Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection

Back River Project, Nunavut, Canada

B2Gold Corp.

SRK Consulting (Canada) Inc. ■ CAPR003105 ■ April 2024

srk consulting

Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection

Back River Project, Nunavut, Canada

Prepared for:
B2Gold Corp.
666 Burrard Street, Suite 3400
Vancouver, BC, V6C 2X8
Canada

+1 604 681 8371
www.b2gold.com

Prepared by:
SRK Consulting (Canada) Inc.
320 Granville Street, Suite 2600
Vancouver, BC V6C 1S9
Canada

+1 604 681 4196
www.srk.com

Lead Author: Anna Timchenko **Initials:** AT
Reviewer: John Kurylo, PEng **Initials:** JBK

File Name:
BackRiver_Goose_2023AGI_Report_CAPR002290_FINAL_20240409.docx

Suggested Citation:
SRK Consulting (Canada) Inc. 2024. Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection. . Prepared for B2Gold Corp.: Vancouver, BC. Project number: CAPR003105. Issued April. 2024.

Cover Image:
Aerial stitched drone photographs of the Goose Plant and Camp sites, taken September 2023.

Disclaimer. SRK Consulting (Canada) Inc. has prepared this document for B2Gold Corp., our client. Any use or decisions by which a third party makes of this document are the responsibility of such third parties. In no circumstance does SRK accept any consequential liability arising from commercial decisions or actions resulting from the use of this report by a third party.

The opinions expressed in this document have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. While SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

Contents

Tables

Figures

Appendices

Executive Summary

The Back River site continues to be in a period of transition, in a pre-operation ramp up stage. This means that many of the pads, roads, ponds, and water conveyance (culvert) structures were at an interim state and / or were not yet completed at the time of the 2023 Annual Geotechnical Inspection (AGI). For many of the structures if the infrastructure and earthworks construction is completed as per the available designs, then notable issues would not be expected. Further site's current operational procedures, which were not all know to SRK as part of this inspection, likely will help to further manage risks on site and address many of the observations made of the partially constructed infrastructure.

Observations of the interim state of the construction have been made in attempt to allow for site to improve the final configuration of the earthworks and water management infrastructure, to avoid larger scale permafrost degradation, and / or to minimize larger ongoing maintenance requirements.

Figure 1 and 2 show recent earthwork progress at the Goose site, and Figure 7 and 8 shows progress for the MLA site. These figures show a high-level overview and comparison to the more final design footprints and planned working areas. These figures also highlight some of the current in progress areas that B2Gold Corp is working on as Goose moves from the development to the operational stage, and as the MLA continues to evolve as a port, laydown, fuel storage, and transfer location.

The most critical or time sensitive observations from the 2023 AGI are summarized in the list below:

1. **MLA – Tank Farm - Increase MLA tank #2 pedestal width.** Increase the extents of the Tank 2 pedestal. Buttress the current pedestal with additional and coarser fill material.
   - *This has now been completed onsite.*
2. **MLA – General - Develop a remediation plan for the historic temporary fuel storage area**. Area in the low point where tundra has been damaged and degraded. Comment first noted in the 2022 AGI. Develop a remediation plan for this area. Note that the remaining fuel tanks in this area were empty at the time of the 2023 AGI summer site visit.
   - *This remediation planning has been acknowledged and is in progress.*
   - *B2Gold confirmed this location was the original permitted design location for storage, and that upon commencing construction, B2Gold (Sabina at the time) recognized the area was at a topographic low point and relocated the storage approximately 75m within the approved MLA Potential Development Area to an alternate high point. An Operational Update to the Nunavut Impact Review Board containing this information was provided at that time. As per the sites Interim Closure and Reclamation Plan, B2Gold progressively reclaims areas that are no longer in use and will continue to do so for this specific location.*
3. **Site Wide – Complete the first draft of the site Thermal Monitoring Plan** – first draft to be submitted as part of the annual reporting.
   - *This has now been completed.*

4. **Primary Pond – Mitigate the thermal degradation within the dam footprint.** Construction is ongoing at this location. As part of the 2024 construction mitigation of some of the thermal degradation that has resulted on site in the summer of 2023 will be required.
    - *This has been incorporated into the construction plans and is currently in the process of being completed on site.*
5. **Echo – Pit - Revisit the overburden pit slope cladding thickness.** It is suggested that site consider thicker cladding of the overburden slopes. This is not a near term concern but may have design and operational impacts on the future planned in-pit tailings deposition and water reclaim activities. The Echo pit is currently at an interim state and pit slopes were not complete, not at design extents, at the time of the 2023 AGI inspection.
    - *This area is being revisited and further looked at now as part of the Echo Pit tailings disposition planning and design work (being completed in 2024).*
6. **Goose Neck - Culverts - Some of the culvert inlets and/or outlet are covered with material that should be removed to avoid flow impediments.** In addition to the obstructed culvert inlets, site should conder the potential of add in new culvert on southern end of the Goose Neck culvert crossing area (low point in road before the slope goes uphill towards the Explosives access road).
    - *B2Gold staff have confirmed that routine watercourse crossing maintenance and monitoring programs include impendence inspections prior to freshet and will ensure all culverts are clear and functioning prior to necessary conveyance. As part of upcoming 2024 pre-freshet preparation all culverts are planned to be re-inspected and clear to maintain function (if / as appropriate).*
7. **Goose - General – Complete additional surveys and checks on the constructed road widths and thicknesses.** A full updated survey of the roads on site is suggested to be completed. This survey then can be used to do a review of the current road thickness on site. The existing road thicknesses can then be cross-referenced and compared against past permafrost and geomorphological observations (e.g. area with expected higher ground ice would be targets for thicker road fills).
    - *B2Gold have indicated that these survey pick-ups have been started and are partly complete. The recommendation for additional checks will be revisited in 2024 with the updated survey information.*
8. **Goose and MLA – Airstrips - Monitor and consider longer term water management measures for the impediment of flow at the airstrips**. Ponding water and expected ice rich ground was noted to be adjacent to, or intersecting, both site airstrips. These locations should be carefully monitored, and ongoing maintenance should be expected.
    - The Goose airstrip extension to the South is currently in progress. As this airstrip extends to the south, it intersects some more notable surface water flow pathways / ephemeral streams. The South end of the extended Goose Airstrip is expected to be an area that will need to be closely monitored and more permanent long term water conveyance through portions of the airstrip is expected to be required.

- *B2Gold site staff have confirmed that at the Goose and MLA that they carry out daily strip checks to ensure integrity of the airstrip surface and surrounding area. These checks constitute a portion of the information relayed to the airline companies prior to every landing.*

9. **Goose – General - The temporary drilling water 'pond' should be removed before freshet 2024.** A temporary moderate 'pond' of water had been established by the drillers on site for use during exploration drilling. This pond was located north of the Goose Neck crossing area and south of Umwelt Pit. This pond is suggested to be decommissioned (at least breached in multiple locations so that it no longer impounds water) before freshet 2024. This 'pond' was used for exploration drilling. The side berms were un-engineered and just constructed of uncompacted stacked soil. The primary concern with this area would that that the ponded water may rapidly discharge and cause thermal erosion and damage to adjacent tundra. . If this area is planned to be constructed over, road to expand over area, then any massive surface ice should first be removed.
   - *B2Gold site staff have indicated that this area is no longer planned to be used for exploration drilling and will be decommissioned and visually monitored during and immediately after freshet 2024.*

Many additional, typically secondary, or best practice comments, observations, and suggestions were made as part of the AGI. These observations are summarized in the following report text and shown in the attachments.

1 Introduction

SRK Consulting (Canada) Inc. (SRK) was retained by B2Gold Corp. (B2Gold) to conduct a geotechnical site inspection for the active development areas at the Back River Project (Project). The Project is a proposed gold mine and will be licensed to conduct mining, milling, and associated activities. The site is located in the Kitikmeot Region of Nunavut, about 525 km northeast of Yellowknife. The current areas of active development are the Goose project site (Goose), located approximately 160 km south of Bathurst inlet (Figures 1 and 2), and the Marine Laydown Area (MLA or port area), located on the southern portion of Bathurst Inlet (Figures 7 and 8).

In April 2023, Sabina Gold and Silver Corp. (Sabina) was acquired by B2Gold. The project is under development now, and much of the licensed infrastructure components are still under active construction as illustrated in Figures 1 and 2. Construction of the Project started in 2018 and is expected to continue through 2025; ore processing is currently not scheduled until 2025.

2 Background

This annual geotechnical inspection (AGI) is an annual requirement in response to Part 1, Item 10 of the site Water License 2AM-BRP1831 – Amendment No. 1, issued by the Nunavut Water Board (NWB) on October 15, 2021. The objective of the geotechnical inspection is to ensure that the project's surface infrastructure is performing as intended from a geotechnical perspective and in the context of the project site use. The emphasis is, to a large extent, based on the project's location in a cold climate continuous permafrost area, is ensuring permafrost integrity is upheld, reviewing water management, and looking at more classical geotechnical and civil earthworks development (many of which are in an interim or active in-progress construction stage).

On August 29-31, 2023, SRK completed a site geotechnical inspection of the engineered infrastructure, focus on the earthwork components, located on the surface at the Back River Project. The Goose Property (Figures 1 and 2) and the Marine Laydown Area (MLA) (Figure 7 and 8) are the subject of this memorandum.

The purpose of the 2023 AGI was to document the physical condition of these structures based on visual observations and to provide geotechnical assessment and to provide suggestions for improvement. The physical inspection focused on noting potential signs of physical instability such as erosion, differential settlement, cracking, sloughing, or bulging of material, thermal degradation, seepage, etc. All operational procures and all planned work scopes, which were or may have been in place on site, were not know to SRK at the time of the inspection and may not have been factored in this AGI. This AGI inspection is documented in the photographic compilation provided in Appendix A for Goose and Appendix B for the MLA. The primary purposes of the photolog is to show the site progress and development at the time of the inspection. A review of the available monitoring and instrumentation data associated with these structures is also included and discussed further in Section 5.1. The end of this memo then summarizes observations based on the 2023 AGI site visit and data review.

3 2023 Annual Geotechnical Inspection

The Back River site continues to be in a period of transition, in a pre-operation ramp up stage. This means that many of the pads, roads, ponds, and water conveyance (culvert) structures were at an interim state and / or were not yet completed at the time of the 2023 Annual Geotechnical Inspection (AGI).

Observations of the interim state of the construction have been made in attempt to allow for site to improve the final configuration of the earthworks and water management infrastructure, to avoid larger scale permafrost degradation, and / or to minimize larger ongoing maintenance requirements.

3.1 Overview

A site visit was carried out as part of the 2023 annual geotechnical inspection (AGI). The site visit was carried out by John Kurylo, MSc, PEng, and Anna Timchenko, PhD, E.I.T. from SRK Consulting, between August 29th and August 31st, 2023. John and Anna first went to the MLA on August 29th and then on August 30th, partly through the day, flew to the Goose site. SRK was then at the Goose site from August 30th to 31st. Access to the site for all inspections was fly-in / fly-out (via plane) based on the remote location. Weather conditions during the inspection were cool with periods of light winds and precipitation. A photo logs showing an overview of the August 2023 inspection are provided in Appendix A for Goose and in Appendix B for the MLA.

At the Goose area the inspections were focused on the water management infrastructure and, at the time, the portions of the camp pad and partially completed tank farm (two of the four planned tanks erected) and processing plant site. The portal and decline areas were outside the scope of this inspection and were not looked at or included as part of this AGI; only surface infrastructure was inspected (Figure 3). The inspection of the airstrip, Echo Pit, culverts, access roads, tank farm and processing plant site foundations, and the Camp Contact Water Pond and Primary Pond Dam footprints were carried out by pickup truck. Frequent stops were made for physical (on foot) inspections. No drone photography or helicopter access was available at the time of these inspections, but the latest drone surveys of the Primary Pond Dam footprint, Camp Pad and Processing Plant Site, Echo Pit, and Airstrip were provided by B2Gold after the site visit for review.

At the MLA, the inspections were focused on the access roads, pads, airstrip, and the partially completed tank farm (two of the four planned tanks within the Phase 2 tank farm designs were erected at the time of the inspection) (Figure 9). All inspections at the MLA were completed on foot (the entire site was walked over).

Following the site visit, B2Gold was able to provide some aerial images of MLA infrastructure, which were also reviewed as part of the 2023 AGI. The following list the additional data that was provided after the site visit:

<u>For Goose:</u>

- Drone survey of the Drill Pad Road done, survey completed on August 28th, 2023.

- Drone survey of the Mag Road progress, survey completed on August 28th, 2023.
- Drone survey of the Plant Site, survey completed on September 4th, 2023.
- Drone survey of the Airstrip SE end extension, surveys completed on August 10th, 2023, October 11th, 2023 and November 6th, 2023.
- Drone survey of the Echo Pit, survey completed on January 1st, 2024 and January 7th, 2024.

For MLA

- Aerial photos of Airstrip, Laydown Areas, Tank Farm (not orthorectified or georeferenced)
- Tank Farm as-built survey performed on October 7th, 2023.

This document provides a summary of the conditions observed and resulting inspection observations. Table 1 and Table 2 provide a summary of the inspected components for the Goose and MLA sites respectively.

Table 1: List of Inspection Components at Goose

Component	Inspection Item	Photo Reference (Appendix A, C, and D)
Instrumentation	Primary Pond Dam GTCs[1)] Previously installed GTCs (no data collected starting from 2017)	N/A
Mining Infrastructure	Goose Quarry Echo Pit[2)]	Appendix A, Figures 1 to 3 Appendix A, Figures 4 to 7 and Appendix C
Containment Structures	Overburden Stockpile Crusher Stockpile Goose Tank Farm Secondary Fuel Containment Area Camp Pad Contact Water Pond	Appendix A, Figures 8 to 10 Appendix A, Figures 11 to 12 Appendix A, Figures 13 to 16 Appendix A, Figure 17 Appendix A, Figures 18 to 20
Infrastructure	Primary Pond Dam[2)] All-Weather Road: – Goose Neck Crossing – Echo Crossing – Gander Crossing[2)] Echo Diversion Camp Pad Processing Plant Pad[2)] Airstrip[2)] and access road	Appendix A, Figures 21 to 27 Appendix A, Figures 28 to 33 Appendix A, Figures 34 to 35 Appendix A, Figures 36 to 39 Appendix A, Figures 40 to 41 Appendix A, Figures 42 to 45 Appendix A, Figures 46 to 51 Appendix A, Figures 52 to 57 and Appendix D
Infrastructure (continued)	Explosives Access Road[2)] Exploration Camp Temporary Road Access to the Exploration operations at Llama Lake	Appendix A, Figures 58 to 59 Appendix A, Figures 60 to 63 Appendix A, Figures 64 to 66

Notes:

[1] GTCs – Ground Temperature Cables.

[2] Was under construction during the time of the 2023 AGI.

Table 2: List of inspection Components at the MLA

Facility	Inspection Item	Photo Reference (Appendix B)
Instrumentation	Previously installed GTCs (no data collected starting from 2017)	N/A
Containment Structures	MLA Quarry Tank Farm[2)] Former Temporary Fuel Containment	Appendix B, Figures 22 to 29 Appendix B, Figures 16 to 17
Infrastructure	Shoreline Pad Freight Storage Pad Camp Pad Access roads MLA Airstrip Former Explosives Storage Access Road Upper Laydown Pad Fuel Offload Pads and Access Road	Appendix B, Figures 1 to 5 Appendix B, Figures 6 to 9 Appendix B, Figures 10 to 12 Appendix B, Figures 13 to 15 Appendix B, Figures 18 to 21 Appendix B, Figures 16 to 17 Appendix B, Figures 30 to 31 Appendix B, Figures 22 to 29

Notes:

[1] GTCs – Ground Temperature Cables

[2] Was under construction during the time of the 2023 AGI

3.2 Limitations

The annual geotechnical inspection completed by SRK (as part of this scope of work / memo) includes only engineered structures on surface; a geotechnical inspection of the underground mine and associated underground infrastructure is completed by others.

This SRK's review does not include an assessment of the structural integrity of any buildings and bridges. SRK will highlight potential structural concerns based on observations during the AGI; however, an assessment of structural integrity would need to be completed by a suitably qualified Structural Engineer if / as required. Thus, the focus on the observations in the memo is primary around water management, thermal and geotechnical performance.

4 Design and Operation Considerations

Back River Project is located within a zone of continuous permafrost with the permafrost being up to 570 m below ground surface (bgs). The active layer depth ranges from approximately 1 to 4 m bgs (with an average thickness around the site of approx.1.5 m bgs), with the greatest active layer depths occurring in areas with thin soil veneers above bedrock. Due to the presence of salinity in some surficial groundwater, the active layer can take up to 60 days to freeze in some areas from the time when the mean average air temperature drops below 0°C.

In general, overburden soils are frozen from mid-October to the beginning of June. Overburden reaches its maximum (warmest) seasonal temperature between the middle of August and the middle of September, at which point the average air temperature starts to decrease and freeze up begins (SRK 2019).

Prior to detailing the specific observations (as outlined in Sections 5 and 6), SRK would like to reiterate several overarching design and operating principles as they relate to geotechnical stability, design and performance while specifically focusing on maintaining permafrost integrity at the project site.

- **Underbuilt (lower fill thickness) Pads and Roads**
  - Design and construction of all pads and roads at Back River are intended to minimize permafrost damage and are designed based on specific thermal criteria. Underbuilding of roads and pads could result in permafrost damage because of thermal erosion, which will require ongoing maintenance or potentially additional remediation costs at closure; conversely, minimal coverage of less trafficked areas may be fine based on the ground conditions (specifically if the underlying ground is not ice rich). SRK currently is involved in the scopes of work related to the water management infrastructure at the Goose site, in additional to the MLA Tank Farm. SRK are unable to further comment on all of the current pad, airstrip and road designs (many of which were in progress at the time of the 2023 inspection) that they have been less involved in the design aspects of. SRK is therefore only able to comment on what has been communicate and what is visible on site. B2Gold is reminded to consult the appropriate site-specific reference materials when designing and constructing new pads and roads. Specific areas of interest are noted in the 2023 AGI, and often key observations are near areas where surface water was noted to be flowing into or below infrastructure, along the toes and outside crest of the roads, or at the outside edges of the airstrip and pads.
  - In general, the roads and pads are still in a partially built state. In some areas the roads have been built up and are approaching the expected design thickness. However, the majority of the roads are typically only in the fill thickness range of 1 m thick, with some areas thicker and some areas thinner (typically fills always at least 0.5 m thick). Many of these roads continue to be in process of being expanded (widened) and /or being built up as more material became available from the developments around the: MLA tank farm (former quarry location), Echo Pit (at Goose area), and Goose Camp pad areas. Required fill thickness will ultimately be related to the underlying foundation conditions (i.e. thicker fill thickness required over areas with more ice rich overburden permafrost) however at the current thicknesses ongoing maintenance may be expected (will be dependent on underlying ground conditions). B2Gold has worked to

develop an initial revision of a site-specific thermal monitoring plan. This is a positive and proactive step and will assist in providing more concrete recommendations (linked to the roads and pads) for future AGIs. Since 2022 the Camp Pad and Plant Pad specifically have had notable work done to them and are generally at design thicknesses and grades.

- **Consideration of Heated Building on Rockfill Pads**
  - Care needs to be taken when constructing permanently heated buildings on the rockfill pads. Prolonged heat generated from these buildings will result in the active layer below the pad deepening (specifically important for any areas where portions of the buildings are built over overburden permafrost). Heated building directly on rockfill pads could in turn lead to degradation of the underlying permafrost in the right circumstances (specifically if ice rich overburden is apparent in the foundation), and manifestation of undue settlement.
  - The new observations related to heated structures (outside of the historic exploration camp area) were noted as part of the 2023 AGI. Progress has been made in advancing the plant site area and permanent camp pad since 2022, with construction currently underway for the processing plant and associated facilities. Phase 1 of the permanent camp was finished in the Summer of 2023, and Phase 2 construction is currently ongoing. Careful consideration of building-to-ground heat transfer is essential to continue to incorporate into the deigns and construction, particularly in the areas surrounding the permanent camp pad and plant site, which are expected to be further developed in 2024. For the components at the camp pad constructed at the time of the AGI the building-to-ground heat transfer had been considered (for example camp building were elevated on wood cribbing to allow for airflow below the main camp buildings).
    - Where possible it should be considered if structures can be situated on bedrock, elevated to allow air flow below the buildings, or if this is not possible if additional insulation material, or in extreme case thermosyphons may be required (specifically in the foundation areas built on overburden permafrost that has been identified as having massive ice). Site appears to have been following this best practice with most of the critical infrastructure associated with the plant site being situated on bedrock.
    - The impact of heat transfer to the foundation will be directly linked to the design tolerance of the buildings and structures and can be considered accordingly. For example, foundation below tanks would have very low tolerance, whereas general roads and pads below items like trailer buildings or seacans would have higher tolerances and would be able to accommodate more foundation movements.
    - Most of the Goose Camp site, or at least the critical mechanical or fuel storage components, appear to have been so far built on fill pads that were constructed mainly over blasted areas (inferred to be bedrock below the majority of the fill pads around the plant site for example). Towards the outside of the current pads there appears some higher overburden and may require additional considerations and monitoring. The Camp and Plant Pads generally looked appropriately designed and constructed but will require ongoing monitoring to confirm this as the site activities progress. Specifically any loadings or

building placed within approximately 5 to 7m of the pad edges should be more carefully monitored or more routinely inspected.

- **Consideration of Seasonal Active Layer Fluctuations**
  - B2Gold is reminded that the maximum active layer thickness occurs around August at the end of the summer season. All road and pad shoulders are at their most vulnerable during this period as the thermal protection at these shoulders are less than the minimum required (by standard geometry), resulting in localized deepening of the active layer. As a result, tension cracks and general softening are most prevalent at the shoulders (outer sides). B2Gold should take special precautions to limit vehicle traffic (specifically loaded haul trucks or vehicles carrying larger loads) within 1 to 3 m from all shoulders.
- **Consideration of Construction Within the Talik Zones**
  - It may be necessary to construct facilities on or near lakes or surface waters, which may lead to foundation interactions with talik zones. Soils within talik zones may have lower bearing capacities and construction on these overburden soils poses some challenges including settlement and possible foundation bearing failure. Settlement can be compensated for by overbuilding; however, foundation bearing failure is a more challenging problem and may require pre-consolidation in areas with significant fines and/or design of foundation strengthening elements This can be achieved through constructing load distribution pads. The design thickness of these pads should be calculated based on the required loads and geometry. If necessary, geosynthetics (geogrid and geotextile) can be used to optimize the fill requirements of these pads. Alternatively, load bearing piles can be driven through the talik overburden soils into bedrock under these conditions. At this time SRK has not observed any construction in or over this type of talik area.
- **Consideration of the Impacts of Surface Water Flow Paths**
  - As outlined in Appendix A and Appendix B, tension cracking along sides of the Goose and MLA airstrips and portions of the roads and pads, continues to be noted. This cracking is especially prevalent where any of the pre-existing surface water flow paths have been intercepted by earthworks activities. These cracks in the fill material are not atypical but should be monitored.
    - Specifically, the airstrip(s) shoulders (both Goose and the MLA) should continue to be closely monitored to ensure that any additional maintenance is able to be conducted as required. Routine airstrip inspections should occur year-round by site staff but would be suggested to be increased in frequency over the spring to fall months (around June to November). In addition to any observations at the airstrip shoulder, any areas of larger undulations or settlements that require ongoing maintenance should be noted and records kept to assist with long term performance monitoring.
    - *Following the initial SRK site inspection B2Gold site staff have confirmed that at the Goose and MLA that they carry out daily strip checks to ensure integrity of the airstrip surface and surrounding area. These checks constitute a portion of the information relayed to the airline companies prior to every landing.*

- B2Gold should take extra care to consider the location of existing surface water flow paths in the infrastructure plans and earthwork constructions (Figures 5, 6, 10, 11, and 12). One example of this would again be at both airstrip locations (for the Goose and MLA sites). Due to the long linear nature of the airstrip they inevitably cross some ephemeral surface flow paths.
- Goose airstrip extension to the South is currently in progress. As this airstrip extends to the south, it intersects some more notable surface water flow pathways / ephemeral streams (Figure 5). The Rascal Diversion berm started to be constructed in October – November 2023 (Appendix D) and should be completed before the 2024 freshet if the airstrip is planned to be extended further south or used in the areas where the main natural surface water flow paths are intersected. The South end of the extended Goose Airstrip is expected to be an area that will need to be closely monitored and more permanent long term water conveyance through portions of the airstrip should be considered by site (again depending on the length and use of the airstrip that site is targeting).
- At the MLA there is ponding water against the southern-to-southern western edges of the airstrip (Figure 11). B2Gold should monitor these areas (specifically as temperatures annually warm on site from winter to spring to summer conditions). Some consideration should be given to redirecting or trying to push any ponding water further away from the toes of the existing MLA airstrip. This could be done in an attempt to push any thermal degradation further away from the main airstrip fill. Pumping down / removal of any ponded water at the toes of the airstrip in the fall (before winter freeze-up) would increase the cold ambient air and ground heat transfer to help slow down permafrost degradation (reduce thawing rates and slow deepening of the active layer). This increased water management may help to reduce overall maintenance activities at this airstrip.

5 Site Inspection

5.1 Instrumentation

Background

According to the Project Certificate Condition, No. 12 (Sabina 2023) B2Gold has to monitor and mitigate impacts from the Project on permafrost conditions relative to project infrastructure, including associated roads, waste rock stockpiles, trails, and quarries. In cases where permafrost degradation has been observed, B2Gold shall report on measures implemented to restore and promote the reestablishment of the surrounding permafrost integrity. During construction, B2Gold shall, on an annual basis, provide information regarding the results of monitoring and identifying any mitigation measures undertaken in fulfillment of this Term and Condition; in the B2Gold's annual report to the Nunavut Impact Review Board. Subsequently, once monitoring has demonstrated that the area(s) assessed are stable, B2Gold has to provide information regarding monitoring results and any updates to mitigation measures every 2 (two) years in the Proponent's annual report to the Nunavut Impact Review Board.

B2Gold has made notable progress in this area and have developed an initial revision of a thermal monitoring plan in the first part of 2024. SRK also had some input into the initial revision of this site wide thermal monitoring plan. The thermal monitoring plan is a stand-alone document and the details of this plan are therefore not included in this AGI memo.

There were forty-six previously installed Ground Temperature Cables (GTCs) at Goose Property and MLA (SRK 2024). The installation of the monitoring GTCs was performed between 2013 and 2017. The last reading for most of the ground temperature cables was from 2017 or earlier. This past background information has been included into the Back River thermal monitoring plans. Plans are also in progress to see if any of the historic site will be able to be re-commissioned and monitoring readings re-established. The latter is a work in progress with discussions ongoing between B2Gold, SRK and past instrument suppliers (such as RST and Campbell Scientific).

As part of the Primary Pond design, a detailed monitoring system has been designed and included. A set of vertical and horizontal GTCs was installed in the dam key trench at Primary Pond during the 2023 winter construction season. This new instrumentation has been included as part of the site thermal monitoring plans.

In addition to the Primary Pond GTC installations two ground temperature cables were installed in 2023 at the Camp Pad area. These cables are also included in the site thermal monitoring plans.

Observations

B2Gold, in collaboration with SRK, have developed an initial revision of a site-specific thermal monitoring plan. This plan is provided as a standalone report and included as part of the 2024 annual reporting. This plan is expected to be revisited and updated (if/ as appropriate) on an annual basis.

B2Gold is working on a plan for2024 to go and revisit ground temperature cable locations that still exist on site and are accessible to see if any additional readings can be opportunistically collected.

Many of these historic Goose sites were visited in 2023 and the status of these locations documented. Communications and planning with original instrumentation providers are ongoing; this so far has been a slow process. Data collection will be further attempted in 2024 from the areas where historic instrumentation appears to be still active.

During the MLA site visit, it was observed that all historical GTC locations had been removed due to the site development.

There are no specific thermal monitoring recommendations for this 2023 AGI. More acknowledgment that this is in progress and past 2021 and 2022 AGI recommendations around this topic are in the process of being addressed.

Aside from the GTC / thermal monitoring there is no other geotechnical monitoring data to review, as part of this AGI. The primary source of additional information is the comparison between ongoing site earthwork and drone surveys (which was reviewed as part of this AGI). It is SRKs understanding that in 2024 B2Gold plans to establish additional thermal monitoring locations, as well as physical survey monitoring locations (survey pins or markers) at the tank farm locations. Once completed, a detailed set of monitoring instrumentation is also planned to be installed at the Primary Pond dam. Any additional monitoring information that becomes available will be reviewed as part of the 2024 AGI.

5.2 Goose Property

Refer to the Appendix A photolog for photos pertaining to the Goose Property inspection.

5.2.1 Goose Quarry

Background

Development of the pit was started in 2021 to provide the Non Potentially Acid Generating (NPAG) Run of Mine (ROM) material for the site, but since the Echo Pit pre-stripping development was initiated in 2022, there has been no notable activity at the Goose quarry. As a result, the former Goose quarry is currently being used as a temporary landfill / storage site with long term plans of relocating all temporarily placed landfill material within the limits of a waste dump (as permitted).

Site Inspection Observations

- No notable mining activity at the Goose Quarry. The quarry is currently being used as a temporary disposal area for refuse. Refuse material should be periodically cleaned up and consolidated to prevent it from being dispersed by wind.
- There were no observations of large-scale global slope instability in the quarry (from areas that were visible)

- The Goose Quarry is a restricted access area on site. Signage should be placed at all access points / entrances to this quarry to inform and limit vehicle traffic into this area.
  - *SRK was informed that site has now further restricted the entrance to this quarry by using barriers and a security chain.*

5.2.2 Echo Pit

Background

The general Echo Pit area includes the Echo Pit and Overburden Stockpile. The Overburden Stockpile location is located north-northeast of the pit. Echo Pit mining activities began to increase in 2022, with a paused in operations from around July 2023 to November 2023. During the 2023 AGI the mining of the pit was noted to have exposed up to 6 m of soil overburden on top of the bedrock in the south-southwest wall.

Site Inspection Observations

- No detailed assessment on the pit walls was performed during the inspection (rock mechanics of the pits outside the scope of this inspection). All observations presented herein are related to the overburden slopes at SSW.
- At the time of the inspection the south-southwest wall is over steepened. The slope was found to be approx. 1.5H:1V, with an overburden wall height of about 6 m. These slopes have since been further cut back and slopes reduced as part of the early 2024 mining activities.
- Erosion gullies at the SSW wall were noted during the 2023 inspection. An example of some of the thawing overburden in section of the pit wall. Again, many of these areas have been further cut back in early 2024 as the site approaches the design pit wall extents.
- The set of small elongated fans formed of fine silty material was observed at the toe of the SSW wall of the open pit. The fines were being eroded away from the overburden material as a result of permafrost thaw, surface water flow, flow through the active later, and general soil erosion. An example of some of the thawing overburden in section of the pit wall are included in the Appendix C notes. Again, many of these areas have been further cut back in early 2024 as the site approaches the design pit wall extents.
- The development of the pit was continued after the inspection was completed. In December 2023 B2Gold re-sloped the SSW wall to approximately 1H:2.3H (based on the drone survey conducted on 2024-01-01 and provided by B2Gold). In January 2024, the placement of the rock cladding was initiated to stabilize the slopes and prevent thermal erosion of the overburden material at the SSW wall of the pit. The work was in progress at the time of report completion. The thickness of the cladding is expected to be increase in extents and thickness (Appendix C presented additional noted in the status of the overburden pit slope cut backs and in progress thermal cladding).

SRK provides the following comment about the suggested thermal objectives for the rock cladding of the overburden pt slopes.

Thermal objectives of rock cladding:

- Material provides thermal cover for exposed permafrost and ground ice.
- Limits direct solar radiation with permafrost/ground ice.
- Reduces the amount of heat transfer to the overburden to establish a new position of permafrost.

If there is insufficient thickness or extent of thermal cladding (lack thereof) then:

- Seasonal thaw will advance into ice-rich permafrost and be less effective.
- Thaw may be retrogressive through the thawing season and over multiple years.

SRK suggests that the thermal cladding designs for the Echo pit slope are suggested to be revisited and consideration given to increasing the cladding thickness.

5.2.3 Overburden Stockpile

Background

The overburden stockpile is used to store overburden material mined from the Echo Pit. Construction of the Stockpile was commenced in 2022. The overburden soil continued to be hauled to the stockpile in 2023 during the periods when the Echo pit mining operations resulted.

Site Inspection Observation

- The stockpile started to be formed during the winter season when the overburden soil was in frozen condition (blocky frozen material, often with entrained or massive ice in areas). Compaction to consolidate this material was not practical in the frozen state, and as a result, significant thaw and settlement were observed during the 2023 AGI. Most slopes on the outside of the stockpiles appear to have had some sloughing and relaxation due to the high water content of the thawed materials.
- The slopes of the stockpiles were oversteepened (approx. 2H:1V slopes after sloughing). Due to the higher ice content in areas and the unconsolidated state of the overburden material it is recommended that shallower overall slope angles for the overburden stockpile be considered (such as 3H:1V or incorporation of some rock buttressing where required. This slope reduction is not an immediate priority but should be considered as part of ongoing operations and as additional material is placed at the overburden stockpile location.
- The ponding water was observed in areas the toe of the stockpiles. This is likely in part from the release of water from the overburden soil due with the high ice and water content as the outside layers of the stockpile thaw in the warmer months. It would be suggested collect water samples from the ponded water around this area to better characterize (in terms of water quality, e.g. TSS, salinity, ammonia etc..). Based on the water sampling result and observations around the time of

next freshet, additional water management or sediment management (such as a small filtering berm or silt fencing) at the toe of this stockpile may be considered.

- *SRK was informed that site has an overburden stockpile monitoring program and corresponding that is in place and should address this comment. This overburden monitoring program was not reviewed as part of the 2023 AGI.*

5.2.4 Goose Tank Farm

Background

The design of the Goose Tank Farm was done by Sacré-Davey Engineering Inc. A detailed review of the tank farm design was not completed as part of this scope of work and the comments in this section are based primarily on visual inspection and review of the available drone data. The initial design of the Goose Tank Farm comprised a row of four fuel tanks, with capacities ranging between 10 and 15 million (M) liters (L). The foundation of the Goose Tank Farm, as well as the construction of the containment area, commenced in the summer of 2021. The foundation of the facility was excavated into the bedrock (tanks on bedrock), surrounded by a bermed area up to about two meters in height. The tank farm area includes a geosynthetic liner system (High Density Polyethylele or HDPE liner covered with geotextile).

In the summer of 2022, the first tank (10ML) installed at the western side of the containment area. By September 2023, the containment facility for the second fuel tanks has been constructed, including the HDPE liner element. The assembling process of Tank #2 was in progress at the time of the 2023 field inspection. Both tanks were built on pedestals with a minimum of 1 m thickness that typically appear to extend a minimum of 1 m beyond the toe of the fuel tank.

Site Inspection Observation

- Phase 1 (Tanks #1 and #2) of the Tank Farm was under construction during the annual inspection. Tank#1 had been completed and had fuel in it while Tank #2 was under construction. This tank farm is in progress and was inspected in an interim state.
- The inner and outer slopes of the containment berm appear to be oversteepened in areas. This had led to the observations of minor cracking in some areas of the berm. There is no concern about an overall berm stability at this stage. However, cracking is expected to be a result of the oversteepened slopes. This area was in progress, and it is expected that these slopes would be further constructed and shallowed as part of the final construction.
- There is limited overliner crush (or bedding material) that has been placed over the liner in the Goose Tank Farm. The engineering crush fill was not yet placed over the installed HDPE liner. Specifically the inner slopes of the tank farm still showed exposed liner, as well as areas around the bottom of the pedestal for Tank #1. The HDPE liner remains exposed, causing a high risk of puncturing and potential damage. Again, this area was in progress of being constructed. The overliner fill thicknesses should be surveyed and checked as part of the as-built checks and documentation. Based on SRK's past experience, typically it is recommended that 0.6 m of fill be

placed over HDPE liner to avoid puncture from heavy equipment operating within the bunded area. Fill thicknesses as low as 0.3 m are then sometimes used for smaller equipment (usually small, tracked equipment that spreads out loads) or is low traffic areas. From discussions with site staff it is understood that current designs for the tank farms may vary from these suggested minimum overliner thicknesses. It is suggested that as part of the overliner thickness checks that the design thicknesses be reviewed, with consideration of the expected vehicle loading, and when in doubt the geosynthetic supplier should contacted to confirm that manufacturers specifications (confirm the minimum cover over the liner to protect from vehicle traffic).

- HDPE liner was found not to be well anchored at the southern and western berm crests of the tank farm during the inspection tour. The top liner in the southern and western berm crests is expected to be further anchored before the Tank Farm is completed. The final anchoring and top elevations of the liner should be surveyed as part of the as-built survey pick-ups and this information should be reviewed.
- Overline fill thicknesses should be checked as part of the final as-built review and compilation (once the tank farm is completed) so that traffic routes or 'no-go' areas can be delineated within the bunded area.
- The base of the containment area had some water over the base in areas during the inspection. This likely was due to some of the recent rainfall on site around the time of the inspection. Active pumping was not noted at the time of the inspection.
  - *Site staff indicated that each spring water from both sides of the containment area are managed / pumped. Around the time of the 2024 freshet additional pumping and water management would be expected to be required. It is SRK's understanding that this is on sites radar and plans have already been made for this ongoing operational and maintenance support.*
- The pedestal slopes of the Tank #1 was noted to be oversteepened in areas. This may in part be from some erosion that has occurred over time. The distances from the tank to the crest of the pedestal is varied from around 0.5 m to 3 m. Consideration should be given, and the design engineer consulted, to see if the tank pedestals should be further expended / widened (by another meter or two, specifically in the areas where the pedestal has steeper slope segments)

5.2.5 Secondary Lubricant Storage Area

Background

The secondary lubricant storage area is located on the southern side of the tank farm. This area is located on bottom (south) portion of the plant pad. This area was noted in the site inspections to be comprised of a shallow depression that was lined with HDPE liner. Three berms, each approximately 1 m high, surround the containment area from the eastern, western, and northern sides. This area contained 330-gallon IBC Tanks within plastic containers and pallets at the time of the summer inspection.

Site Inspection Observation

- The berm located from the northern side of the temporary fuel storage facility is not lined with a geosynthetic liner.
- The geosynthetic liner system is not anchored, and liner panels do not appear to be seamed.
- The surface appeared to be constructed from engineering fill (mainly 1” minus crush)
- The base of the storage facility is undulating. Some surface depressions where water was accumulating were observed.

This area appeared to be a temporary storage location. SRK were informed that B2Gold is currently working on design of permanent containment structures and plan on transferring existing contents into engineered insta-berms temporarily while the designs are finalized.

5.2.6 Camp Pad Contact Water Pond

Background

The Camp Pad Contact Water Pond (CWP) was designed to capture run-off from the ore stockpile and a portion of the camp pad. Containment was planned to be achieved with a fully lined pond footprint. Construction of the pond was initiated in 2022. The Camp Pad CWP HDPE liner installation was in progress at the time of the 2022 AGI inspection. The HDPE liner placement was predominantly finished in the summer of 2023, before the 2023 AGI was performed. It is unknown to SRK if further construction activities are planned for this pond or how this pond will be ultimately utilized.

Site Inspection Observations

- Most of the liner at the base and inner slopes and crest of the containment berm are exposed (this appears to be as per design).
- The HDPE liner is not well anchored on its southern side / extents.
- The elevation of the SE section of the Camp Pad CWP appeared visually to be lower than the highest point of the liner placed. An as-built survey data review, or if not available and as-built survey pick-up up the crest of the liner, would be suggested to be completed to confirm the as-constructed containment volume for this pond.
  - *Site has indicated to SRK that an as-built of liner crest has been completed and was reviewed by others.*
- The HDPE liner is exposed and can easily be damaged. Overliner material appears to have been placed in select routes (maximum fill thickness appears to be 0.3 m) to allow for smaller vehicle traffic (maybe only a skid steer) into and out of the base pond area. Exposed liner is also more prone to degradation and folding / warping over time from ultraviolet (UV) or solar radiation. It is expected that some maintenance of this pond, and or removal of sediment accumulating in this pond over time would be required.

  - It is suggested that any routes over the liner that will be used for vehicle access or maintenance be well denoted and the overline thicknesses in these areas checked (to ensure adequate cover thickness).
  - Also, consideration should be given to if there are long term benefits to cover all of the exposed liner (to protect from solar impacts and assist with sediment removal and longer term maintenance activities).
- Liner damage was observed in several spots around the inspected area (specifically along the back / southern end where the liner tie-in to the tundra and toe of the ore stockpile pad and access road). An investigation is needed to inspect the condition of the geotextile and HDPE liner. Repairs should be completed to the liner system (specifically at the back or southern end) before this pond construction is finalized.

5.2.7 Primary Pond Dam

Background

The Primary Pond dam was designed as a frozen foundation dam to limit water and heat transfer to the foundation. The water retention capabilities of the dam rely on an impermeable HDPE liner that is incorporated in the dam fill and key trench (key trench is 'keyed' into the permafrost foundation). The Primary Pond Dam is designed to have a crest elevation of 314.5 masl, with a maximum height of 9 m. The downstream slopes of the dam should be graded at 2.5H:1V (or gentler), and the upstream slopes at 4H:1H. The centerline of an overflow spillway crosses the dam embankment approx. at Sta 0+775. This spillway is designed to safely route potential flow over the dam in the event of a larger flood event. The foundations of the Primary Pond dam will consist of permafrost bedrock and frozen overburden (in some areas ice rich overburden).

During 2023 AGI the construction of the Primary Pond Dam was in progress. Construction of the dam started in December 2022 and was paused for the summer season in May 2023 (paused to limit the impacts of summer temperatures on the foundation). During the 2023 construction season, the majority of the spillway, and the key trench sections from Sta 0+450 to Sta 0+750 were blasted. After the bulk rockfill was removed, the key trench was lined with an HDPE liner and backfilled, typically to or above the original ground surface elevations, with the engineering fill. In May 2023 a minimum winter cover started to be placed to protect the key trench and ice-rich foundation material from the thawing during the summer season. In winter 2024, the dam construction resumed (quarter one 2024). The key trench is planned to be built between Sta 0+50 and Sta 0+450, and following this the dam shell is planned to be constructed to finish the Primary Pond dam structure.

Site Inspection Observations

- The temporary road built in January 2023 along the upstream crest of the key trench was made of overburden soils. This road was used to assist with the winter 2023 construction. The thickness of this upstream temporary road varied from 0.3 to 1.0 m, with an average thickness of around 0.6 m.

- Due to the tundra degradation and the thawing processes (material with high overburden and ice content), a series of cracks, holes, and depression were observed during the inspection of the upstream side of the dam. This is an indication of some deepening of the active layer and some thermal degradation at the upstream toe. These areas would plan to be remediated in the winter, after the active layer had frozen back to the top of the existing ground surface. No long term impacts are expected in this area, if construction completed as per design, as this area will all be within the ultimate dam footprint and mitigated by the next stage of the Primary Pond construction.
- Based on visual inspection, a dark color fill material with a more synthetic smell, was used for a small portion of the temporary road construction at the upstream side of the dam. This was between approx. Sta. 0+100 and Sta. 0+200. SRK is unable to comment on the quality of this rockfill material or its suitability for use as construction material. This location has been flagged to site staff so that additional characterization of this material can be completed, or this material removed from the dam footprint. This is not a large area and likely only represents only a couple of haul truck loads.
- Ponding water was observed along the upstream side of the key trench.
- The ephemeral stream flow around approx. Sta 0+325 was impeded in part from the upstream access road fill that was placed as part of the winter 2023 construction activities.
- Some overburden material was observed in the fill material that was used for the minimal winter cover of the key trench (between approx. Sta 0+450 and Sta 0+500). The ice content in these overburden soils is unknown. This type of material is more prone to consolidation and settlements. Material with high overburden content is prone to differential settlements and has a higher likelihood of void formation. Most of this material, however, is within the zone that would be expected to thaw over the summer (within the new active layer in this area). This area will however need to be further considered, and potentially revisited as part of the next phase of the Primary Pond construction.
- Spillway sizes were developed by routing the Inflow Design Flood through the pond, then widening the spillway base width to meet freeboard design criteria. The spillway upstream and downstream side slopes were selected to be 10H:1V and 5H:1V, respectively, to enable trafficability and maintenance over the spillway section that intersections the main dam structure. The longitudinal slope of spillways through the dams was assumed to be 1%. In the current condition, the slopes are over steepened in many areas and will need to be revisited before construction is finalized at the spillway (many areas with approx. 1H:1V slopes). This area is in progress and will be revisited as part of the next phase of the Primary Pond construction.

5.2.8 All-Weather Road

Background

All-Weather and Access roads (AWRs) are considered private roads under the exclusive administration and control of B2Gold. Working from west to east:

- The current Goose all-weather road, from the forward camp located to the south of Llama Lake to the laydown area at Camp Pad, is an approximately 2.5 km long, and approximately 15 m wide (road width is variable as it is in the process of being constructed). The road was built primary in 2021 with sections being upgraded or expanded in 2022.
- The section of the all-weather road (approximately 2.4 km long) that connects the Echo Crossing to the laydown area at the northeast corner of Camp Pad, was constructed primary in 2019.
- Additionally, the roadway linking the Exploration Camp to Echo Crossing was completed in or before 2017 and spans a length of about 2.1 km.

Site Inspection Observations

AWR segment between the Forward Camp (at Llama Lake) and laydown area at Camp Pad

- The thickness of the road is observed to be typically less than 1.5 m (current road thickness typically varies from 0.4 to 1.5 m). A series smaller depressions ranging from 0.3 to 0.5 m deep were observed; within the road boundaries from the lower camp to the Goose Neck Crossing.
- Some tundra disturbance with some ponding water, spanning a width of 15 to 20 meters, has been noted on the downstream (south) side of the AWR. This disturbance appears to be in part from thawing of snow piles that were deposited during the previous winter seasons.
- A small pond was observed from the downstream side of the AWR to facilitate the exploration drilling. It was not confirmed if this area is within the area of the ultimate Umwelt pit disturbance. The ‘berms’ around this area were temporary and not engineered (appeared to be a temporary drilling measure). It is expected that this area is going to be covered as part of the road widening and future construction in this area. A release of water from this area could have higher erosive and thermal erosion potential to the surrounding and downstream tundra areas. As a result, this is an area suggested to be checked in on and monitoring in future inspections.

AWR segment between Echo Crossing and the Camp Pad

- This road segment is adjacent to the shoreline of Goose Lake. The road segment between Camp Pad and Underground Mine Portal (Portal) is a single lane road.
- The side slopes of the road embankment are typically oversteepened (approx. 1H:1V), which may result in the formation of cracks at the road edges. The outside edges of this road are expected to relax over time (likely to slope angles closer to 1.3 to 1.5H: 1V). The segment of the road between Echo Crossing and Portal has thicker fill that appears to exceed 3 m in areas. The side slopes in this area specifically would be expected to slightly reduce over time.
- These slopes should be monitored and may require some offset for vehicle traffic from the outside edge, and / or some slope regrade may be required in sections as part of ongoing maintenance activates onsite.

AWR segment between the Exploration Camp and Echo Crossing

- The thickness of the embankment is observed to be less than 1.5 m in areas with oversteepened slopes in areas. The surface of the road closer to the exploration camp was undulating in many sections.

Many of the AWR segments were in a state of active construction and development. This is not uncommon for a site that is still in a pre-operational stage. It is suggested that as-built surveys be completed of the AWRs to better highlight what areas are complete, to design grades and widths, and what sections are still in the process of being constructed. Section 4 provides some overarching comments to consider for 'Underbuilt (lower fill thickness) Pads and Roads'.

5.2.9 Goose Neck and Echo Crossings

Background

Multiple culvert crossings are required to maintain surface water drainage pathways across, and allow for storm event peak flows to bisect, the access and haul roads at the Goose Property. The Goose Neck and Echo Crossing culverts are non-fish-bearing, typically ephemeral, streams. Culvert conveyance was designed for these locations. The Echo crossing and consist of a series of twined 600 mm diameter circular corrugated steel culverts with a corresponding Manning's roughness of 0.024 modeled in HY-8 (U.S. Department of Transportation Federal Highway Administration Culvert Hydraulic Analysis program). The upstream extent of the Goose Neck Crossing is wide and flat which will provide attenuations of storm water inflows during large precipitation events. Culverts were designed as circular culverts placed in compacted fine-grained engineered fill according to the appropriate manufacturer's specifications. At Goose Neck Crossing the road elevations where also set so that the low point in the road would not be travelled on during larger storm events and would overtop for storm events larger than the 1:50 year event. HDPE pipes were installed at the Goose Neck location by site staff due to their ability to better conform to the coarse and undulating fractured rock foundation conditions around this area. As-built information was not available to review for the culverts and the site inspection notes are based on visual inspections.

Site Inspection Observations

- The thickness of the fill material typically varies from 0.8 to 2.5 m. Some boulders greater than 0.8 m in diameter are observed at the toe of the road. Some overburden material is also observed at the toe of the road in areas (it is unclear if this is in from annual snow clearing or from some of the construction material used for this portion of the road).
- The embankment slopes are oversteepened in many area (approx. 1H:1V range).
- Five culvert outlets were inspected at Goose Neck Crossing. Two culverts are found to be functioning properly, but three culverts were slightly damaged, or the inlets or outlets of the structures were covered by blasted rock material (roadfill or material relaxed from the slopes). Maintenance of the culverts should be expected to be required prior to the 2024 freshet.

- The main area of ephemeral stream flow, at the time of the 2023 site inspection, was found at the Goose Neck Crossings after the last culvert is placed (furthest to the south). Most of this flow was noted to be within the fractured rock or slightly below the ground surface in that area at the time of the inspection. This area could be, opportunistically visually monitored around (before and slightly after) freshet to see if this location should be considered for the installation of future additional flow measures (e.g. culvert or rock drain).
- Two culvert locations were inspected at Echo Crossing. At one location, five culverts appear to have been installed to facilitate water passage beneath the all-weather road that connects the Processing Plant area and the Exploration Camp. An additional culvert was installed beneath the all-weather road along the eastern slope of the haul road connecting Echo Pit and the all-weather road. Upon inspection, ponding water was noticed around both the inlet and outlet of these culverts. Increased ponding water levels were detected at the inlet of the culvert buried in areas beneath the toe of the road fill. Note that flow was still going through these areas but was partly impacted by material that has slough or be graded off the top of the road over the culvert inlets. Maintenance of the culverts should be expected to be required prior to the 2024 freshet.

5.2.10 Gander Crossing

Background

Gander Pond outflow stream, located north of the Goose Airstrip is required to maintain fish passage. Before summer 2023 this crossing included a temporary bridge, which planned to be upgraded during to a more permanent structure. In the summer of 2023, two large diameter culverts and one smaller diameter culvert were installed. The upstream extent of the Gander Crossing is flat and wide, which, according to design, will provide attenuations of stormwater inflows during large precipitation events. The downstream side of the Gander Crossing is clad with rounded-shaped cobbles to protect it from erosion. The Gander Crossing was under construction during the time of the 2023 AGI site visit. The circular corrugated steel culverts were observed to have been placed in compacted fine-grained engineered fill.

Site Inspection Observations

- No surface flow was observed during the inspection, all water appeared to go through the gravel at the base and outlet of the culvert.
  - It is SRKs understanding, from discussions with site staff, that additional measures were put in place to help promote flow more towards the surface for fish passage and this was just in interim construction state. Environmental monitors, and government and permitting representatives, were on site at the time of the culvert installations and were actively involved in this construction.
- Some tundra disturbance was found around the construction site. It was unclear if these areas were going to be covered with the final culvert construction or not (work was in progress at the time of the inspection).

- Typically, and as part of the installation process for these types of crossing, as-built surveys of the constructed works will be completed and reviewed as part of the permitting body approval process. As-built surveys of the constructed works were not reviewed as part of this AGI. This area would likely be revisited as part of the 2024 AGI.

5.2.11 Echo Diversion

Background

The Echo Diversion Berm was designed with 2 m thickness of rock fill in order to encourage freeze back of permafrost, and to promote the active layer raising to within the base of the berm. This would be done to help reduce the foundation seepage, through the active layer, and below the berm. During larger storm events, larger overland flows would result which then would be accommodated by this diversion (and diverted away from the Echo mining area (less potential for larger volumes of contact water to manage). The diversion berm was designed with shallow grades (at the downstream toe, usually within approximately 1 to 5%) to ensure a minimum freeboard of 0.3 m was maintained during the 100-year, 24-hour peak design flow. The Echo Diversion started to be constructed in 2022.

Site Inspection Observations

- The constructed berm was generally similar to the design alignment, but different (varies) in areas; specifically around the areas to the south-southeast of the Echo Pit. It appears the current Echo Diversion berm progress was constructed in two phases to assist with contact water management in the early construction phase.
- The thickness of the diversion berm typically varies from 1 m to 1.5 m; i.e. not yet at design thickness in all areas.
- The slopes of the berm are oversteepened in areas (this is more critical on the upstream section where the toe of the berm crosscuts the topography to get promote flow down slope / down gradient).
- The end of the Echo Diversion appeared to be within the planned footprint for the future Echo Contact Water Pond (CWP).
  - The current diversion berm alignment should be considered as part of the Echo CWP designs. It is expected that either the end of the current diversion will need to be moved or the Echo CWP designs will need to be adjusted to better match current site conditions. Construction has not yet started for this CWP and therefore modifications to the CWP could still be readily made to adjust for this field fit modification.
- As part of the original design there was considerations for additional ‘cut-off’ to be considered for areas around station 1+000 to 1+100 on the Issued For Review (IFR) diversion alignment. It was not apparent if this was needed on site or if this had been completed. Monitoring should be established at the locations where the original ‘cut-offs’ were proposed to determine if flow is being observed to be flowing below this diversion structure or if the structure is adequately performing in these sections.

An as-built review of the existing (in progress) Echo Diversion berm alignment, then compared to the design alignment and design criteria is suggested to be completed (could be done in house or externally). This would be done to assist site in helping to identify, target, and update the sections for the diversion that are below grade, and or need to have adjustments to the existing alignment to uphold the design intent and finalize the construction. Areas where the slopes at the upstream toe are shallower than the original designs should be specifically looked at to ensure that these areas do not preferentially pond, and / or to ensure that the design freeboard is still being maintained (for shallower conveyance grades typically need a deeper or thicker section for the same unit flow).

5.2.12 Camp Pad

The access road to the Camp pad footprint was built in late 2020. The camp pad construction was started around spring 2021 and finished in February 2023. In the spring of 2023, some surfacing material (1” crush) was placed to even out the top pad surface prior to the dorm (camp building) installations. Phase 1 of the main camp construction took place from April 2023 through July 2023. Phase 2 of the main camp is planned to be finished around Q2 2024. SRK typically inspects the slopes of the camp pad during the AGI looking mainly at larger scale instability or potential thermal degradation at the toes of the pad.

Site Inspection Observations

- The camp pad area and slopes are overall in good condition. Some ‘pockets’ of overburden material were observed in the pad, but most of these overburden areas appear to be encapsulated with the rock material (ROQ/ROM).
- The southern slope of the pad, based on the visual inspection, is approx. 2.5H:1V, and the height of the slope is around 2.5 m. The temporary office container and seacans have been placed within 1 m from the crest of the pad in areas.
- The western slope of the pad, based on the visual inspection, is approx. 2H:1V and the height of the slope is about 5 m. At the northern-west corner of the pad, the materials and seacans are placed within 1.5 m from the crest of the pad.
- The overall slope of the northern side of the pad, based on the visual inspection, is approx. 2H:1V and the height of the slope is about 5 m. The top 1.5 m of the pad are slightly oversteepened in areas and reach 1.5H:1V.

Where possible, seacans and any temporary structures should be offset further from the top crest / edges of the camp pad. This is most relevant in the areas adjacent to the sections of the pad that have side slopes greater than 2H:1V and in areas where the original ground below those sections appear to be more ice rich.

5.2.13 Processing Plant Pad

Background

The foundation of the processing plant pad was blasted in 2022 to expose the bedrock. The processing Plant, Truck Shop, Light Vehicle Maintenance Shop, and Power Plant are all being built, or planned to be constructed at the Processing Plant Pad. Construction of the Processing Plant and related facilities' foundation was in progress during the 2023 AGI.

Site Inspection Observations

Processing Plant

- Construction operations were actively underway at the Processing Plant site during the site inspection. Notably, work was in progress on the foundations for the Processing Plant, Truck Shop, and Power Plant. Simultaneously, localized blasting activities were being conducted to level out areas for future construction.
- Ponding water was observed at the eastern side of the Processing Plant footprint, as well as at the northern part of the Truck shop. These appeared to be in the process of being managed by site staff as part of the ongoing construction in this area.

Batch Plant and other tent structures

- The concrete strip footing of the Batch Plant and other tent buildings are built on the fill crush. It was noted that there were some voids observed between the strip footing and the fill material. Many of these tent structures are fairly tolerate to differential settlement.

Southern Slope of the Pad

- This area was a past temporary pad expansion area.
- A set of depressions and cracks were found at the southern crest of the tank farm pad (well outside the bunded tank farm area, as previously noted the tank foundations themselves are on bedrock). Thawing of the ice/overburden material that appears to have been incorporated in areas of this pad, along with the ROQ/ROM likely contributed to some of these localized depressions.
- The material stored on this pad is within 1-1.5 m from the slope crest in areas. The slope angle of the southern side plant pad (south of the tank farm pad is approximately 2H:1V). Some overburden material is observed in the pad slopes.
- The pad surface was found uneven and uncompact in area. This may be a result of some thawing of material used in portions of this pad construction. No buildings, equipment, or heavy items should be placed within this area.
- Maintenance of this southern pad area and slope should be expected to be required if this area is planned to be used for material storage (laydown) in the future. At the time of the inspection no critical materials (fuels, fluids etc..) were stored in this area.

5.2.14 Goose Airstrip and Access Road

Background

Construction of Goose Airstrip resulted in and before 2016. In August 2020 the northwest end of the airstrip was extended. Subsequent extensions and widening activities were undertaken in 2022 and 2023. As part of the 2023 AGI, construction was ongoing at the southeast end of the airstrip (was at an interim construction state). It should be noted that the southern extension of the airstrip is in a low lying area with numerous natural small ponds and ephemeral stream flow paths.

B2Gold has outlined that additional fill material was hauled and placed to complete the southern extension of the Airstrip. The Rascal Diversion started to be constructed in October 2023. The constructed berm is approximately 1 m to 4.5 m (NW end) thick. Additional notes on this area are presented in Appendix D.

Site Inspection Observations

- SRK's review of the airstrip focused on identifying distress of the airstrip embankment and changes in the natural terrain based on the available imagery data and visual inspections.
- A water management channel / trench was apparent along the eastern side of the airstrip during the site inspection. Some flowing water was observed in this 'trenched' area during the summer inspection.
- Water was noted to have ponded along the edge of the airstrip and has initiated some localized permafrost degradation. This in line with previous years AGI observations. Note that areas of the foundation of the airstrip (specifically in the most southern ends) are expected to have higher foundation ice contents (base on geomorphological, visual inspection and aerial photo review). So some degradation in the South end of the airstrip should be / is expected.
- The southeast extension of the airstrip was under construction at the time of the 2023 AGI summer site visit. Water flows, and large natural surface water features were noted along the southeast side of the airstrip as the Rascal Diversion berm, which is meant to control the water, was not yet constructed. No engineered drainage conveyance (through the airstrip) had yet to be implemented during this construction phase at the southeast airstrip extension (at the time of the 2023 AGI inspection).
  - Ponding water can potentially lead to ongoing thermal degradation and may contribute to the airstrip settlements and formation of depressions.
  - If thermal erosion leads to removal of ice in the foundation this could more readily lead to bridging of the overlying fill material that later leads to the formation of depressions.
  - Ongoing maintenance is currently expected to be required on the airstrip, with increased frequency and more frequent monitoring suggested on the southern extents (for the areas that have been constructed post 2021).

- Tension cracking along the western side of the airstrip continues to be noted. This cracking is especially prevalent where any of the pre-existing surface water flow paths have been intercepted by earthworks activities. This is specifically apparent in the newly widened sections and less apparent in the older sections of the airstrip.
- Some settlement and/or slope relaxation along the airstrip shoulders is starting to occur at the northwest end. This is likely a result of some active layer deepening in that area.

The airstrip shoulders should continue to be closely monitored to ensure that any additional maintenance is able to be conducted as required to uphold the airstrip integrity. Offsets (depending on location of up to a couple meters) from the should of the airstrip should be targeted to avoid any equipment of aircraft coming into contact with 'soft' shoulders. This will be more relevant between around May to November (in the warmer months where the active layer is deeper or more prevalent) and more relevant in areas where ponding water is observed against the airstrip toes. The design criteria and widths of the airstrip were not reviewed as part of this AGI, however site informed SRK that the airstrip has been constructed wider than required (in areas between 10 to 15m wider) in part to help buttress the main airstrip surface and to allow for some relaxation and expected degradation at the outer airstrip toes.

5.2.15 Explosives Access Road

Background

The design of the emulsion plant pad and access road was done by B2Gold. Construction of the explosive access road was initiated in Q4 2022. During the 2023 AGI, the road was still undergoing construction. Completion of both the emulsion plant pad and the access road is scheduled for early to middle of 2024.

Site Inspection Observation

- The road embankment thickness varied from 0.4 to 1.5 m. The slopes of the embankment are oversteepened (approx. 1H:1V).
- Due to the ongoing construction, some parts of the embankment were not yet compacted.
- Some overburden content was observed in the embankment fill material. In some areas, the overburden content in the fill material can reach 30-40%. This mainly is a consideration for ongoing maintenance and settlement. It has been noted however that this will be an infrequently trafficked access roadway with restricted access.
- No culverts or drains were identified, or yet installed at the points where the road intersects ephemeral surface flow pathways. If coarse rockfill is apparent in this area, then this is likely not a notable item (flow will go through road). However, is the road in this area was built to finer fill material, and or if of thin fill thickness and settles into the tundra, then some additional work on these areas of the road would be expected. This road should be inspected next summer, at or after freshet, to confirm if water ponds in these lower lying areas or not.

5.2.16 Exploration Camp

Background

An exploration camp was built around and before 2016 to support exploration works at the Goose property. There are tents and wooden cabins for site personnel, as well as core logging and cutting shacks, an office, a warehouse, an incinerator facility, a camp kitchen with a dining room facility and food storage, a garage / equipment shop, a smaller tank farm, and washing facilities. SRK is unaware of the future plans or remediation planned around the exploration camp area. Most of this area has not had any significant changes since the last AGI.

Site Inspection Observations

- During the inspection, permafrost degradation was observed at the exploration camp footprint. This is not a new observation and has been seen in past inspections. The larger depression and accumulation of surface water is noted behind the incineration and drill shack area (southeastern extents of the exploration camp).
- The outer slopes of the fuel containment berm remain oversteepened and minor cracking is observed on the berm. There is no concern of an immediate overall berm failure, however cracking is expected to be a result of the overstepped slopes and overliner slippage. Some ongoing maintenance is expected to be required if this area is planned to continue to be used. These observations were similar to the 2022 AGI with minor change noted.
- There was ponded water in the tank farm at the time of the 2023 AGI. The water level should be monitored after each freshet or after any significant precipitation event and managed to avoid overtopping. This is specifically relevant if any fuel is stored in this location. It is SRK's understanding that most fuel storage at Goose has now shifted to the purpose-built Goose Tank Farm locations (at the Goose plant site).

5.2.17 Access Roads and Pads at Llama Lake

Background

The set of single lane access roads and areas leveled for pads was built in 2023 to support winter road construction and the fish out and future dewatering of Llama Lake.

Site Inspection Observations

- It was observed that the tundra was damaged by the equipment at some spots along the access roads. It is expected that these areas would be later covered with road fill material when the road is built out to design width which would assist to mitigate any damage.
- The thickness of access roads and pads was generally thin and varied from approximately 0.4 to 0.8 m. The engineering material used for construction is mainly ROQ with some overburden material content (mostly fine sand, estimated to be 10-20% of content).

- The edges of the roads and pads were oversteepened (approx. 1H:1V based on the visual observation). Some tension cracking and some settlement and/or slope relaxation along the pads and roads edges were apparent.

5.3 MLA Site

MLA property started to be developed in 2017. All the infrastructure (airstrip, roadways, and pads) were constructed from Run-Of-Quarry (ROQ) material that was sourced from the MLA Quarry Area (the current MLA Tank Farm area). In general, this blasted material contains a notable sand content that appears to create a more tightly packed top surface (more readily breaks down after blasting, transportation, placement, and compactions). However, due to its' finer (more sand rich) gradation, this material may experience more settlement over the project life and is more prone to erosion.

By the time of the 2023 AGI, the MLA area was in a functional but still transitional and developing state. The MLA continues to evolve as a port location that can be utilized to bring in supporting equipment, supplies and buildings to support the Back River project. Similar to the Goose area of site, many of the comments in the Annual Geotechnical Inspection are linked to items that should continue to be monitored, or specific considerations for ponding water have been noted to help reduce thermal impacts to the underlying permafrost, as the MLA port construction and associated infrastructure continues.

Refer to the Appendix B photolog for photos pertaining to the MLA site inspection. Figured 13 and 14 show a high-level overview of Sentinel-2 satellite images that show an overview of the development of the MLA site from 2017 to 2023.

5.3.1 MLA Quarry Tank Farm

The design of the MLA Tank Farm was done by SRK Consulting. Construction of the tank farm was performed in two phases. The containment area (Phase 1) for fuel tank No.1 (a tank capacity of 10M liters, a height of 12.2 m, and a diameter of 33.5 m) was completed in 2021. Based on the information provided by B2Gold prior to the construction the area was excavated to expose the underlying bedrock / blasted rock surface. The berms and the base of the containment area are made impervious using an HDPE liner. The secondary (Phase 2) portion of the MLA tank farm was constructed in 2022 and 2023. Specifically additional liner was placed at the MLA tank farm (for the Phase 2 portion) in 2023.

At the time of the AGI site inspection, a 10Mt fuel tank was erected and a 15Mt one was half-assembled. The fuel tank foundation consisted of a pedestal with a minimum thickness of 1.0 m, which is underlain by a bedrock foundation. A minimum 1 m shoulder (pedestal offset) was built around the perimeter of the fuel tank, and the slope of the pedestal was designed at 2H:1V. At the time of the site inspection, Phase 2 of construction was in progress. The containment facility for tanks No. 2, 3, and 4 was built and lined with HDPE liner. Two types of HDPE liners were used at the MLA Tank Farm: smooth and textured. The smooth liner was placed in areas at the base of the containment area, while the textured liner was used on the berm slopes. From discussions with site staff this was done primarily to assist the liner installers working on the slope during the HDPE installation and Quality Control

testing. Available on-site engineering fill (blasted and sorted material) was used for backfilling of the base and later the above liner components.

Site Inspection Observations

- As outlined in the 2022 AGI notes, the east-southeast (ESE) quarry area – loose material (previously drilled and blasted) still exists in this area, and this is one of the current sources for additional fill material for the MLA construction activities if / as needed.
- Engineering fill was placed at the base of the facility, but the berms were not fully covered with fill material at the time of inspection. So, in many areas the nonwoven geotextile that covered the HDPE liner was still exposed on the slopes. This also has been observed during the 2022 AGI.
- The western and northern inner and outer slopes of the containment berm were observed to be over-steepened in areas (approximately 1.5H:1V). Minor cracking was also noted on the area of the berm. There is no concern of an overall berm failure, however cracking is expected to be a result of the oversteppened slopes and overliner slippage. All HDPE and geotextile, including on the berm slopes, should be covered as per the original design drawings. This would be done to help protect the liner system (from equipment as well as from solar radiation) and to assist with reducing the over liner material slippage; overliner material slippage if left longer term, could lead to liner wrinkles which increase seepage potential or in extreme cases lead to ripping of the liner.
- During the inspection there was ponding water accumulated in the northwest, northeast, and southwest corners of the Tank Farm containment area.
- The tank pedestal (specifically for Tank #2) is built on the smooth liner which has a lower expected interface friction angle. The southwest side, where the thickness of the fill material is the biggest, needs to be supported with the buttress. This was communicated to site staff during the AGI site visit and was started to be addressed shortly after this visit.
- Northeastern and eastern inner slopes are not covered with geotextile and are not backfilled or covered with engineering fill. To avoid liner damage, it is suggested that priority be given to placing the overliner fill within the containment area.
- There was no cap for the underliner drainage pipe at the southwest corner of the Tank Farm, near Tank No. 2 sump location. It is suggested that this pipe be covered when not being used to limit any additional water ingress below the liner system.
- The drainage pipe positioned at the northeast corner may not be able to collect all accumulated water effectively due to the bottom elevation of the pipe within the Tank Farm area. During months where ambient air temperatures are consistently above -5^{o}C this area should be closely monitored and frequent pumping should be expected to be required as part of ongoing operations and maintenance activities in spring to fall months.
- Two deeper erosion paths were observable at the southwestern side of the tanks farm slopes. These appeared to be formed from water being discharged over the side of the berm. Water should not be discharged onto the berm slopes to avoid further erosion.

- The base of the tank farm is undulated in area. Some surface depressions are located at the bottom of the Tank Farm that were collecting water. An updated as-built survey of the base of the current tank farm is suggested to be completed to check the overline fill thicknesses and to improve grading to minimize locations for ponding.
- A series of narrow, elongated tension cracks were observed at the southwestern berm of the containment area.
- Following the site visit in September 2023, B2Gold was able to provide some aerial images as well as an as-built survey of the fuel tank farm containment area and tank pedestals (which were also reviewed as part of this inspection). A buttress (35 m in length, 1 m in height, a berm width of 3 m, and 2H:1V slopes) was constructed to provide support for the southwestern slope of the pedestal (for Tank No. 2). In addition to the buttress, the southern slopes of the pedestal were modified to reduce steepness, resulting in current slopes of 2.5H:1V. These were both positive improvements.

5.3.2 Former Temporary Fuel Containment

Background

This area was used for temporary fuel storage during the initial development of the MLA property (from 2018 through 2021). Previously, there were multiple Enviro Tanks (fuel tanks) that had been placed in the area. The majority of these tanks have been removed / pulled out of this area. There is still one Insta-Berm section (and corresponding three empty tanks) left at this location that are planned to be removed. SRK understands that this area is in the process of being decommissioned. It is suggested that a more formal remediation plan, or increased monitoring plan to better monitor the disturbance, be developed for this area once the tanks and remaining insta-berm structure are removed.

Site inspection Observations

- There is no longer any traffic in or around this area.
- The tanks in this area were placed on a very thin fill and / or directly on the tundra. Given the low-lying nature of this area and its tendency for greater surface water retention, as well as expected higher ground ice contents and natural ground saturation, increased ponding water and permafrost degradation were noted during the 2023 AGI. Similar observations were noted during the 2022 AGI, with slightly increased magnitude of water ponding and settlement into the tundra noted in 2023.
- Permafrost degradation and some potential, expected to be minor ground contamination were observed at the spot where the fuel tanks were temporarily located.
- The remaining bermed section (Insta-Berm) with three empty tanks accumulated had accumulated a notable amount of precipitations. The secondary containments had notable volumes of water in them during the site inspection. The historic lined areas should be strategically drained and decommissioned to mitigate the risk of pond overtopping (which may cause increased degradation or erosion in the area).

5.3.3 Shoreline Pad

The shoreline pad is a critical piece of infrastructure that is required to offload the barges at the MLA site. The Shoreline Pad started to be constructed around the beginning of 2018. Ongoing maintenance should be expected on the roads and pads that join this area. The underlying foundation below the Shoreline Pad is typically comprised (based on available geotechnical drilling information) of sand to silty sand overburden. The top active layer likely now has consolidated (as most of this fill has been in place since 2018) and assists in increasing the foundation strength below this pad. As the Shoreline Pad is around the highwater level, the front it is more prone to wave erosion and settlement from ongoing use and fluctuating water levels. Annual maintenance is expected at this location to check and improve the slopes each year before the annual sea-lift offloading. The upstream and downstream faces of the Shoreline Pad were inspected during the 2023 AGI.

Site Inspection Observations

- The overall thickness of the pad varies from around 0.4 m (southern edge, tundra side) to 2.5 m (northern edge, seaside).
- The upstream (in water) slope is quite steep (slope is approx. 1.6H:1V range based on visual observations). Bigger boulders tend to be located at the toe, and the finer material was found closer to the crest of the pad.
- Some overburden material (sand) was indicated in the pad fill. The erosion and movement of the fine sandy material was observed at the pad slope from the upstream side. Therefore, settlement and ongoing maintenance should be expected.
- Erosion processes are apparent at the upstream slope of the pad (some surface water stream paths and the decrease and steeper pad slope angle close to the seawater level). The toes of this pad should be carefully monitored to ensure that erosion of the toes does not lead to under cutting or slope oversteepening that then results in slope sloughing.
- The top lift of the rock fill placed for accessing the dock was not yet compacted at the time of the visual inspection.
- In areas adjacent to the Shoreline pad a series of equipment tracks were indicated on the tundra. Also narrow, elongated regions of the degraded tundra were formed due to the relocation of a few pipelines. It is SRK's understanding that these were from around 2019 and regulators were notified of the tracks at that time and there is notable natural revegetation occurring within them.
- The start of some, more minor, tundra degradation was found along the upstream side of the road that connected the Shoreline pad and Lower Laydown Area. These areas should be monitored to ensure that they do not need to be remediated, or the pads or roads extended over these areas.

5.3.4 Freight Storage Pad

Background

The construction of the Freight Storage Pad commenced in 2018, with subsequent fill thickening and widening activities undertaken in 2019 and 2022.

Site Inspection Observations

- The thickness of the pad varied from 0.1 m (SW corner of the pad) to 2.8 m (NE corner of the pad)
- The fill material present appeared to typically be well-graded gravel with medium to fine sand on the top of the pad. Surface undulation and depressions filled with atmospheric and surface water were found at the pad surface.
- A lined area, approximately 10 m x 15 m in size, is located on the northern side of the pad. The HDPE liner in this area placed to form a berm approx. 0.6 m in height, which is then backfilled with engineering fill to a thickness of approximately 0.1 m. It was observed that the HDPE liner is not anchored to the berm. This appeared to be a temporary location. The exact purpose of this area was not confirmed.
- Equipment and stored material were placed less than 1 m away from the pad crest in areas.

5.3.5 Camp Pad

Background

The camp pad was built in 2018 and is used for a level walking surface, low ground pressure storage items and elevated camp modular installation. During the 2023 inspection, the southeast extension of the pad was under construction.

Site Inspection Observations

- The thickness of the pad varies from 0.3 m to 0.8 m.
- Depressions at the pad surface were observed. Some of the depressions were filled with water.
- The stored materials and seacans were located at or near the edge of the pads in areas.

5.3.6 Fuel Offload Pads and Access Road

Background

Construction of the access road commenced in summer 2022 and was completed in the summer of 2023. The series of fuel offload pads was built in the summer of 2023. The roads and pads are utilized for light vehicles during the summer months on a limited basis and generally don’t see any traffic until the winter months when they are frozen.

Site Inspection Observations

- The thickness of the access road and pads are varied but typically less than 0.8 m. Insufficient thickness of the road embankment can lead to thermal erosion and differential settlements in the road foundation, potentially resulting in damage to the fuel pipe. The fuel transfer conduit is inspected and tested annual each year before use for fuel offloading.
- The edges of the access road lack proper compaction of the fill material or in many areas the slopes are at angle of repose or over steepened.

5.3.7 Airstrip

Background

The airstrip was built in 2018. The southern end of the airstrip appears to cross areas where ephemeral flow pathways previously existed, and likely areas where more massive ice was apparent in the foundation.

Site Inspection Observations

- The slopes of the airstrip are over-steepened in areas (1.5H:1V based on the visual observation).
- Distress of the airstrip embankment, mainly near the immediate edges / shoulders, was identified as narrow linear tension cracks or depressions, in areas (specifically the south and southwestern edges) likely resulting from permafrost degradation in the underlying foundation. Tension cracking and minor settlement and/or slope relaxation noted along the airstrip. Also during summer months, the outside edges may experience ‘softer’ shoulders in areas and could be more prone to slope relaxation over time.
- Deep erosion paths / gullies were observed at the northwest end of the airstrip.
- In areas, the observed airstrip embankment cracking is enhanced by ponding water against the side of the airstrip (some from natural flow paths). This ponding is most prevalent near the south and southwestern portions (specifically near the edges) of the airstrip. The depth of the ponds varied from 0.1 m to 0.6 m at the time of the site inspection.

5.3.8 Roadways (Including Former Explosives Storage Access Road)

- The general observation is that all the roads in this area have road thickness that are quite thin and now are very undulating. The embankment thickness varies from 0.2 m to 1.0 m with an average thickness of approx. 0.5 m, which can lead to a thermal erosion of the tundra. Therefore, settlement and ongoing maintenance should be expected. It is SRK’s understanding that the former explosives storage access road was no longer in use.
- Some spots with ponding water were indicated along the toe of existing roads. The shoulders of the roadways should be watched and inspected closer to freshet and throughout the summer. Specifically, 1 to 3 m from the edge of each road should be watched to see if vehicle traffic is expected to result in the areas. Care should be given for loaded equipment not to traveling too

close to the edges of the roadways (specifically in the summer), and for loads or equipment not to be storage too close to the edges of the roadways (specifically where any tension cracking has been observed or where there is ponding water against the pads).

5.3.9 Upper Laydown Pad

Background

The construction of the upper laydown area commenced in winter 2022, with subsequent extensions and widening activities undertaken in 2023. This facility is used as a secondary storage pad mostly for equipment.

Site Inspection Observations

- The thickness of the eastern side of the pad varies, but typically does not exceed that 1 m. The stored material is found to be placed close to the edge of the pads in many areas.
- The southern slope of the pad is oversteepened.

6 Primary Observations

Based on the observations from the site visit, the following recommendations were developed. Overview figures of the site are provided in Figures 1 to 6 for Goose and in Figure 7 to 14 for the MLA. Photographs of the site are provided in Appendix A (Goose) and Appendix B (MLA).

6.1 Goose Property

The main observation as part of the, 2022, and again the 2023 Annual Geotechnical Inspection (AGI) for the Goose area was that, as the site is currently in a transition stage, many of the pads and roads and water conveyance (culvert) structures were underbuilt or at an interim state. The site is currently in a transition from exploration towards an operating site (pre-operation ramp up stage). So many of the comments in the Annual Geotechnical Inspection are linked to items that should continue to be monitored or considerations for some of the key water management areas that should be addressed as the site infrastructure construction advances. Table 3 summarizes the main recommendations for the Goose Property.

Table 3: Summary of 2023 AGI Observations (Goose Property)

Infrastructure	Observations and Comments	Comment ID
Goose Airstrip	▪ Prior to landing any aircraft on the runway, the aircraft operators should conduct their own assessment of the runway conditions (in terms of functionality). Ultimately it will be at the discretion of the aircraft operators if the airstrip surface is acceptable for their aircraft.	2023-AGI-G-1
	▪ Any observations at the airstrip shoulder, any areas of larger undulations or settlements that require ongoing maintenance should be noted and records kept to assist with long term performance monitoring. This will also assist to see if items such as degradation of ice in the foundation (specifically for the southern extents) of the airstrip are apparent and being adequately addressed through routine maintenance (such as just adding more fill to the top surface). ▪ Permafrost degradation at the Goose airstrip is suggested to continue to be visually monitored each year during the annual geotechnical inspection. Ground-level photographs, measurements, and aerial drone imagery should again be collected in 2024 to assist with ongoing monitoring. The area of most interest at this time is the southern end of the airstrip where the most ponded water was observed adjacent to the toes.	2023-AGI-G-2
	▪ A full topographic ground survey of the airstrip should be completed, and this survey compared against the expected ground conditions (from geomorphological interpretations).	2023-AGI-G-3
	▪ Temporary access area / roadway to the airstrip to be expanded (thicker). Current access thickness is thin (in areas less than 1 m and less than 0.5 m in areas). This also was outlined in the 2022 AGI notes. It is understood from discussions with site staff that this is not the permanent access	2023-AGI-G-4

Infrastructure	Observations and Comments	Comment ID
	point and that a permanent road will be constructed at a later date.	
	▪ Consideration should be given to redirecting or attempting to move any ponded water away from the toes of the airstrip. Pumping out or removing ponded water at the toes of the airstrip in the fall, before winter freeze-up, would enhance the transfer of cold ambient air and ground heat. This could help mitigate permafrost degradation by reducing thawing rates and slowing the deepening of the active layer. Improved water management of this nature may contribute to a decrease in both short and long-term maintenance activities	2023-AGI-G-5
	▪ Ponding water and expected ice rich ground was noted to be adjacent to, or intersecting, both site airstrips. These locations should be carefully monitored, and ongoing maintenance should be expected. ▪ Special attention should be given to the SSW end of the airstrip. Some softer shoulders were noted when walking around the perimeter of the airstrip. Additional and ongoing settlement is expected at the airstrip (specifically at the southern end). The expansion of the airstrip is in progress. The Rascal Diversion should finish being constructed at the time of, or before, the airstrip expansion is completed to ensure that the water flow in this area does not impact the airstrip. ▪ The Goose airstrip extension to the South is currently in progress. As this airstrip extends to the south, it intersects some more notable surface water flow pathways / ephemeral streams. The South end of the extended Goose Airstrip is expected to be an area that will need to be closely monitored and more permanent long term water conveyance through portions of the airstrip is expected to be required.	2023-AGI-G-6
	▪ Continue visual and drone image monitoring. Due to the critical and higher risk nature of the Goose airstrip, drone photographs and photos taken from ground level should be taken again in the summer of 2024 and compared to the information collected in 2022 and 2023. Orthorectified drone imagery is suggested to be collected in the summer of 2024 for use as part of the 2024 AGI and to help improve the ongoing monitoring, tracking, and review.	2023-AGI-G-7
Tank Farm	▪ No change to prior 2022 recommendation: A survey of the base and the slopes of the tank farm should be done to verify the fill thickness. This will ensure that there is a minimum of 0.3 meters of fill material on top of the HDPE liner, allowing for the safe operation of smaller equipment within the containment area. For heavy equipment, a minimum of 0.6 meters of cover is required.	2023-AGI-G-8
	▪ HDPE liner should be anchored to the berm properly. Prior to the placement of the engineering fill, perform the as-build survey with special attention to the liner seam and patch locations.	2023-AGI-G-9
	▪ The top crest of the liner should be surveyed. This survey should be used to assist with the containment volume checks	2023-AGI-G-10

Infrastructure	Observations and Comments	Comment ID
	▪ Containment volume checks should be completed on the as-built arrangement of the existing tank farm. *Site has indicated that this is planned to be completed once the tank farm construction is complete (or near final completion).*	
	▪ No pumps were found at the tank farm and some ponding water at the western bottom of the tank farm close to Tank #1 was observed. Develop and implement operating procedures that would highlight how to get rid of the ponding water in the containment area and ensure that adequate capacity is available in the tank farm. Site has informed. *SRK that this is in the current Standard Operating Procedures and will be carried out on onsite.*	2023-AGI-G-11
	▪ Re-slope the tank pedestal, keeping the minimum distance from the tank to the pedestal crest of greater than1m to avoid the risk of a bearing failure through the pedestal fill. Some buttress may be required to ensure the pedestal stability and decrease the risk of a bearing failure through the pedestal fill. *This has now been completed on site*	2023-AGI-G-12
Temporary Fuel Storage Facility Southwest of the Tank Farm	▪ The area is not acting as an effective secondary containment (no southern berm of the facility). This area should be upgraded if it is planned to be used for future storage. *Site has indicated that this area is being deconstructed in favor of temporary insta-berms while design for a permanent facility is underway.* ▪ All berms should be lined with geosynthetic material and properly anchored if this area. ▪ Fill material should be compacted to avoid surface undulation at the base of the secondary containment area.	2023-AGI-G-13
Explosives Access Road	▪ Access road to the emulsion plant pad to potentially be expanded (thicker). Current access thickness is thin (average thickness is less than 1 m and less than 0.5 m in areas). This comment is only applicable where longer term monitoring shows the active layer is deepening or unstable.	2023-AGI-G-14
	▪ B2Gold should consider installing culverts or constructing French drains at the points where the road intersects seasonal (ephemeral) creek flow.	2023-AGI-G-15
	▪ Overburden rich material should be encapsulated by placing the compacted Run-of-Quarry (ROQ) rock fill over this material. This will help with erosion control and for improved thermal protection.	2023-AGI-G-16
	▪ The slopes of the road embankment are oversteepened, which can lead to the fill material cracking close to the road edges. B2Gold should consider reslope, shallowing, the side slopes of this road or placing signage at the start of the road (as it is infrequently trafficked) to highlight that care should be taken to avoid driving near the shoulders of the road.	2023-AGI-G-17
Camp Pad CWP	▪ An as-built survey (including the top elevations of the exposed liner placed at the bench crest) should be performed and	2023-AGI-G-18

Infrastructure	Observations and Comments	Comment ID
	compared to the design elevations to ensure the projected capacity of the pond is being met or to check the available containment capacity of this pond. *It is SRK's understanding that interim as-built checks have been completed by others and that this pond construction is not yet complete (still in progress). Therefore this comment is more applicable to the final pond construction once compete.*	
	▪ Cover exposed edges of the HDPE liner so that it is not damaged and so it is anchored and not picked up, ripped, or damaged by the wind	2023-AGI-G-19
	▪ Do an inspection before using this lined pond to determine a maximum temporary operating level. This maximum level should be based on observations of the top liner elevation and the liner seam elevations (below the elevation of any current damage).	2023-AGI-G-20
	▪ Perform the assessment of the liner panels and seams. After the liner inspection, repairs should be undertaken to prevent seepage through the liner. All panels should be welded in areas of repair.	2023-AGI-G-21
Camp Pad	▪ Offset from the pad crest and avoid placement of the buildings and heavy structures close to the edge of the slopes, Keep the buffer zone from the crest of the camp pad.	2023-AGI-G-22
Processing Plant Area	▪ Construction operations were actively underway at the Processing Plant site during the site inspection. Therefore, the area should be revisited during the 2024 Annual Geotechnical Inspection The summary of the construction should be presented in the annual reporting (once complete).	2023-AGI-G-23
	▪ Ponding water was observed at the eastern side of the Processing Plant footprint, as well as at the northern part of the Truck shop. The water should be pumped out prior to the backfilling process. If the construction process occurs during the winter season ice/snow pockets should be removed from the footprint area. *It is SRK's understanding that this comment was addressed in 2023.*	2023-AGI-G-24
	▪ A set of holes and cracks were found at the southern crest of the pad. Those holes were possibly formed due to the thawing of the ice/overburden material that was used in pad construction along with ROQ/ROM. No buildings, or equipment should be placed within this area unless this area is first re-graded to shallower slopes, and any voids backfilled. This area is mainly suitable for laydown space for less critical items or items that are more tolerant to differential settlement). *SRK was informed by site staff that this area has since been expanded and additional work as resulted to tie this pad into the surrounding areas.*	2023-AGI-G-25
	▪ The concrete footing of the Batch Plant and other tent buildings is built on the fill crush. In areas there were some voids observed between the footing and the fill material. Observed voids can potentially lead to concrete cracking. The adjacent	2023-AGI-G-26

Infrastructure	Observations and Comments	Comment ID
	area to the concrete foundation should be backfilled, or fill material placed against and around. This action is aimed at mitigating the likelihood of additional concrete cracking due to the thawing/freezing cycles or for water migration in or below these areas.	
All-Weather Road (General)	▪ A full updated survey of the roads on site is suggested to be completed. This survey then can be used to do a review of the current road thickness on site. The existing road thicknesses can then be cross-referenced and compared against past permafrost and geomorphological observations (e.g. area with expected higher ground ice would be targets for thicker road fills)	2023-AGI-G-27
	▪ Special attention should be given to the ponding water locations as surface / tundra degradation can be found more commonly at these locations due to the thermal loading imposed from the ponding water, and in the winter how these ponds limit the freezing back of the active layer (energy goes into freezing the water and not into freezing the ground). In areas around or adjacent to critical infrastructure consideration should be given to dewatering these areas before winter freeze-up, or widening the road can be considered to prevent ongoing thawing of the foundation. This is more of a best practice comment.	2023-AGI-G-28
	▪ It is suggested that B2Gold visit each culvert outflow before and during freshet to ensure appropriate energy dissipation is installed. Observations and photos should be collected of these culvert outlet locations to help track any developments in these areas. Specifically of interest is the area where the site will have future Echo Pond, as erosion in these areas this could have thermal impacts on that pond design. This was also suggested 2022 AGI notes.	2023-AGI-G-29
	▪ Monitor the road shoulders especially in August-September when the active layer is the deepest. Avoid driving and parking any equipment closer to the edge, specifically in any areas where slopes are steeper than 1.5H:1V.	2023-AGI-G-30
Goose Neck Crossing	▪ Unblock the existing inlets and outlets. The outlet areas of the culverts should continue to be visually monitored and revisited as part of the 2024 AGI. Areas where culverts appear to be damaged (such as compressed) may be required to be replaced (site to determine after visual inspections before and around freshet).	2023-AGI-G-31
	▪ Stream flow was observed at the Goose Neck crossings' location before the most northern culvert was placed (at the bottom of the slope before the road goes upload towards the Umwelt Pit area). To avoid excessive ponding water, an additional culvert or drainage measures should be considered to be implemented in this area (low point in road before the slope goes uphill towards the Explosives access road	2023-AGI-G-32
Echo Crossing	▪ The fill cover thickness over the culvert pipes should be checked to ensure that the fill thickness is sufficient enough for the larger haul trucks (775CAT) that are now on site. This would be done to avoid damage or compression of the underlying	2023-AGI-G-33

Infrastructure	Observations and Comments	Comment ID
	culverts and to ensure that the culvert design cross-sections are maintained.	
	▪ B2Gold should conduct continuous monitoring of all culverts to track progressive permafrost degradation. It is particularly important to prioritize monitoring during the freshet period and in August and September when the active layer reaches its maximum depth. ▪ To mitigate the tundra degradation, from the culvert construction activities, it may be necessary to extend the culvert fill cover around the area.	2023-AGI-G-34
Primary Pond	▪ Mitigate the thermal degradation within the dam footprint. Construction is ongoing at this location. As part of the 2024 construction mitigation of some of the thermal degradation that has resulted on site in the summer of 2023 will be required. ▪ *This has been incorporated into the construction plans and is currently in the process of being completed on site.*	2023-AGI-G-35
Echo Pit	▪ Revisit the overburden pit slope cladding thickness. It is suggested that the site consider thicker cladding of the overburden slopes. This is not a near term concern but may have design and operational impacts on the future planned in-pit tailings deposition and water reclaim activities. The Echo pit is currently at an interim state and pit slopes were not complete, not at design extents, at the time of the 2023 AGI inspection.	2023-AGI-G-36
General / Exploration Drilling	▪ The temporary drilling water 'pond' should be removed before freshet 2024. A temporary moderate 'pond' of water had been established by the drillers on site for use during exploration drilling. This pond was located north of the Goose Neck crossing area and south of Umwelt Pit. This pond is suggested to be decommissioned (at least breached in multiple locations so that it no longer impounds water) before freshet 2024. This 'pond' was used for exploration drilling. The side berms were un-engineered and just constructed of uncompacted stacked soil. The primary concern with this area would that that the ponded water may rapidly discharge and cause thermal erosion and damage to adjacent tundra. If this area is planned to be constructed over, road to expand over area, then any massive surface ice should first be removed. ▪ *B2Gold site staff have indicated that this area is no longer planned to be used for exploration drilling and will be decommissioned and visually monitored during and immediately after freshet 2024.*	2023-AGI-G-37
General / Site Wide	▪ Complete the first draft of the site Thermal Monitoring Plan – first draft to be submitted as part of the annual reporting. ▪ *This has been completed*	2023-AGI-G-38

SRK is unaware of the current or future plans for the exploration camp area. There were not many notable changes to this area in 2023. It is expected that longer term mitigation of this area (specifically the areas east and southeast of the main camp area) may be required. For this report only general observations around the exploration camp have been presented and specific recommendations for this area have not been included in this recommendations section.

6.2 MLA Site

Similar to the 2022 AGI, during the 2023 AGI, the primary observation was that the MLA area remained functional but was also still in a transitional or developing phase. The site continues to evolve as a port location, serving to bring in supporting equipment, supplies, and buildings essential for the Back River project operations. Analogous to the Goose area of the site, many of the comments in the Annual Geotechnical Inspection pertain to matters that require ongoing monitoring or attention, such as addressing water ponding issues and enhancing thermal protection for permafrost, particularly as port construction and associated infrastructure progress. A summary of the 2023 AGI recommendations for the MLA area are presented in Table 4.

Table 4: Summary of 2023 AGI Recommendations (MLA Property)

Infrastructure	Observations and Comments	Observation ID
Shoreline Pad	▪ The Shoreline Pad is suggested to be inspected by site staff before the 2024 sealift and likely some additional maintenance activities performed, which likely would include adding some additional rip-rap / coarser rockfill off the upstream (in or near water) slope of this pad or adding erosion mitigation such as blast matts over the front edge of this pad. This would be done to help minimize erosion to the pad.	2023-AGI-M-1
	▪ Currently this Shoreline Pad appears to be of a reasonable fill thickness (in the range of 2 to 4 m from the seaside). The outside / upstream (or in water) slope is quite steep (more in the 1.5H:1V range based on visual inspections). These steeper slopes appear to have been constructed to allow the barges to dock closer to the fill material. Care should be taken to ensure that any offloading ramps from the barges to the pad are offset at least a few meters inwards from the pad crest to avoid any offloading leading to some slope relaxation or sloughing. At this stage, this is more of an operational consideration.	2023-AGI-M-2
	▪ As it was outlined in the 2022 AGI notes the underlying foundation below the Shoreline Pad is typically comprised (based on available geotechnical drilling information) of sand to silty sand overburden. The top active layer likely now has consolidated (as most of this fill has been in place since 2018) and assisted in increasing the foundation strength below this pad. This noted, the sandy foundation would be more prone to elevated pore pressure generation (thereby decreasing the effective stress of the foundation soil) if large loads are placed over this pad. If loads larger than this pad has experienced / seen to date from the barge offloading, and / or if additional fill material is placed to raise this pad in the future, then the impacts on the foundation should be looked at in closer detail to ensure that a failure through the foundation does not occur. At the time of the 2023 AGI this is not a critical concern but should be considered as this area evolves and develops. B2Gold should consider including this area (Shoreline Pad) as part of future version of their site wide thermal monitoring plan (the first revision of this plan now completed).	2023-AGI-M-3
Freight Storage Pad	▪ The thickness of the pad varied from 0.1 m (SW corner of the pad) to 2.8 m (NE corner of the pad). The pad should be surveyed and	2023-AGI-M-4

Infrastructure	Observations and Comments	Observation ID
	the thickness reviewed and compared against the long thermal closure commitments for these pads.	
	▪ The HDPE liner placed on this pad should be anchored to the berm if this area is planned to be used in the future.	2023-AGI-M-5
Camp Pad	▪ The thickness of the pad is quite thin (in many areas 1 m or less) therefore there are depressions sometime filled with water. Ongoing maintenance is expected to be required for the camp pad. This is more of a general observations. ▪ Care should be given for loads or equipment not to be storage to close to the edges of the pad (specifically where any tension cracking has been observed or where the thickness of the pad is less than 1.5m	2023-AGI-M-6
Roadways	▪ No change to prior (2022) recommendations: The general observation is that the road thickness is quite thin (in many areas, 1 m or less), and settlement and ongoing maintenance should be expected.	2023-AGI-M-7
	▪ Similar to the recommendations given for roads built at Goose property, B2Gold should compile and update as-built pick-up of the roads and infrastructure at the MLA.	2023-AGI-M-8
Fuel Offload and Access Road	▪ The Fuel Offload access road thickness is quite thin (in many areas, 0.8 m or less). Insufficient thickness of the road embankment can lead to thermal erosion and differential settlements in the road foundation, potentially resulting in damage to the fuel pipe. *SRK understands from discussions with site that this road is used primarily in the wintertime.*	2023-AGI-M-9
Former Temporary Fuel Storage Depot Area	▪ Previously there were multiple Enviro Tanks (fuel tanks) that had been placed in this area; placed within tertiary containment. The historic containment areas should be drained and decommissioned to mitigate the risk of Insta-Berm overtopping.	2023-AGI-M-10
	▪ As the tanks in this area were placed on very thin fill, and or on the tundra, and as this low-lying area appears to have had more surface water accumulation and natural ground ice in the foundation soils, increased ponding and degradation of the permafrost was noted as part of the AGI. This was also observed during the 2022 Inspection. Ongoing monitoring of this location should occur to track the permafrost degradation in this area to assist with the development of long-term remediation plans (for this former temporary fuel storage depot area). ▪ *Note that the remaining fuel tanks in this area were empty at the time of the 2023 AGI summer site visit.*	2023-AGI-M-11
MLA Airstrip	▪ Prior to landing any aircraft on the runway, the aircraft operators should conduct their own assessment of the runway conditions (in terms of functionality). Ultimately it will be at the discretion of the aircraft operators if the airstrip surface is acceptable for their aircraft.	2023-AGI-M-12
	▪ Continued visual and drone image monitoring should be completed at this airstrip. This was done in 2023 and is suggested to be done again in 2024 for comparison. Additional orthorectified drone imagery is suggested to be collected in the summer of 2024 for use	2023-AGI-M-13

Infrastructure	Observations and Comments	Observation ID
	as part of the 2024 AGI and to help improve the ongoing monitoring, tracking, and review.	
	▪ Distress of the airstrip embankment, mainly near the immediate edges / shoulders, was identified as a series of linear tension cracks or depressions, inferred to be caused by permafrost degradation in the underlying foundation. B2Gold should monitor the airstrip edges and avoid placing the lights close to the crest, and or the slide slopes of the airstrip should be resloped (to shallower overall slopes). This was more relevant for the southwest and southern ends of the MLA airstrip.	2023-AGI-M-14
	▪ In areas permafrost degradation is enhanced by ponding water against the side of the airstrip (some from natural flow paths). This ponding is most prevalent near the south and southwestern portions (specifically near the edges) of the airstrip. B2Gold should watch these areas (specifically as temperatures annually warm on site from winter to spring to summer conditions). Some consideration should be given to redirecting or trying to push any ponding water further away from the toes of the existing MLA airstrip. Pumping down / removal of any ponded water at the toes of the airstrip in the fall (before winter freeze-up) would increase the cold ambient air and ground heat transfer to help slow down permafrost degradation (reduce thawing rates and slow deepening of the active layer). This increased water management may help to reduce overall short and long-term maintenance activities.	2023-AGI-M-15
	▪ Re-sloping of the northwest end of the airstrip should be completed mitigate the further development and advancement of the series of erosion gullies. B2Gold should consider backfilling this depression with engineering fill to create a positive surface expression. This will help to reduce concentrated flow through and instead promote flow over this area, while providing some additional thermal protection to the underlying and adjacent permafrost.	2023-AGI-M-16
MLA Tank Farm	▪ As-built checks should be used to confirm that the overliner thicknesses are sufficient for equipment to travel over the liner. The base and slopes of the containment area should be backfilled to the designed thickness. Ongoing survey checks should be performed to compare against the design in these areas. The Phase 2 tank farm construction was in progress at the time of the 2023 AGI site inspection.	2023-AGI-M-17
	▪ During the inspection there was water accumulated at the base of the containment area. The presence of ponding water in the northwest corner of the bunded area was also outlined in the 2022 Inspection report. It is suggested that in the summer of 2024, when all water is removed from the tank farm base, that a visual inspection be done around the design sump area to check the liner integrity. This was unable to be inspected at the time of the AGI. This could be done by B2Gold site staff and photographs taken to document the current tank farm base conditions in that area. This is suggested as areas where water pool and water level fluctuate are typically more prone to erosion of overliner material.	2023-AGI-M-18
	▪ The MLA tank #2 pedestal width should be increased. Increase the extents of the Tank 2 pedestal to buttress the current pedestal with additional and coarser fill material. The pedestals should be built of	2023-AGI-M-19

Infrastructure	Observations and Comments	Observation ID
	good quality engineering fill, ideally coarser gradation material, without any overburden material. ■ *This has now been completed onsite.*	
	■ Settlement monitoring is suggested (e.g., monitoring of survey monuments and fixed settlement points, survey markers on the tanks for total station surveys) on and around the tanks and pedestal. This will help to track the performance of the tank pedestal and the underlying foundation. This additional monitoring could be incorporated into the site monitoring programs and could be used for early warning and help plan future maintenance (if / as required).	2023-AGI-M-20

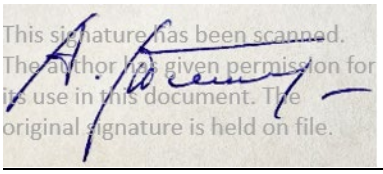
7 Final Remarks

Notwithstanding the observations and comments provided in this AGI (see Table 3 and Table 4), the Back River site is reasonably aligning with the anticipated geotechnical expectations. The main observations from the 2023 AGI were fairly similar to the 2022 AGI. The site continues to be in transition, primarily in the pre-mining development stage. This means that many of the pads, roads, and water conveyance (culvert) structures were in an interim state and / or not yet fully completed at the time of the 2023 AGI. An increase focused on monitoring, water management, and generally increasing fill thicknesses for improved thermal protection still should be considered and implemented before the site goes into full operation. Observations of the interim state of the construction for many areas have been made in this report in an attempt to allow site to improve the final configuration of the earthworks and water management infrastructure as construction progress or to proactively implement management or other engineering controls to help reduce long term maintenance requirements.

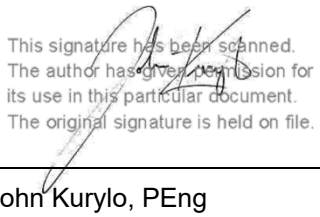
For completeness, additional comments and observations are provided in Figures 1 to 14 and Appendix A to Appendix D.

Closure

This report, Goose & MLA Project Sites – 2023 Annual Geotechnical Inspection, was prepared by



Anna Timchenko, PhD, EIT
Senior Consultant



John Kurylo, PEng
Principal Consultant (Geotechnical / Civil)

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

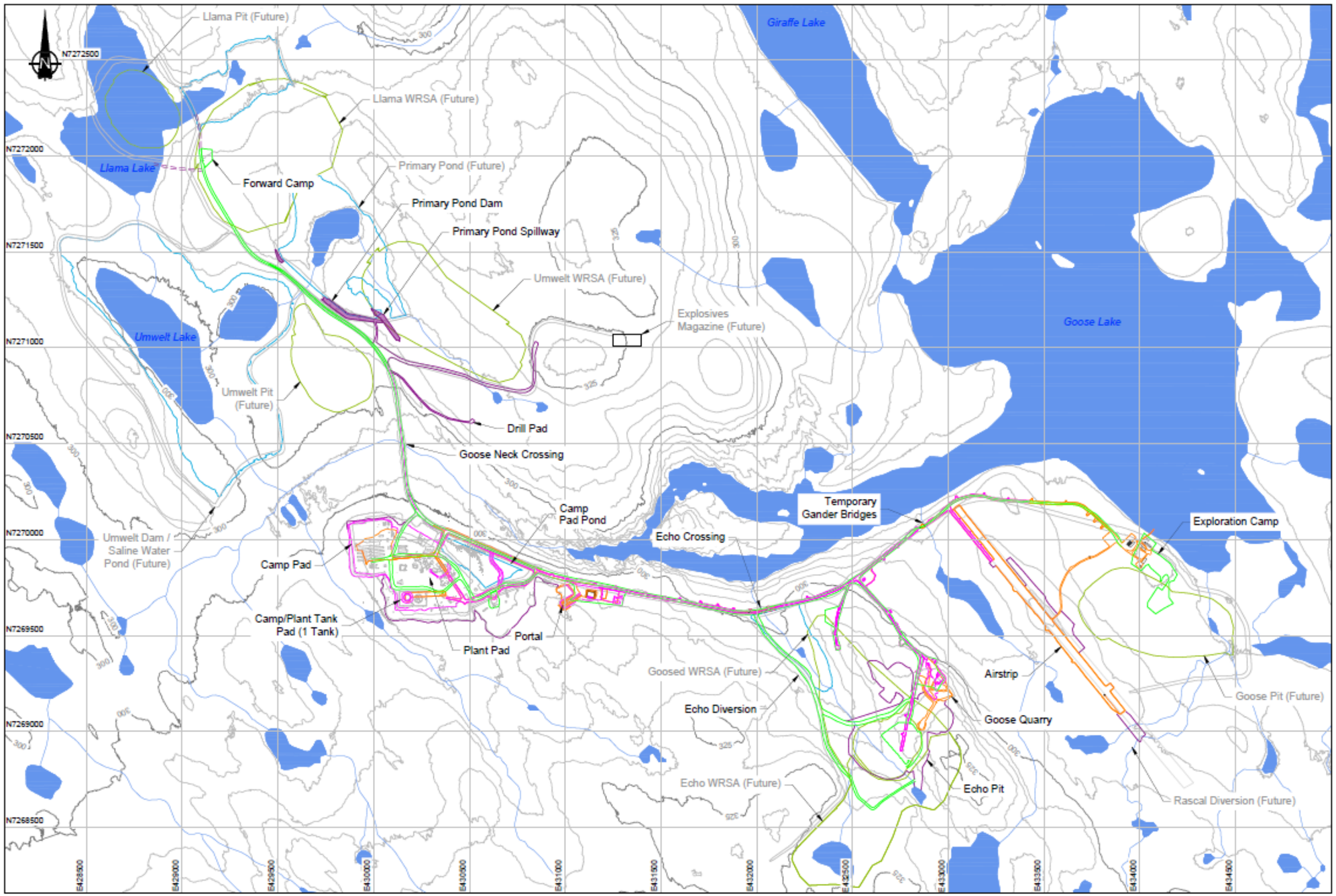
References

Sabina (2023). Back River Project. 2022 Nunavut Impact Review Board Annual Report. Sabina Gold & Silver Corp. March 31, 2023

SRK (2019). Back River Property Geotechnical Design Parameters – Revision 0 –'For Comment'. Project 1. Prepared for Sabina Gold & Silver Corp.CS020.017. July 2019

SRK (2024). Back River Project: Site-wide Ground Thermal Monitoring Plan (Draft).

Figures



LEGEND

- Design Infrastructure
- 2020 As-Constructed Infrastructure
- 2021 As-Constructed Infrastructure
- 2022 As-Constructed Infrastructure
- 2023 As-Constructed Infrastructure
- Extrapolated from Drone Survey
- Digitized from Satellite Imagery
- Conventional Survey

NOTES

1. All units are in meters unless otherwise specified.
2. Contours are shown at 5.0 m intervals.

REFERENCES

NAD83 UTM Zone 13.

srk consulting

Job No: CAPR003105

Filename: BackRiver_2023AGI_ Figures..pdf

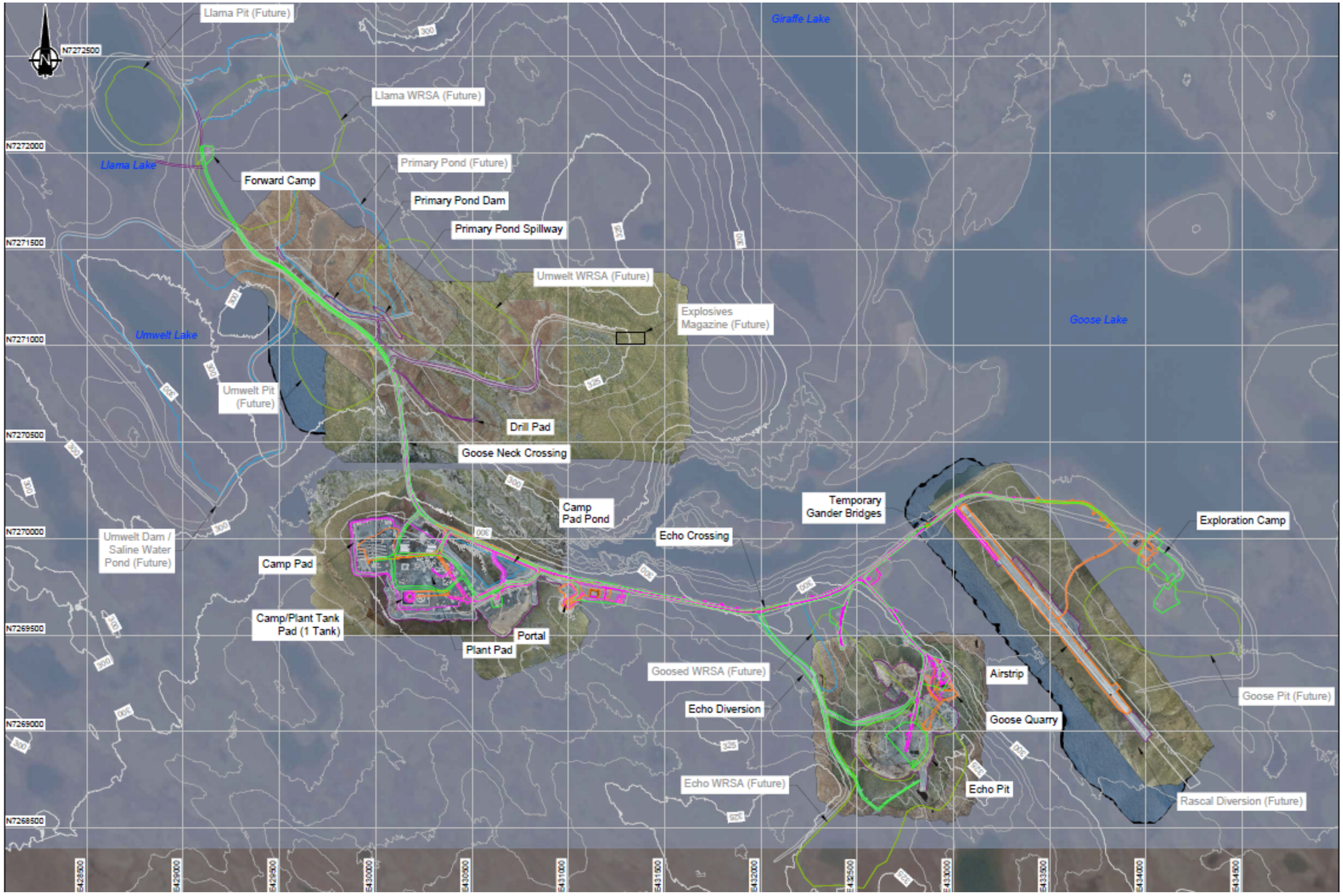
B2GOLD NUNAVUT

Back River Project

2023 Annual Geotechnical Inspection

Goose Lake Site - Plan View

Date:	Approved:	Figure:
2024-02-28	JBK	1



LEGEND

- Design Infrastructure
- 2020 As-Constructed Infrastructure
- 2021 As-Constructed Infrastructure
- 2022 As-Constructed Infrastructure
- 2023 As-Constructed Infrastructure

NOTES

1. All units are in meters unless otherwise specified.
2. Contours are shown at 5.0 m intervals.

REFERENCES

NAD83 UTM Zone 13.
Aerial Imagery is compiled from:

- 20230309 Drone Survey
- 20230318 Drone Survey
- 20230602 Drone Survey
- 20230708 Drone Survey
- 20230711 Drone Survey
- 20230715 Drone Survey
- 20230720 Drone Survey
- 20230722 Drone Survey
- 20230828 Drone Survey
- 20230828 Drone Survey
- 20230904 Drone Survey
- 20230908 Sentinel-2 Satellite
- 20230916 Drone Survey

srk consulting

Job No: CAPR003105
Filename: BackRiver_2023AGI_ Figures..pdf

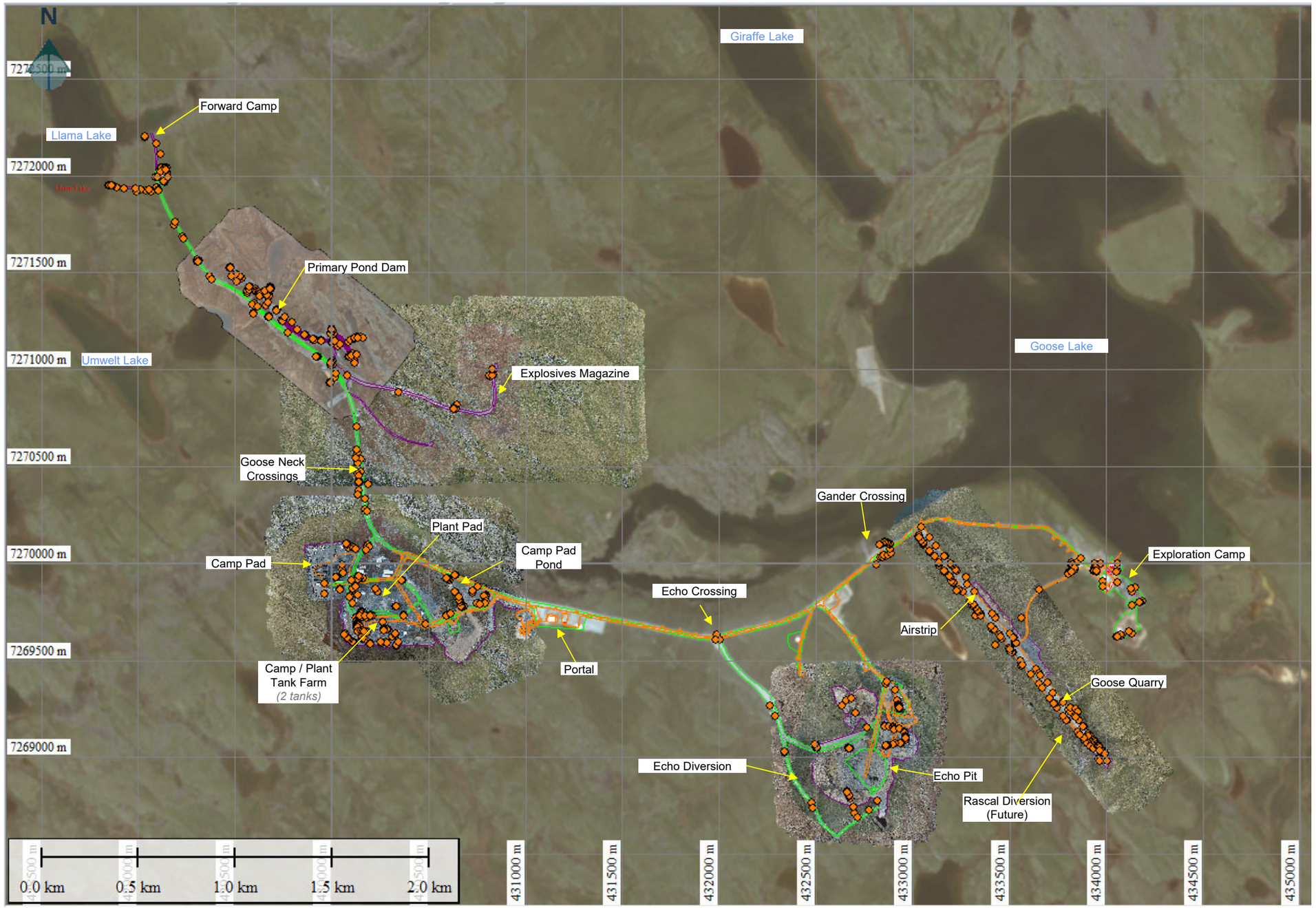
B2GOLD NUNAVUT

Back River Project

2023 Annual Geotechnical Inspection

Goose Lake Site - Plan View with Imagery

Date: 2024-02-28 | Approved: JBK | Figure: **2**



LEGEND:

- As-Constructed Infrastructure
- Points Along the 2023 Inspection Track

Notes:

1. Drone Images were provided by B2Gold in June-September 2023.
2. Plan view imagery extracted from World Imagery (approx. 2020-2021 time range). Reference: source: "Esri, USGS | Northwest Territories, Esri Canada, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCan, Parks Canada"

srk consulting	B2GOLD NUNAVUT	2023 Annual Geotechnical Inspection
Job No: CAPR003105 Filename: BackRiver_2023AGI_ Figures..pdf	Back River Project	**Goose Site Inspection Areas** Date: 2024-02-28 · Approved: JBK · Figure: **3**

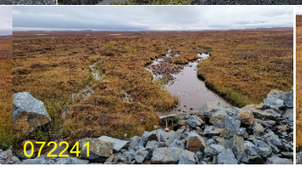
LEGEND:

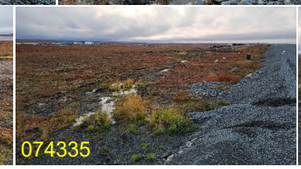
Voids and cracks in the pad due to the excessive amount of overburden material in the pad fill.

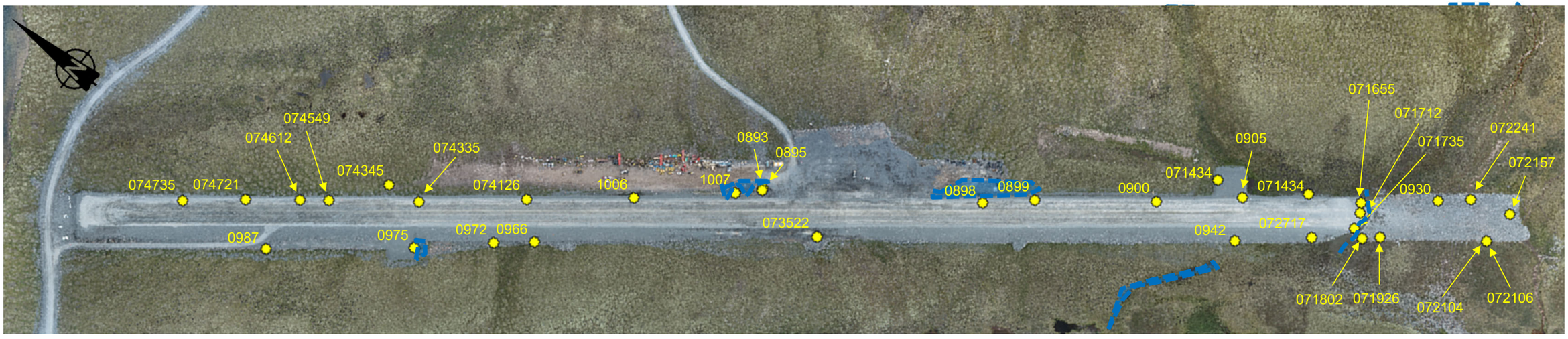
7270000 m

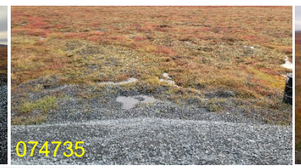
0 m 100 m 200 m 300 m

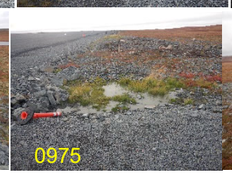
srk consulting	B2GOLD NUNAVUT	2023 Annual Geotechnical Inspection
Job No: CAPR003105 Filename: BackRiver_2023AGI_ Figures..pdf	Back River Project	**Voids in the Camp Pad**
		Date: 2024-02-28 / Approved: JBK / Figure: **4**

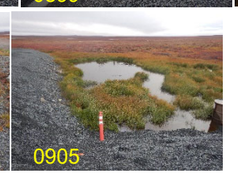












Ponding water and bodies of water near pads.

srk consulting

Job No: CAPR003105

Filename: BackRiver_2023AGI_ Figures..pdf

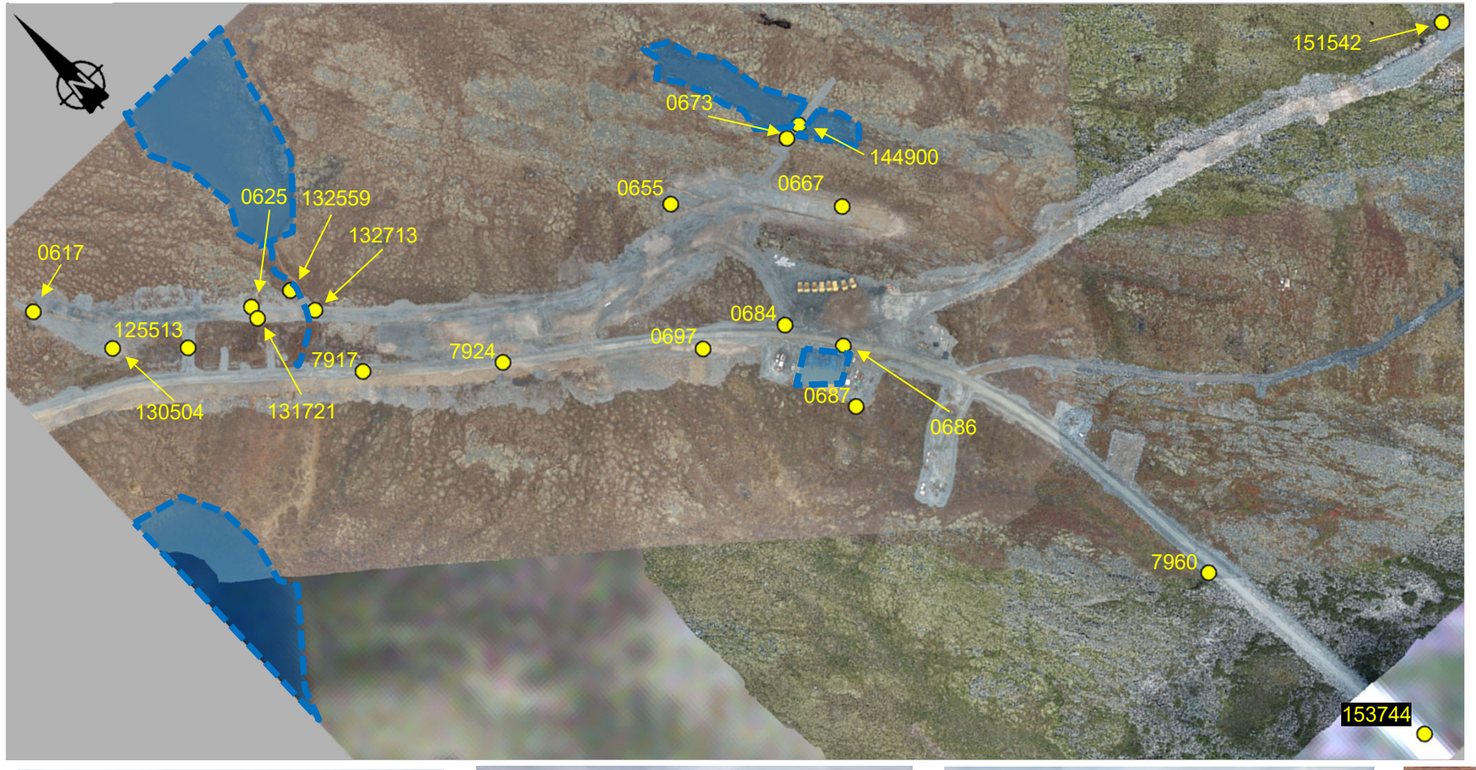
B2GOLD NUNAVUT

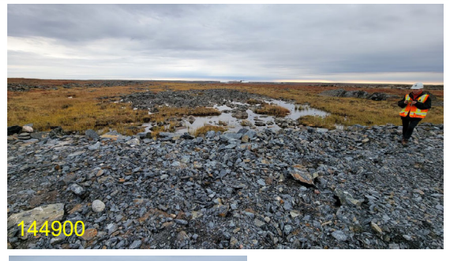
Back River Project

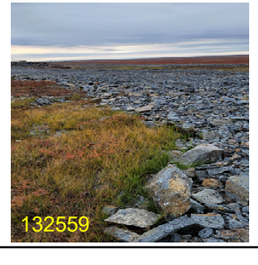
2023 Annual Geotechnical Inspection

Ponding Water
Goose Airstrip

Date:	Approved:	Figure:
2024-02-28	JBK	5







LEGEND:

Ponding water and bodies of water near pads.

srk consulting

Job No: CAPR003105

Filename: BackRiver_2023AGI_ Figures..pdf

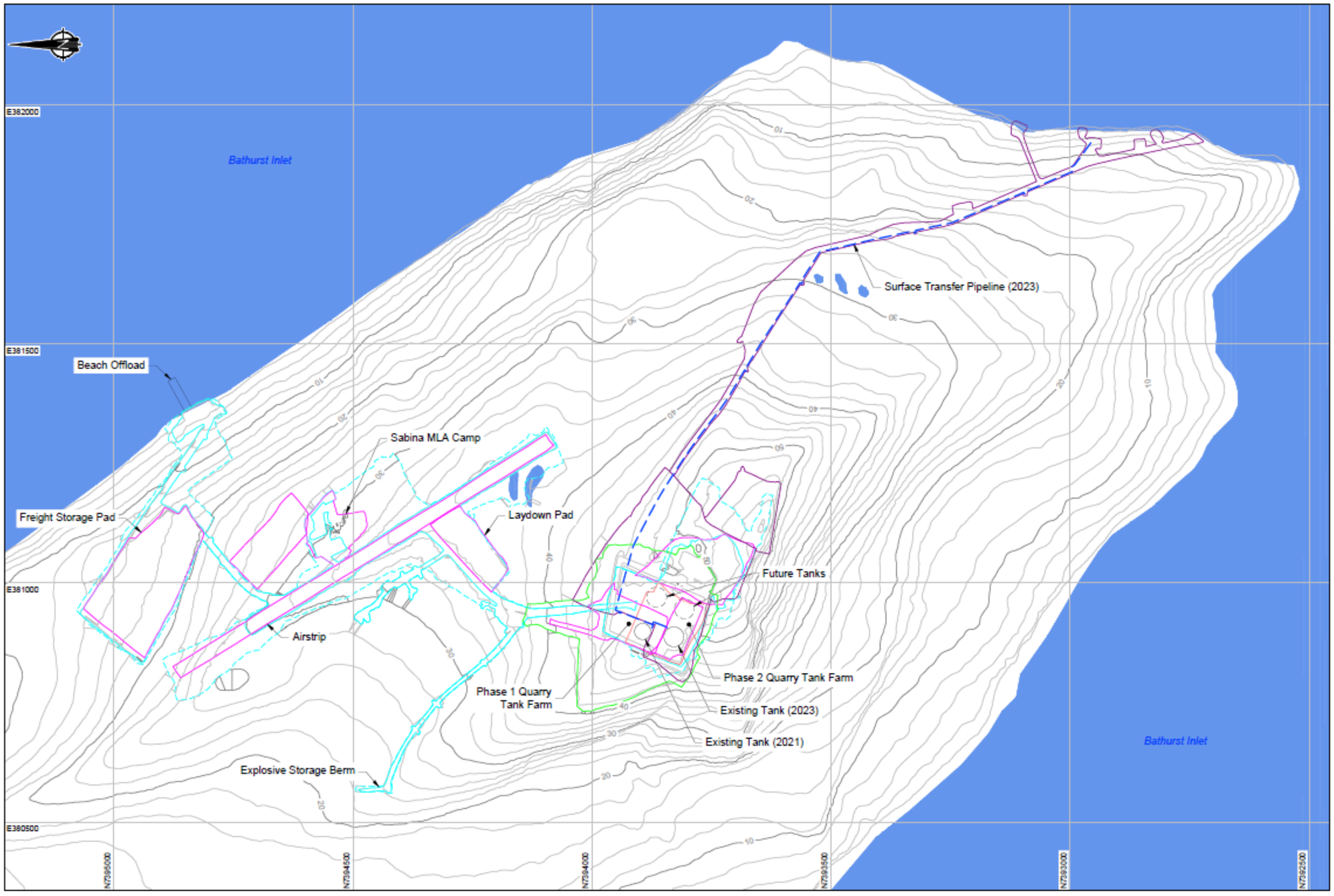
B2GOLD NUNAVUT

Back River Project

2023 Annual Geotechnical Inspection

Ponding Water
Goose Primary Pond

Date:	Approved:	Figure:
2024-02-28	JBK	6



LEGEND

- 2018 Initial Survey
- 2018 As-Constructed Infrastructure
- 2019 As-Constructed Infrastructure
- 2021 As-Constructed Infrastructure
- 2022 As-Constructed Infrastructure
- 2023 As-Constructed Infrastructure

NOTES

1. All units are in meters unless otherwise specified.
2. Contours are shown at 2.0 m intervals.

REFERENCES

NAD83 UTM Zone 13.

0m 200 400 600 800

srk consulting

B2GOLD NUNAVUT

Job No: CAPR003105

Filename: BackRiver_2023AGI_ Figures..pdf

Back River Project

2023 Annual Geotechnical Inspection

Marine Laydown Area
Plan View

Date: 2024-02-28 | Approved: JBK | Figure: 7

LEGEND

- 2018 Initial Survey
- 2018 As-Constructed Infrastructure
- 2019 As-Constructed Infrastructure
- 2021 As-Constructed Infrastructure
- 2022 As-Constructed Infrastructure
- 2023 As-Constructed Infrastructure

NOTES

1. All units are in meters unless otherwise specified.
2. Contours are shown at 2.0 m intervals.

REFERENCES

NAD83 UTM Zone 13.
Aerial Imagery is compiled from:

- 20230823 Aerial Photo
- 20230829 Aerial Photo
- 20230830 Aerial Photo
- 20230903 Aerial Photo
- 20230914 Aerial Photo
- 20231007 Aerial Photo
- 20231014 Sentinel-2 Satellite

The images dated 20230823, 20230829, 20230830, 20230903, 20231007, and 20230914 were not georeferenced and had to be located manually.

0m 200 400 600 800

srk consulting

B2GOLD NUNAVUT

Job No: CAPR003105
Filename: BackRiver_2023AGI_ Figures..pdf

Back River Project

2023 Annual Geotechnical Inspection

Marine Laydown Area
Plan View with Imagery

Date:	Approved:	Figure:
2024-02-28	JBK	**8**

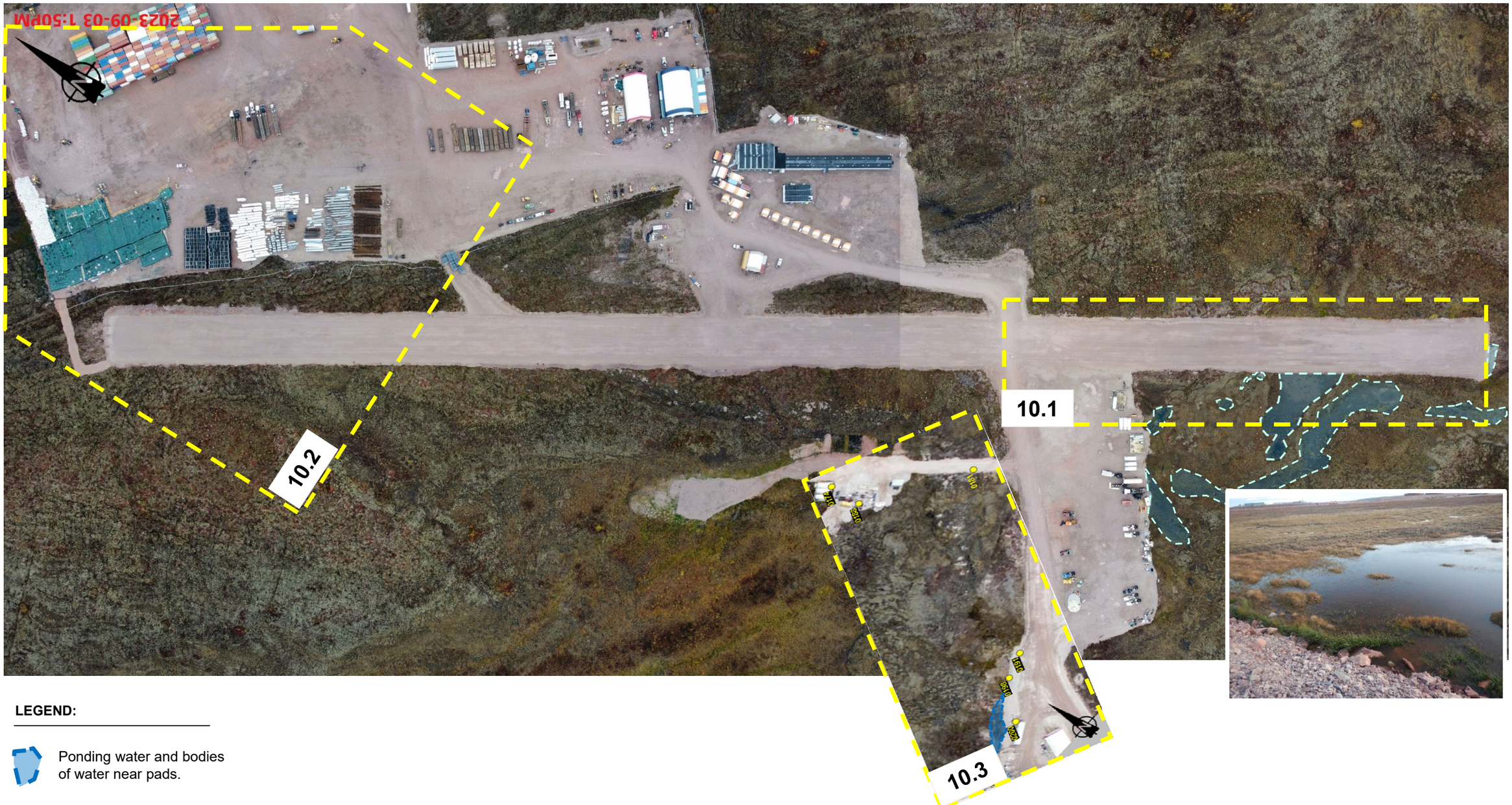
LEGEND:

- Points Along the 2023 Inspection Track

Notes:

1. Aerial images were provided by B2Gold in September 2023.
2. Plan view imagery extracted from World Imagery (approx. 2020-2021 time range). Reference: source: "Esri, USGS | Northwest Territories, Esri Canada, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCan, Parks Canada"

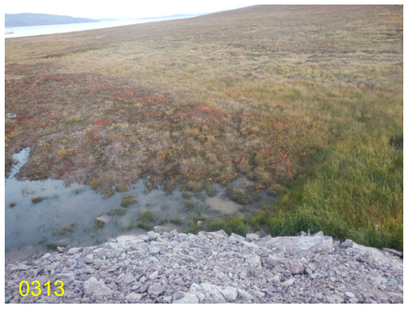
srk consulting	B2GOLD	2023 Annual Geotechnical Inspection
Job No: CAPR3105 Filename: Figure xxxx.pptx	Back River Project	**Marine Laydown Area Inspection Areas**
		Date: 2024-02-28 / Approved: JBK / Figure: **9**

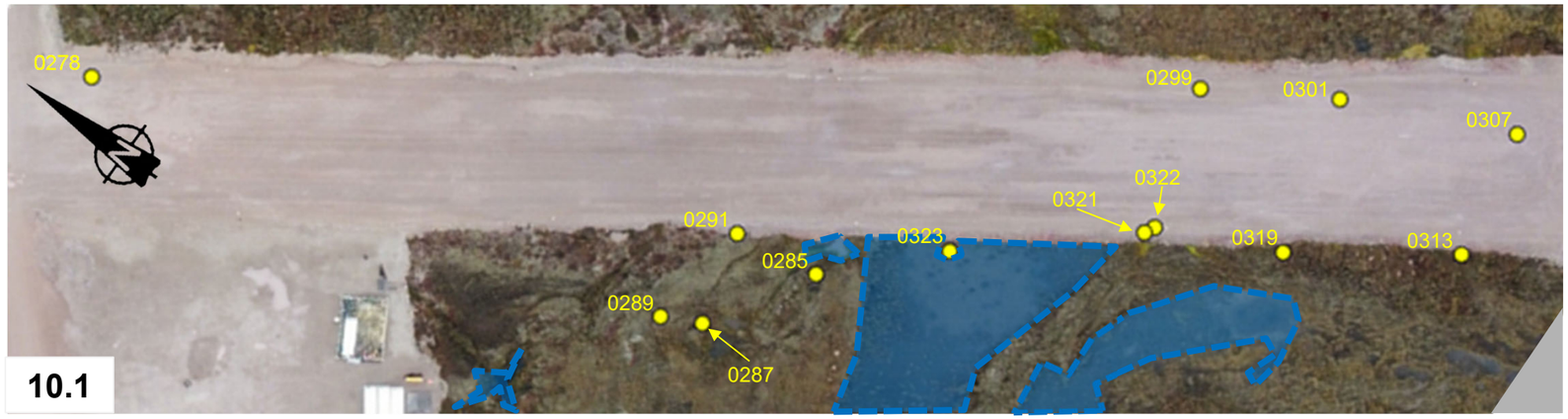


LEGEND:

Ponding water and bodies of water near pads.

srk consulting	B2GOLD NUNAVUT	2023 Annual Geotechnical Inspection
		Marine Laydown Area Ponding Water
Job No: CAPR003105 Filename: BackRiver_2023AGI_ Figures..pdf	Back River Project	Date: 2024-02-28 | Approved: JBK | Figure: **10**



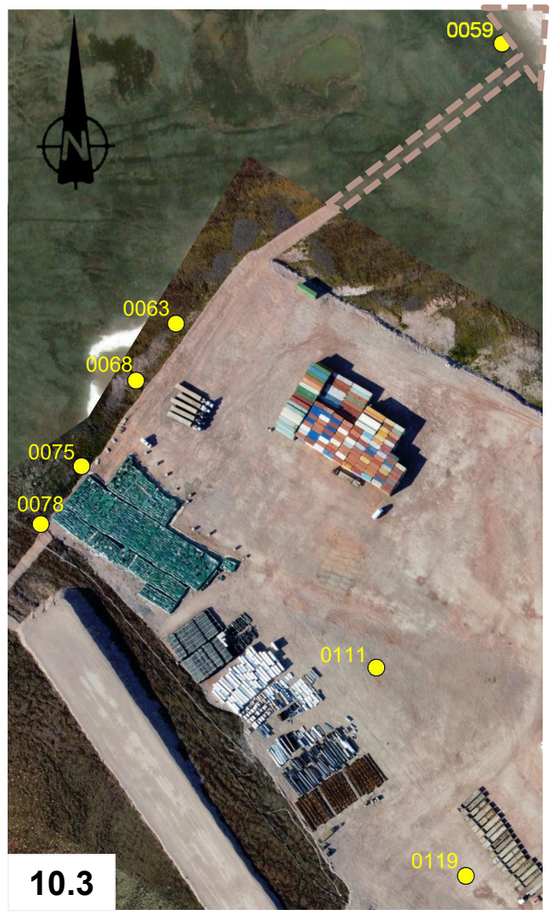


LEGEND:

Ponding water and bodies of water near pads.

srk consulting	B2GOLD NUNAVUT	2023 Annual Geotechnical Inspection
		Ponding Water MLA Airstrip
Job No: CAPR003105 Filename: BackRiver_2023AGI_ Figures..pdf	Back River Project	Date: 2024-02-28 | Approved: JBK | Figure: **11**

10.2



10.3

Ponding water and bodies of water near pads.

srk consulting

B2GOLD NUNAVUT

Job No: CAPR003105

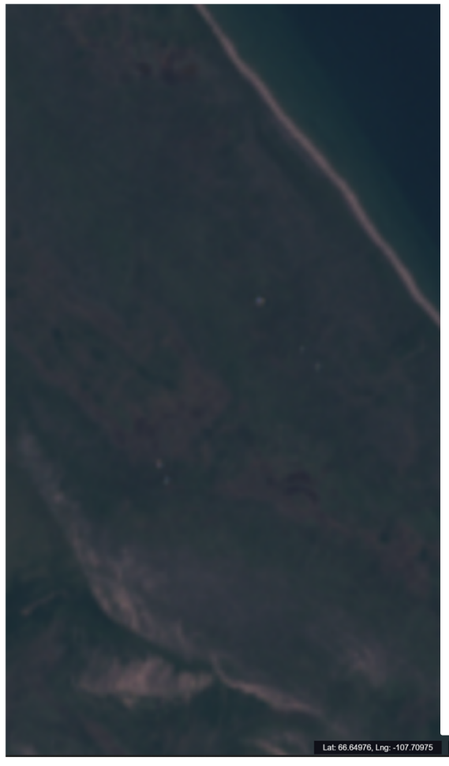
Filename: BackRiver_2023AGI_ Figures..pdf

Back River Project

2023 Annual Geotechnical Inspection

Ponding Water
MLA Lower Laydown Pad and Temporary Fuel Storage

Date: 2024-02-28 | Approved: JBK | Figure: 12



Dataset: Sentinel-2 L1C
Date: 2017-07-10

Dataset: Sentinel-2 L1C
Date: 2018-06-27

Dataset: Sentinel-2 L1C
Date: 2019-06-27

Dataset: Sentinel-2 L1C
Date: 2020-07-01

Notes:

1. All images from free Sentinel-2 L1C satellite data.

srk consulting	B2GOLD	2023 Annual Geotechnical Inspection
		Marine Laydown Area Satellite Image Review – 1 of 2
Job No: CAPR3105 Filename: Figure xxxx.pptx	Back River Project	Date: 2024-03-22 | Approved: JBK | Figure: **13**