



Crown-Indigenous Relations
and Northern Affairs Canada

Relations Couronne-Autochtones
et Affaires du Nord Canada

JERICO DIAMOND MINE OPERATION, MAINTENANCE AND SURVEILLANCE PLAN

NUNAVUT IMPACT REVIEW BOARD FILE #16UN058 2020 ANNUAL REPORT

December 31, 2020

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The Proponent shall submit a comprehensive annual report to the Nunavut Impact Review Board at the end of each year of permitted activities, and before December 31st of each year. It is expected that reporting requirements under NIRB File No. 16UN058 will be coordinated with existing reporting requirements associated with INAC's ongoing site management and monitoring functions related to the Jericho Diamond Mine Project (NIRB File No. 00MN059) as approved to proceed under Project Certificate No. 002. The Board expects to receive the first such report on or before December 31, 2017.

The annual report must contain, but not limited to, the following information:

a) A summary of activities undertaken for the year, including:

- **a map and associated details pertaining to remediation activities and site operations conducted to-date;**

The activities that took place during the year included:

- The planned freshet site visit in June was canceled due to COVID-19 and associated travel restrictions, all planned activity was completed during the fall site visit.
- August 31st to September 2nd Site Visit
 - Mobilization via aircraft
 - Implementation of Year 3 of the Operation, Maintenance and Surveillance (OMS) Plan
 - Installed a new power control system on the remote camera system
 - Site Tour (CIRNAC Inspector, NIRB)
 - Demobilization via aircraft

See Appendix A for maps of the site showing all work areas.

- **a map detailing the locations of all fuel storage areas illustrating all containment structures, accompanied with a description of all containment measures implemented;**

Current fuel storage is limited to drummed fuel located within the Truck Shop Building (see Appendix A, Figure 2). This building has an in-ground sump to contain any fuel spills.

- **a description of local hires and employee training initiatives;**

Due to the short duration of on-site activities there were no local hires or training initiatives.

- **details on transportation activities undertaken including:**
 1. **aircraft flight frequency, approximate flight routes, and altitudes;**

Transportation to and from the site was completed via flights from Yellowknife using Twin Otter aircraft. A total of two flights into the site were completed in conjunction with the one site visit in 2020.

2. finalized winter road routing and vehicle traffic information (number of return trips, types of vehicles);

Not applicable.

- **site photos illustrating site conditions and areas of remediation works;**

Site photos are provided in the following Appendices:

- Appendix B: *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report*

- **a summary of wastes disposed on-site as well those transported for disposal offsite, including locations and any required mitigation during transportation;**

During the August 31-September 2 site visit no wastes were disposed of on-site. All wastes were collected and back-hauled to Yellowknife for disposal.

b) An updated work plan for the following year including an approximate work schedule;

The project is now in long-term Operation, Maintenance and Surveillance (OMS), 2020 was the third year and final year of the first phase of the OMS. The results to date are currently being evaluated as we move into the second phase (years 4-10) of the OMS Plan.

The work plan for 2021 currently includes Care & Maintenance (C&M), OMS activities, and a Community Meeting:

- C&M
 - Start operational vehicles and generators
 - Maintenance on Airport Camp Genset
 - Removal of Pumphouse from Jetty
 - Closure of Truck Shop Storage Room
 - General cleanup around site
- OMS (although year 4 of the OMS Plan did not include site activity it has been included since the incremental cost of completing this is minor)
 - Visual inspections
 - Water sampling

These activities will all be completed during one site visit in late summer 2021.

- Community Meeting
 - Meeting in Kugluktuk to provide residents with an update on the OMS activities to date.

c) A summary of community consultations undertaken throughout the year, providing copy of materials presented to community members, a description of issues and concerns raised, discussions with community members and advice offered to the Proponent, as well as any follow-up actions that were required or taken to resolve any concerns expressed about the project;

A community meeting was scheduled for February 2021 to provide an update on the results of the OMS to date. This has been postponed to 2022 due to COVID-19 and the related travel restrictions.

d) A log of instances in which community residents occupied or transited through the project area for the purpose of traditional land use or harvesting. This log should include the location and number of people encountered, activity being undertaken (e.g., berry picking, fishing, hunting, camping, etc.), date and time; and any mitigation measures or adaptive management undertaken to prevent disturbance;

There were no instances where community residents occupied or transited through the project area during the 2020 field activities in August/September.

e) A brief summary of wildlife mitigation and monitoring results as well as any mitigation actions undertaken. In addition, the Proponent shall maintain a record of wildlife observations while operating within the project area and include it as part of the summary report. The summary report should include the following:

One Grizzly Bear was observed on August 31st during the 2020 fieldwork. Upon spotting the bear the Wildlife Monitor was dispatched and chased it away with a vehicle. The bear fled to the east of the airstrip and was watched until it crested a hill approximately 1,500 metres from the airstrip. The bear did not return during site activities.

- **Locations (i.e., latitude and longitude) and species of wildlife observed on-site including number of animals, a description of the animal activity, and a description of the gender and age of animals if possible; Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting);**

A Grizzly Bear was observed on the southern end of the Airstrip near the Airport Camp (66°01'20.00" N, 111°27'54.45" W).

- **The Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites;**

Given the short duration of on-site activities in 2020 (3 days) there were minimal impacts to wildlife.

- **A summary of the effectiveness of mitigation measures for wildlife impacts; and**

A member of the field team was equipped with a firearm and acted as a Wildlife Monitor. The standard approach to a bear encounter is to first attempt to scare the bear away from site using non-lethal tactics (i.e. chase or shoot bear bangers). In this case the approach of scaring the bear away worked effectively.

- **If mitigation measures are observed to be ineffective or not achieving the expected outcomes, a discussion of issues interfering with the mitigation and alternative plans to reduce impacts to the wildlife in the vicinity of the project;**

Not applicable.

f) A summary of any heritage sites encountered during the exploration activities, any follow-up action or reporting required as a result, and how project activities were modified to mitigate impacts on the heritage sites;

No heritage sites were encountered during the site activities.

g) A summary of its knowledge of Inuit land use in/near the project area and how project activities were modified to mitigate impacts on Inuit land use; and

Inuit land use in/near the project area is limited and mostly consists of winter access (via snowmobile) to Contwoyto Lake. There was no need to alter project activities to mitigate impacts on Inuit land use due to the fact that:

- the main area of use, Contwoyto Lake, is over 3 kilometres from the main part of the Jericho site; and
- project activities took place between June and September, when snowmobile access is not possible

h) A summary of how the Proponent has complied with conditions contained within the Screening Decision Report, and all conditions as required by other authorizations associated with the project proposal.

The Proponent complied with the Screening Decision Report and all other Permits, Licences and Authorizations throughout the completion of the site stabilization work. Compliance was achieved by:

- discussing all regulatory requirements during the pre-mobilization and all other project meetings;
- copies of all regulatory documents are readily available to the project team;
- the Crown had site representatives on-site during all activities to ensure compliance with contracts and regulatory authorizations; and
- Inspectors were given access to the site in order to complete compliance inspections.

Supplemental Questions

The Nunavut Impact Review Board issued Board Recommendations with the *2016-2017 Annual Monitoring Report for the Jericho Diamond Mine Project* on November 27, 2017. Below are the recommendations and responses:

By way of a motion carried during its regular meeting held in November 2017, Board via Recommendation #5 requests that Indigenous and Northern Affairs Canada (INAC) requests that Indigenous and Northern Affairs Canada provide the NIRB with a detailed report of the stabilization works undertaken at the Jericho site under NIRB File No. 16UN058. The report should include details related to all activities conducted, results of the work, expected short and long-term management requirements, community consultation conducted or to be conducted, and an outline of the expected monitoring and management program. The Board requests that the report include, but not be limited to, the following information in addition to what is required by the Screening Decision Report for 16UN058. This report should be provided as part of the annual report to be submitted to the NIRB on or before December 31st of each year:

a) Details related to water monitoring, sampling, treatment, and discharge activities conducted during the reporting year;

Details on the water monitoring, sampling, treatment and discharge activities that took place in 2020 can be found in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report* in Appendix B.

A summary of water sampling activities and associated laboratory analyses can be found in Appendix A of the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report* in Appendix B.

b) Details related to earthworks conducted during the reporting year including modifications to water management structures, berms, dykes, and pads;

No earthworks were completed in 2020.

c) Details related to stabilization activities in the open pit area;

No stabilization activities took place in the open pit area in 2020. The OMS activities completed in the open pit area are detailed in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report* in Appendix B.

d) Details related to the covering of the Processed Kimberlite Containment Area;

The covering of the Processed Kimberlite Containment Area (PKCA) was completed in 2017. The OMS activities completed on the PKCA are detailed in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report* in Appendix B.

e) Details related to the collection and disposal of hazardous wastes;

No hazardous waste was collected for disposal in 2020. All known hazardous wastes were previously addressed.

f) Details related to the collection, treatment/disposal of contaminated soils;

No contaminated soils were collected, treated or disposed of in 2020.

g) Plans to manage deteriorating structures on-site;

A long-term Operation, Maintenance and Surveillance (OMS) Plan has been drafted for the site. Implementation of the OMS Plan began in 2018 and included surveillance activities to ensure the stabilization actions completed (e.g. West Dam Breach, PKCA Cover) are meeting their design intent.

With respect to the buildings, tanks, and camp, all hazardous materials have been removed and disposed of off-site. Since the deteriorating structures are considered a low risk to human and environmental health we do not have a plan to manage them. However, as issues arise we may add them to the C&M plan for the following year. In 2021 we have included some C&M activities, these are:

- Removing the Pumphouse from the Jetty to ensure it does not fall into the lake
- Closure of the Storage Room in the Truck Shop to prevent access
- Continued general cleanup around the site

h) Details related to any other remediation activities undertaken and any additional hazards identified;

No remedial activities were undertaken in 2020. No additional hazards were identified during the site activities.

i) Community consultation summaries; and

No community consultations were conducted this year.

j) Monitoring and management plans to ensure the environmental stability of the site and to ensure the effectiveness of the stabilization activities undertaken.

A long-term Operation, Maintenance and Surveillance (OMS) Plan is being implemented at the site. Year 3 of OMS activities were completed in 2020, the results of these activities are provided in the *Jericho Mine Site – Operation, Maintenance and Surveillance Program – 2020 Report* in Appendix B. These results will be used to inform and plan OMS activities going forward.

2019-2020 Annual Monitoring Report for the Jericho Diamond Mine Project and Board's Recommendations

Based upon the Board's review of the monitoring report and other materials related to the Jericho Diamond Mine Project during a Board Meeting held in October 2020, the Board is issuing the following recommendation to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). The recommendation is to ensure that the NIRB has all the information necessary to adequately discharge its mandate with respect to provisions within Section 12.7 of the Nunavut Agreement as they pertain to the Jericho Diamond Mine Project.

In photos provided by CIRNAC during their visit to site on August 31 – September 2, 2020, it was noted that the pumphouse located on the jetty in Carat Lake had suffered damage, presumably caused by lake ice buildup and movement, and that the ice movement had also displaced armour stone meant to protect the jetty from erosion. The damage indicates the possibility of increased erosion at the jetty and undercutting of the pumphouse base.

Recommendation 3: The Board requests that Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) provide a contingency plan for inspection and potential moving or dismantling of the Carat Lake pumphouse in order to prevent collapse into Carat Lake in the event of erosion or future ice buildup and movement. This information should be provided to the Board in the 2021 CIRNAC site report.

The erosion of the Jetty and ice damage to the Pumphouse has been noted by CIRNAC during annual site visits and OMS activities. Although there is no immediate risk of the Pumphouse falling into the lake (erosion has undermined less than ¼ of the building and it is securely anchored by the pump located near the centre of the building) CIRNAC agrees that the erosion is progressing and eventually the Pumphouse could fall into the lake. As such, CIRNAC plans to remove the Pumphouse from the Jetty during the 2021 site visit. To accomplish this CIRNAC plans to withdraw or cut the pump out of the Jetty and then use the onsite excavator or loader to pull the Pumphouse (mounted on skids) off the Jetty to the shore of Carat Lake.

**APPENDIX A:
JERICHO DIAMOND MINE
SITE MAPS**



Figure 1: Site Overview

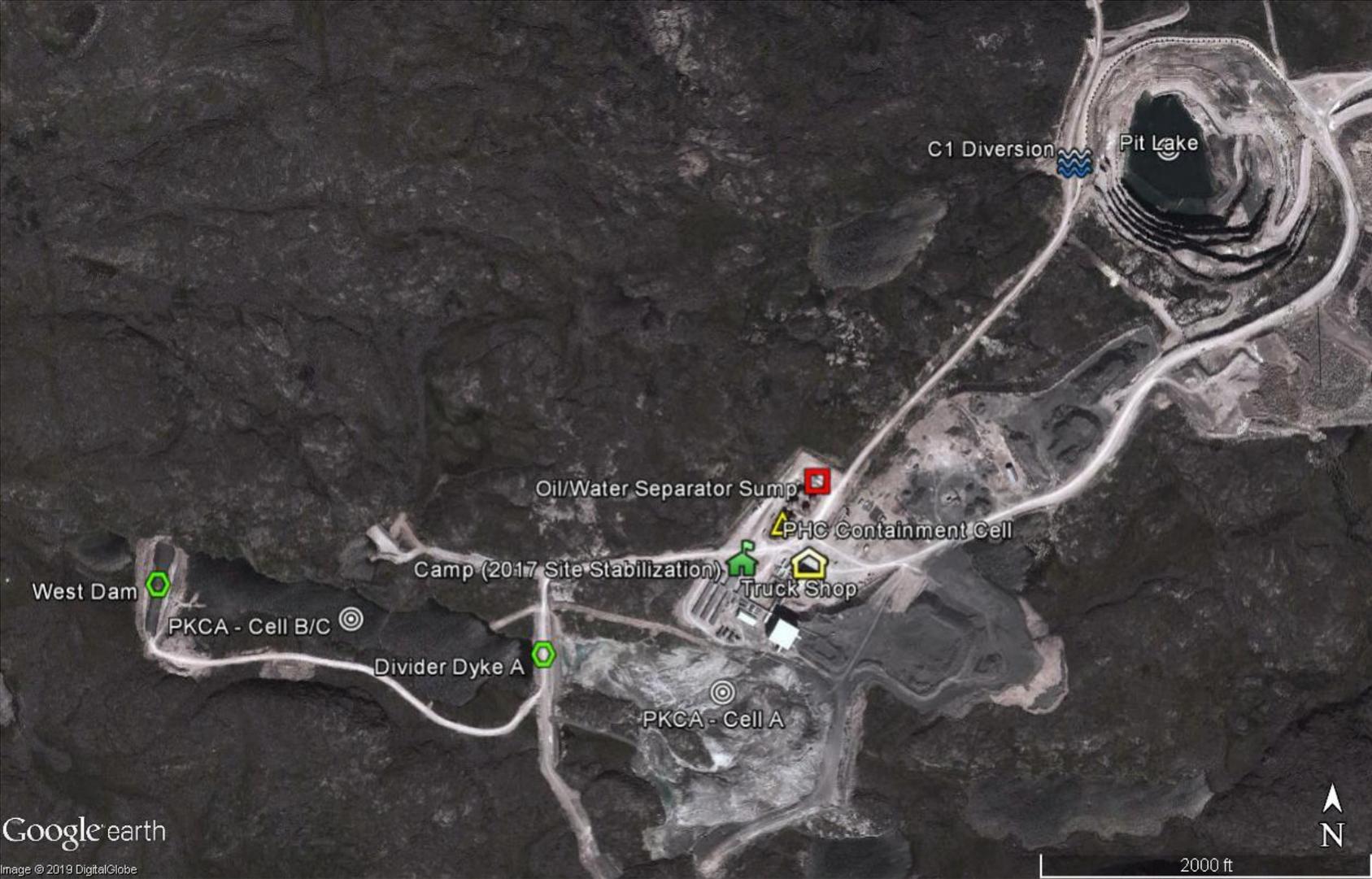


Figure 2: South End of Site – Showing 2020 OMS Activity Areas

**APPENDIX B:
JERICO MINE SITE
OPERATION, MAINTENANCE AND SURVEILLANCE PROGRAM
2020 REPORT – FINAL**

**JERICO MINE SITE – OPERATION, MAINTENANCE AND SURVEILLANCE PROGRAM
2020 REPORT-FINAL**

Prepared for:

Public Services and Procurement Canada

By:

DXB Projects

December 11, 2020

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TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	SITE BACKGROUND	1
3.0	OMS PLAN	2
4.0	OMS PROGRAM TO DATE (LEADING INTO 2020)	3
5.0	FINDINGS AND RESULTS OF 2020 SURVEILLANCE	6
5.1	SITE VISITS	6
5.1.1	Spring Session	6
5.1.2	Fall Session – August 31- September 2, 2020	6
5.2	SURVEILLANCE REQUIREMENTS	8
5.2.1	Inspection of Physical Features/ Long-Term Infrastructure	9
5.2.2	Long-Term Monitoring – Water Quality	14
5.2.3	Frequency Assessment	14
6.0	SUMMARY OF OMS DECISION CRITERIA	15
7.0	CONTINGENCY ACTIONS	16
8.0	REGULATORY REQUIREMENTS	16
9.0	SUMMARY AND RECOMMENDATIONS	18
10.0	CLOSING	21
11.0	REFERENCES	22

LIST OF TABLES

	PAGE
Table 1 – Summary of Residual Risks-to-Date	4
Table 2 – Comparison Summary 2019 and 2020 Inspections	10
Table 3 – Uranium Concentrations in Open Pit Water	14
Table 4 – OMS Decision Criteria	15
Table 5 – Regulatory Water Samples from Cell B/C	17
Table 6 – Post-2020 Update of Residual Risk	18

LIST OF FIGURES

PAGE

Figure 1 – Remote Camera Image of Open Pit from September 23, 2019 7
Figure 2 – Remote Camera Image of Open Pit from September 26, 2020 7

LIST OF APPENDICES

Appendix A - Water Quality Monitoring Laboratory Certificate of Analyses

LIST OF PHOTOGRAPHS END OF TEXT

- Photo 1: Sept. 1, 2020 West Dam Breach, Looking NE – Fall inlet water level.
- Photo 2: Sept. 1, 2020 West Dam Breach, Looking W across Channel Base – Fall flowing water.
- Photo 3: June 17, 2019 West Dam Breach – 2019 photo of erosion gully on North Bank.
- Photo 4: Sept. 1, 2020 West Dam Breach – no significant change observed in erosion gully on North Bank.
- Photo 5: Sept. 1, 2020 West Dam Breach – Fall aerial photo.
- Photo 6: Sept. 1, 2020 PHC Containment Cell Cover, Looking SW (to camp) – Protection soil cover in good condition.
- Photo 7: Sept 1, 2020 PHC Containment Cell Cover – Some minor drainage erosion in north corner of East Bank.
- Photo 8: Sept. 12, 2019 PKCA Cover, Looking W – 2019 photo of remaining ponded water during Fall visit.
- Photo 9: Sept. 1, 2020 PKCA Cover, Looking W – North PKCA (Very little ponded water).
- Photo 10: Sept. 1, 2020 PKCA Cover, Looking N – West end of North PKCA, wet exposed tailings.
- Photo 11: Sept. 1, 2020 PKCA Cover, Looking SE – Aerial photo of northeast PKCA.
- Photo 12: Sept 1, 2020 PKCA Cover, Looking W – Aerial photo of north and south PKCA.
- Photo 13: Sept. 11, 2019 PKCA Cover, East PKCA – 2019 photo of erosion from drainage into PKCA.
- Photo 14: Sept. 1, 2020 PKCA Cover, East PKCA – Erosion from drainage into PKCA (some expansion from 2019).
- Photo 15: Sept. 11, 2019 PKCA Cover, Looking N – 2019 photo of potholes.
- Photo 16: Sept. 1, 2020 PKCA Cover – Fall view of potholes (seasonally collapsed).
- Photo 17: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of Channel Base and inflow into Pit.
- Photo 18: Sept. 10, 2019 C1 Channel, Looking E – 2019 photo of eroded section into Open Water @ 6.3 m in Fall.
- Photo 19: Sept. 1, 2020 C1 Channel, Looking E – Eroded section into Open Pit (no significant change).
- Photo 20: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of upstream water during Fall visit.
- Photo 21: Sept. 1, 2020 C1 Channel, Looking W – Upstream water during Fall visit.
- Photo 22: June 17, 2019 Pit Outflow, Looking W.
- Photo 23: Sept. 10, 2019 Open Pit, Looking E – 2019 photo of Open Pit water level.
- Photo 24: Sept. 1, 2020 Open Pit, Looking E –Open Pit water level.

ABBREVIATIONS

CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
LOD	Letter of Decision
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NWB	Nunavut Water Board
NWNSRTA	Nunavut Waters and Nunavut Surface Rights Tribunal Act, S.C. 2002, c. 10
OMS	Operation, Maintenance and Surveillance
PHC	Petroleum Hydrocarbon
PKCA	Processed Kimberlite Containment Area
PSPC	Public Services and Procurement Canada

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1.0 INTRODUCTION

DXB Projects was retained by Public Services and Procurement Canada (PSPC) on behalf of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) to undertake the Operation, Maintenance and Surveillance Program for the Jericho Mine Site (OMS Program). The OMS Program does not have operational or identified maintenance requirements but focuses on surveillance activities to assure the physical and environmental stability of the site. The terms of reference for the work are based on the *Operation, Maintenance and Surveillance (OMS) Plan – Jericho Diamond Mine Site* (Arcadis, 2018), developed following completion of the 2017 Jericho Mine Site Stabilization Project.

The OMS Program entered Year 3 in 2020 and consisted of a single autumn field surveillance session. A spring session was planned but canceled due to the COVID-19 outbreak in Canada at the time. The cancellation followed Canada and Nunavut Public Health policy on inter-provincial/ territorial travel. The later autumn surveillance session was planned and done in coordination with Nunavut Public Health and Protect NWT.

This report is a presentation of the findings from the 2020 surveillance activities. General background information for the Jericho Mine Site is found in Section 2, a summary of the key points from the OMS Plan in Section 3, a description of the OMS Program-to-Date in Section 4; findings from the 2020 surveillance activities in Sections 5 through 7, and summary and conclusions in Section 8.

2.0 SITE BACKGROUND

The Jericho Mine Site is in Nunavut; approximately 420 km northeast of Yellowknife, NT and 260 km southeast of Kugluktuk, NU, the closest local community. The former Jericho Diamond Mine was Nunavut's first and, to-date, only diamond mine. The mine was opened and operated in 2006, by the Tahera Diamond Mine Corporation (Tahera). In early 2008, after less than 2 years of operation and reported financial losses, active mining ceased at Jericho; and Tahera filed for creditor protection. Shear Diamonds Corp. eventually purchased the mine in 2010; and after limited re-processing of the existing recovery reject piles in early 2012, shut down all activities and abandoned the site in September of 2012.

CIRNAC assumed custodial responsibility of the Jericho Mine Site in 2014. In parallel with continued environmental protection of the site, development of a site stabilization plan was initiated in 2014; and implementation of the remediation construction carried out in 2017. The scope of the remedial work focused on addressing priority human health and environmental hazards at the site; and included removal and off-site disposal of hazardous waste materials, construction of a tailings cover, and breaching of the former West Dam to reinstate natural drainage across the site. The site stabilization project was successfully executed and fully completed following corrective work in 2018. Given that no further remediation or risk management activities were planned, the Jericho OMS Plan was developed, and Year 1 carried out in 2018.

3.0 OMS PLAN

The Jericho OMS Plan was developed as a guide for management of the Jericho site, in its post-stabilization state. The key points and findings from the plan, in correlation to its own stated objectives, consisted of the following:

Objective	Key points/ Findings
Summarize site stabilization activities that have occurred at the Jericho Mine Site	Completed remedial activities were summarized to give context for the OMS Program.
Summarize surveillance activities that are planned for the Jericho Mine Site	Visual inspections would be conducted to assess the stability of physical features, including; <ul style="list-style-type: none"> • covers and cells • dams and dykes • pits (including water level) • roads Long-term monitoring would be required to monitor the expected change in Pit water uranium concentration, as it filled.
Describe residual risks following implementation of the stabilization activities	Seven (7) residual risk items were identified and listed with accompanying risk levels and proposed actions.
Describe operation and maintenance activities required following stabilization activities to mitigate residual risks	No preventative maintenance was warranted.
Describe surveillance (i.e., long term monitoring, LTM) activities required at the site to mitigate residual risks	The surveillance program would include; <ol style="list-style-type: none"> i. Visual inspection of the West Dam breach for slope instability and sediment release, ii. Visual inspection for changes in the PKCA potholes, iii. Visual inspection of the pit lake elevation, iv. Visual inspection of the pit lake road as the pit lake fills, v. Visual inspection of the stability and integrity of the PHC containment cell, vi. Long term monitoring of the pit water uranium concentration trend, vii. No action with respect to building condition.

Objective	Key points/ Findings
Describe iterative process to assess and adapt OMS activities over time, as evidence gathers to support reductions or discontinuation of one or more OMS activities	An OMS Decision Criteria Table was developed to; <ul style="list-style-type: none"> • facilitate decisions on whether there should be modifications to the OMS activities during each phase review period, • organize activities, triggers and contingency/ closure actions.

4.0 OMS PROGRAM TO DATE (LEADING INTO 2020)

The 2019 program marked the 2nd year of the Jericho OMS Program. No significant change in site conditions or identification of new residual risks were noted for 2019. A remote camera with satellite communication-link was installed during the fall site trip, part of a CIRNAC initiative for advancing remote monitoring at their sites.

Following the 2019 program, it was recommended that all physical features continue to be visually inspected and that the concentration of uranium in the pit lake continue to be monitored in Year 3, i.e. no change to the activities or near-term frequency set out in the OMS Plan. A baseline of post-construction site conditions should be established prior to an evaluation to change the plan.

Table 1 presents a summary of the updated residual risks leading into the 2020 program; those from the original 2018 OMS Plan (seven original risks) and changes as a result of finding/ results from the yearly inspections (one additional risk added). A column was inserted to the table to note post-original conditions and recommended new actions, if applicable.

Table 1 – Summary of Residual Risks-to-Date

Risk ID	Residual Risk	Level	OMS Plan – Proposed Action	New OMS Program Notes/ Recommendations
1	Sediment release and instability of side slopes could result in poor performance of the West Dam breach.	Low	Surveillance of the West Dam breach. Erosion and slope failure not expected to pose a risk.	Not applicable.
2	Potholes in the PKCA cover were observed near the end of the 2017 field season. Further erosion could result in localized failure of the tailings cover and release windblown tailings.	Moderate	Potholes will be filled in 2018 field season and monitoring of the PKCA cover.	Continue assessment of potholes, and fill, if appropriate.
3	The Open Pit could result in injury to third party, as there are no access restrictions.	Moderately high	The Open Pit is being converted to a pit lake which is expected to take 11 to 15 years. Signage has been posted near the pit, at the airstrip and at the southwest end of site.	Not applicable.
4	Due to design inconsistencies, the road adjacent to the Open Pit could hold water and eventually wash out, resulting in a sediment release to Carat Lake.	Low	Survey the existing conditions and take corrective actions as appropriate.	A survey of the outflow area, relative to the pit perimeter road, showed that the channel inlet was lower than the rest of the road; and therefore, the road would not eventually hold back any of the pit lake. <u>The residual risk is recommended to be closed.</u>
5	Hydrocarbon contaminated soils have been placed into a lined containment cell. The liner could be compromised resulting in water contacting soil and contaminated water release to the environment.	Low	Surveillance of the PHC containment cell.	Not applicable.

Risk ID	Residual Risk	Level	OMS Plan – Proposed Action	New OMS Program Notes/ Recommendations
6	The water in the pit contains uranium concentrations above CCME guidelines for the protection of aquatic life. Eventually the pit lake will overflow into Carat Lake.	Low	Long term monitoring of the pit lake water, to determine if there is a risk prior to overflow.	Not applicable.
7	Building condition will deteriorate over time, resulting in loss of asset value.	Low	No action. Building asset value to progress towards \$0.	Not applicable.
8 (2018)	Washout erosion from the underside of the C1 Channel, at the outlet into the Open Pit, could cause sediment release and instability of side slopes and result in poor performance of the C1 Channel.	Low	<p>New risk noted for 2018.</p> <p>The risk level is assessed to be 'low', since vehicular access to the area is restricted and immediate environmental impact mitigated by flow directly into the open pit.</p> <p>Erosion and slope failure not expected to pose a risk.</p>	New surveillance of C1 Channel.

5.0 FINDINGS AND RESULTS OF 2020 SURVEILLANCE

5.1 Site Visits

5.1.1 *Spring Session*

The 2020 spring session was cancelled due to the COVID-19 outbreak in Canada at the time.

5.1.2 *Fall Session – August 31- September 2, 2020*

The 2020 fall surveillance session was completed over a three (3)-day site trip, August 31 through September 2. Site conditions were generally overcast and cool with moderate to strong winds blowing. There was no snow on the ground and overall surface water levels low. The work was carried out by a five-person team; PSPC representative, CIRNAC representative., 3x DXB Projects personnel (of which, 1 Arcadis sub-contractor – remote camera specialist).

Driving access was available to all the mine features identified for inspection. Visual inspections of the Open Pit, C1 Channel, Pit Outflow, PKCA, Divider Dike A, PHC Containment Cell and roads were completed on the second day; and water samples collected from the Open Pit and West Dam on the third. Aerial photos were taken by drone of the inspected features.

Two water samples, one of the Open Pit (for the OMS program) and one of the West Dam – Cell B (for regulatory management), were collected on the morning of September 2, packaged in a cooler and flown out as the team demobilized. The cooler was dropped off at the ALS Environmental Laboratory (Yellowknife depot), a CALA accredited laboratory, and samples submitted for a full suite of water quality parameters, in addition to the total uranium analysis specified in the OMS Program. Results were reported on September 18, 2020.

As a part of the fall work program, a new power control system was installed for the remote satellite linked cameras overlooking the Open Pit and Carat Lake. A specialist from Arcadis was sub-contracted to complete the camera system work. The system was confirmed in operation and daily photos from the site being collected.

Figure 1 and Figure 2 show the fall images of the Open Pit from 2019 and 2020.



Figure 1 – Remote Camera Image of Open Pit from September 23, 2019



Figure 2 – Remote Camera Image of Open Pit from September 26, 2020

5.2 Surveillance Requirements

The OMS Plan identified a low level of residual risk post stabilization. Surveillance requirements were focused on assuring that the site remains in a physically and environmentally stable condition. The planned surveillance activities (i.e. visual inspection and monitoring) were designed to mitigate the residual risks, and, based on the low-risk impacts, expected to show evidence of natural attenuation over time. The evaluations of the following were outlined in the plan:

- i) Stability of physical features.
 - There are several physical features, both natural and “human made”, at the Jericho site that require visual inspection
 - If the surveillance identifies significant structural changes, maintenance activities may be required
- ii) Requirements for long-term monitoring.
 - Environmental long-term monitoring considerations are anticipated to be contained within the boundaries of the site and largely be addressed through stabilization
 - The only residual risk identified that required long-term monitoring was the uranium concentration in the pit water
 - The concentration has been trending downward and the monitoring to confirm if water quality will meet guidelines prior to it overflowing from the pit
- iii) Frequency of future surveillances.
 - Generally, the frequency of surveillance activities for the Jericho site was minimized given the low level of residual risk
 - Site-based visual inspections and monitoring will be conducted at regular intervals to provide assurance that the site is stable and below acceptable thresholds
- iv) Contingency plans.
 - Based on the residual risk items identified, some will potentially require contingency plans if further action is required
 - Contingency actions and their triggers are listed in the OMS Decision Criteria table
 - Specifically, in advance of the pit water overflowing, a risk assessment and contingency plan should be developed if uranium concentrations in pit water are expected to still be above CCME guidelines
- v) OMS Decision Criteria.
 - OMS Decision Criteria are used to facilitate decisions on whether there should be modifications to OMS activities during each phase review period

5.2.1 Inspection of Physical Features/ Long-Term Infrastructure

The visual inspections of the mine features are showing only minor changes and appear to be trending towards stability. The most notable change is the continued slow erosion of the west end (downstream) PKCA cover, in the area of seasonally ponded water. The area was designed to allow water to back-up following the winter season, to provide additional time for particulate settlement. As the water seasonally filters through the dike, the leading edge of the cover is slowly eroding away.

A summary and comparison of the 2019 and 2020 inspections are presented in Table 2.

Table 2 – Comparison Summary 2019 and 2020 Inspections

Feature ID	Physical Feature	2019 Inspections	2020 Inspections	Photos
1	West Dam Breach	<p>Walking visual inspection during June and September field sessions.</p> <p>Cell C (upstream of West Dam) was at the designed water elevation during both June and September surveillances; with water observed and heard flowing through the base of channel base rip-rap.</p> <p>Some minor erosion gullies and settlement were observed; however, no significant change in the erosion noted from 2018 or that would affect the integrity of the structure.</p>	<p>Walking visual inspection during September site visit.</p> <p>No noticeable change in the West Dam breach was observed in 2020. Cell C (upstream of West Dam) remains at the designed water elevation; with water observed and heard flowing through the rip-rap channel base.</p> <p>Minor erosion and settlement have been noted in the north and south side-slope banks. The observed surface changes are not expected to affect the slope stability or downstream water quality.</p>	1 – 5
2	PHC Containment Cell	<p>Walking visual inspection during June and September.</p> <p>Cover of Containment Cell appeared in good condition, i.e. no obvious settlement or erosion. A small area of settlement and drainage erosion on the East Bank was observed.</p>	<p>Walking visual inspection – September.</p> <p>The protective soil cover of PHC Containment Cell is intact and appears in good condition, i.e. no significant settlement or erosion. An area at the north end of the East bank has some minor drainage erosion and not expected to affect the integrity of the liner system.</p>	6 – 7
3	PKCA	<p>Walking visual inspection in June and September.</p> <p>In June, ponded water was observed in the PKCA, at the furthest downstream point of its natural drainage – directly against Divider Dike A (expected frozen/ partially frozen at the time of inspection). The water covered the east access road across the dike (access across Dike A was</p>	<p>Walking visual inspection – September.</p> <p>Only a small amount of ponded water was observed in the PKCA during the 2020 fall inspection. The leading edge of the tailings cover in the area of the seasonally ponded water, is eroding back and leaving some saturated tailings exposed.</p>	8 – 16

Feature ID	Physical Feature	2019 Inspections	2020 Inspections	Photos
		<p>still possible by driving down and up across the constructed 'notch'). The stabilization design for the Divider Dike was meant to accommodate the natural backup of water in the PKCA.</p> <p>The water in the PKCA had significantly dropped by the time of the September inspection (expected spring then fall condition); the east access road was available again to vehicle travel.</p> <p>Overall, there are some eroded gullies where the spring surface water runs into the ponded PKCA section, observed after the ponded water has receded. The upstream areas in the PKCA have been more protected from erosion, in part due to the coarse rock drainage path that was constructed.</p> <p>The underlying tailings are exposed in the developed gullies; however, represent a small percentage of the total covered area.</p> <p>Some new pothole depressions were observed in 2019. The largest pothole measured approximately 1.6 m in diameter.</p>	<p>Although most of the seasonal water appears to flow through the placed 'coarse rock' cover towards the divider dike, minor erosion channels have developed in different areas of the PKCA.</p> <p>The 'potholes' in the South PKCA appear to change from year to year, both increasing and decreasing in size, as snow and water washes out and fills in the depressions.</p>	
4	C1 Channel	Walking visual inspection in June and September.	<p>Walking visual inspection – September.</p> <p>The C1 Channel is intact and appears in good condition. Water was observed upstream and flowing through the</p>	17 – 21

Feature ID	Physical Feature	2019 Inspections	2020 Inspections	Photos
		<p>Some of the channel base was still snow covered during the June inspection; however, significant runoff was heard and seen below the snow.</p> <p>The channel base was visible in September, with surface water observed actively draining into the Pit and ponded water upstream of the channel structure. The channel erosion at the Pit Inflow was measured to be 6.3 m long</p> <p>A photo comparison of the sloughed material (2018 vs. 2019) did not show any obviously change in material slough; however, sediment was observed in the zone of runoff mixing into the pit water.</p>	<p>channel. No significant change in the erosion of the channel outlet into the Open Pit was observed for 2020.</p>	
5	Pit Outflow Channel	<p>Walking visual inspection in June and September.</p> <p>No noticeable change from 2018.</p>	<p>Walking visual inspection – September.</p> <p>No significant change noted from 2019.</p>	22
6	Open Pit	<p>Walking visual inspection in June and September.</p> <p>The water level was visually observed to have risen approximately 2 m from August 2018 to June 2019. Photos 28 (from 2018) and 29 (June 2019) provide a perspective of the change in water height.</p> <p>The pit water level was measured to have risen another 3.0 m (10 ft) between June and September.</p>	<p>Visual inspection – September.</p> <p>Based on visual observations (another perimeter mine-vehicle bench covered), the fall 2020 water level has risen an estimated 4 meters from 2019.</p> <p>Due to water now covering access to a former reference point, an estimate of the increased water volume in the pit was not completed for 2020.</p>	23 – 24

Feature ID	Physical Feature	2019 Inspections	2020 Inspections	Photos
		<p>The pit water elevation was measured with a hand-held GPS device; reading of 455.3 masl. The change in water elevation from August 2018 to September 2019 was approximately a 5.5 m rise (2 m rise August 2018 to June 2019 and 3.5 m rise June 2019 to September 2019), a correlating total annual increased water volume of ~ 484,000 m³ (estimated average 88,000 m² area).</p> <p>For reference, the Jericho Option Analysis Rev 02 (TetraTech, 2015) projected an infill flow rate of 241,000 – 328,000 m³/ year.</p>		
7	Roads	<p>A section of the Main Road between the former Hazard Waste Transfer Area (HWTA) and Open Pit was partially flooded.</p> <p>A section of the Main Road past the north Open Pit access road showed significant runoff erosion</p>	<p>No significant change in road conditions was noted in 2020. The main access road section between the former Hazard Waste Transfer Area (HWTA) and Open Pit, and a section of the Main Road past the north Open Pit access should continued to be assessed if vehicle access to the site is required.</p>	n/a

5.2.2 Long-Term Monitoring – Water Quality

The water level in the former Open Pit continues to rise, as precipitation and surface water from the C1 Channel catchment continues to inflow.

A sample was collected of the Pit Water on September 2; and the laboratory result continuing to show a significant decreasing Uranium concentration trend. Although still currently above the CCME guideline, the current fall season water quality, after 3 years, is near the predicted 9 – 13 year final Uranium concentration.

A summary of the uranium concentrations measured to date is shown in Table 3. The results are shown separately for the spring and fall monitoring periods to account for seasonal dilution.

Table 3 – Uranium Concentrations in Open Pit Water

Project Phase	Sample Date	Open Pit Water Uranium – Spring (mg/L)	Open Pit Water Uranium - Fall (mg/L)
CCME CWQG for Uranium (Total, unfiltered) for PFAL ¹ Long-Term Exposure		0.015	0.015
Mining	Jun. 27, 2007	0.0508	
Mining	Jul. 22, 2007	0.0184	
Mining	Aug. 25, 2007		0.12
Mining	Oct. 9, 2008		0.234
2014 Assessment Work	Aug. 29, 2014		0.117
2017 Stabilization Work	Jun. 19, 2017	0.035	
	Sep. 22, 2017		0.094
2018 Surveillance	Aug. 5, 2018		0.075
2018 Project Close-out	Aug. 28, 2018		0.069
2019 Spring Surveillance	Jun. 19, 2019	0.0185	
2019 Fall Surveillance	Sep. 12, 2019		0.0576
2020 Fall Surveillance	Sep. 2, 2020		0.0304

The lab certificate of analyses for the 2020 water samples have been included in Appendix A.

5.2.3 Frequency Assessment

The frequency of the surveillance activities for the Jericho site was intended to be minimal, given the low level of residual risk. In accordance with the OMS Plan, visual inspection and long-term monitoring at

¹ Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Ministers of the Environment, 2011

Jericho were planned for Years 1 (2018), 2 (2019), 3 (2020) and an evaluation of conditions and adjustment of surveillance/ update risks scheduled to occur in Year 4.

Following the completion of the Year 3 surveillance program, the site appears to be trending towards stability, with only minor erosion observed after the recent year. The Pit continues to fill with water at a rate close to the original estimate; an overflow timeline of 11 – 15 years, i.e. 2028 – 2032.

Based on the findings to date, DXB recommends keeping with the frequency of surveillance activities outlined in the OMS Plan; that is planned surveillance sessions for Years 5, 7 and 9, and leading into a Year 10 evaluation timetable.

6.0 SUMMARY OF OMS DECISION CRITERIA

Table 4 presents an overview of findings from the 2020 surveillance activities, in reference to triggers established for contingency actions.

Table 4 – OMS Decision Criteria

Parameter	Activity	Trigger
Monitoring	The uranium concentration was measured for the Pit water in September 2020.	Uranium remains above the CCME guideline and therefore, does not trigger action to discontinue monitoring.
Visual Inspection	Inspection for the development of potholes, and changes to the stability of the long-term infrastructure components (i.e., roads, tailings cover, PHC containment cell, west dam breach, C1 channel).	Some continued minor erosion observed at the PKCA cover. The changes, at this time, are not expected to affect the overall stability of cover and therefore not warrant any action for maintenance.
Frequency	Site visit requirements	<p>Visual inspections are showing minor changes and appear be trending towards stability. Uranium levels in Open Pit water are trending down and the Pit Lake will not overflow for several more years.</p> <p>Based on the findings to date and with no described action triggers, we recommend keeping with the outlined scheduled in the OMS Plan; that is planned surveillance sessions for Years 5, 7 and 9, and leading into a Year 10 evaluation timeline.</p>

7.0 CONTINGENCY ACTIONS

Based on the findings of the surveillance activities, no contingency actions are warranted:

- Continued minor erosion
- Pit Lake water levels rising as expected
- Pit Lake Uranium levels in water still exceed CCME, but are trending down

The first evaluation period of the OMS is now complete. It is DXB's opinion that the recommended frequency of surveillance for the second phase, outlined in the OMS Plan as Years 5, 7 and 9, is appropriate for the conditions of the site.

8.0 REGULATORY REQUIREMENTS

The Jericho Site Stabilization Project obtained the following authorizations prior to implementing the remedial activities:

- Nunavut Planning Commission (NPC) Conformity Check (File #148350)
- Nunavut Impact Review Board (NIRB) Screening Decision (File #16UN058)
- Crown Land Use Permit (#N2016U0013)
- Inuit Owned Land Use Permit from the Kitikmeot Inuit Association (#KTX117X009)
- Nunavut Water Board Letter of Decision accepting the Site Stabilization Project to be implemented under the Minister's powers under Section 89 of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, S.C. 2002, c. 10 (NWNSRTA)

The Jericho OMS Program maintains compliance with these authorizations through regular communications with the authorities and submission of annual reports.

In the NIRB's 2018-2019 Annual Monitoring Report for the Jericho Diamond Mine the Board recommended: "Recommendation 4: The Board requests that Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) include a larger suite of water quality parameters in testing of Pit Lake water until the pit is full and add water quality testing every three (3) years in Cell B/C before the West Dam to its Operations, Monitoring and Surveillance (OMS) Plan to ensure that no water quality issues have developed with time. An adaptive management strategy should be created if changes in water quality are noted to ensure that water quality has been maintained to meet Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of freshwater aquatic life."

CIRNAC responded to this recommendation "To address this CIRNAC proposes to add the additional Pit Lake water parameters and Cell B/C water sampling to the final year of each phase of the OMS Plan. This will allow us to check the long-term water quality prior to developing the subsequent phase of the OMS Plan and make adjustments as necessary. The first additional sampling event will be completed in 2020."

In action to the proposed response CIRNAC had added a water sample from Cell B/C at the former West Dam to the end of each OMS Phase (Years 3, 9 and 25) to check long-term water quality prior to implementing the subsequent phase.

A water sample was collected this year from Cell B/C on September 2, 2020. The laboratory analytical results were compared against the effluent discharge limits set out in the NWB June 23, 2017 Letter of Decision (LOD), as well as CCME CWQG for PFAL guidelines for reference. No exceedances were observed from either set of standards of the 2020 water sample.

The results from the 2017 West Dam original post-Stabilization water sample have also been included as a baseline for the start of the current evaluation phase. The results are presented in Table 5.

Table 5 – Regulatory Water Samples from Cell B/C

Parameter	LOD Maximum Allowable Concentration	CCME CWQG PFAL	2017 West Dam	2020 Cell B/C
pH	6- 8.8	6.5-9	7.48	8
Total Suspended Solids (TSS)	25	25	<3	<3
Total Dissolved Solids (TDS)	4,000		82	92
Chloride - Cl	1,000	120	2.58	2.22
NH3-N	12		<0.05	NA
T-NO3-N	56	13	0.071	0.0019
T-NO2-N	5			0.152
Fecal Coliforms	20		<1	3
T-Al	3	0.1	0.0144	0.0147
T-As	0.1	0.005	<0.0001	0.00037
T-Cd	0.0024	0.00009	<0.000005	<0.000005
T-Cr	0.17		0.00019	0.00011
T-Cu	0.04	0.002	0.00139	0.0017
T-Pb	0.02	0.001	<0.00005	<0.00005
T-Mo	1.5	0.073	0.00122	0.00308
T-Ni	0.1	0.025	0.00108	0.00115
T-U	1	0.015	0.00253	0.00325
T-P	0.4	0.004	<0.05	<0.05
T-Zn	0.5	0.03	<0.003	<0.003
Dissolved-Al	2		0.0058	0.0055
Biological Oxygen Demand (5 days) BOD ₅	25		<2	<2
Oil and Grease	5		<1	<5
Benzene	0.37	0.37	<0.0005	<0.0005
Ethylbenzene	0.09	0.09	<0.0005	<0.0005

Parameter	LOD Maximum Allowable Concentration	CCME CWQG PFAL	2017 West Dam	2020 Cell B/C
Toluene	0.002	0.002	<0.0005	<0.00045
F1 (C6-C10)	9.8		<0.1	<0.1
Total Extractable Hydrocarbons	6		<0.38	<0.25
F1-BTEX	9.8		<0.1	<0.1
F2 (>C10-C16)	1.3		<0.1	<0.3

9.0 SUMMARY AND RECOMMENDATIONS

Following the 2020 surveillance session, the Jericho site remains in an environmentally stable condition and most identified physical features appear to be trending towards physical stability. The Pit Water Uranium concentration remains above CCME guideline but continues to decrease as the pit fills. The erosion of the PKCA cover in the ponded water area should continue to be monitored, along with the Pit overflow, and uranium concentration in the water.

Ongoing surveillance is recommended to include all current items, no items are recommended for closure. As per the CIRNAC response to the NIRBs recommendations in the 2018/2019 annual monitor report, add a water sample from Cell B/C at the West Dam at the end of each monitoring phase to check for any long-term changes to water quality that may arise from the water flowing through the PKCA into Cell B/C and through the former West Dam. This sample was taken this year (Year 3) and should also be added to Year 9 and Year 25 surveillance activities.

With no increase or decrease to the frequency of surveillance activities triggered following findings from 2020, Year 4 is scheduled as an 'evaluation' year with no planned surveillance activities. However, in consideration of the Pit Water Uranium Concentration beginning to decrease below the predicted final levels and the loss of the 2020 spring surveillance session, a 2021 site visit would provide key data to evaluate the timeline for the site to reach its final state.

Table 6 presents an on-going summary of the residual risks and potential actions for consideration, following the 2020 OMS Program.

Table 6 – Post-2020 Update of Residual Risk

Risk ID	Residual Risk	OMS Plan Proposed Action	Post-2020 Update
1	Sediment release and instability of side slopes could result in poor performance of the West Dam breach.	Surveillance of the West Dam breach. Erosion and slow failure not expected to pose a risk.	No update for proposed action.

Risk ID	Residual Risk	OMS Plan Proposed Action	Post-2020 Update
2	Potholes in the PKCA cover were observed near the end of the 2017 field season. Further erosion could result in localized failure of the tailings cover and release windblown tailings.	Potholes will be filled in 2018 field season and monitoring of the PKCA cover.	Continue assessment of potholes, and fill, if appropriate.
3	The Open Pit could result in injury to third party, as there are no access restrictions.	The Open Pit is being converted to a pit lake which is expected to take 11 to 15 years. Signage has been posted near the pit, at the airstrip and at the southwest end of site.	No update for proposed action.
4	Due to design inconsistencies, the road adjacent to the Open Pit could hold water and eventually wash out, resulting in a sediment release to Carat Lake.	Survey the existing conditions and take corrective actions as appropriate.	<p>A survey of the outflow area, relative to the pit perimeter road, showed that the channel inlet was lower than the rest of the road; and therefore, the road would not eventually hold back any of the pit lake.</p> <p>The residual risk is recommended to be closed and removed as a residual risk as part of the planned evaluation of conditions scheduled to occur after the completion of Year 3 OMS work.</p>
5	Hydrocarbon contaminated soils have been placed into a lined containment cell. The liner could be compromised resulting in water contacting soil and contaminated water release to the environment.	Surveillance of the PHC containment cell.	No update for proposed action.

Risk ID	Residual Risk	OMS Plan Proposed Action	Post-2020 Update
6	The water in the pit contains uranium concentrations above CCME guidelines for the protection of aquatic life. Eventually the pit lake will overflow into Carat Lake.	Long term monitoring of the pit lake water, to determine if there is a risk prior to overflow.	No update for proposed action.
7	Building condition will deteriorate over time, resulting in loss of asset value.	No action. Building asset value to progress towards \$0.	No update for proposed action.
8 (2018)	Washout erosion from the underside of the C1 Channel, at the outlet into the Open Pit. Noted following the first winter cycle after construction.	<p>New residual risk noted for 2018.</p> <p>The risk level is assessed to be 'low', since physical access to the area is restricted and immediate environmental impact mitigated by flow directly into the open pit.</p> <p>Erosion and slow failure not expected to pose a risk.</p>	Continued surveillance of C1 Channel.

10.0 CLOSING

We trust this report suitable and in accordance with the terms of reference for the Jericho 2020 OMS Program.

Prepared by:

Henry Wong, P.Eng.
DXB Projects – Senior Engineer

Reviewed by:



David Bynski, P.Eng.
DXB Projects – Principal

11.0 REFERENCES

Arcadis. 2018. *Operation, Maintenance and Surveillance (OMS Plan) – Jericho Diamond Mine Site.*

DXB. 2019. *Jericho Mine Site – Operation, Maintenance and Surveillance Program, 2018 Report – Final.*

DXB. 2020. *Jericho Mine Site – Operation, Maintenance and Surveillance Program, 2019 Report – Final.*

TetraTech. 2015. *Options Analysis Rev 02 – Jericho Diamond Mine, Nunavut.*

APPENDIX A

Appendix A - Water Quality Monitoring Laboratory Certificate of Analyses

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DXB PROJECT MANAGEMENT INC.
ATTN: Henry Wong
315 Montgomery Avenue
Winnipeg MB R3L 1T6

Date Received: 03- SEP- 20
Report Date: 18- SEP- 20 12:35 (MT)
Version: FINAL

Client Phone: 204- 795- 5508

Certificate of Analysis

Lab Work Order #: L2498404
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 17- 818286
Legal Site Desc:

Edward Ngai
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2498404-1 WATER 02-SEP-20 10:30 2020-09-02-PIT	L2498404-2 WATER 02-SEP-20 10:00 2020-09-02-WD		
Grouping	Analyte				
WATER					
Physical Tests	pH (pH)	7.72	8.00		
	Total Suspended Solids (mg/L)	<3.0	<3.0		
	Total Dissolved Solids (mg/L)	61	92		
Anions and Nutrients	Chloride (Cl) (mg/L)	1.74	2.22		
	Nitrate (as N) (mg/L)	1.74	0.152		
	Nitrite (as N) (mg/L)	0.0046	0.0019		
	Sulfate (SO4) (mg/L)	5.64	16.9		
Bacteriological Tests	Fecal Coliforms (CFU/100mL)	1	3		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0485	0.0147		
	Antimony (Sb)-Total (mg/L)	0.00011	<0.00010		
	Arsenic (As)-Total (mg/L)	0.00039	0.00037		
	Barium (Ba)-Total (mg/L)	0.0120	0.0195		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050		
	Boron (B)-Total (mg/L)	0.013	0.016		
	Cadmium (Cd)-Total (mg/L)	<0.0000050	<0.0000050		
	Calcium (Ca)-Total (mg/L)	8.42	10.1		
	Cesium (Cs)-Total (mg/L)	0.000029	0.000043		
	Chromium (Cr)-Total (mg/L)	0.00024	0.00011		
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010		
	Copper (Cu)-Total (mg/L)	0.00326	0.00170		
	Iron (Fe)-Total (mg/L)	0.048	0.067		
	Lead (Pb)-Total (mg/L)	0.000095	<0.000050		
	Lithium (Li)-Total (mg/L)	0.0011	<0.0010		
	Magnesium (Mg)-Total (mg/L)	4.02	8.57		
	Manganese (Mn)-Total (mg/L)	0.00123	0.0613		
	Molybdenum (Mo)-Total (mg/L)	0.00231	0.00308		
	Nickel (Ni)-Total (mg/L)	0.00154	0.00115		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	1.53	4.85		
	Rubidium (Rb)-Total (mg/L)	0.00257	0.0101		
	Selenium (Se)-Total (mg/L)	0.000116	0.000157		
	Silicon (Si)-Total (mg/L)	1.09	0.20		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	2.57	6.09		
	Strontium (Sr)-Total (mg/L)	0.0761	0.184		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2498404-1 WATER 02-SEP-20 10:30 2020-09-02-PIT	L2498404-2 WATER 02-SEP-20 10:00 2020-09-02-WD		
Grouping	Analyte				
WATER					
Total Metals	Sulfur (S)-Total (mg/L)	1.96	5.88		
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010		
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	<0.00010	0.00020		
	Titanium (Ti)-Total (mg/L)	0.00086	<0.00030		
	Tungsten (W)-Total (mg/L)	0.00013	<0.00010		
	Uranium (U)-Total (mg/L)	0.0304	0.00325		
	Vanadium (V)-Total (mg/L)	0.00057	<0.00050		
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030		
	Zirconium (Zr)-Total (mg/L)	<0.00020	<0.00020		
	Dissolved Metals	Dissolved Metals Filtration Location	LAB	LAB	
Aluminum (Al)-Dissolved (mg/L)		0.0208	0.0055		
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0		
	Oil and Grease (mg/L)	<5.0	<5.0		
Volatile Organic Compounds	Benzene (mg/L)	<0.00050	<0.00050		
	Ethylbenzene (mg/L)	<0.00050	<0.00050		
	Methyl t-butyl ether (MTBE) (mg/L)	<0.00050	<0.00050		
	Styrene (mg/L)	<0.00050	<0.00050		
	Toluene (mg/L)	<0.00045	<0.00045		
	ortho-Xylene (mg/L)	<0.00050	<0.00050		
	meta- & para-Xylene (mg/L)	<0.00050	<0.00050		
	Xylenes (mg/L)	<0.00075	<0.00075		
	F1 (C6-C10) (mg/L)	<0.10	<0.10		
	Surrogate: 4-Bromofluorobenzene (SS) (%)	86.8	88.7		
Surrogate: 1,4-Difluorobenzene (SS) (%)	107.7	112.0			
Hydrocarbons	F1-BTEX (mg/L)	<0.10	<0.10		
	TEH10-30 (mg/L)	<0.25	<0.25		
	F2 (C10-C16) (mg/L)	<0.30	<0.30		
	F3 (C16-C34) (mg/L)	<0.30	<0.30		
	F4 (C34-C50) (mg/L)	<0.30	<0.30		
	Surrogate: 2-Bromobenzotrifluoride (%)	85.6	91.3		
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	76.9	80.4		
	Surrogate: 3,4-Dichlorotoluene (SS) (%)	106.8	104.9		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2498404-2
Matrix Spike	Lithium (Li)-Total	MS-B	L2498404-2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2498404-2
Matrix Spike	Nickel (Ni)-Total	MS-B	L2498404-2
Matrix Spike	Potassium (K)-Total	MS-B	L2498404-2
Matrix Spike	Sodium (Na)-Total	MS-B	L2498404-2
Matrix Spike	Strontium (Sr)-Total	MS-B	L2498404-2
Matrix Spike	Sulfur (S)-Total	MS-B	L2498404-2
Matrix Spike	Uranium (U)-Total	MS-B	L2498404-2

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD5-TG	Water	Biochemical Oxygen Demand- 5 day (TAIGA)	SM5210B
CL-IC-N-VA	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EPH-ME-FID-VA	Water	EPH in Water	BC Lab Manual
EPH is extracted from water using a hexane micro-extraction technique, with analysis by GC-FID, as per the BC Lab Manual. EPH results include PAHs and are therefore not equivalent to LEPH or HEPH.			
F1-BTX-CALC-VA	Water	F1-Total BTX	CCME CWS PHC TIER 1 (2001)
This analysis is based on the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." For F1 (C6-C10), the sample undergoes a purge and trap extraction prior to analysis by GC/FID. The F1-BTEX result is calculated as follows:			
F1-BTEX: F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).			
F1-HSFID-VA	Water	CCME F1 By Headspace with GCFID	EPA 5021A/CCME CWS PHC (Pub# 1310)
This analysis is based on the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." For F1 (C6-C10), the sample undergoes a headspace purge prior to analysis by GC/FID.			
F1 (C6-C10): Sum of all hydrocarbons that elute between nC6 and nC10.			
F2-F4-ME-FID-VA	Water	CCME F2-F4 Hydrocarbons in Water	CCME CWS-PHC, Pub #1310, Dec 2001
F2-F4 is extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, Dec 2001.			
FC-MF-TG	Water	Fecal Coliforms by MF	SM9222D
MET-D-XXX-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020B (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-VA	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

Reference Information

OGG-SF-VA	Water	Oil & Grease by Gravimetric	BCMOE (2010), EPA1664A
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
SO4-IC-N-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.			
VH-SURR-FID-VA	Water	VH Surrogates for Waters	BC Env. Lab Manual (VH in Solids)
VOC7-HSMS-VA	Water	BTEX/MTBE/Styrene by Headspace GCMS	EPA 5021A/8260C
The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.			
VOC7/VOC-SURR-MS-VA	Water	VOC7 and/or VOC Surrogates for Waters	EPA 5035A/5021A/8260C
XYLENES-CALC-VA	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Calculation of Total Xylenes			
Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
TG	TAIGA ENVIRONMENTAL LABORATORY (INAC)
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

17-818286

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
200706

- FINAL REPORT -

Prepared For: ALS Environmental

Address: 314 Old Airport Road
Unit 116
Yellowknife, NT
X1A 2R1

Attn: Oliver Gregg

Facsimile:

Final report has been reviewed and approved by:

A handwritten signature in black ink, appearing to read "Glen Hudy".

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Wednesday, September 09, 2020

Print Date: *Wednesday, September 09, 2020*

Page 1 of 4



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
200706

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **L2498404-1 2020-09-02-PIT**

Taiga Sample ID: **001**

Client Project:

Sample Type: Water

Received Date: 03-Sep-20

Sampling Date: 02-Sep-20

Sampling Time:

Location:

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Biochemical Oxygen Demand	< 2	2	mg/L	03-Sep-20	SM5210:B	
<u>Microbiology</u>						
Coliforms, Fecal	1	1	CFU/100mL	03-Sep-20	SM9222:D	

ReportDate: Wednesday, September 09, 2020

Print Date: *Wednesday, September 09, 2020*

Page 2 of 4



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
200706

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **L2498404-2 2020-09-02-WD**

Taiga Sample ID: **002**

Client Project:

Sample Type: Water

Received Date: 03-Sep-20

Sampling Date: 02-Sep-20

Sampling Time:

Location:

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Biochemical Oxygen Demand	< 2	2	mg/L	03-Sep-20	SM5210:B	
<u>Microbiology</u>						
Coliforms, Fecal	3	1	CFU/100mL	03-Sep-20	SM9222:D	

ReportDate: Wednesday, September 09, 2020

Print Date: *Wednesday, September 09, 2020*



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

200706

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **L2498404-2 2020-09-02-WD**

Taiga Sample ID: **002**

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

Comments *L2498404*

ReportDate: Wednesday, September 09, 2020

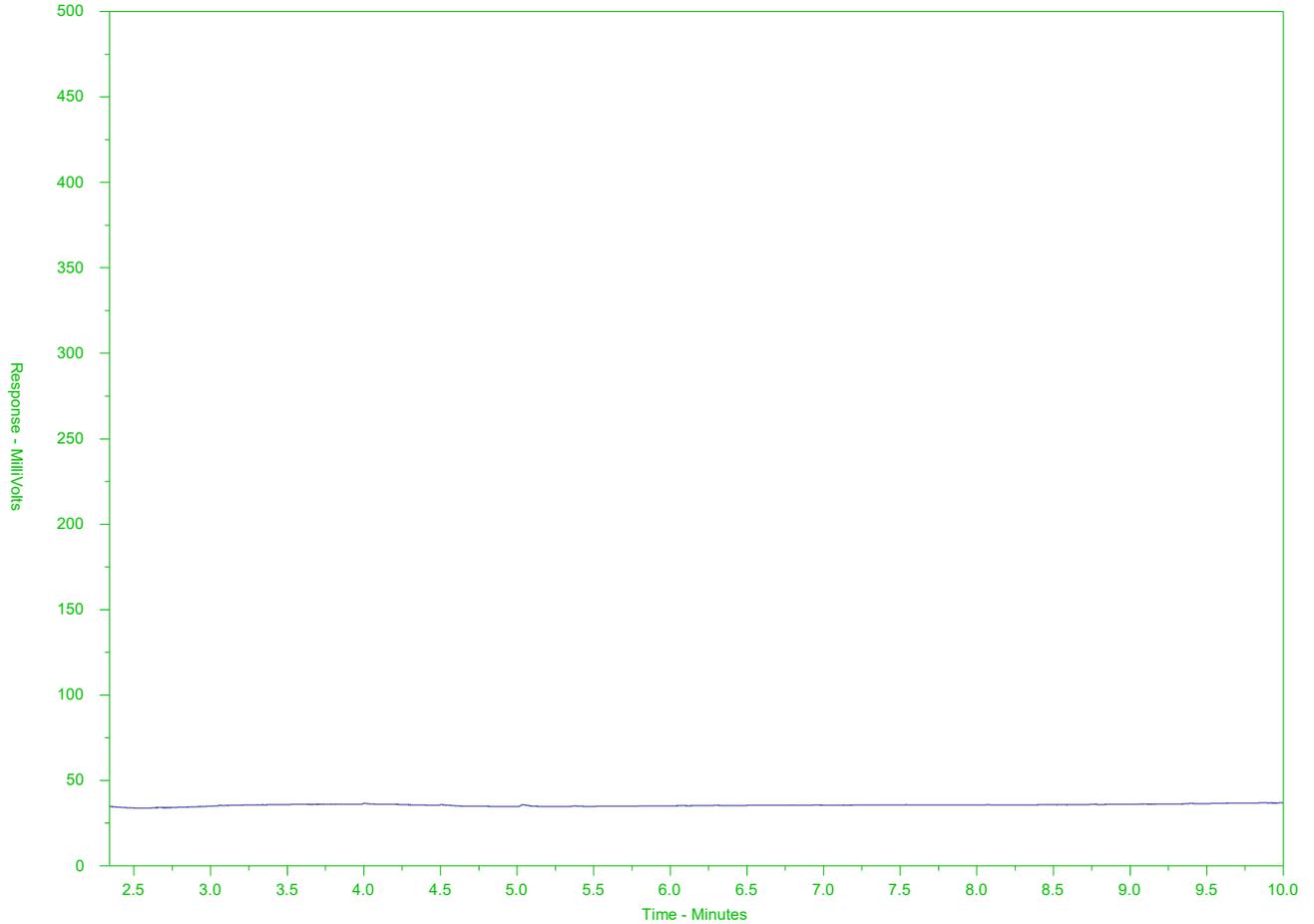
Print Date: *Wednesday, September 09, 2020*

Page 4 of 4

BC EPH HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2498404-1
 Client Sample ID: 2020-09-02-PIT



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →	← Motor Oils/ Lube Oils/ Grease →		
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

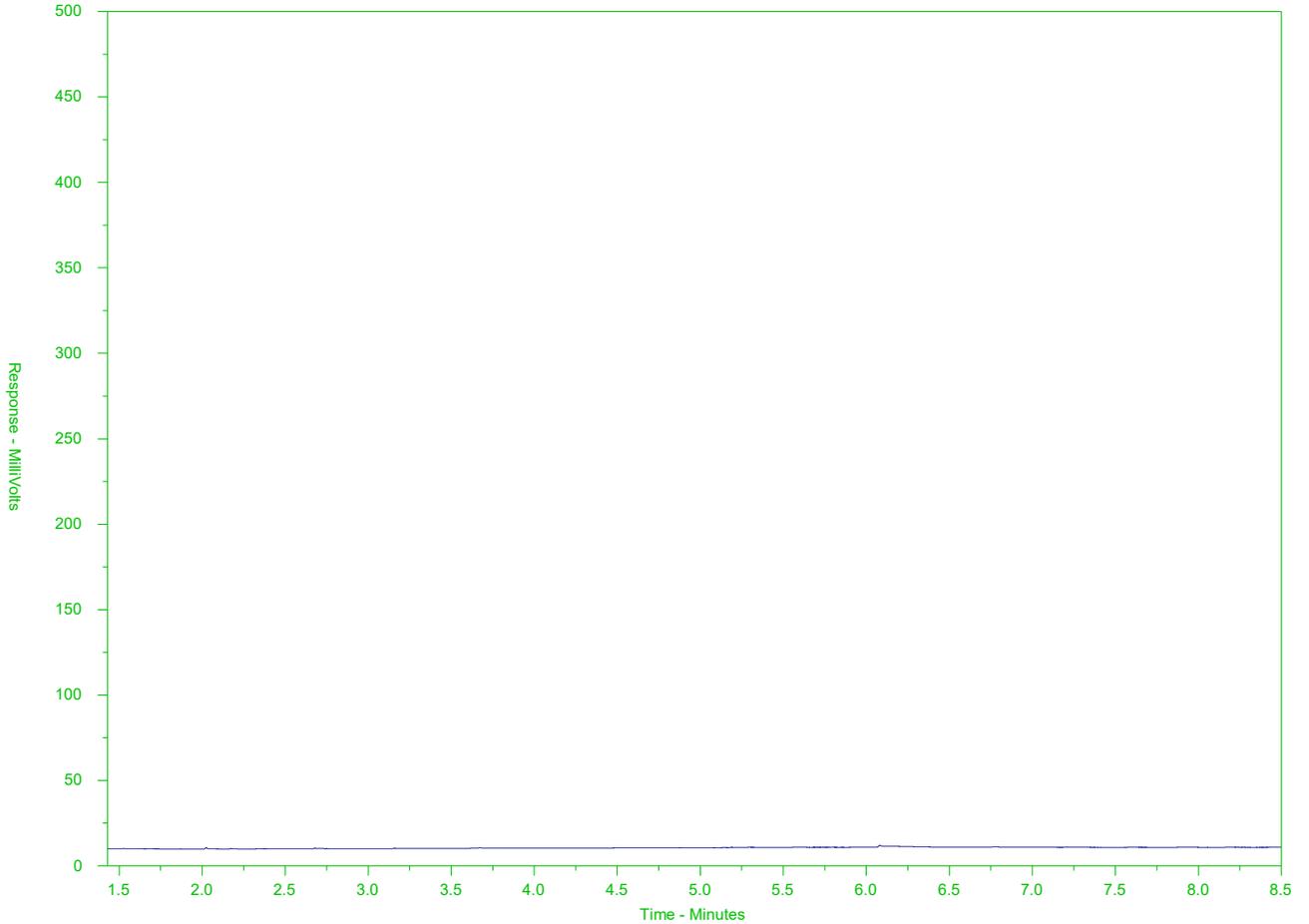
A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2498404-C-1
 Client Sample ID: 2020-09-02-PIT



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →			
← Diesel/ Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

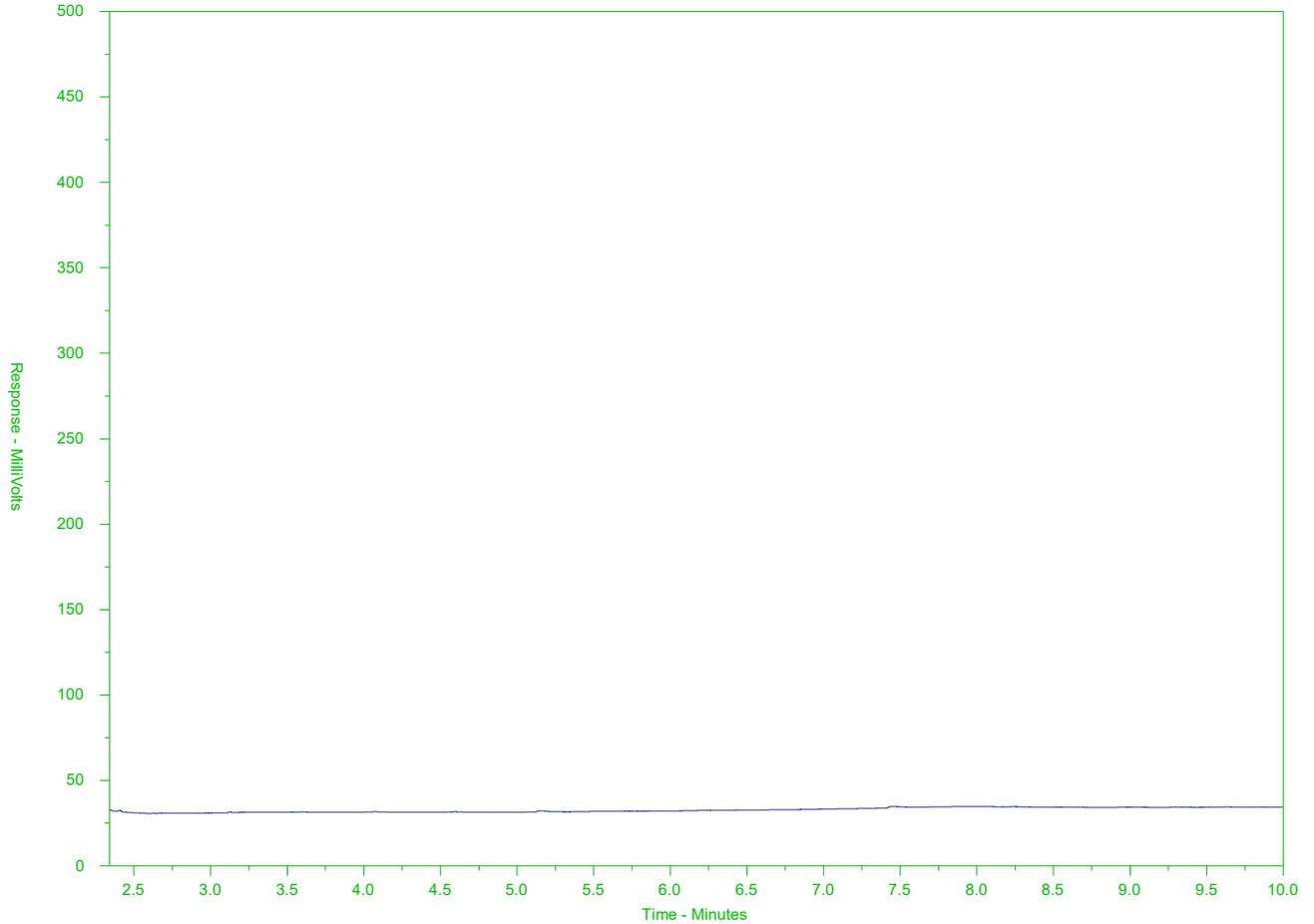
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

BC EPH HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2498404-2
 Client Sample ID: 2020-09-02-WD



← EPH10-19 →		← EPH19-32 →	
nC10	nC19	nC32	
174°C	330°C	467°C	
346°F	626°F	873°F	
← Gasoline →	← Motor Oils/ Lube Oils/ Grease →		
← Diesel/ Jet Fuels →			

The BC EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

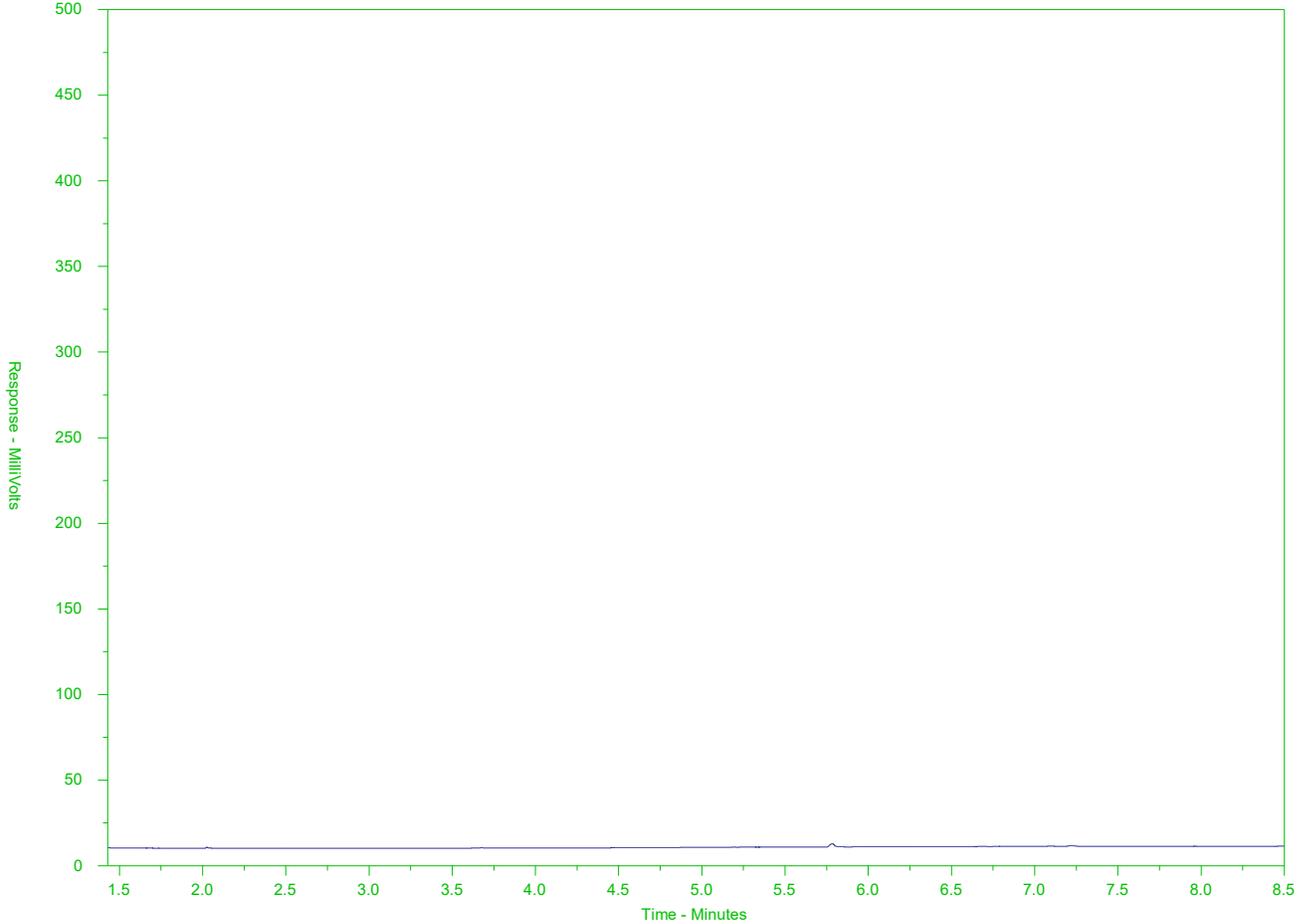
A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Note: This chromatogram was produced using GC conditions that are specific to the ALS Canada EPH method. Refer to the ALS Canada EPH Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2498404-C-2
 Client Sample ID: 2020-09-02-WD



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →			
← Diesel/ Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC Number: 17 - 818286

Page of

Affix ALS barcode label here (lab use only)

Report To Contact and company name below will appear on the final report Company: DXB Project Management Contact: HENRY WONG Phone: 416 515 8064 Company address below will appear on the final report		Report Format / Distribution Select Report Format: <input type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax Email 2 Email 3		Select Service Level Below - Contact your AM to confirm all EAP TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply 4 day [P4-20%] <input type="checkbox"/> 1 Business day [E - 100%] 3 day [P3-25%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 - 200%] 2 day [P2-50%] <input type="checkbox"/> (Laboratory opening fees may apply) Date and Time Required for all EAP TATs: _____ dd-mm-yy hh:mm For tests that can not be performed according to the service level selected, you will be contacted.	
ALS Account # / Quote #: Job #: PO / AFE: LSD:		Invoice Distribution Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax Email 2		Oil and Gas Required Fields (client use) AFE/Est Center: Major/Minor Code: Requisitioner: Location:	
ALS Lab Work Order # (lab use only): L2498404		ALS Contact:		Sampler:	
ALS Sample # (lab use only) Sample Identification and/or Coordinates (This description will appear on the report) 2020-09-02 - PIT 2020-09-02 - WD		Date 02/09/20 02/09/20		Time 1030 1000	
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		NUMBER OF CONTAINERS 11 11	
SHIPMENT RELEASE (client use) Released by: _____ Date: _____ Time: _____		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <i>[Signature]</i> Date: 2-SEP-20 Time: 1430		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: _____ FINAL COOLER TEMPERATURES °C: _____	
SHIPPING INFORMATION REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION		SHIPMENT RELEASE (client use) Released by: _____ Date: _____ Time: _____		FINAL SHIPMENT RECEPTION (lab use only) Received by: _____ Date: _____ Time: _____	



SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

GENERAL TERMS AND CONDITIONS:

These terms and conditions are incorporated in and form part of the Agreement between ALS Group's Environmental Division and the party named in the Offer (the "Client").

1. **Definitions.** Capitalized Terms not defined in these Terms and Conditions have the definitions set out in the other Agreement documents.
2. **The Services.** ALS will provide the Services to the Client as described in the Offer and in any chain of custody form provided with any sample.
3. **Prices.** ALS may review and change all prices, fees, surcharges or other charges set out in the Agreement if there are changes to ALS's cost beyond ALS's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding Condition 3, all quotations expire after three years.
4. **Payment Terms.** The Client shall pay ALS within 30 days of the invoice date OAC. ALS may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. **Quotation Numbers.** The Client shall provide the quotation number to ALS (where applicable) to ensure correct pricing.
6. **Taxes.** Applicable taxes are not included in prices. Applicable surcharges and additional fees will be added at the time of invoicing.
7. **Quality Control.** ALS has an extensive QA/QC program. Clients' samples are analyzed using approved, referenced procedures followed by thorough data validation prior to reporting of the analytical results.
8. **Test Results.** Results are obtained from analytical measurements that are subject to inherent variability. Measurement results reflect characteristics of submitted test samples at time of analysis. The Client is responsible for informing itself on the limitation of test results and acknowledges that test results are not guaranteed. When statements of conformity are requested on test reports (e.g. within Criteria Reports), measurement uncertainty is not applied to test results prior to the evaluation.
9. **Standard of Care.** ALS will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested.
10. **Storage.** Where possible, ALS will store; soil and water samples for 45 days from date of receipt, tissue/blota samples for 6 months from date of receipt, air samples or re-usable media for 14 days from date of receipt, and microbiological samples for 3 days from date of receipt.
11. **Holds.** If the Client requests a sample to be placed on hold, ALS will store the samples according to paragraph 10, after which ALS will invoice the Client and discard the sample. Each sample is subject to a minimum \$5.00 hold fee. Longer hold periods are available upon request. See paragraph 12.
12. **Archives.** If the Client requests a sample be archived, ALS will invoice in advance and store the sample for the period requested, after which ALS may discard the sample.
13. **Legal Sample Handling Protocol.** Legal sample handling protocol must be arranged before samples are collected. ALS charges a surcharge on the list price plus the hourly technologist or chemist rates for legal sample protocol. Additional charges will apply for samples that require storage by ALS.
14. **Samples.** The quality, condition, content and source of samples stored and tested are not known to ALS except as declared and described on the chain of custody form completed and submitted by the Client and accompanying the sample.
15. **Risk of Loss.** ALS will use reasonable care to protect samples during storage, however all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged, or destroyed and the Client releases ALS from any claim the Client may have for any loss or damage to the sample.
16. **Environmental.** The Client must comply with all applicable environment legislation, including labeling all hazardous samples to comply with GHS and TDG regulations, and must provide appropriate Safety Data that include the nature of the hazard and a contact name and phone number to call for information. The Client will indemnify ALS for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
17. **Hazardous Materials Disposal.** ALS may return, at the Client's cost, hazardous material to the Client for disposal.
18. **Hazardous Materials Surcharge.** ALS may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials (NORM), H2S, CN, etc.
19. **Sample Containers.** ALS may ship sample containers to the Client's location by the most cost effective means using ALS preferred courier suppliers, within the specified project timeline.
20. **Additional Charges.** ALS may charge the Client (a) its cost for emergency bottle shipments and shipments to and from a remote site, and (b) where pick up and delivery services are provided, subject in each instance to a minimum charge of \$25.00.
21. **Re-Tests.** ALS reserves the right to re-test any samples that remain in its possession. Re-tests requested by the Client may be subject to charges.
22. **Waiver.** The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any claims against ALS it may have as a result of the interpretation of the results. The Client shall indemnify ALS for all claims made by any third party against ALS in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
23. **Limitation of Liability.** In no event shall ALS be liable for any consequential, indirect, incidental, special, exemplary, or punitive damages, whether foreseeable or unforeseeable (including claims for loss of profits or revenue or losses caused by stoppage of other work or impairment of other assets), incurred by the Client arising out of breach or failure of express or implied warranty, breach of contract, breach of warranty, misrepresentation, negligence, strict liability in tort or otherwise. In any event, the liability of ALS to the Client shall be limited to the cost of testing the sample as requested in the chain of custody form under which the sample was originally deposited. For the purposes of this paragraph and paragraphs 8, 15, 16, 22 and 24, as applicable, "ALS" includes without limitations its directors, officers, employees and affiliates and the "Client" includes without limitation any third party that may have a claim against ALS through the Client.
24. **Notice of Liability.** Notwithstanding paragraph 23, ALS shall not be liable to the Client unless the Client provides notice in writing to ALS of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk under the Agreement between the Client and ALS, and the fees to be paid by the Client to ALS reflect this allocation of risks and the limitations of liability in this Agreement.
25. **Third Party Service Provider Indemnity.** For testing not performed at ALS, and where the Client requires ALS to forward samples to a third party service provider, the Client indemnifies ALS against any breach of this Agreement, all liabilities or losses incurred in connection with the third party service provider, including but not limited to courier services, testing turn-around time, and any additional costs associated with such third party.
26. **Third Party Service Provider Indemnity.** If ALS is required to engage a third party service provider for whatever reason, the Client indemnifies ALS against any breach of this Agreement, liabilities, or losses incurred in connection with the third party service provider, including but not limited to courier services, testing turn-around time, and any additional costs associated with such third party.
27. **Entire Agreement.** The Agreement is the entire agreement between the parties and supersedes and takes precedence over any terms and conditions contained in any documentation provided by the Client. ALS's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein. If there is a conflict between these terms and conditions and any other Agreement document, these terms and conditions prevail.
28. **Term.** Providing the first batch of samples to which this tender refers is submitted within three months of the starting date of this quotation, the following prices, terms and conditions will remain firm until the closing date. This offer, and its terms and conditions will automatically lapse if the offer has not been accepted and samples not delivered to ALS by the Closing Date.
29. **Termination.** (a) Either party may terminate this Agreement for any reason by giving the other party thirty (30) days written notice (Notice Period). (b) If the Agreement is terminated pursuant to clause (a), then the Client must pay ALS for all Services performed up to the expiry of the Notice Period.

LIST OF PHOTOGRAPHS **END OF TEXT**

- Photo 1: Sept. 1, 2020 West Dam Breach, Looking NE – Fall inlet water level.
- Photo 2: Sept. 1, 2020 West Dam Breach, Looking W across Channel Base – Fall flowing water.
- Photo 3: June 17, 2019 West Dam Breach – 2019 photo of erosion gully on North Bank.*
- Photo 4: Sept. 1, 2020 West Dam Breach – no significant change observed in erosion gully on North Bank.
- Photo 5: Sept. 1, 2020 West Dam Breach – Fall aerial photo.
- Photo 6: Sept. 1, 2020 PHC Containment Cell Cover, Looking SW (to camp) – Protection soil cover in good condition.
- Photo 7: Sept 1, 2020 PHC Containment Cell Cover – Some minor drainage erosion in north corner of East Bank.
- Photo 8: Sept. 12, 2019 PKCA Cover, Looking W – 2019 photo of remaining ponded water during Fall visit.*
- Photo 9: Sept. 1, 2020 PKCA Cover, Looking W – North PKCA (Very little ponded water).
- Photo 10: Sept. 1, 2020 PKCA Cover, Looking N – West end of North PKCA, wet exposed tailings.
- Photo 11: Sept. 1, 2020 PKCA Cover, Looking SE – Aerial photo of northeast PKCA.
- Photo 12: Sept 1, 2020 PKCA Cover, Looking W – Aerial photo of north and south PKCA.
- Photo 13: Sept. 11, 2019 PKCA Cover, East PKCA – 2019 photo of erosion from drainage into PKCA.*
- Photo 14: Sept. 1, 2020 PKCA Cover, East PKCA – Erosion from drainage into PKCA (some expansion from 2019).
- Photo 15: Sept. 11, 2019 PKCA Cover, Looking N – 2019 photo of potholes.*
- Photo 16: Sept. 1, 2020 PKCA Cover – Fall view of potholes (seasonally collapsed).
- Photo 17: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of Channel Base and inflow into Pit.*
- Photo 18: Sept. 10, 2019 C1 Channel, Looking E – 2019 photo of eroded section into Open Water @ 6.3 m in Fall.*
- Photo 19: Sept. 1, 2020 C1 Channel, Looking E – Eroded section into Open Pit (no significant change).
- Photo 20: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of upstream water during Fall visit.*
- Photo 21: Sept. 1, 2020 C1 Channel, Looking W – Upstream water during Fall visit.
- Photo 22: June 17, 2019 Pit Outflow, Looking W.*
- Photo 23: Sept. 10, 2019 Open Pit, Looking E – 2019 photo of Open Pit water level.*
- Photo 24: Sept. 1, 2020 Open Pit, Looking E – Open Pit water level.



Photo 1: Sept. 1, 2020 West Dam Breach, Looking NE – Fall inlet water level.



Photo 2: Sept. 1, 2020 West Dam Breach, Looking W across Channel Base – Fall flowing water.



Photo 3: June 17, 2019 West Dam Breach – 2019 photo of erosion gully on North Bank.



Photo 4: Sept. 1, 2020 West Dam Breach – no significant change observed in erosion gully on North Bank.



Photo 5: Sept. 1, 2020 West Dam Breach – Fall aerial photo.



Photo 6: Sept. 1, 2020 PHC Containment Cell Cover, Looking SW (to camp) – Protection soil cover in good condition.



Photo 7: Sept 1, 2020 PHC Containment Cell Cover – Some minor drainage erosion in north corner of East Bank.



Photo 8: Sept. 12, 2019 PKCA Cover, Looking W – 2019 photo of remaining ponded water during Fall visit.



Photo 9: Sept. 1, 2020 PKCA Cover, Looking W – North PKCA (Very little ponded water).



Photo 10: Sept. 1, 2020 PKCA Cover, Looking N – West end of North PKCA, wet exposed tailings.



Photo 11: Sept. 1, 2020 PKCA Cover, Looking SE – Aerial photo of northeast PKCA.



Photo 12: Sept 1, 2020 PKCA Cover, Looking W – Aerial photo of north and south PKCA.



Photo 13: Sept. 11, 2019 PKCA Cover, East PKCA – 2019 photo of erosion from drainage into PKCA.



Photo 14: Sept. 1, 2020 PKCA Cover, East PKCA – Erosion from drainage into PKCA (some expansion from 2019).



Photo 15: *Sept. 11, 2019* PKCA Cover, Looking N – *2019* photo of potholes.



Photo 16: Sept. 1, 2020 PKCA Cover – Fall view of potholes (seasonally collapsed).



Photo 17: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of Channel Base and inflow into Pit.



Photo 18: Sept. 10, 2019 C1 Channel, Looking E – 2019 photo of eroded section into Open Water @ 6.3 m in Fall.



Photo 19: Sept. 1, 2020 C1 Channel, Looking E – Eroded section into Open Pit (no significant change).



Photo 20: Sept. 10, 2019 C1 Channel, Looking W – 2019 photo of upstream water during Fall visit.



Photo 21: Sept. 1, 2020 C1 Channel, Looking W – Upstream water during Fall visit.



Photo 22: *June 17, 2019* Pit Outflow, Looking W.



Photo 23: Sept. 10, 2019 Open Pit, Looking E – 2019 photo of Open Pit water level.



Photo 24: Sept. 1, 2020 Open Pit, Looking E –Open Pit water level.