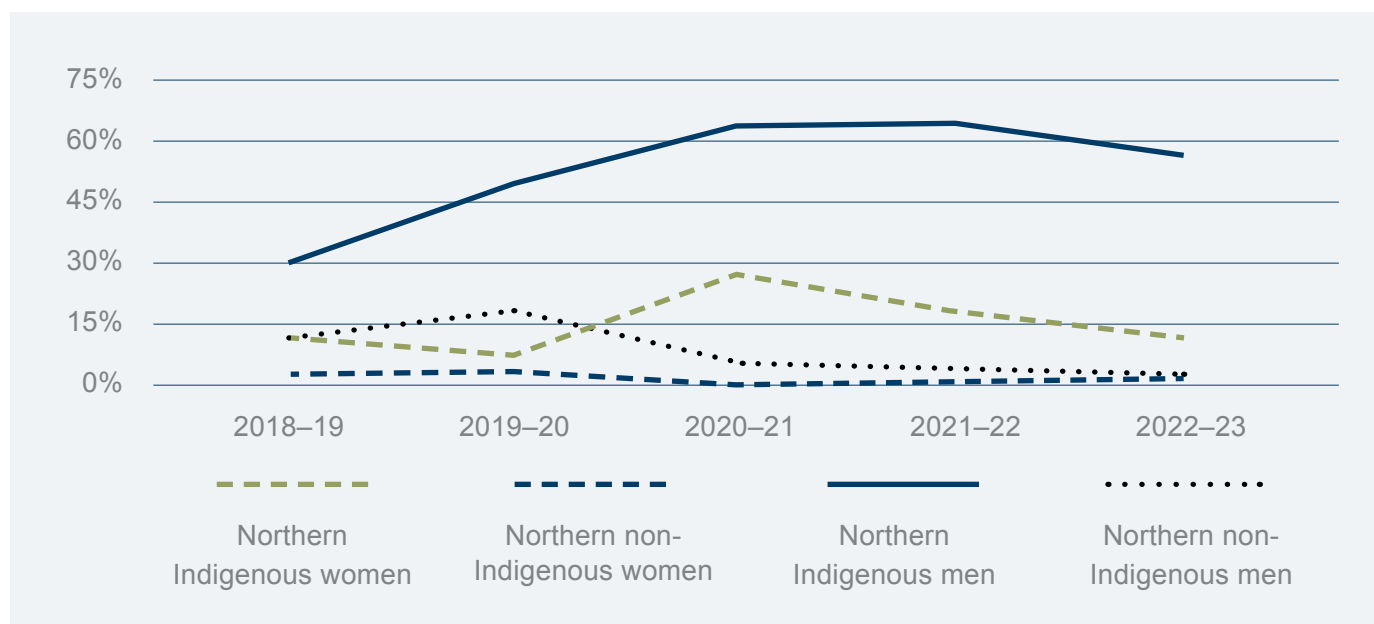
- Workforce training accounted for by (Table 23):
  - Northern Indigenous women (# of persons, p-hrs, %)
  - Northern Indigenous men (# of persons, p-hrs, %)
  - Northern non-Indigenous women (# of persons, p-hrs, %)
  - Northern non-Indigenous men (# of persons, p-hrs, %),
- Trending information on percentage of person-hours accounted by Northern employees;
  - Data was limited to 4 years of recording (Figure 16),
- Professional development scholarships funded (# of scholarships, \$ amount of each, and # filled by priority groups); and,
  - In 2022-23, Project issued 1 scholarship of \$5,000 issued to the YKDFN.
- Northern Indigenous and Northern Non-Indigenous apprentices supported (#, % out of total apprentices).
  - In 2022-23, Project supported 1 electrical apprentice for a total of 1,017.50 hours.

Table 23: Total Number of People trained and Total Person Hours of Training, by Northern sub-category (Parsons and CIRNAC), in 2022-23

Employee type	Total # persons (incl. contractors)	Total person-hours	Persons as % of all employees	Person-hours as % of all person-hours
Northern Indigenous women	31	4,170	8%	14%
Northern non-Indigenous women	12	281	3%	1%
Northern Indigenous men	104	16,753	28%	56%
Northern non-Indigenous men	44	1,210	12%	4%



Figure 16. Non-normalized percentage of person-hours trained by Northern sub-category (Parsons and CIRNAC), 2018-19 to 2021-22.



### 8.2.3.2. Dechġta Nàowo

Through a Contribution Agreement, the GMRP funded the YKDFN Dechġta Nàowo Training Program in 2022-23. The 2022-23 training programs and number of participants are summarized below:

- **Activity 1:** two sessions of Heavy Equipment Operator: 12 participants between the two sessions; total hours 2,800.
- **Activity 2:** Environmental Monitoring
  - Research Skills: 7 participants; total hours 1,049.
  - Regulatory: 6 participants; total hours 2,176.
  - ECO Canada Project Management and Drone Training: 8 participants; total hours 2,804.
  - BEAHR Core (Environmental Monitoring): 4 participants; total hours 336.
  - Environmental Site Assessment: 5 participants; total hours 651.
- **Activity 3:** On-the-Job Training and Post-Secondary Preparation in partnership with Aurora College Learning Centre in Ndilq: 8 participants; total hours 938.

### Next Steps: Training

The revised Socio-Economic Strategy has identified three focus areas to advance Training & Capacity Building, which include:

- **Development of skills and capacity** – supporting workforce skills and capacity development, incentivising apprenticeships, and providing funding for scholarships;
- **Funding support for Indigenous communities to deliver training** – providing funding support through Contributions Agreements for training program as identified by the YKDFN, Tłıchq Government, and North Slave Métis Nation; and,
- **Information sharing with training providers and program supports** – providing project information (e.g., labour demand forecasts) to training providers and coordinators, as well as engaging with partners to identify and communicate other training and supports available to workers.

The Project will identify specific actions to support the above focus areas through implementation planning with the Socio-Economic Working Group in fall 2023.

8.2.4. Social Impact Management

There is potential for negative social impacts associated with large-scale projects, such as impacts related to health, housing / infrastructure, social services, crime and violence, culture, and money management. Several factors influence the realization and extent of impacts, including the location of the Project and associated work schedules, whether there is an influx of permanent or temporary workers to the region, and whether community members are introduced to the wage economy through the Project. In 2021, the GMRP worked with its rights holders and stakeholders to identify potential social impacts of the Project, as well as associated mitigation measures.

The table below provides a summary of the actions and deliverables related to social impact management that were advanced or completed.

Table 24: Key Actions and Deliverables Advanced in 2022-23 - Social Impact Management

Action	Deliverable
Further identification of opportunities to reduce social impacts	The GMRP updated the Social Wellness pillar to Social Impact Management as per the GMRP Socio-Economic Strategy to better reflect the scope of objectives, outcomes, and activities. They also included Health Effects Monitoring Program and results from the Human Health Risk Assessment as action items under the renamed pillar.

Next Steps: Social Impact Management Actions

The revised Socio-Economic Strategy has identified four focus areas to advance Social Impact Management, which include:

- **Information sharing and review** – sharing of project information to local service providers (e.g., City planners), including projected labour demand and planned increases in site activity;
- **Health effects monitoring** – monitoring to understand if remediation activities are affecting community exposure and to share this information transparently with the community;
- **Activities on site to reduce negative social impacts** – providing wellness information to employees on site, including through information pamphlets and meetings; and,
- **Supporting reconciliation** – actions and progress by the Project and its responsible organizations to advance reconciliation with local Indigenous communities, including establishing agreements as well as providing cultural awareness training at site.

The Project will identify specific actions to support the above focus areas through implementation planning with the Socio-Economic Working Group in fall 2023.

## 9.0 IN CLOSING

In 2022-23, the Project team continued remediation work on site. The Project team continued site operations (C&M), immediate risk mitigation activities, and community engagement while progressing work on the review and resubmission of Management and Monitoring Plans and other requirements under the Water Licence.

In 2023-24, the Project expects to start or continue the following activities:

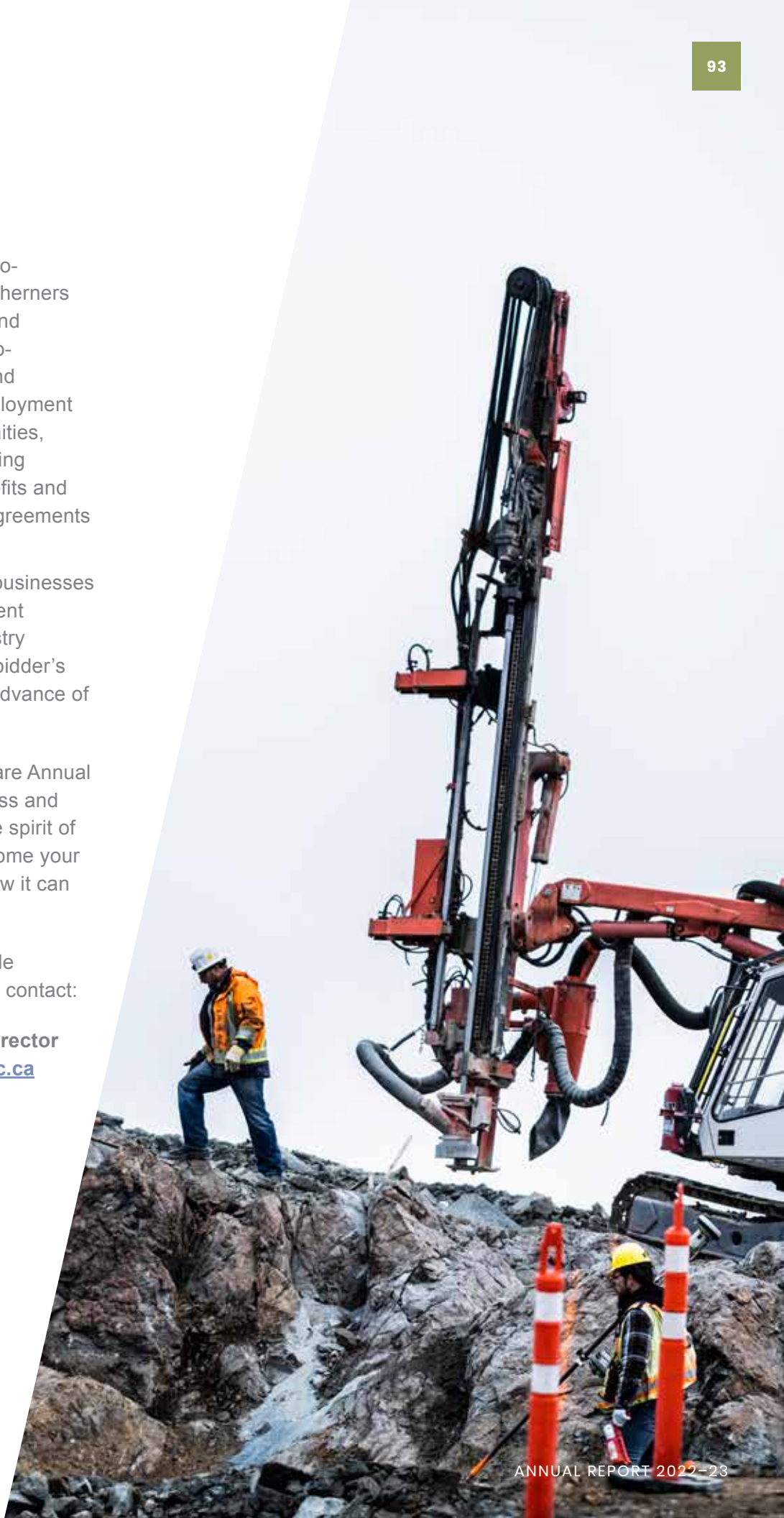
- **Advancement of Remediation**
  - Commence the tendering and onboarding of a consultant to support the next phase of work on the Perpetual Care Plan.
  - Initiate freeze pad and pit fill design work for B1 Pit in 2023-24.
  - Continue demolition of remaining Townsite structures.
  - Award WTP construction package and begin WTP construction activities in Spring 2023.
- **Advancement of Remediation Design and Preparation**
  - Complete a drilling program in support of ongoing and future design work.
  - Continue underground stabilization with plan to complete in 2024-25.
  - Continue to advance design for contaminated soils and for highly arsenic-contaminated waste removal, soil washing, and Chamber 15 backfill.
  - Start the detailed design of the original Tailings Containment Areas (South, Central and North Ponds) as well as the Northwest Tailing Containment Area.
  - Continue to work on the Site Services Design Plan.
- **Operations**
  - Continue C&M in accordance with contract, regulatory requirements, and site conditions.
  - Continue work on improvements to the stench emergency warning system and replacement of the propane mine air heater burner.
  - Conduct ongoing monitoring of all dams on Site and monitor the water elevations at the original Tailings Containment Areas and Baker Creek.
- **Environment**
  - Continue air quality monitoring, dust management, and aquatic effects monitoring.
  - Continue managing waste and operating the Waste Transfer Station.
  - Continue to log and report wildlife sighting and interactions (including the bird survey).
- **Health and Safety**
  - Continue to track and report H&S incidents and provide oversight for the H&S of GMRP employees and contractors, including urinalysis for on-site workers.
  - Continue the Health Effects Monitoring Program.
- **Community**
  - Continue to engage and collaborate with rights holders and stakeholders.
  - Begin to implement the revised Socio-economic Strategy.

- Continue to maximize socio-economic benefits for Northerners and Indigenous Peoples and to deliver on regional socio-economic commitments and requirements through employment and procurement opportunities, training and capacity building activities, community benefits and procurement framework agreements
- Continue to engage with Northern and Indigenous businesses ahead of formal procurement processes, including Industry Day 2023, and additional bidder's meetings/conferences in advance of procurement opportunities

The GMRP will continue to prepare Annual Reports that describe the progress and performance of the GMRP. In the spirit of continual improvement, we welcome your comments on this Report and how it can be enhanced in the future.

For more information or to provide comments on the Report, please contact:

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867-669-2838



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# APPENDICES

**Appendix A:** Environmental Agreement – Report Alignment

**Appendix B:** List of 2022-23 Studies / Reports

**Appendix C:** Project Risks

**Appendix D:** Progress on Environmental Assessment  
Measures and Suggestions

**Appendix E:** Additional Information on Monitoring Parameters

**Appendix F:** Greenhouse Gas Emissions

**Appendix G:** Plain Language Summary





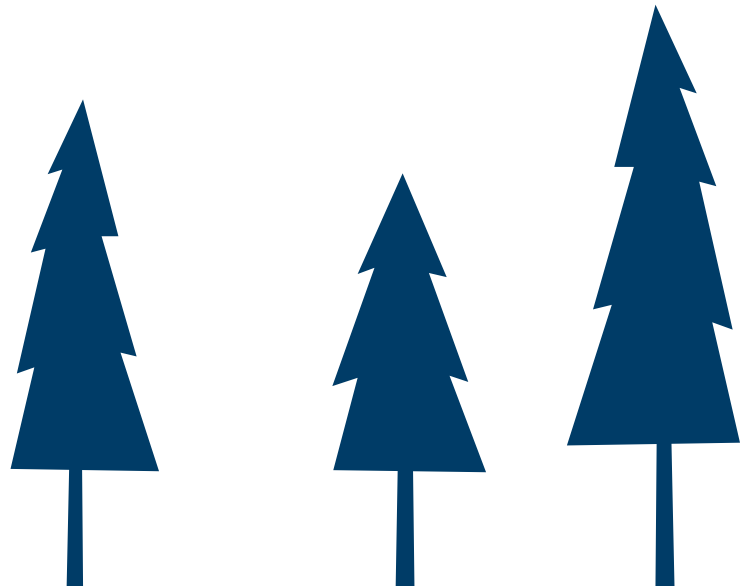


## APPENDIX A – ENVIRONMENTAL AGREEMENT – REPORT ALIGNMENT

A significant driver for the development of the GMRP Annual Report is the Environmental Agreement, the signing of which is a mandatory requirement per Measure 7 of The Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013). This agreement establishes an independent oversight body (i.e., GMOB) for the GMRP, and was signed in June 2015 by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC; formerly Aboriginal Affairs and Northern Development Canada [AANDC]), the Government of the Northwest Territories (GNWT), the City of Yellowknife, the Yellowknives Dene First Nation (YKDFN), Alternatives North, and the North Slave Métis Alliance (NSMA).

Article 5 of the Environmental Agreement stipulates that “the Co-Proponents shall prepare, provide to GMOB and make available to the public an Annual Report on the Project each year,” to be submitted to GMOB “no later than October 1 in each year,” starting October 1, 2016 (the report addressing the 2015-16 fiscal year).

The Environmental Agreement specifies what content must be included in each Annual Report. The table below outlines each requirement and where the content can be found in this 2022-23 report.



Environmental Agreement Requirement	Section of Report
A summary of the Project's key operational activities and associated expenditures	Operational Summary
A summary of any other significant developments relating to the Project	2022-23 Year in Review Health and Safety Community
A summary of the results or findings of all monitoring done for the Environmental Programs and Plans and a description of actions taken or planned to implement Adaptive Management	Environment Health and Safety
An assessment of the effectiveness of actions already taken to address the results or findings of all monitoring completed for the Environmental Programs and Plans	Environment
A summary of any environmental or engineering studies conducted by the Co-Proponents in relation to the Project	Advancement of Remediation Design and Preparation Operational Summary Environment Appendix B: Studies
A summary of any changes to, or plans for changes to, the Environmental Program and Plans	Annual Plan and Program Review
A summary of the environmental audits of the Project, and the Co-proponents' response to the audit	Operational Summary
A summary of any reportable spills, accidents or significant malfunctions, and a summary of the Co-Proponents' responses	Operational Summary Environment
A listing of regulatory inspections, reports or directions, and a summary of the Co-Proponents' response to any issues arising therefrom	Operational Summary
An analysis of trends in environmental effects data over time	Environment Health and Safety Community
A summary of significant public engagement activities, or matters raised as public concerns, and the Co-Proponents' responses	Community
A summary of the Project's planned key operational activities for the coming year and associated planned expenditures, subject to the need to protect commercially sensitive financial information	Operational Summary In Closing
A summary of the progress of the Project, including the Mackenzie Valley Resource Management Act (MVRMA) Measures, Mackenzie Valley Environmental Impact Review Board Suggestions, and Co-Proponents' Commitments	Progress on Environmental Assessment Measures Appendix D
References to all sources relied on by the Co-Proponents in coming to conclusions in the Annual Report	References
A plain language summary of the Annual Report	Plain Language Summary Appendix G



## Addressing GMOB Recommendations

In the GMOB feedback on the 2020-21 Report, GMOB identified several questions and areas for improved clarity. The table below provides GMOB's report recommendations and the Project team's responses.

GMOB Comment	GMOB Recommendation	GMRP Response
<p>As noted in last year's review comments, "advance" is not a precise term. The word has several interpretations and may not provide full insight into the status of the initiative.</p> <p>Consider using "started", "continued", "partially completed" or other descriptors that have a more definite interpretation. Note: there are instances where terms are used in the report that should be adjusted to make the meaning clearer.</p>	<p>GMOB recommends the GMRP consider ways to make the language clearer and increase the specificity of the terminology.</p>	<p>The GMRP is appreciative of the suggestion to make the language clearer to readers and will look to make terminology changes in subsequent Annual Reports.</p>
<p>There is no mention in this section of the potential economic opportunities that the Project provides and that one of the Projects' goals is to maximize Northern and Indigenous employment opportunities.</p>	<p>GMOB recommends that the GMRP include "economic opportunities" and the "maximization of Northern and Indigenous employment opportunities" as part of the Objectives and Outcomes of the Project Overview.</p>	<p>The objectives GMRP has listed come from the socio-economic plan/strategy and are not for the Project as a whole. GMRP does not intend to provide an exhaustive list of all objectives within the Project. However, upon review, the GMRP discovered some discrepancies that will be addressed in future reports. The objectives listed in the Annual Report were originally drawn from the DAR, where they are termed 'objectives', however, in the Closure and Reclamation Plan (CRP) the same objectives are listed as goals in the CRP. The GMRP recognizes objectives as being the individual or smaller actions that the GMRP takes to achieve a goal, therefore, the GMRP will update the terminology to reflect what is found in the CRP and change the term 'objectives' to 'goals' in future reports.</p> <p>The goals of the GMRP are as follows:</p> <ul style="list-style-type: none"> <li>• Minimize public and worker health and safety risks;</li> <li>• Minimize the release of contaminants from the Site to the surrounding environment;</li> <li>• Remediate the Site in a manner that instills public confidence; and,</li> <li>• Implement an approach that is cost-effective and robust over the long-term.</li> </ul>

GMOB Comment	GMOB Recommendation	GMRP Response
<p>What is the difference between “detailed design” and “substantive design” from a project engineering point of view? The difference needs to be clearly defined as it is confusing.</p>	<p>GMOB recommends the GMRP clarify the difference between the terms “detailed design” and “substantive design”.</p>	<p>The GMRP is appreciative of the suggestion to make the language clearer to readers and will look to make terminology changes in subsequent Annual Reports.</p> <p>Substantive design is a term used by the GMRP to indicate the level of design required to develop the cost estimate for the remediation activities. The cost estimate was required to receive GMRP’s project, expenditure, and contracting authorities from the Treasury Board. The purpose of this level of design is to adapt the conceptual design to the specific site. It is based on field investigations and confirms feasibility of conceptual designs. Substantive design provides sufficient detail for the development of the Project Implementation Plan and to gain regulatory approval.</p> <p>Detailed design is a term used by the GMRP to refer to the level of detail required to procure each Construction Work Package. This design level is based on more detailed analysis of design elements and site features and results in contract specifications.</p>
<p>If wetland plants (presumably) accumulate metals (As, Sb, Cu, Pb, etc.) and thereby reduce the concentrations in the water, do the plants need to be harvested and disposed periodically to remove the contaminants from the environment?</p>	<p>GMOB recommends the GMRP explain how passive treatment and the management of it remove metals of concern from the environment.</p>	<p>The GMRP does not currently have details associated with the likely maintenance of a potential passive or semi-passive treatment wetland. However, the GMRP commits to updating GMOB when further information becomes available.</p>
<p>The second paragraph references a “structural review” of buildings on the site. The third paragraph refers to a “Building Assessment” on all remaining buildings. GMOB assumes this refers to the same type of assessment, but it is unclear. For clarity and to improve the understanding of what work is being done year over year, the same terminology should be used to describe project activity.</p>	<p>GMOB recommends the GMRP use consistent terminology to describe work activities.</p>	<p>The GMRP will use consistent terminology in future reports for clarity and to improve the understanding of work completed throughout the life of the project.</p>

GMOB Comment	GMOB Recommendation	GMRP Response
The opening portion of the paragraph refers to an assessment conducted on 68 buildings, but then provides a further breakdown of yellow, green and red classifications for 63 buildings. There are 5 building assessments not included in this breakdown.	GMOB recommends the GMRP confirm the number of assessments that were conducted.	The report lists the following structures as not having been assessed because they were slated for demolition as part of the Townsite demolition work (in the following 2 years): <ul style="list-style-type: none"> <li>• 059 New Diesel Plant</li> <li>• 144 Planar Shop</li> <li>• 155 Main Office and Extension</li> <li>• 1087 Shed</li> <li>• 128 Pipe Rack</li> </ul>
Under Category in Table 2, does Consultation refer to Crown requirements for Indigenous consultation, or is this a broad category that includes all engagement, meetings, and communications with Indigenous, Metis, and the broader spectrum of Yellowknife residents?	GMOB recommends the GMRP define what broadly is covered by the term “Consultation” as it refers to the expenditure. This could be a footnote for all of the terms used in Table 2.	The GMRP appreciates that the term could be defined more clearly and will do so in future reports. The amount cited includes funding to Alternatives North, the City of Yellowknife and Indigenous partners. Moving forward, the heading will be adjusted to “Engagement and Consultation”, and Table 2 will include footnotes to describe terms.
There is no definition of what a reportable spill is. This should be clearly defined.	GMOB recommends the GMRP define what a reportable spill is.	Reportable spills are defined by GNWT based on substance and reportable quantity. Additional information can be found at the following GNWT link: <a href="https://www.ecc.gov.nt.ca/en/services/report-spill">https://www.ecc.gov.nt.ca/en/services/report-spill</a> . Future reports will more clearly reference what constitutes a reportable spill.
The report presents very precise numbers for calculations that are mostly model estimates or CO <sub>2</sub> equivalent calculations based on average emissions from fuel use. Would rounding to two significant figures provide the level of comparative reporting that is generally needed? i.e., 2.2M kg CO <sub>2</sub> e and 2.7M kgCO <sub>2</sub> e.	GMOB recommends the GMRP review and update the calculation if appropriate.	The GMRP does not consider a revision of the calculation necessary but will report the GHG calculations rounded to two significant digits moving forward.
The third paragraph indicates: “The indirect emissions emitted on site in 2021-22 (April 2012 to March 2022) were....” GMOB suspects the date range should be April 2021 to March 2022.	GMOB recommends the GMRP review and update the date range if appropriate.	The GMRP is appreciative of GMOB’s attention to detail in their review and will work to avoid these errors in future reports.
The footnote on Page 44 is the same as, and relates to, the discussion on Page 43. The footnote on Page 44 should be removed.	GMOB recommends the GMRP make the editorial correction.	The GMRP is appreciative of GMOB’s attention to detail in their review and will work to avoid these errors in future reports.

GMOB Comment	GMOB Recommendation	GMRP Response
GMOB notes this as a positive approach to groundwater sampling and confirming hydrogeologic information as it will keep the hydrogeologic models updated.	GMOB recommends the GMRP continue to develop positive and proactive approaches to reporting on monitoring, as is evident in this case.	The GMRP thanks GMOB for the feedback and recommendation.
GMOB notes that the Dust Communication Strategy is a positive reaction to concerns raised by the rights holders and stakeholder over the management of dust issues on the site.	GMOB recommends the GMRP continue to develop positive and proactive approaches to community concerns, as is evident in this case.	The GMRP thanks GMOB for the feedback and recommendation.
GMOB notes that the Arsenic 101 Workshop in Dettah was well run and received.	GMOB recommends the GMRP continue to develop positive and proactive approaches to educate and inform the community, as is evident in this case.	The GMRP thanks GMOB for the feedback and continued support with regards to risk communication initiatives. The GMRP is open to exploring any suggestions from GMOB to other ways to share information.
GMOB notes an error in the following Invitation Tender: \$25,000-\$99,000 to \$100,00-\$1,000,000. It is presumed to read -\$100,000-\$1,000,000	GMOB recommends the GMRP make the editorial correction.	An updated version of the designed document was provided on April 21, 2023, to address this error among other additional data errors.  An additional 0 was added to indicate \$100,000.
GMOB notes that Employee Type reporting does not include on separate lines those who are employed by the Project Team (CIRNAC and GNWT) or Parson (MCM). In line with other major developments in the North, projects are expected to report on their staff numbers and differentiate between a Yellowknife office and non-NWT staff.	GMOB recommends that the GMRP and the MCM report separately their own employment associated with the Project and that these be defined also between a Yellowknife office and non-NWT staff.	Parsons already reports on staff that work on this Project and this is identified in the "Parsons and its subcontractors" category in the report.  The Project team does not currently have an internal mechanism to track its own employees but will consider using one once Matilda has been established. Matilda is an online portal that will be the Project's internal repository for socio-economic statistics and contracting information. It is currently being developed in two phases: (1) contracting and (2) socio-economic statistics. While the timeline for phase 1 is to-be- determined, phase 2 is estimated to be completed by the end of 2023-24 fiscal year.

GMOB Comment	GMOB Recommendation	GMRP Response
<p>GMOB notes that the explanation of employment results remains confusing. The information is all there, but so many statistics are being reported together.</p> <ul style="list-style-type: none"> <li>For example, it is not clear in Table 8 whether IOC employees is a subset of Northern Indigenous.</li> <li>By excluding southern employees as a line item under total from these tables, the numbers never add up and therefore it is difficult to understand.</li> </ul> <p>Total # of persons can be very misleading on its own. Some persons contribute no more than a few hours to the Project. They are important to report, but context is needed.</p>	<p>GMOB recommends that the GMRP rework the reporting of the “Total Number of Persons and Total Person Hours and target ranges (Parsons and CIRNAC and their contractors) by Category” so that there is no confusion about the reported data.</p>	<p>The Project team will attempt to simplify the reporting by clearly identifying which categories are sub-sets and which are primary in future reports.</p> <p>As for the examples GMOB has highlighted, please see the explanations below:</p> <ul style="list-style-type: none"> <li>Indigenous Opportunity Considerations (IOC) is a subset of Northern Indigenous since Northern Indigenous incorporates all three Territories and IOC is a geographic area around the Great Slave Lake within the Northwest Territory.</li> <li>Table 8 does not exclude Southern employees as a separate line item; it only notes that Southern Indigenous and Northern Indigenous persons constitute the general Indigenous category – due to this being a federal project and its mandate spanning across Canada. The Project team does track how many Southern employees are working for this Project, as this is a mandatory indicator that the GMRP is required to track.</li> <li>The GMRP agrees that the total number of persons can be misleading without context, which is why the Project team reports on person hours in addition to number of persons for all categories. Additionally, Project targets are based on person hours and not number of people.</li> </ul>
<p>GMOB notes that the Total Employment 2021-22 Data reads 33. GMOB is assuming that this is incorrect.</p>	<p>GMOB recommends the GMRP review the data in Table 11 and make any required corrections.</p>	<p>An updated version of the designed document was provided on April 21, 2023, to address this error among other additional data errors.</p> <p>The total Northern employment are now reported as the following:</p> <ul style="list-style-type: none"> <li>Total # of persons: 638</li> <li>Total Northern person hours: 258,830</li> </ul>
<p>The second paragraph ends with the statement “...although the Project is hopeful that CIRNAC information will be available in the future.” This is an unusual statement, is there a reason why CIRNAC would not be able to provide this data?</p>	<p>GMOB recommends that the GMRP provide the socio-economic data required to effectively track project performance.</p>	<p>While the same template is provided to both Parsons and CIRNAC contractors at the same time, whenever changes are made to it (example being the addition of NWT residential status), CIRNAC contractors continued to use the original template that dates back to 2018. Efforts have been made to request the use of the updated version (the same that Parsons uses), but there have been concerns brought forward from the contractors regarding individuals' privacy. The Project team continues to work with CIRNAC contractors to try to mitigate the issue without impacting the quality of data.</p>



GMOB Comment	GMOB Recommendation	GMRP Response
GMOB notes that the results in these two tables should be compared to the results in Table 9. I. It is also noted that the stated '319 individuals in each category' cannot be found in either Table 9 or 13. Is there a difference between NWT Resident and Northern?	GMOB recommends the GMRP review the data in all Tables and make any required corrections and ensure that they can be cross-referenced clearly.	The Project team agrees that overall changes need to be made on the number of tables and how they are reported, including noting sub-sets. Changes will be made in future reports.  Northern incorporates all three Territories; NWT resident is only exclusive to the Northwest Territories.
Does this Table include contracts to engineering and environmental consulting firms? i.e., AECOM, WSP(Golder), etc.?	GMOB recommends the GMRP define what broadly is covered by the term 'Suppliers' as it refers to the expenditure.	Table 14 does include contracts for the engineering and consulting firms. Those firms are further reported on in Table 16 under the "Southern suppliers" category.  The definition of a "Supplier" is: any business that provides goods and services. Table 2 provides a further breakdown of the different types of expenditures.
GMOB notes that the Total Spent in Table 16 is less than some of the sub-categories. As a result, the data is incorrect in this Table.	GMOB recommends the GMRP review the data in Table 16 and adjust accordingly.	An updated version of the designed document was provided on April 21, 2023, to address this error among other additional data errors.  The error is in the "Northern suppliers" category. The following changes have been made in the updated report: <ul style="list-style-type: none"> <li>• \$ value is now correctly reports as \$1,368,232.30</li> <li>• % of total \$ spent is now correctly reported as 7%.</li> </ul>
GMOB asks, what are the values of contracts awarded to professional consulting companies? E.g., AECOM, WSP, etc., and is there a statistic of the number of staff who reside in or out of the NWT?	GMOB recommends the GMRP report specifically on contracts awarded to professional consulting companies and that these include a tracking of the number of staff who reside in or out of the NWT.	The Project reports on the total spent on professional services under the "CIRNAC contractors" category. In the recently announced Project cost estimate, the total estimate for the life of the Project for these services is also included.  As previously noted, the NWT resident category is being asked of those contractors but is not yet being consistently reported on due to privacy concerns. The Project team continues to work with those contractors to mitigate the gap without impacting quality of data.
GMOB notes that IOC deductions issued for not meeting IOC commitments, are specified in contracts. However, it seems to be an open "secret" that companies simply add the penalty percentage to their overhead in a bid, so the deduction is not a disincentive. The concern is that these bonuses or deductions are insignificant in terms of the overall expenditure. Does the Project track these bonus and deduction trends and report on them?	GMOB recommends the GMRP review and report on the trends in contracting regarding IOC commitments.	The 2021-22 fiscal year was the first time the Project reported on bonuses and penalties issued. The Project team is committed to continuing to report on these amounts.

GMOB Comment	GMOB Recommendation	GMRP Response
GMOB notes that the Project target is only 1 apprenticeship per year. Could there be more uptake if there was an increase in apprenticeship opportunities, whether through Parsons, CIRNAC, or any of the procurement companies?	GMOB recommends the GMRP review and adjust its apprenticeship/trainee uptake.	The Project's target for apprentices is 1 apprentice at minimum.  The Project team continues to work with GNWT's department of Employment, Culture and Education and training institutions to stay current on the availability of apprentices in the Territory. Parsons continues to review the most current information available and make calculated recommendations on the inclusion of apprentices in upcoming contracts. This is the method in which Parsons approaches every contract.
GMOB notes that including mandatory training may account for most of the upward trend in training stats. Also, the Dechinta Nawo program will elevate the stats for Indigenous employees if that is included in Indigenous training. Do these statistics account for career training by the MCM or the Contractors?	GMOB recommends the GMRP review, adjust and account for training statistics as they apply to all aspects of the Project.	The significant contributor to the upward trend in Northern and Indigenous training is due to the inclusion of Dechinta Nawo in the training statistics and this is noted in the report on page 69.  The statistics relating to career training are reported in the overall training hours. As noted on page 87, in the past the Project team excluded mandatory training but added it in 2019 – 2020 report and onwards. The Project team will consider making the distinction between mandatory and other training in future reports.
GMOB notes that this section can be strengthened especially when accounting for potential negative social issues. Currently its focus is on increasing Indigenous opportunities and addressing equity. There is only one reference under next steps to continue to build relations with service providers.	GMOB recommends the GMRP review, adjust and account for the range of social impacts and begin to monitor and report on these for subsequent Annual Reports.	The GMRP has updated its SE Strategy with additional activity areas relating to social impacts. Future reports will reflect efforts being made to enhance this section.
GMOB notes that the response to previous GMOB comment on evaluation of a hydraulic head increase and arsenic fluctuation in MW00-02 indicated that the results of the evaluation would be included in the 2021 report to GMOB. There was no update provided in the 2021-22 Annual Report.	GMOB requests that the GMRP provide an update on the evaluation of MW00-02.	At shallow groundwater well MW00-02, located near the Northwest Pond, water levels increased from 2018 to 2020 in conjunction with a corresponding increase in water levels in the Northwest Pond. In 2022, water levels decreased in MW00-02 despite high water levels in the Northwest Pond. The cause of the changing water levels in MW00-02 between 2017 and 2022 is unclear but may be a combination of site factors (water levels in the Northwest Pond) and climate (2021 and 2022 were relative dry years).

GMOB Comment	GMOB Recommendation	GMRP Response
<p>GMOB notes that this Annual report from the GMRP does not offer any further breakdown or information on measures such as job retention or career development; improvement in these areas is a desired long-term goal.</p>	<p>GMOB recommends the GMRP review, adjust and account for training, job retention and other measure statistics as they apply to all aspects of the Project.</p>	<p>Each year, the Project team reviews what data is being tracked on via its Key Performance Indicators and how this data is being reported on to maintain trends and quality.</p> <p>Unlike a typical private sector mine-site, the Project does not employ those working on the site, as they are employed by individual contractors. Therefore, tracking and reporting on individual career development and job retention is not feasible. If GMOB has suggestions on how this can be achieved, please provide them to the GMRP.</p>
<p>GMOB notes that under Number of Risks by Status it is not clear what Total Issues 3 specifically refers to. This should be upfront in the Annual Report and not included as part of a summary under a separate cover.</p>	<p>GMOB recommends the GMRP clarify what each of the total risk issues are for subsequent Annual Reports.</p>	<p>The GMRP's risk register is an internal document used to identify and mitigate risks on the site. As the Annual Report is intended to be a high-level overview, the GMRP does not feel it's appropriate to go into further detail on the risk section. However, the GMRP also understands that further clarification could be beneficial to GMOB and will consider how this could be included in future reports. Issues are those risks that have been realized or occurred, and sometimes remain in the register and tracked to ensure mitigation is acceptable, in the same way other risks are tracked. In general, however, risk registers are not designed to reflect or enable the management of issues.</p>
<p>GMOB notes that the "Activity Risk Type Distribution" identifies 89 legacy and 21 activity risks, which total 110. Information elsewhere in the section suggests that the total sum is 112.</p>	<p>GMOB recommends the GMRP confirm the data in this section.</p>	<p>In the breakdown the register typically creates a report on the legacy and activity risks which excludes any risks that have been designated as "issues".</p> <p>In this case, the total sum should have been listed as 113 (not 112) with the breakdown as follows:</p> <ul style="list-style-type: none"> <li>• 89 legacy risks;</li> <li>• 21 activity risks; and,</li> <li>• 3 issues</li> </ul> <p>As noted in previous responses, this is meant to be a high-level overview and not a detailed accounting of the Project's risk register.</p>

GMOB Comment	GMOB Recommendation	GMRP Response
GMOB notes that the EA process is completed but recommends that this initiative should also include Con and Negus Mines which, with Giant Mine, contributed to historic contamination impacts on Indigenous communities and the environment.	GMOB recommends the GMRP include Con and Negus Mines in this initiative and engage on this with affected parties prior to finalizing the details of a monument and communicate this decision to the public.	The GMRP will engage with parties affected by Giant Mine on the details of the monument, or other perpetual care considerations and communications and support them in the inclusion of other information if requested.
GMOB notes that the Plain Language Summary is for the most part well done and asks if this would it be worthwhile having as a standalone document for the public? As is, the Summary is lost as an Appendix in this Annual Report. GMOB does note that there is no mention of social impact issues in the Summary.	GMOB recommends the GMRP consider ways to use the Plain Language Summary as a possible communication tool and consider translation of this into the local Indigenous language. GMOB also recommends that the Summary include social impact issues.	<p>The GMRP appreciates that the Plain Language Summary may be less effective as an Appendix. The Project is open to moving the PLS to the beginning of future reports, but not as a stand-alone document. The GMRP believes that there is merit in having it remain as part of the report to reduce the chance for it to be disconnected from the main report (e.g., lost or not having the data that justifies some activities on site).</p> <p>The purpose of the Plain Language Summary is to summarize the content of the report, and the report does not address social impact issues. Therefore, GMRP does not agree that social impact issues should be included in the Plain Language Summary.</p>
The reported Gap for “Employment Accounted by Northerners” is 9 to 24%; it is assumed that this should read 24-39%.	GMOB recommends the GMRP review the data in this table.	An updated version of the designed document was provided on April 21, 2023, to address this error among other additional data errors.





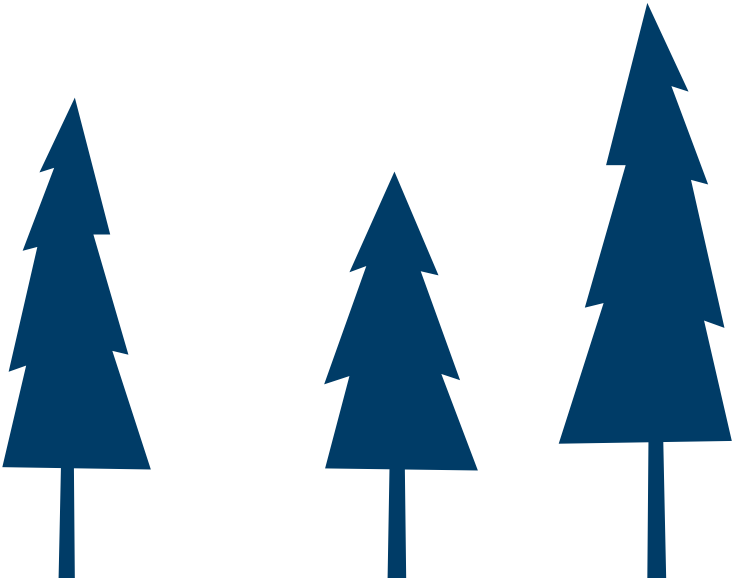


APPENDIX B – LIST OF 2022–23 STUDIES/REPORTS

Table 25 lists environmental or engineering studies conducted in 2022-23 by the GMRP. It includes studies that were completed, as well as several that are still underway. Many of these studies are intended to provide information needed to inform closure design, while others are monitoring programs to ensure the safety of the surrounding communities during current site operations. Additional details on these studies can be found throughout the report.

Table 25: Studies Undertaken in 2022-23

Theme	Study / Report
Design	<ul style="list-style-type: none"><li>• 2022 Annual Geotechnical Inspection of Dams</li><li>• Geotechnical Monitoring Annual Report - 2022</li><li>• Pit Diversion Assessment</li><li>• Open Pits Permafrost Assessment</li></ul>
Air	<ul style="list-style-type: none"><li>• Ambient Air Quality Monitoring Program Annual Report 2022</li></ul>
Water	<ul style="list-style-type: none"><li>• Aquatic Effects Monitoring Program (AEMP) 2022 Annual Report</li><li>• Annual Water Licence Report 2022</li><li>• AEMP Design Plan with Moderate and High Action Levels</li><li>• Phase 7 Environmental Effects Monitoring Program Results</li></ul>
Health & Safety	<ul style="list-style-type: none"><li>• CIRNAC and MCM Incidents Reports</li><li>• Environment, Health &amp; Safety Audit for the Giant Mine Remediation Project (GMRP) Underground operations</li><li>• Health Effects Monitoring Program (Health Study – ongoing)</li></ul>



## APPENDIX C – PROJECT RISKS AND MITIGATION

Risk management has been an important and ongoing management activity for the GMRP since 2002-03. Risk is about uncertainties, or unknowns, and how these could impact the objectives of the GMRP, such as the objective to minimize impacts to the environment. Risk management involves identifying and understanding risks, ranking them (which ones are low or high), and taking steps to prevent risk events from happening or to reduce their impact if they do happen. Organizations with strong risk management processes are better prepared to anticipate, avoid or reduce the impact and/or likelihood of risk events, should they occur.

The GMRP has a risk management procedure and process which it uses to reduce risks to acceptable levels (e.g., legacy risks; see text box) and to manage risks which may increase with increased project activity (e.g., project activity risks; see text box).

### Examples of GMRP Risks

- **Legacy Risks:** risks related to the infrastructure (e.g., dams) and environmental conditions (e.g., underground chambers) left by the former mining operation that could have human health and environmental impacts. Examples include: the release of arsenic trioxide from the underground chambers, or the injury or death of a trespasser from falling into a mine opening.
- **Activity Risks:** risks related to the remediation project and the activities involved in reducing the legacy risks. These risks include risks to scope, budget, schedule, health and safety of workers and the surrounding environment. Examples include: delays in advancing work (and associated cost impacts), health and safety impacts to workers while conducting remediation activities (e.g., moving earth), and air pollution due to dust from remediation work.

There are many examples of how risk management has informed project decision-making. When the risk management process was first implemented in 2002-03, the identification of various public access risks led to the implementation of a range of site security measures to prevent unauthorized entry to the Site. More recently, the identification of significant risks related to the Roaster Complex, Baker Creek, and underground chamber instability led to the development of a Site Stabilization Plan (SSP) – a set of remediation measures (including the demolition of the Roaster Complex) that were approved and implemented ahead of schedule to minimize impacts to human health and safety and the environment. An overview of current legacy and activity risks for the GMRP, and associated risk treatment activities, is presented below.

## Risk Profile Summary – 2022–23

This section provides a summary of the GMRP 2022-23 risk profile. The information is from the GMRP Risk Register (a large excel file) and summarizes the number of risks by status (i.e., active, closed), number of risks by category (e.g., dams), the distribution of risks across levels (e.g., low, moderate), the distribution of risks across types (active vs legacy), the active risk drivers, and the historical profile since 2010.

A more detailed summary report is available under separate cover. The detailed summary report describes each active risk, its driver, level, and treatment (Giant Mine Remediation Project, 2023a).

### NUMBER OF RISKS BY STATUS

Total Active Risks	109
Total Closed Risks	177
Total Issues	4

Figure 17: GMRP Risk Profile Summary

### NUMBER OF ACTIVE RISKS BY CATEGORY



**23** BUILDINGS & STRUCTURES



**20** UNDERGROUND



**16** DAMS



**13** INFRASTRUCTURE



**4** WATER TREATMENT



**3** OPEN PITS



**1** HUMAN RESOURCES

**3** GENERAL H&S

**0** CONTAMINATED SOIL

**0** OTHER – TECHNICAL

**3** GOVERNANCE

**1** FUNDING



**3** TAILINGS & SEDIMENTS



**8** DIVERSIONS



**2** ENGAGEMENT



**3** PROCUREMENT



**2** PLANNING & CONTROLS



**2** REGULATORY



**2** FUEL TANKS

**0** WASTE ROCK

**0** WASTE, BARRELS  
AND SITE DEBRIS

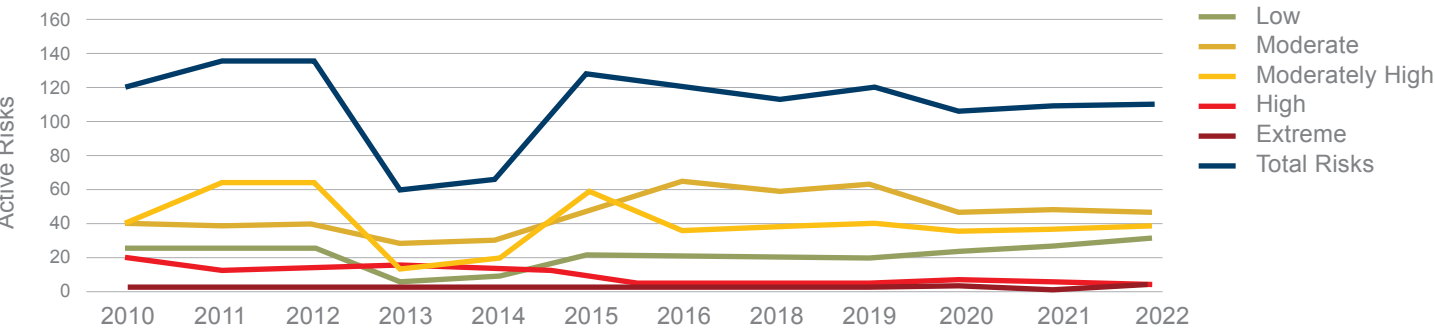
**0** FRAUD

**0** OTHER – MANAGEMENT

Figure 18: Active Risks by Level



Figure 19: Historical Risk Profile



The dip in risks in 2020 reflects a change in how risks were captured in the risk categorization process.

## APPENDIX D – PROGRESS ON ENVIRONMENTAL ASSESSMENT MEASURES AND SUGGESTIONS – DETAILED TABLES

*This appendix provides supplemental details about progress toward achieving the Measures stipulated via The Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013), and plans for 2022-23. Throughout these tables, “the Project” refers to the GMRP. The language in the Measure column is drawn directly from The Report of Environmental Assessment and Reasons for Decision (Mackenzie Valley Review Board, 2013).*

Table 26: Giant Mine EA Measures Tracking Table (as of March 31, 2023)

#	Measure	Status	GMRP Comments on Status
1	To prevent the significant adverse impacts on environment and the significant public concern from the proposed perpetual timeframe, the Project will proceed only as an interim solution, for a maximum of 100 years.	No Action Required	The closure period is 100 years as outlined in the CRP.
2	<p>Every 20 years after the beginning of Project implementation, the Developer will commission an independent review of the Project to evaluate its effectiveness to date, and to decide if a better approach can be identified. This will:</p> <ul style="list-style-type: none"> <li>consider results of the ongoing research</li> <li>be participatory in nature</li> <li>follow the requirements of procedural fairness and be transparent in nature.</li> </ul> <p>If the periodic review identifies a better approach that is feasible and cost-effective, the Developer will further study it, and make the study and its results of the study public.</p>	Future action required	Article 8 of the June 9, 2015 Environmental Agreement further formalized the process through which the future Independent Project Review will be conducted. The Agreement ensures the independent review of the Project is conducted in a manner that considers ongoing research results, is participatory and transparent in nature and follows the requirements of procedural fairness.
3	<p>To facilitate active research in emerging technologies towards finding a permanent solution for dealing with arsenic at the Giant mine site, the Developer will fund research activity as advised by stakeholders and potentially affected Parties through the GMOB. The ongoing funding for this research activity, and additional resources required to manage its coordination, will be negotiated and included as part of the Environmental Agreement specified in Measure 7 and will make best use of existing research institutions and programs. The GMOB will ensure through the research activity that, on a periodic basis:</p> <ul style="list-style-type: none"> <li>reports on relevant emerging technologies are produced;</li> <li>research priorities are identified;</li> <li>research funding is administered;</li> <li>results of research are made public, and</li> <li>results of each cycle are applied to the next cycle of these steps.</li> </ul>	Complete	Articles 7 & 11 of the June 9, 2015 Environmental Agreement provide a commitment of funding for the Oversight Body (which will be known publicly as the Giant Mine Oversight Board, or GMOB) to manage a research program as required by Measure 3. Initial funding flowed for this Measure in 2016-17 and will be ongoing.



#	Measure	Status	GMRP Comments on Status
4	<p>The GMOB will provide the results of the research funded by the Developer to the periodic reviews of the Project described in Measure 2. If better technological options are identified through the funded research in-between these periodic 20-year reviews, these will be reported publicly by the GMOB to the Parties, the Developer and the Canadian public. The Developer will consider these technologies and make decisions regarding their feasibility. The Developer will make any such decisions public.</p>	Complete	<p>The Giant Mine Oversight Board (GMOB) hosted a research workshop in March 2018 and negotiated an MOU with the University of Waterloo for TERRE-NET researchers to establish a formal research relationship with respect to alternate technological options for the permanent remediation solution for the arsenic trioxide dust stored at the Giant Mine site. Currently, the research focus is on stabilization of the dust; the safe extraction of the dust will be a future focus.</p>
5	<p>In order to mitigate significant adverse impacts that are otherwise likely, the Developer will commission an independent Quantitative Risk Assessment to be completed before the Project receives regulatory approvals. This will include:</p> <ul style="list-style-type: none"> <li>• explicit acceptability thresholds, determined in consultation with potentially affected communities</li> <li>• an examination of risks from a holistic perspective, integrating the combined environmental, social, health and financial consequences.</li> <li>• possible events of a worst-case/ low frequency high consequence nature</li> <li>• additional considerations specified in Appendix D of the Report of Environmental Assessment</li> </ul> <p>From this, the Developer will identify any appropriate Project improvements and identify management responses to avoid or reduce the severity of predicted unacceptable risks.</p>	Complete	<p>An independent consultant (Wood) was retained in 2018 to complete the Quantitative Risk Assessment. A separate consultant was retained to develop the engagement component (Stratos). The report and findings will be presented during engagement sessions in Spring / Summer 2020. The completed report was submitted to the MVLWB in June 2020.</p> <p>Design Plan submissions to the MVLWB in 2022/23 included sub sections specific to the outcomes of the QRA and how these have been addressed.</p>
6	<p>The Developer will:</p> <ul style="list-style-type: none"> <li>• investigate long-term funding options for the ongoing maintenance of this Project and for contingencies, including a trust fund with multi-year up front funding,</li> <li>• involve stakeholders and the public in discussions on funding options; and,</li> <li>• make public a detailed report within three years that describes its consideration of funding options, providing stakeholders with the opportunity to comment on the report.</li> </ul>	Complete	<p>The Measure 6 report on long term funding options for Giant Mine was finalized in July 2019 (Deloitte LLP, 2019).</p>

#	Measure	Status	GMRP Comments on Status
7	<p>The Developer will negotiate a legally-binding environmental agreement with, at a minimum, the members of the Oversight Working Group, and other appropriate representative organizations, to create an independent Oversight Body (GMOB) for the GMRP. These negotiations will build on the existing discussion paper and draft environmental agreement of the Giant Oversight Working group. This GMOB will exist for the life of the Project unless otherwise agreed by the Parties to the Environmental Agreement. Every effort will be made to have the GMOB in place as early as possible. The negotiations will make significant progress within six months of the Ministers' Environmental Assessment decision or proceed to mediation. The Developer will cover any mediation costs. The environmental agreement will include a dispute resolution mechanism to ensure compliance with the agreement and a stable funding mechanism for the GMOB.</p>	Complete	<p>Through negotiations with the six affected parties (GNWT, CIRNAC, Alternatives North, the NSMA, the YKDFN, the City of Yellowknife) an Environmental Agreement was signed in June 2015. This Agreement established the mandate for GMOB. Details of the Board's mandate are included in the Giant Mine Environmental Agreement and Society's by-laws found on the GMOB's website.</p>
8	<p>The activities of the oversight body will include:</p> <ul style="list-style-type: none"> <li>• keeping track of monitoring activities by the Developer and the results of those activities, including water quality and aquatic effects monitoring, health monitoring and other monitoring;</li> <li>• considering the adequacy of funding for the Project and ongoing research;</li> <li>• providing advice to the Developer, regulators and government on ongoing improvements in monitoring and Project management to prevent risks and mitigate any potential impacts;</li> <li>• sharing the oversight body's conclusions with the general public and potentially affected communities in a culturally appropriate manner</li> </ul>	Complete	<p>The Environmental Agreement provides for the creation of the Oversight Board and funding to fulfill these obligations going forward. Article 3 of the Environmental Agreement outlines the mandate of the GMOB. The GMRP continues engaging with GMOB staff and directors through various engagement initiatives and venues, further described in the Engagement Plan.</p>
9	<p>The Developer will work with other federal and territorial departments as necessary to design and implement a broad health effects monitoring program in Ndilq, Dettah and Yellowknife focusing on arsenic and any other contaminants in people which might result from this Project. This will include studies of baseline health effects of these contaminants and ongoing periodic monitoring. This will be designed with input from:</p> <ul style="list-style-type: none"> <li>• Health Canada, GNWT Health and Social Services and the Yellowknife medical community; and</li> <li>• The Yellowknives Dene and other potentially affected communities.</li> </ul> <p>The organization conducting the monitoring will provide regular plain language explanations of the monitoring results in terms that are understandable to lay people, and communicate this to potentially affected communities in a culturally appropriate manner.</p>	Underway	<p>The Health Effects Monitoring Program was established in 2017. The Program is carried out by University of Ottawa's Dr. Laurie Chan and his team. It is a Site-Wide Monitoring program to establish levels of arsenic and other contaminants of concern in residents of Ndilq, Dettah and Yellowknife. The results of baseline data collection phase (two waves in 2017 and 2018) indicated: that overall arsenic levels in urine are similar between the overall Yellowknife population and the Canadian Health Measures Survey (CHMS) levels, which represent the general Canadian population.</p> <p>An illustrated, plain language brochure that provides information on the YKHEMP study, reasons for the study, results from the 2017-2018 sample collection, and some background on arsenic and Giant Mine was published in 2021.</p> <p>The 5 year follow-up study for children and youth is starting in Spring 2023.</p>

#	Measure	Status	GMRP Comments on Status
10	<p>The Developer will commission a comprehensive quantitative human health risk assessment by an independent, qualified human health risk assessor selected in collaboration with Health Canada, the Yellowknives Dene, the City of Yellowknife, and the Developer. This human health risk assessment will be completed before the Project receives regulatory approvals. It will:</p> <ul style="list-style-type: none"> <li>• Include a critical review of the 2006 Tier II human health risk assessment and the previous screening reports;</li> <li>• Consider additional exposures and thresholds (as specified in Appendix F of the Report of Environmental Assessment);</li> <li>• Decide whether a Tier III risk assessment is appropriate;</li> <li>• Provide a plain language explanation of the results in terms that are understandable to the general public, and communicate this to potentially affected communities in a culturally appropriate manner;</li> <li>• Provide interpretation of results and related guidance; and</li> <li>• Inform the broad health effects monitoring program (described in Measure 9 above).</li> </ul> <p>The Developer may conduct the human health risk assessment concurrently with the Quantitative Risk Assessment described in Measure 5. Based on the results of this human health risk assessment, and on any existing results of the health effects monitoring program (described in Measure 9 above), the Developer will, if necessary in response to this information, identify, design and implement appropriate design improvements and identify appropriate management responses to avoid or reduce the severity of any predicted unacceptable health risks. Also, footnote #133 in the Report of Environmental Assessment (Appendix D) is revised to read, in its entirety, "including inference of causality and pathologies deducted from any available health studies."</p>	Complete	<p>The Human Health Ecological Risk Assessment (HHERA) was completed by Canada North Environmental Services. The HHERA was carried out with significant input from stakeholders, community members and traditional knowledge holders. This input included both the scope of the assessment and the implementation to better assess risks considering differences in traditional land use, food consumption, and lifestyles for residents living in Yellowknife, Ndilq and Dettah. The final report was released in January 2018. Additional considerations for communications are underway to ensure residents understand the outcomes which have informed public health advisories through the GNWT Department of Health and Social Services.</p> <p>The GMRP developed the Hoëla Weteest'eède study (formerly called the Stress Study) via an independent research team through the University of Wilfred Laurier. Wilfred Laurier were the principal investigators of the study which has been co-designed with the YKDFN. The requirement of this study was identified in Appendix F to the Report of Environmental Assessment noting the requirement to "evaluate indirect effects of potential exposures to arsenic on wellness, including stress effects.</p> <p>On June 6, 2022, the Yellowknives Dene First Nation advised the GMRP they were withdrawing from the study. In September 2022, the GMRP met with the remaining members of the study's advisory committee to seek advice with respect to how to proceed. After careful deliberation, the committee unanimously advised that the Study should not proceed; as such, the Study has been discontinued.</p>

#	Measure	Status	GMRP Comments on Status
11	<p>The Developer, with meaningful participation from the Oversight Body and other parties, will thoroughly assess options for, and the environmental impacts of, diversion of Baker Creek to a north diversion route previously considered by the Developer or another route that avoids the mine site and is determined appropriate by the Developer. Within one year of the Project receiving its water licence, a report outlining a comparison of options including the current on-site realignment will be provided to the appropriate regulatory authorities, the Oversight Body and the public.</p> <p>Once informed by the advice of the Oversight Body and regulatory authorities, the Developer will determine and implement the preferred option. In doing so, the Developer will consider the advice of the Oversight Body, regulatory authorities, and the public, and will ensure that the primary considerations in selecting an option are to:</p> <ul style="list-style-type: none"> <li>• minimize the likelihood of Baker Creek flooding and entering the arsenic chambers, stopes and underground workings, and</li> <li>• minimize the exposure of fish in Baker Creek to arsenic from existing contaminated sediments on the mine site, surface drainage from the mine site or tailings runoff. If off-site diversion is selected, the Developer will seek required regulatory approvals to implement the diversion within five years of receiving its water licence.</li> </ul>	Complete	<p>A comprehensive evaluation of diversion alternatives was undertaken and documented in the Baker Creek Diversion Alternatives Evaluation Report. The assessment included an evaluation of alignment options based on environment, society and feasibility. The Draft Report was engaged on with GMOB, the GMRP Working Group, and the YKDFN Giant Mine Advisory Committee. Engagement details are documented in the engagement log. Overall support for the recommendations provided for alignment option.</p> <p>The Final report was provided as Appendix 5.5A to the Closure and Reclamation Plan in the Water Licence Package.</p> <p>Actions taken as part of the Baker Creek design to address a) include:</p> <ul style="list-style-type: none"> <li>• providing Baker Creek with geomorphic channel including floodplain conveyance;</li> <li>• designing closure channel and floodplain conveyance for floods up to and including the Probable Maximum Flood (PMF), sealing underground mine openings to surface to mitigate potential for inundation and uncontrolled flow to the underground mine during extreme events and placing pit fills in a manner to provide additional flood protection.</li> </ul> <p>Actions taken as part of the Baker Creek design to further address b) include: removing tailings, where present from Baker Creek and removing fine sediments, where present, from Baker Creek.</p>

#	Measure	Status	GMRP Comments on Status
12	<p>To prevent significant adverse impacts on Great Slave Lake from contaminated surface waters in the existing or former channel of Baker Creek, should it be re-routed to avoid the mine site, the Developer will ensure that water quality at the outlet of Baker Creek channel will meet SSWQO based on the CCME <i>Guidance on the Site-Specific Application of Water Quality Guidelines in Canada</i>.</p>	Complete	<p>Water quality objectives specific to and protective of Yellowknife Bay were developed based on CCME Guidance and are presented in the Effluent Quality Criteria (EQC) report. Extensive modelling including a site model in GoldSim, a near field model of the mixing zone (CORMIX) and a 3D Model of Yellowknife Bay (GEMSS) were developed to support the development of EQC and demonstrate the Project's ability to meet Water Quality Objectives. Modelling documentation is included in the EQC report along with prediction of future water quality in Yellowknife Bay. The Water Quality Objectives will be met upon completion of the GMRP active remediation phase and will be met in the vicinity of the outlet of Baker Creek (see Measure 13), at the edge of a 200 m mixing zone (see Measure 15) that includes the Project's new WTP outfall and the influence of Baker Creek. Site Specific Water Quality Objectives (WQO) were presented as part of pre-engagement and submitted in the EQC Report to the MVLWB for approval in April 2019. These were discussed at the first technical session in July 2019, hosted by the MVLWB, in support of the Water Licence application process and approved by the MVLWB in July 2020. Final EQC were determined by the MVLWB and included in the GMRP Water Licence MV2007L8-0031 issued September 18, 2020.</p>
13	<p>The Developer will design and, with the applicable regulators, manage the Project to ensure that, with respect to arsenic and any other contaminants of potential concern, the following water quality objectives are achieved in the vicinity of the outlet of the existing or former channel of Baker Creek, should it be re-routed to avoid the mine, excluding Reach 0:</p> <ul style="list-style-type: none"> <li>• Water quality changes due to discharge from the former channel of Baker Creek will not reduce benthic invertebrate and plankton abundance or diversity;</li> <li>• Water quality changes due to discharge from the former channel of Baker Creek will not harm fish health, abundance or diversity;</li> <li>• Water quality changes due to discharge from the former channel of Baker Creek will not adversely affect areas used as drinking water sources,</li> <li>• Water quality changes due to discharge from the former channel of Baker Creek will not adversely affect any traditional or recreational users; and,</li> <li>• There is no increase in arsenic levels in Great Slave Lake due to discharge from the former channel of Baker Creek beyond the parameters described in Measure 12.</li> </ul>	Complete	<p>Measure 13 a) through d) are satisfied by selecting Water Quality Objectives for Yellowknife Bay that are protective of aquatic life and drinking water. Arsenic concentrations in Great Slave Lake, beyond the edge of the mixing zone (200 m from breakwater), will not increase from present-day concentrations as demonstrated in the EQC report and supporting documentation (see Measure 12).</p>



#	Measure	Status	GMRP Comments on Status
14	The Developer will add an ion exchange process to its proposed water treatment process to produce WTP effluent that at least meets Health Canada drinking water standards (containing no more than 10µg/L of arsenic), to be released using a near shore outfall immediately offshore of the Giant mine site instead of through the proposed diffuser. The Developer will achieve this concentration without adding lake water to dilute effluent in the treatment plant.	Complete	The new WTP will include ion-exchange technology as part of the treatment process and will discharge effluent meeting the criteria of 10 ug/L of Arsenic. The outfall location was identified through stakeholder engagement and options analysis and will be located nearshore of the Giant site in the vicinity of Baker Creek. No diffuser is proposed. Final EQC were determined by the MVLWB and included in the GMRP Water Licence MV2007L8-0031 issued September 18, 2020.
15	<p>The Developer and regulators will design and manage the Project so that, with respect to arsenic and any other contaminants of potential concern:</p> <ul style="list-style-type: none"> <li>• Water quality at the outfall will meet the Health Canada Guidelines for Canadian Drinking Water Quality; and,</li> <li>• The following water quality objectives in the receiving environment are met: <ul style="list-style-type: none"> <li>— Water quality changes due to effluent discharge will not reduce benthic invertebrate and plankton abundance or diversity at 200 metres from the outfall;</li> <li>— Water quality changes due to effluent discharge will not harm fish health, abundance or diversity;</li> <li>— Water quality changes due to effluent discharge will not adversely affect areas used as drinking water sources; and,</li> <li>— There is no increase in arsenic levels in Yellowknife Bay water at 200 metres from the outfall: and,</li> <li>— There is no increase in arsenic levels in Yellowknife Bay sediments at 500 metres from the outfall.</li> </ul> </li> </ul>	Complete	All parameters of potential concern (POPC) will meet relevant Canadian Drinking Water Guidelines (DWG) at the edge of the mixing zone. Water Quality Objectives specific to Yellowknife Bay have been developed to be protective of aquatic life and drinking water and all Water Quality Objectives will be met at the edge of the mixing zone. Arsenic concentrations in Great Slave Lake, beyond the edge of the mixing zone will not increase from present-day concentrations due to effluent discharge. See Measure 12 for more details on Water Quality Objectives and supporting evidence. Final EQC were determined by the MVLWB and included in the GMRP Water Licence MV2007L8-0031 issued September 18, 2020.
16	Before construction, the Developer will model re-suspension of arsenic from sediments and resulting bioavailability in the vicinity of the outfall. If the modeling results indicate that the outfall may re-suspend arsenic from sediments, the Developer will modify the outfall design until operation does not cause resuspension of arsenic from sediment.	Complete	<p>The GMRP is taking a more protective approach and mitigating the potential of sediment resuspension through design of a sediment cover, rather than modelling. The design criteria for the outfall will include the requirement to avoid resuspension of arsenic from sediments.</p> <p>During design of the WTP outfall, modelling of the outfall to predict scour and potential resuspension of sediment was completed and the design was completed to prevent any resuspension of sediment at the outfall. In December 2022, details of the design were submitted to the MVWLB in the WTP Design Plan.</p>

#	Measure	Status	GMRP Comments on Status
17	<p>Before operating the outfall, the Developer will design and implement a comprehensive aquatic effects monitoring program that is sufficient to determine if the water quality objectives listed in Measure 15 are being met. This program will:</p> <ul style="list-style-type: none"> <li>• at a minimum, be able to identify any accumulation of arsenic over time in the water, sediment or fish in the receiving environment;</li> <li>• include appropriate monitoring locations near N'dilo, in Back Bay and in Yellowknife Bay, with a focus on areas in the vicinity of the outfall and areas used by people;</li> <li>• include the establishment of a baseline for aquatic effects in Back Bay before beginning Project construction and installation of the outfall;</li> <li>• be developed according to AANDC Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009, with corresponding action levels and management response framework.</li> </ul>	Underway	The AEMP Design Plan will be updated prior to operation of the WTP, as required by the Water Licence.
18	<p>Prior to preparing chambers and stopes for freezing, the Developer will conduct a comprehensive Quantitative Risk Assessment evaluating both wet and dry methods for the initial freezing design, with respect to current risks and implications for future removal. This will include an evaluation of potential effects of the proposed freezing and wetting method on the thawing or frozen excavations, and potential impacts of ongoing design changes prior to implementing the Project. The Developer will release a plain language report to the public describing its considerations and the resulting design.</p>	Complete	The Freeze Design Basis Report was finalized in 2016 and included an evaluation of wet versus dry methods, resulting in the selection of the dry method. The plain language report was finalized and distributed to the Giant Mine Working Group, YKDFN Giant Mine Advisory Committee, and email distribution list (June 2019).
19	<p>Considering the results of the risk assessment described in Measure 18, the Developer will not adopt any method of freezing that significantly reduces opportunities for future arsenic removal or other remediation by future technologies.</p>	Complete	The Freeze Design Basis Report was finalized in 2016 and included an evaluation of wet vs dry. The Project is proceeding with the dry method, which combined with a passive freezing approach will allow for reversibility if needed. Closure Objective F2 and associated closure criteria address reversibility in the CRP.

#	Measure	Status	GMRP Comments on Status
20	The Developer will conduct all major demolition and construction activities with the potential to release large amounts of dust or contaminants into the air when wind directions will minimize the chances of dust and contaminants blowing into the City of Yellowknife, Dettah and Ndilo.	Underway	The Dust Management and Monitoring Plan takes into account Measure 20 and outlines mitigations to minimize the generation of dust, particularly when wind is blowing towards Yellowknife, Ndilo, and Dettah. As well, the site wide Air Quality Monitoring Plan is an existing and ongoing program that was designed to adapt to changing activities on site, and will incorporate all suitable measures and activities to mitigate the risks of exposure to contaminated dust throughout the life of the Project. The Air Quality Monitoring Plan is an appendix to the Dust Management and Monitoring Plan.
21	The Developer will collect dust and contaminant level data from soil and vegetation in the vicinity of major reclamation activities before and after major demolition or construction activities to serve as a baseline for any related adaptive management activities that may follow.	Future Action Required	The GMRP conducts ambient air quality monitoring, as required by Measure 25, that includes real-time monitoring of TSP and PM <sub>10</sub> during non-snow covered months and when warranted by remediation activities during snow covered months. This allows for additional mitigation and adaptive management options to be implemented in a timely manner. Wildlife surveys will be completed post-remediation which include a vegetation monitoring component.
22	The Developer will conduct a study to determine appropriate depth of the tailings cap and B1 pit cover, in consultation with Environment Canada and responsible regulators, to verify that the depth proposed will ensure the tailings cap and B1 pit cover are not compromised by vegetation growth. The Developer will provide a report of this study to the MVLWB before it issues a water licence for the Project.	Complete	During Surface Design Engagement some affected parties preferred the selection of a non-vegetated tailings cover. The selection of a rock cover as outlined in the CRP addresses the concern of the cover being compromised by vegetation growth. As a result of input received during engagement and the selection of a rock cover, this measure has been addressed.
23	The Developer will work cooperatively with responsible regulatory authorities and interested Parties in the development and submission of a Tailings Management and Monitoring Plan prior to receiving regulatory approvals. This plan will not only identify potential issues for the management of tailings but will also identify mitigation measures to prevent problems related to the tailings cap failure, and will include consideration of the B1 pit cover as applicable.	Underway	A Tailings Management and Monitoring Plan (Version 1.0) was developed as part of the Water Licence application and approved. In September 2022, GMRP submitted an updated version (2.0) of the Tailings Management and Monitoring Plan to the MVLWB. Comments from MVLWB led to an engagement process that resulted in a revised version (version 2.1), which is expected to be submitted April 2023.
24	The Developer will physically prevent all-terrain vehicle access to the tailings cap and B1 pit cover to prevent the surface from being eroded or otherwise compromised. The Developer will monitor the effectiveness of this prevention and will take any additional management measures as necessary to prevent all-terrain vehicle access.	Future Action Required	The selection of a coarse rock cover will prevent the surface from being eroded or comprised through ATV access. Closure objective T6 addresses this in the CRP.

#	Measure	Status	GMRP Comments on Status
25	The Developer will work cooperatively with responsible regulatory authorities and interested Parties in the development and submission of an Air Quality Management Plan which incorporates an ongoing air quality monitoring program. This ongoing monitoring program will include all previously identified on-site air quality monitoring stations and one off-site air quality monitoring station near Niven Lake. At a minimum, ambient concentrations of NO <sub>2</sub> and PM <sub>2.5</sub> will be monitored at the Niven lake site. Total suspended particulate and metal concentrations will be monitored at the on-site locations. This AQMP will identify action levels and trigger additional management and mitigation activities, if required.	Underway	The GMRP maintains an Air Quality Monitoring Plan (AQMP). The AQMP comprises nine site perimeter stations and three community stations. PM <sub>2.5</sub> is measured at the community stations, with the Niven community station also measuring NO <sub>2</sub> . The AQMP, in conjunction with the Dust Management and Monitoring Plan, identifies action levels which trigger additional management and mitigation measures as required. The AQMP will be reviewed and updated as required as remediation progresses.
26	In conjunction with Measure 10 above, the Developer will consider the results of the comprehensive human health risk assessment and consult with the YKDFN and City of Yellowknife when determining suitable end uses of the site, to ensure that those proposed uses do not pose a health risk to people, including toddlers.	Underway	The Human Health Ecological Risk Assessment (HHERA) was completed in 2018. The results were presented to the communities of YKDFN, the NSMA, the City of Yellowknife and other affected parties. The GMRP Engagement Plan outlines the extensive engagement sessions held to inform the Human Health Ecological Risk Assessment, including a Dietary Survey and a Voluntary Country Food Sampling Program. The outcome of the HHERA informed post-closure land use constraints. The GMRP has shared the details of the post-closure land use constraints with GNWT Lands, and the City of Yellowknife. The GMRP will continue to work with its municipal, territorial and federal counterparts to communicate post-closure risks, and their consideration within the Perpetual Care Plan.

Table 27: Giant Mine Environmental Assessment Suggestions Tracking Table (as of March 2023)

#	Suggestion	Status	GMRP Comments on Status
1	The Developer should consult with surrounding communities, including Dettah, Ndilq and the City of Yellowknife, prior to finalizing its Project design, so that design improvements may be incorporated to address any remaining concerns.	Underway	The extensive engagement completed since the EA is documented in the CRP, Engagement Plan and the Engagement Log. This includes the Surface Design Engagement process and regular ongoing engagement through the Giant Mine Working Group, the YKDFN Giant Mine Advisory Committee and other engagement venues.
2	The Developer should create a monument as a memorial to the impacts of past contamination from Giant Mine on Indigenous communities and the environment.	Underway	The Project has committed to a monument as this was widely supported by affected parties during Surface Design Engagement, however the details of exactly what and where the monument would go were not discussed during Surface Design Engagement. The Project will engage on this with affected parties prior to finalizing the details of the monument and communicate this decision to the public.

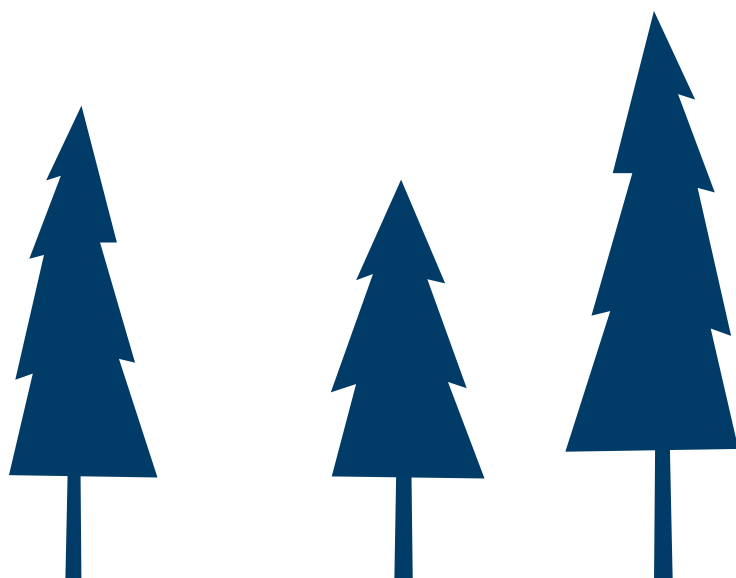
#	Suggestion	Status	GMRP Comments on Status
3	<p>To encourage widespread learning from and remembering of the experiences of the Giant Mine, the Developer, in conjunction with the GNWT Department of Education, Culture and Employment, should:</p> <ul style="list-style-type: none"> <li>develop an education resource unit on the impacts of Giant Mine on the land and on people, including impacts on Indigenous peoples, and</li> <li>distribute this resource unit for use within the school curriculum across Canada.</li> </ul>	Underway	<p>GMRP is working with the YKDFN, NSMA, GMOB and AN on the development of a Giant Mine education resource. The committee has begun to address the questions and explore options of finding the best home for the future resource. The aim is to provide an effective and comprehensive resource that encompasses information that is meaningful and relevant to the history of Giant Mine and remediation of contaminated sites in the NT.</p>
4	The Federal Contaminated Sites Action Program should develop a policy framework and guidance for the perpetual care and management of remediated contaminated sites.	Outside of the Project scope	<p>A response to this suggestion is outside the mandate of the GMRP however, a Perpetual Care Plan is a requirement under the Environmental Agreement. A Perpetual Care Task Force (the Task Force) has been established to assist in the development of the PCP. The Task Force is made up of representatives from each signatory to the GMRP Environmental Agreement. Under the Agreement, a draft was to be available to GMOB by June 2020; however, GMRP requested a formal extension from GMOB. The GMRP, with significant input from the Task Force, have developed a Scope of Work (SOW) which outlines the requirements of version 1 of the Perpetual Care Plan. This SOW supplements a Request for Information (RFI) to inform a final Request for Proposal to be issued in 2023-24, with a contract award anticipated by fall of 2023.</p>
5	To ensure long-term funding throughout the life of the Project, the Developer should create an independently managed self-sustaining trust fund with multi-year up-front funding for the ongoing maintenance of this Project and for contingencies. A third-party expert should independently manage this trust fund. Annual reports on the condition of the fund should be provided to stakeholders and the public.	Outside of the Project scope	<p>Measure 6. A final report as required under Measure 6 was completed in 2019/20. A response to this suggestion is outside the mandate of the GMRP, however the Project team will ensure the report is provided to the relevant department(s) in the Government of Canada and continue to work with our counterparts in the federal system to ensure funding is in place throughout the life of the Project.</p>
6	To reduce public concern about the multiple roles of AANDC in this Project and to increase public confidence, AANDC should produce guidelines to clarify reporting structures to ensure that Project inspectors, advisors and managers employed by the federal government can perform their duties objectively and without undue pressure from within the federal government. These should be made available to the public within six months of Ministerial acceptance of this Report of Environmental Assessment.	Outside of the Project scope	<p>A response to this suggestion is outside the mandate of the GMRP, however the existing Treasury Board Values and Ethics Code for the Public Sector is available to the public at <a href="http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=25049">http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=25049</a></p>



#	Suggestion	Status	GMRP Comments on Status
7	Based on the results of the health risk assessment described in Measure 10, the appropriate government authorities should remediate garden and playground soils where arsenic concentrations exceed current guidelines for urban soils in Canada.	<b>Outside of the Project scope</b>	The remediation of garden and playground soils is out of scope of the GMRP. The Project continues to cooperate with relevant federal and territorial agencies to share information.
8	The Developer should consider the Trail Human and Environmental Health Committee as a model for the development of the health program.	<b>Complete</b>	The Health Effects Monitoring Program has incorporated lessons learned and similar concepts from that of the Trail BC Monitoring Program.
9	During its review of the diversion of Baker Creek, the Department of Fisheries and Oceans should consider the habitat loss of the existing Baker Creek and decide on any habitat design requirements for the diversion to the extent it deems appropriate. Any resulting habitat compensation requirements should be applied on the new diversion.	<b>Outside of the Project scope</b>	<p>A response to this suggestion is outside the mandate of the GMRP. However, the GMRP is working with the Department of Fisheries with respect to habitat loss and compensation. Discussions began in 2018 and continued in 2019 and 2020. The GMRP, is committed to engaging with the Working Group, Giant Mine Advisory Committee, and the affected parties to determine the appropriate habitat design requirements are incorporated into the final design of Baker Creek. Fisheries and Oceans Canada will determine the final habitat design requirements through the Fisheries Act Authorization process.</p> <p>The GMRP calculated habitat loss associated with construction and remediation activities in Yellowknife Bay and Baker Creek as well as predicted habitat gains based on the design of Baker Creek and the Nearshore/ Foreshore cover in Yellowknife Bay. These details were submitted to DFO as part of the Fisheries Act Authorization for the full scope of the closure and reclamation activities associated with the GMRP (with some minor exceptions) on March 17, 2023. GMRP will consider this suggestion complete upon receipt of the Fisheries Act Authorization.</p>
10	The Developer should investigate the potential advantages and disadvantages of adding an engineered wetland to the Project to reduce arsenic in surface drainage. This investigation should include possible locations in the channel that formerly contained Baker Creek and in the Baker Creek diversion. On completion, the Developer should make a public report of the results of this investigation and of any resulting changes to Project design. This should be completed before a water licence is issued for the Project.	<b>Underway</b>	A Research and Reclamation Plan entitled Passive and Semi Passive Treatment systems is an Appendix to the CRP. This plan outlines research undertaken to date on engineered wetlands and the proposed further steps to investigate the feasibility and potential effectiveness of applying passive and semi-passive treatment systems on the Giant site.

#	Suggestion	Status	GMRP Comments on Status
11	<p>To manage the risks of airborne exposure of contaminated dust from deconstruction of buildings or other structures on site, the Developer should:</p> <ul style="list-style-type: none"> <li>• prepare a dispersion model of dust plume given typical wind direction and speed</li> <li>• define the meteorological window of opportunity to describe acceptable wind conditions to eliminate the potential for a dust cloud release and transport of surrounding communities.</li> <li>• consult a meteorologist to develop a sound model of weather conditions, to indicate when winds are steady and not gusting, blowing to the north</li> <li>• stop if winds change or any dust controlling equipment fails</li> </ul>	Underway	The AQMP is an existing and ongoing program that was designed to adapt to changing activities on site, and will incorporate all suitable measures and activities to mitigate the risks of exposure to contaminated dust throughout the life of the Project. The Dust Management and Monitoring Plan includes Action Levels which include a number of potential mitigations and contingencies, up to and including work stoppage.
12	To prevent impacts on people from potentially harmful contaminant releases from deconstruction of buildings or other structures on site at the Giant Mine site, the Land and Water Board should specify allowable wind directions and wind speeds in degrees, to ensure that contaminated structures are not demolished during blustery multi-directional winds at ground level.	Underway	The Air Quality Monitoring Plan (AQMP) is an existing and ongoing program that was designed to adapt to changing activities on site, and will incorporate all suitable measures and activities to mitigate the risks of exposure to contaminated dust throughout the life of the Project. The Dust Management and Monitoring Plan includes Action Levels which include a number of potential mitigations and contingencies, up to and including work stoppage.
13	The Developer should investigate options for filling in the pits, in consultation with the City of Yellowknife and YKDFN.	Complete	The option to fill pits was investigated and outlined in the Open Pits Options Assessment Report. Pit filling options were evaluated and engaged on during the Surface Design Engagement, where there was support from most affected parties to fill pits. As outlined in the CRP, the pits will be filled or partially filled.
14	The Developer should consider the baseline conditions for existing fish habitat in Back Bay (including a fish habitat assessment in the area of the foreshore tailings and the aquatic effects baseline required in Measure 17) and develop a foreshore tailings cover design and foreshore tailings monitoring and mitigation plan for review by the Department of Fisheries and Oceans pursuant to habitat provisions of the Fisheries Act.	Underway	Fish Habitat surveys of the foreshore tailing areas, the near shore contaminated sediments and the outfall area in Yellowknife Bay began in 2018 and continued in 2020/21. This work informed the Project's application for Department of Fisheries and Oceans Canada Fisheries Act Authorization. Yellowknife Bay baseline condition surveys began in 2018 and will inform a future AEMP Design Plan focused on Yellowknife Bay.

#	Suggestion	Status	GMRP Comments on Status
15	The Developer should consult with the City of Yellowknife in the design of any landfill on the Giant Mine site.	Complete	Engagement sessions occurred with the City of Yellowknife through the Giant Mine Working Group and in the City-GMRP monthly meetings to present the proposed locations and other details of the on-site landfill, resulting in support of the proposed location in the CRP. The Non-Hazardous Waste Landfill Design Plan was submitted to the MVLWB in March 2021.
16	The Developer should consult with Indigenous groups with respect to reduced traditional use cumulatively resulting from the proposed Project in combination with contamination from Giant Mine. This should occur prior to finalizing Project design, so that design improvements may be used to address any remaining concerns.	Underway	The extensive engagement completed by the Project is documented in the CRP, Engagement Plan and Engagement Log. The GMRP has supported Traditional Knowledge studies and continues to incorporate community and Traditional Knowledge across programs and plans, as available.



## APPENDIX E – ADDITIONAL INFORMATION ON MONITORING PARAMETERS

### E.1 Air Quality Monitoring Program

The GMRP team is committed to maintaining air quality parameters below the protective thresholds set by the AQMP and listed below.

Table 28: AQMP Air Quality Criteria (SLR Consulting (Canada) Ltd, 2021)

Analyte	Source <sup>12</sup>	Averaging Period	Guideline / Standard Concentration (µg / m <sup>3</sup> unless otherwise specified)
Total suspended particulates	[3]	24 hr	120
	[3]	Annual	60
Particular matter less than 10µm (PM <sub>10</sub> )	[1]	24 hr	50
Particular matter less than 2.5µm (PM <sub>2.5</sub> )	[2]	24 hr	28
Nitrogen dioxide	[3]	1 hr	213 (ppb)
	[3]	24 hr	106 (ppb)
Arsenic (As)	[1]	24 hr	0.3
Iron (Fe)	[1]	24 hr	4
Lead (Pb)	[1]	24 hr	0.5
Nickel (Ni)	[1]	24 hr	0.2
Antimony (Sb)	[1]	24 hr	25
Asbestos as fibre > 5µm in length	[1]	24 hr	0.04 fibres/c
Fence line – Total suspended particulates Risk Based Action Level*	[4]	15-minute	333
Fence line – PM <sub>10</sub> Risk Based Action Level*	[4]	15-minute	159

\* Derived from toxicological references for the hypothetical on-site worker/trespasser, chronic criterion based on protection against both an incremental carcinogenic risk of  $1 \times 10^{-5}$  (Health Canada, 2004) using the Health Canada Inhalation Unit Risk Factor.

### E.2 Water Quality Monitoring

The GMRP team undertakes effluent and water quality monitoring in and around the Giant Mine site via different programs to report on surface water, groundwater and underground minewater. These programs track parameters such as the volume of water pumped or discharged, water quality, and the performance of the Effluent Treatment Plant.

Parameters tested at all stations include standard general parameters (e.g., temperature, pH, conductivity, hardness), major ions, nutrients, and

total and dissolved metals and metalloids. There are also specific station requirements for other tests such as cyanide, sulphide, hydrocarbons, and radium-226. Samples collected at SNP 43-1 must meet federal requirements under MDMER as well as the discharge criteria defined in the GMRP Water Licence MV2007L8-0031.

The figures below highlight the locations of surface water quality monitoring stations as well as groundwater monitoring wells and well status.

<sup>12</sup> SOURCES: [1] Ontario Ambient Air Quality Criteria (December 2016), [2] Canadian Council for Ministers of the Environment (2015) Canadian Ambient Air Quality Standards, [3] Guideline for Ambient Air Quality Standards in the Northwest Territories (February 2014), [4] Health Canada 2004.







Figure 20: Surface Water Quality Monitoring Stations



Figure 21: Groundwater Monitoring Wells and Well Status



## APPENDIX F – GREENHOUSE GAS EMISSIONS

Table 29 below provides the summary of monthly consumption on site (Parsons Inc., 2022b).

Table 29: Summary of Monthly Consumption for 2022-23 Fiscal Year

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Annual (FY)
Indirect Emissions														
Purchased Electricity	Unit of Measure	Monthly Usage (kWh)												
Purchased Electricity	kWh	504,000	414,000	549,000	549,000	445,500	495,000	463,500	522,000	594,000	535,500	499,500	675,000	6,246,000
Direct Emissions														
Fuel Combustion (for heating or otherwise)		Fuel consumed												
Fuel Type	Unit of Measure													
Natural Gas	m³	0	0	0	0	0	0	0	0	0	0	0	0	0
Propane	L	51,037.8	0	0	0	0	0	34,489	30,112	105,445	101,402	110,443	129,316	562,244.8
Diesel Fuel	L	30,059.6	7,394	0	0	0	0	41,870	31,245	64,627	93,501	76,115	90,314	435,125.2
Gasoline	L	0	0	0	0	0	0	0	0	0	0	0	0	0
Mobile Transportation		Fuel consumed												
Vehicle Type	Fuel Type (Unit of Measure)													
Light-Duty Vehicle (excluding trucks SUVs and minivans)	Gasoline (L)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diesel (L)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Propane (L)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Natural Gas (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0
Light-Duty Truck (<3,900 kg GVWR, including SUVs and minivans)	Gasoline (L)	0	0	0	0	0	0	0	0	0	1,353	1,446	1,565	4,364
	Diesel (L)	7,443.17	5,366.32	6,101.32	7,499	6,225	4,890.9	7,484	9,457.2	11,714.9	8,980	8,850	9,048	93,059.81
	Propane (L)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Natural Gas (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0
Heavy Duty Truck (>3,900 kg GVWR)	Gasoline (L)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diesel (L)	0	0	0	0	0	0	0	0	0	0	0	249	249
Off-Road Vehicle/ Construction Equipment (including ATVs and snowmobiles)	Gasoline (L)	0	0	60	0	0	0	0	0	0	0	0	0	0
	Diesel (L)	16,077.66	27,878.63	21,068.7	18,595	23,050	23,880.7	21,027	19,456.3	32,697.5	12,763	4,664	14,057	235,215.49
Mobile Air Conditioning		# in fleet												
Vehicles (including haul trucks and construction equipment)	17	17	17	17	17	17	17	17	17	17	27	27	32	20

Comments:

1. Mobile Air Conditioning Vehicles include light-duty vehicles
2. Propane consumption is the actual propane received on-site rather than used as there are no flow meters installed on them

Table 30: GHG Emission Summary for 2022-23 Fiscal Year

GHG Emission Summary		Total Emission (Kg CO <sub>2e</sub> )											
Month	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Annual
Indirect Emissions													
Purchased Electricity	171,279.4	140,693.8	186,572.2	186,572.2	151,398.7	168,220.8	157,515.8	177396.5	201,864.96	181,984.3	169,750.08	229,392	2,122,640.64
Direct Emissions													
Stationary Fuel Combustion by fuel type													
Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0
Propane	79,006.51	0	0	0	0	0	53,388.97	46,613.38	163,228.86	156,970.3	170,965.764	200,181.168	870,354.9504
Diesel Fuel	81,311.22	20,000.77	0	0	0	0	113,258.4	84,517.73	174,814.953	252,920.2	205,891.075	244,299.37	1,177,013.666
Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0
Mobile Transportation by Vehicle Type													
Light-Duty Vehicle (excluding trucks, SUVs and minivans)	0	0	0	0	0	11,540.96	0	0	0	0	0	0	11,540.96
Light-Duty Truck (<3,900 kg GVWR, including SUVs and minivans)	20,520.82	14,794.94	16,821.34	20,674.74	17,162.33	13,484.21	20,633.39	26,073.5	32,297.9793	28,133.6	28,007.22	28,850.011	267,454.0762
Heavy Duty Truck (>3,900 kg GVWR)	0	0	0	0	0	0	0	0	0	0	0	681.762	681.762
Off-Road Vehicle/ Construction Equipment (including ATVs and snowmobiles)	48,104.366	83,412.86	63,037.55	55,636.24	68,965.6	71,451.05	62912.78	58,213.25	58,213.25	38,186.9	13,954.688	42,058.544	703,764.7461
Mobile Air Conditioning	607.75	607.75	607.75	607.75	607.75	607.75	607.75	607.75	607.75	965.25	965.25	1,144	713



## APPENDIX G – PLAIN LANGUAGE SUMMARY

### Introduction to the Giant Mine Remediation Project

The Giant Mine is a former gold mine located within Yellowknife, Northwest Territories city limits. It is about 5 km north of city centre. The site lies within the asserted traditional territory of Indigenous communities and groups:

- The site is within the Yellowknives Dene First Nation's traditional territory. As part of the Akaicho Territory Dene First Nations, they are negotiating a land, resource, and governance agreement with the governments of the Northwest Territories and Canada.
- The Tłıchq have a recognized area of traditional land use known as Mqwhi Gogha Dè Nıłtłèè. In this area, members exercise rights set out in the Tłıchq Agreement. The Giant Mine site falls within this area's boundaries.
- The North Slave Métis Alliance represents Métis in Yellowknife. Members assert Indigenous rights in the area that includes the Giant Mine site.
- The Northwest Territories Métis Nation represents the Métis from the Northwest Territories' South Slave region. The Giant Mine site is next to Great Slave Lake, which is within the boundaries of the Land and Resources Final Agreement they are negotiating with the governments of Canada and the Northwest Territories.

The Giant Mine operated from 1948 to 2004.

When the owners went bankrupt, Canada became responsible for the site and the contamination left behind. This includes 13.5 million tonnes of tailings and 237,000 tonnes of arsenic trioxide waste. The Giant Mine Remediation Project (the Project) is jointly managed by:

- The Government of Canada, represented by Crown-Indigenous Relations and Northern Affairs Canada, and
- The Government of the Northwest Territories, represented by the Environment and Climate Change Department



## About the Annual Report

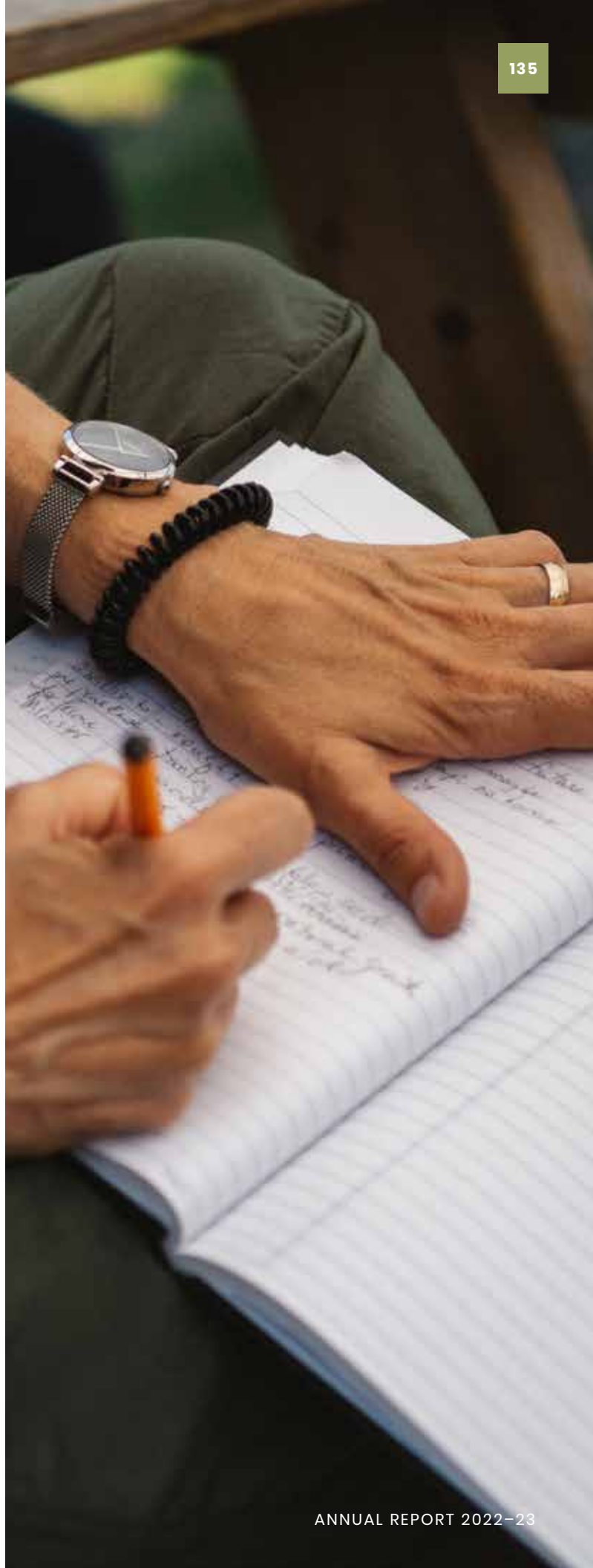
The Project team is committed to informing interested parties about Project progress, activities, and plans. The team engages and shares information in several ways. One way is through submitting an annual report to the Giant Mine Oversight Board.

The report describes what has happened on the site over one federal fiscal year. A fiscal year is the budget year of the federal government, from April 1 to March 31.

In the annual report, the team provides a detailed explanation of its activities, important learnings, and future plans. This is so interested parties can keep track of the Project's progress.

The Project team is required to prepare an annual report as part of the terms of the Giant Mine Remediation Project [Environmental Agreement](#). The agreement guides what information the Project must include in the report. The Giant Mine Oversight Board reviews and comments on the report each year. This process will continue to shape the report's format and content.

This document is a plain language version of the full annual report, which provides more detail about activities and progress in 2022-23. This annual report is Giant Mine Remediation Project's eighth. It covers the period from April 1, 2022 to March 31, 2023. Activities and updates related to the Project after March 31 will be covered in next year's report.



## Project Status

In 2007, the Giant Mine Remediation Project team submitted a Water Licence application to the Mackenzie Valley Land and Water Board. The application included a remediation plan for all aspects of underground and surface clean-up. The City of Yellowknife referred this plan to Environmental Assessment. The assessment was completed in 2014. It included a Report of Environment Assessment with 26 measures that the Project is required to complete. The measures included developing a new clean-up plan, called a Closure and Reclamation Plan (CRP). The CRP is the result of extensive engagement and design work done by the Project team since the Report of Environmental Assessment.

In April 2019, the Project team submitted the new plan and supporting documents to the Mackenzie Valley Land and Water Board. The board approved the Project's Land Use Permit in August 2020 and the Water Licence in September 2020. These can be found on the board's [public registry](#).

In July 2021, the Giant Mine Remediation Project moved from Phase 1, which focused on care and maintenance and planning, into Phase 2, which focuses on active remediation and adaptive management.



## Progress on Environmental Assessment Measures

As noted above, the Report of Environmental Assessment included 26 measures. The team's immediate focus was measures with set timelines and those with the biggest impact on project scope. Since the Report of Environmental Assessment, the Project has completed and advanced many measures. The table below includes their status, as well as the status of suggestions included in the Report of Environmental Assessment.

	STATUS	MEASURES	SUGGESTIONS
	Completed	3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 22	8, 13, 15
	Underway	9, 17, 20, 23, 25, 26	1, 2, 3, 9, 10, 11, 12, 14, 16
	Future Action Required	2, 21, 24	
	No Action Required / Outside Scope of Project	1	4, 5, 6, 7

In 2022-23, the Project focused on Measure 23 and completed the draft Tailings Management and Monitoring Plan and Tailings Design Plan, which was a requirement under the Water Licence conditions. The project team also advanced the Yellowknife Health Effects Monitoring Program (Measure 9), Yellowknife Bay Special Study (Measure 17), and The Perpetual Care Plan (Measure 26).

## Advancement of Remediation Designs and Activities

In 2022-23, the Project advanced remediation designs and activities for several project items. These included:

- Freeze pad design and installation;
- Underground backfill program and open pit closure;
- Water treatment projects (new water treatment plant, pumping system, and passive treatment system);
- Tailings containment areas (including demolition of some of the Townsite buildings); and,
- Waste disposal and management (non-hazardous waste landfill and contaminated soil and sediment).

## Ongoing Site Management

Ongoing management at the Giant Mine site is critical to ensuring it stays stable and safe for staff, the public, and the environment during remediation. This includes:

- Maintaining the site;
- Managing risks;
- Conducting inspections;
- Monitoring the environment;
- Keeping dust levels down;
- Treating water; and,
- Health and safety activities.

## Care and Maintenance

Ongoing care and maintenance at Giant Mine is essential to manage current risks and prevent harm to staff, local communities, and the environment.

In 2022-23 the Project continued care and maintenance activities. These included:

- Conducted ongoing air quality monitoring, dust management, road and site infrastructure maintenance and the provision of site security;
- Continued Effluent Treatment Plant operations;
- Maintained the underground part of the mine, including repairing existing chutes and head covers to reduce hazards to workers;
- Progressed design work for safe access, electrification, and improved ice melting in the A1 and A2 areas;
- Completed a hazardous materials survey of the underground;
- Completed a design for the modifications to the high-test line (required before abandoning the underground). This helps ensure that any water getting underground will drain to a separate location and not overwhelm the Water Treatment Plant;
- Completed construction of the C-shaft ventilation system; and,
- Completed pilot hole program to confirm assumptions regarding target locations for the WTP pumps.

## Infrastructure Review

Every few years the Project examines buildings to see if they pose a risk to people on site and if issues need to be addressed before cleanup or demolition takes place. Structural reviews occurred in 2019 and 2021. The Project has implemented the recommendations from these reviews. The Project team completed an assessment of all remaining buildings and established that a review of all buildings on site is not required, since all buildings are scheduled to be demolished in the short term, and any buildings that required any further inspections will be conducted on a case-by-case basis.

In 2023, the Project Team will complete a structural and hazardous materials inspections of the Core Industrial Area buildings to support demolition scope and planning.

## Northwest Deep Well Pumping Station Upgrade

The Northwest Deep Well Pumping Station pumps water out of the underground at Giant Mine so that the water level in the mine stays well below where the arsenic trioxide is stored. After operating for 4 years, the pump system was working at a slower rate and the Project developed a plan to upgrade the station, including the addition of new pumps and an electrical building to power them. One pump stopped working in August 2019, after a power brown-out. The Project team re-installed the pump 2021-22, which then worked as designed. The Project team then commissioned an additional system-wide review to understand how the issue emerged. The investigation is continuing into 2023-24.



## Dam Inspections

Dams are used to manage mine, surface water and tailings on site. Every year, the dams are inspected. In 2022-23, the inspection included all dams associated with the original Tailings Containment Areas, the Northwest Tailings Containment Area and surface water dams. It was found that, in general, the structures appeared to be performing in a satisfactory manner and that the dams are in similar condition to the last geotechnical inspection in 2021.

## Regulatory inspections

In 2022-23, external regulators conducted four (4) external inspections. The regulators decide how many inspections per year are needed, based on what work is being done at the site. There were no non-compliances identified in 2022-23.

The Main Construction Manager and their subcontractors also conduct regular internal inspections. This includes daily site inspections by care and maintenance staff and regular engineering inspections of major structures and equipment. These inspections identified minor issues only, and these were quickly address and corrected.

In 2022-23, CIRNAC initiated an Environmental Health and Safety (EHS) underground audit, which included thirty-seven (37) above ground activities that might impact underground work. In total, there were five (5) findings related to environmental aspects, twenty-two (22) findings related to occupational health and safety (OHS), and ten (10) findings related to the Environmental, Health, Safety and Community Management System (EHSC MS). The Project team has taken corrective actions for several of these findings and will continue to make progress.

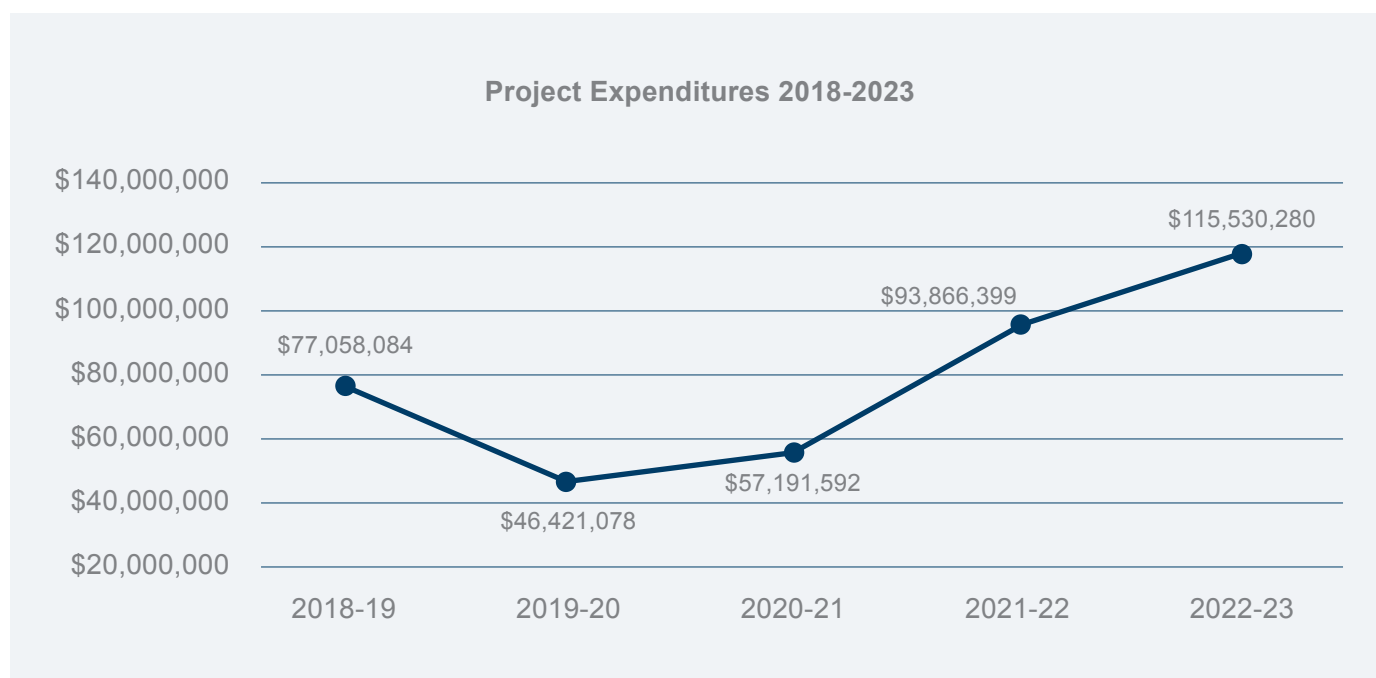




## Summary of Expenditures Trend 2018–2023

The table and figure below outline the Project's expenditures trend from fiscal years 2018-2019 to 2022-2023.

Category	2018-19	2019-20	2020-21	2021-22	2022-23
C&M	\$20,340,033	\$18,808,143	\$22,166,327	\$27,095,659	\$28,919,581
Regulatory	\$50,005	\$1,214,925	\$1,134,420	\$730,733	\$608,230
Consultation	\$3,100,633	\$1,747,380	\$1,345,500	\$3,210,463	\$3,294,542
Investigation & Assessment	\$35,707	-	-	-	\$23,370
Remediation	\$43,657,669	\$11,047,596	\$14,941,948	\$46,328,945	\$64,683,491
Monitoring	-	\$2,905,555	\$3,727,700	\$5,395,981	\$5,623,059
Program Management	\$9,874,037	\$10,697,479	\$13,875,697	\$11,104,618	\$12,378,007
<b>Total</b>	<b>\$77,058,084</b>	<b>\$46,421,078</b>	<b>\$57,191,591</b>	<b>\$93,866,400</b>	<b>\$115,530,280</b>



Environment

The Project has an Environmental Management Plan that guides how each major component of the site is managed. Currently, the Project has several active monitoring programs in place for key environmental issues. The Project’s Long-Term Monitoring Program combines all current monitoring activities and those that will be required in the future. This includes monitoring of the environment and structures/technology.

ENVIRONMENTAL	STRUCTURAL
<ul style="list-style-type: none"><li>• Surveillance Network Program</li><li>• Metal and Diamond Mine Effluent Regulations, including Environmental Effects Monitoring Program</li><li>• Operational Monitoring Program (Effluent Treatment Plant, underground, annual site-wide bird survey)</li><li>• Aquatic Effects Monitoring Program</li><li>• Wildlife and Wildlife Habitat management and Monitoring Plan</li><li>• Air quality – &amp; community</li><li>• Noise</li></ul>	<ul style="list-style-type: none"><li>• Freeze</li><li>• Dams and seeps</li><li>• Landfill</li><li>• Pit stability</li><li>• Tailings covers</li><li>• Underground Structures</li><li>• Baker Creek (icing)</li></ul>

The Long-term Monitoring Program is used to:

- Determine baseline conditions;
- Monitor current conditions and performance of management programs; and
- Inform the design process for remediation activities.



## Air

The Project monitors air quality on a regular basis. In 2022-23, the results of the ambient air quality monitoring indicated the air quality of the airshed was not significantly impacted by activities associated with the Project and was representative of regional and local air quality. In addition, the Project Team applied Soiltac, used for soil stabilization and as a dust suppressant at the Tailing Containment Areas throughout spring and summer as needed. In addition, the Project is taking steps to actively reduce greenhouse gasses now and during remediation.

## Water

The Project continues to treat contaminated water at the site's effluent treatment plant. It is treated to meet the criteria in the former mine's Water Licence and criteria that meets relevant regulations. In 2022-23, a total, 547,118m<sup>3</sup> of treated effluent was released into the environment. Tests showed the treated effluent met requirements before release. The Project conducted environmental effects monitoring to see if the treated effluent caused negative effects on aquatic life. There were no significant concerns, which was similar to previous years' results.

In 2022-23, other key Project activities included:

- Submitting the 2022 Annual Water License Report and the 2022 AEMP Annual Report to the MVWLB;
- Installing groundwater monitoring wells at various location;
- Conducting water management post-construction at Soil Pile 1; and,
- Continuing to engage with Fisheries and Oceans Canada.

## Land

The Project monitors and manages arsenic-impacted waste on site, as well as other hazardous and non-hazardous waste. Monitoring and reducing impacts on wildlife are other important activities on site. In 2022-23, key activities included:

- Continuing to manage wastes on site in accordance with the Waste Management and Monitoring Plan;
- Operating the non-hazardous waste landfill;
- Acquiring General Wildlife Permits from GNWT in 2022;
- Reviewing the Wildlife and Wildlife Habitat Management and Monitoring Plan (Version 2.0) with no changes necessary; and,
- Maintaining the wildlife log on site.

## Health and Safety: Occupational and Public

### Occupational Health and Safety

Health and safety on site are very important to the Project Team. The Project keeps track of how many incidents and near misses happen each month and reports this information to the Project Director. Workers discuss incidents and near misses in daily safety meetings so workers can review lessons learned, identify causes, and prevent future incidents.

The table below shows the incidents and near misses in 2022-23.

INCIDENTS AND NEAR MISSES	2022-23 TOTAL
<b>Major Incident:</b> an activity on site that leads to a severe and permanent disability, impairment, injury, illness or death to someone.	0
<b>Moderate Incident:</b> an activity on site that leads to a reversible disability, impairment, injury or illness that temporarily alters someone’s life.	1
<b>Minor Incident:</b> an activity on site that leads to injury or illness that inconveniences someone.	10
<b>Near Miss:</b> an activity on site that did not result in any disability, impairment, injury, illness or fatality, but could have.	29

Like previous years, there were no major safety incidents on site. There was 1 moderate incident, which is lower than the previous three years (3 in 2021-22, 7 in 2020-21, and 3 in 2019-20). The number of minor incidents in 2022-23 (10) is similar or higher than previous years (9 in 2021-22, 3 in 2020-21 and 5 in 2019-20). There were fewer near misses in 2022-23 compared with the previous four years. When the number of hours worked on site is considered, all health and safety incident trends have decreased or stayed the same.

In the 2022-23 reporting year, the GMRP team continued to monitor arsenic levels in workers. The total percentage of samples above the action level in 2022-23 was 3.35%. Which is higher than last year (1.92% in 2021-22). The increase in the number of samples above the Action Level could be due to the increase in workers and the types of activities on site now, including underground activities and sludge transportation. When a worker’s sample is above the accepted level, the Project takes immediate action. This includes taking steps to reduce the worker’s exposure, which may mean changing the type of work they do until their levels return to below the accepted level. The Project also investigates the cause of the exposure.

The Care and Maintenance contractor also ensures employees and subcontractors receive relevant health and safety training. This includes first aid, wildlife safety, water safety and fire response, as required by applicable regulations.

### Health Effects Monitoring Program and Stress Study: Understanding Community Wellbeing Around Giant Mine

The Health Effects Monitoring Program will establish current levels of arsenic and other contaminants of concern in people's bodies. This means the study had to take place before the cleanup starts. During remediation, the participants will provide samples again. These new results will be compared to the current or baseline to help make sure the remediation activities do not negatively impact people's health.

The timeline for the monitoring program is as follows:

- **2017-2018:** Baseline sample collection in 2018. There was a total of 2037 participants between Fall 2017 and Spring 2018. Individual results were reported back to all the participants by mail, and a progress report summarized key results.
- **2019-2020:** Public engagement was undertaken in May 2019 to report back on the initial results of the study.
- **2021-2022:** The committee continued to provide updates on relevant publications, genetic analysis, and communication strategies for the revised website.
- **2022-2023:** Conducted sampling of children aged 5-18 at the five-year interval. The next round of sampling will occur 2027-2028 with both adults and children being sampled.

In February 2023, the Health Effects Monitoring Program Advisory Committee completed the third progress report for the Yellowknife Health Effects Monitoring Program (YKHEMP). The published 2023 Progress Report can be found here: [Progress Report 2023 | Health Effects Monitoring Program \(ykhemp.ca\)](https://ykhemp.ca/Progress-Report-2023-Health-Effects-Monitoring-Program)

In March 2023, the Project team generated plain-language booklets that show the newest results from the 2017-18 baseline study, including results for health files and genetics. The published 2023 plain-language booklet can be found here: [Results Booklets \(2023\) | Health Effects Monitoring Program \(ykhemp.ca\)](https://ykhemp.ca/Results-Booklets-2023-Health-Effects-Monitoring-Program)

***Stress Study: Understanding Community Wellbeing Around Giant Mine*** (formerly known as the “Hoèla Weteèts’eèdee” Understanding Community Well-being around Giant Mine Study). The study was discontinued after the YKDFN, the Study's partner and main participant, informed the GMRP team that they no longer wished to be a part of the Study, and after careful deliberation by the Study's Advisory Committee. The Project team remains committed to continued engagement and consultation with rights holders and stakeholders, and to the ongoing protection of the environment and the health and safety of Northerners as it relates to the Giant Mine site.



## Key Engagement Activities

Engagement is an important and valued part of the Giant Mine remediation process. In 2022-23, the GMRP team undertook or participated in 78 engagement activities and events, aligned with and in support of the Project or related activities. This represents fewer events compared to 2020-21 (87) and is higher than in 2019-20 (67 engagement events) and 2018-19 (43).

The Project team continued its regular engagement with key affected parties through avenues such as:

- The Giant Mine Oversight Board;
- The Giant Mine Advisory Committee;
- The Giant Mine Working Group; and,
- The annual public forum.

In addition to the above regularly scheduled meetings, the Team provides updates on GMRP activities and progress through multiple communication techniques including:

- e-newsletter: Sent regularly to more than 305 email addresses and posted on the GMRP website,
- Website ([www.giant.gc.ca](http://www.giant.gc.ca));
- X account ([@GiantMine](https://twitter.com/GiantMine) and [@MineGiant](https://twitter.com/MineGiant));
- Media briefings and responses to media requests;
  - There were 39 media interactions (media requests for interview, information/responses) in fiscal year 2022-23.
- Responses to unforeseen events;
- Topic-specific public service announcements, as required; and
- Topic-specific engagements, as appropriate.

The Yellowknife Spring Trade Show took place as an in-person event on May 7th and 8th, 2022. This was the first trade show since 2019 and aimed to inform the local community about the new active remediation work being carried out on site. The next Tradeshow will take place in May 2023. The Project team (led by the MCM) also held Industry Day on November 1 and 2, 2022 (virtually). The next Industry Day is set to occur in the Fall of 2023.



## Socio-economic

The Giant Mine Remediation Project works to deliver social and economic benefits to Indigenous and Northern communities while protecting the environment and people's health. Parsons, the Main Construction Manager, uses several tools to help the Project team achieve their socio-economic goals. This includes subcontracting to Indigenous and Northern businesses and incorporating criteria into all tenders that encourage employment, training, and apprenticeships for Indigenous workers.

The Project tracks total employment and employment by certain categories. This includes:

- Northern workers;
- Indigenous workers;
- How “Indigenous Opportunities Considerations”<sup>13</sup> commitments are met during procurement; and,
- Female workers.

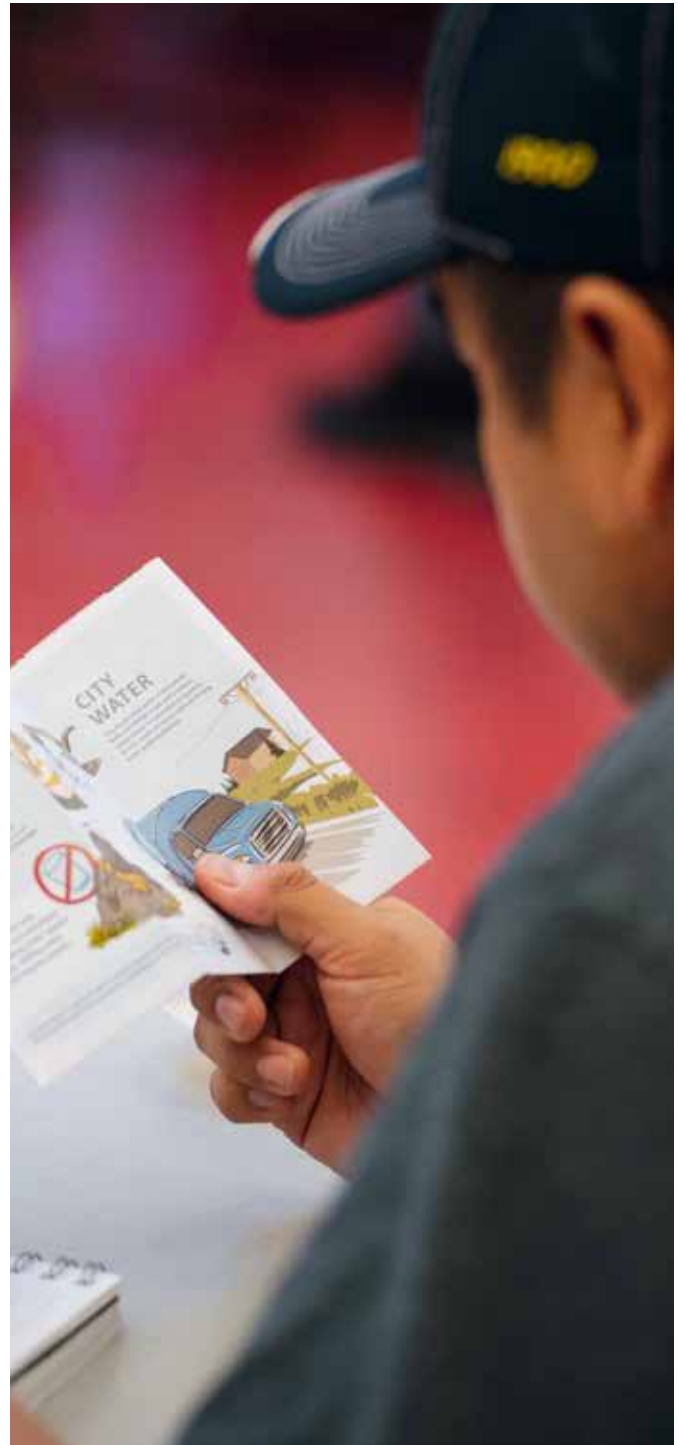
The Project team led a comprehensive update to the Strategy in 2022-23, integrating feedback from rights holders and stakeholders from the past five years. The overall aim of the updated 5-year (2023-2028) Strategy is to maximize socio-economic benefits for Northerners and Indigenous Peoples and to deliver on regional socio-economic commitments and requirements. This socio-economic aim is supported by three pillars:

EMPLOYMENT & PROCUREMENT

TRAINING & CAPACITY DEVELOPMENT

SOCIAL IMPACT MANAGEMENT

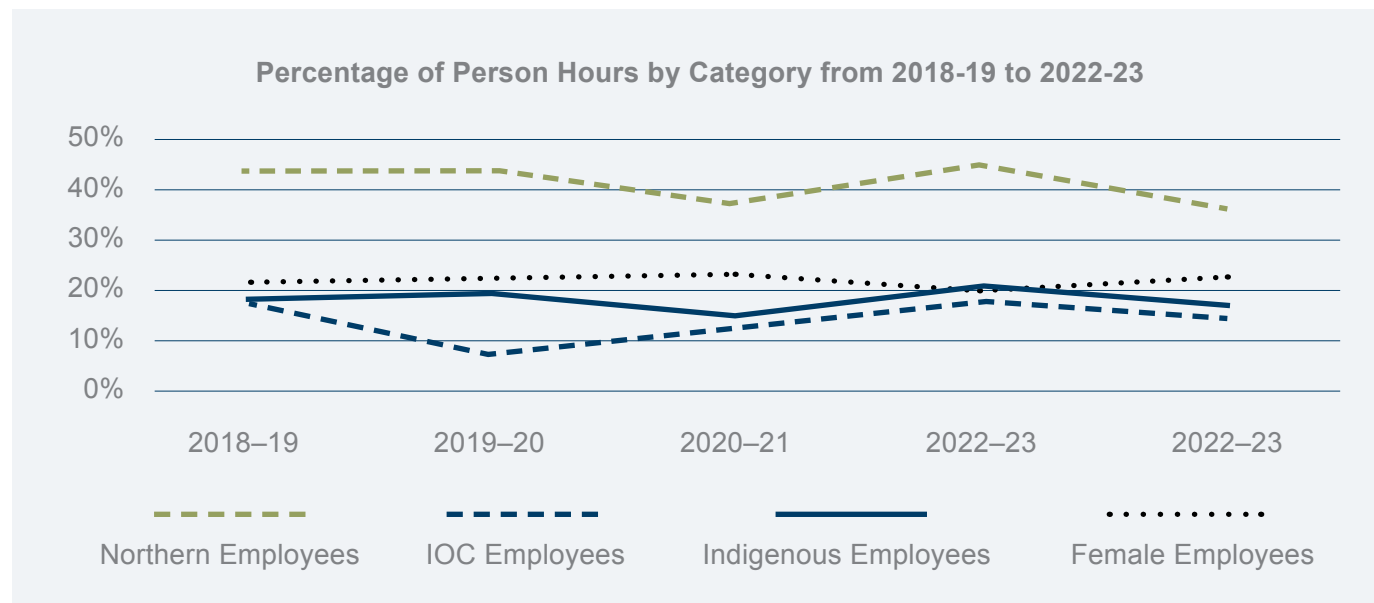
The Strategy describes the objectives, focus areas, desired outcomes, indicators, and targets under each pillar. A Plain Language Summary of the Strategy can be found here: <https://www.rcaanc-cirnac.gc.ca/eng/1566487546150/1618357081011>.



<sup>13</sup>IOC is used by procurement officers to review proposals and evaluate the commitments made by firms, such as the percentage of labour force that is local Indigenous peoples. Incentives and penalties are applied to encourage firms to meet or exceed commitments outlined in their proposal.

## Employment

In 2022-23, the percentage of overall hours worked for Northern employment reached 36%, which is lower than the 2021-22 percentage (46%). Indigenous employment accounted for 18% of total person-hours worked in 2022-23, a 3% decrease compared with the 2021-22 results (21%). IOC employment decreased from 18% in 2021-22 to 15% in 2022-23. Northern Indigenous Employees represented 16% of all employees (in person hours). Female employment increased from 20% in 2021-22 to 22% in 2022-23.



In 2019-20, the Project worked with the Socio-Economic Working Group and the Socio-Economic Advisory Body to set targets for the Project to compare its annual results against. In 2022-23, employment of women was within the target range. Employment of Northerners and Northern Indigenous employees continue to be below the lower end of the target range. The table below shows total employment of Northerners, Northern Indigenous, and Women in 2022-23 compared to the target ranges.

Key Performance Indicator	Number of person hours	Person-hours as percentage of all person-hours	Target ranges for the implementation phase	Gap
Employment accounted by Northerners	135,993	36%	55-70%	19-34%
Employment accounted by Northern Indigenous	59,951	16%	25-35%	9-19%
Employment accounted by Women	85,025	22%	15-30%	within range

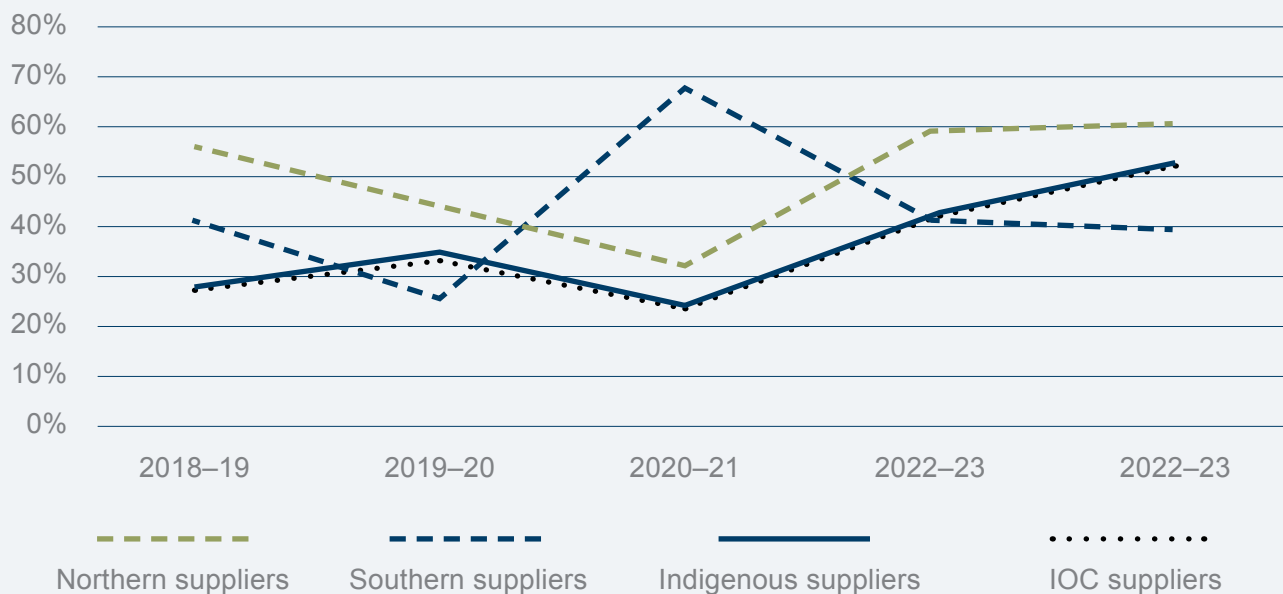
The Project anticipates that the Northern and Northern Indigenous employee statistics will improve during the Implementation Phase of the Project as the demand for on-site work will increase. The Project will continue to work with its partners to identify actions to improve these employment figures.



### Procurement

The Project also tracks suppliers (i.e., contractors) by type, specifically Northern, Indigenous and IOC. In 2022-23, the proportion of money spent on contracts with Northern suppliers reached 61% of all the Project's expenses. The results are higher than previous reported years (59% in 2021-22, 44% in 2019-20, 56% in 2018-2019). The proportion spent with Indigenous suppliers increased to 53% in 2022-23, and money spent on contracts increased to \$50,714,487 in 2022-23 compared to \$30,564,330 in 2021-22. The proportion spent with IOC suppliers followed a similar trend, from 41% in 2021-22 to 52% in 2022-23, which is the highest result achieved compared to previous years (24% in 2020-21, 35% in 2019-20, 28% in 2018-19).

Percent of Total \$ Value Spent from 2018-19 to 2022-23

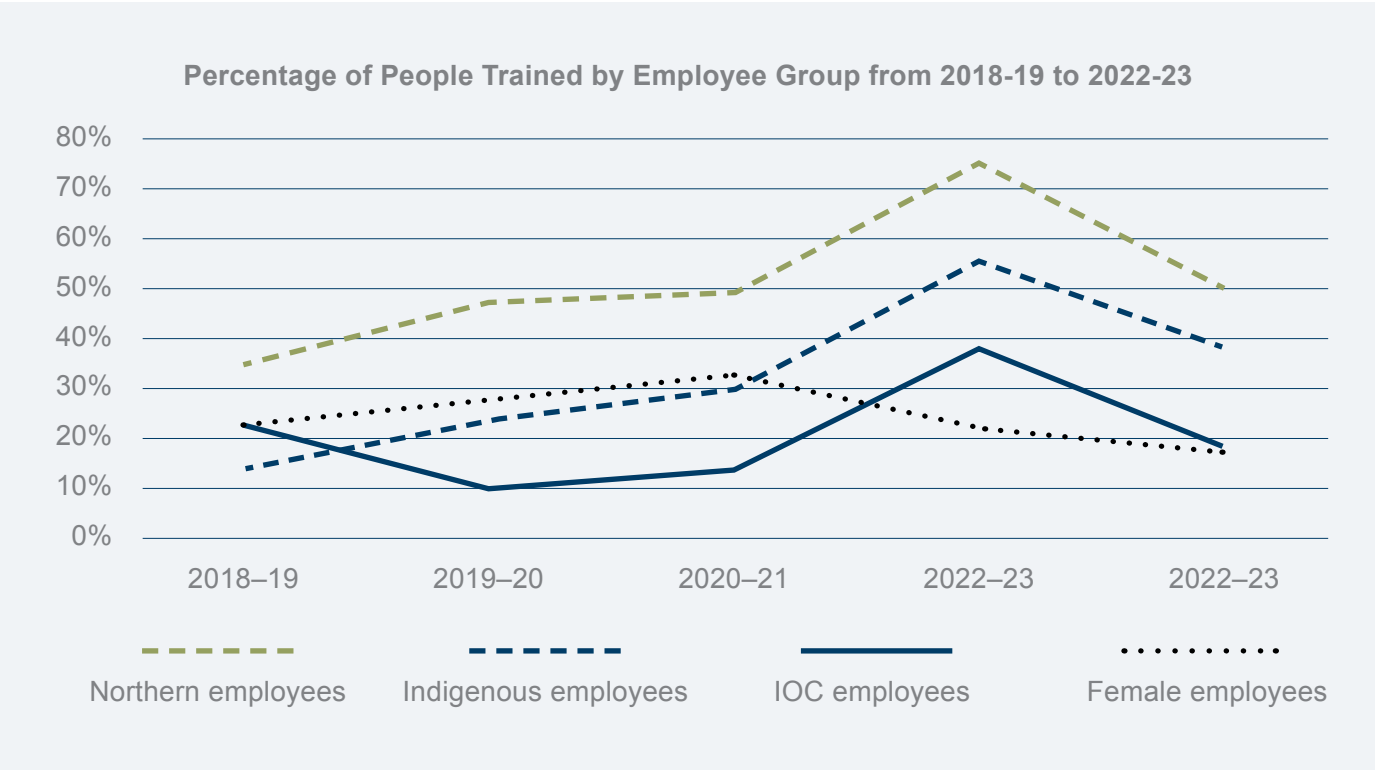






Training

In addition to the occupational health and safety training, Project contractors deliver workforce training, including site orientations. In 2022-23, the total number of people who received workforce training (377) was higher than the last three years (335 in 2021-22, 228 in 2022-21, and 230 in 2019-20). While the number of people who received workforce training was higher overall, training provided to Northern employees (191 people), IOC employees (71) and female employees (68) decreased slightly from 2021-22, but is similar or higher than between 2018-19 and 2020-21.





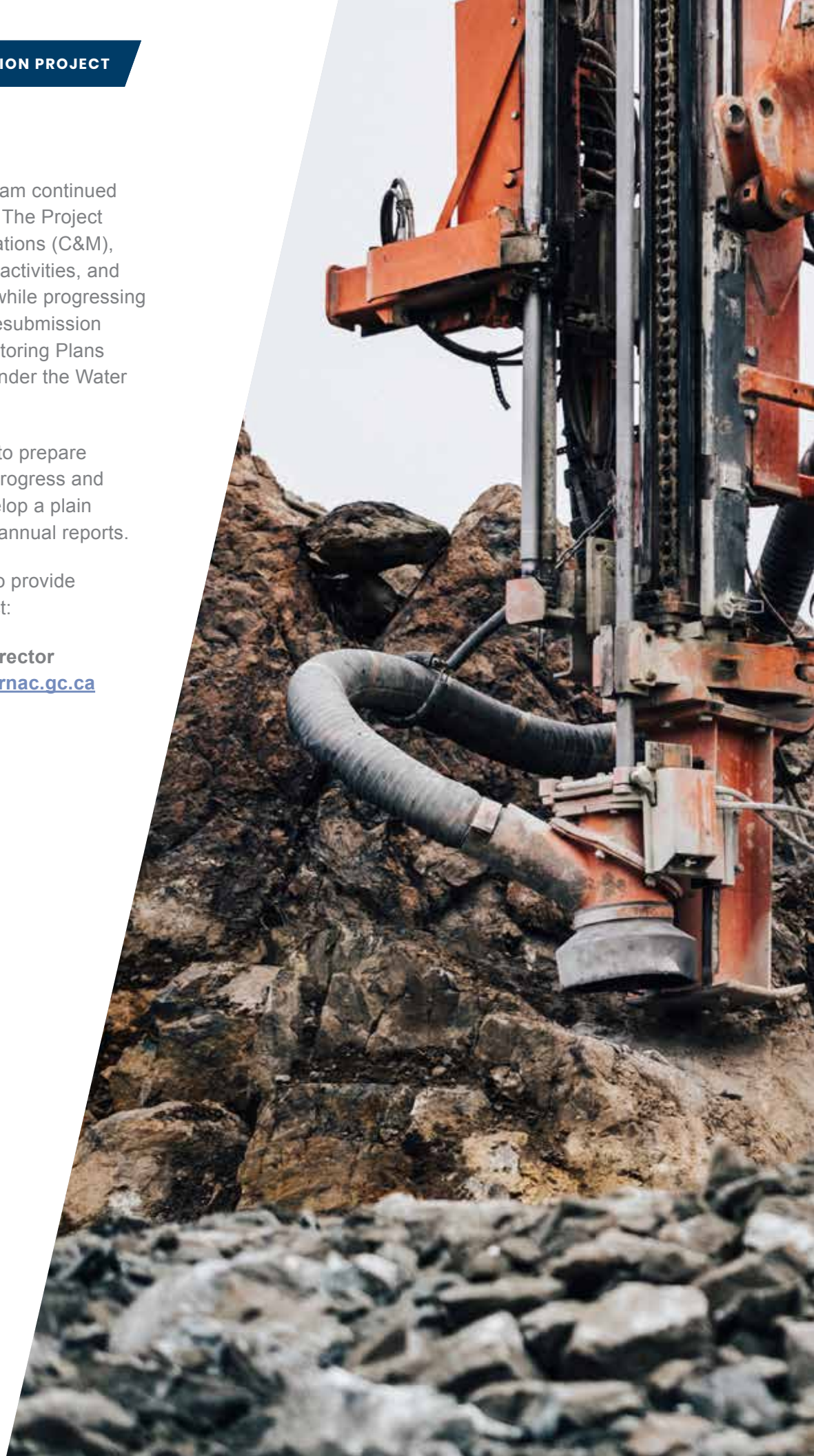
## In Closing

In 2022-23, the Project team continued remediation work on site. The Project team continued site operations (C&M), immediate risk mitigation activities, and community engagement while progressing work on the review and resubmission of Management and Monitoring Plans and other requirements under the Water Licence.

The Project will continue to prepare annual reports about its progress and performance, and to develop a plain language summary of its annual reports.

For more information or to provide comments, please contact:

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Crown-Indigenous Relations  
and Northern Affairs Canada

Relations Couronne-Autochton  
et Affaires du Nord Canada



Government of  
Northwest Territories  
Gouvernement des  
Territoires du Nord-Ouest

Canada