ENVIRONMENTAL IMPACT ASSESSMENT
PELLY LAKE FORMER AIRSTRIP AND FUEL CACHE, PELLY LAKE, NUNAVUT

Prepared for:

Public Services and Procurement Canada
Western Region
10025 Jasper Avenue
Edmonton, AB T5J 1S6

Prepared by:

BluMetric Environmental Inc.
4916 49th Street, Second Floor
Yellowknife, NT X1A 1P3

Project Number: 240355
June 21, 2024

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BluMetric Environmental Inc.

Postal:
P.O. Box 11086
Yellowknife, NT X1A 3X7

Physical:
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EXECUTIVE SUMMARY

IMPORTANT: *This executive summary provides an overview of the main findings of the study to which it pertains. This executive summary does not provide a comprehensive report, and its review should not be considered a substitute for reading the report in its entirety.*

The Pelly Lake Site (the Site) is a former airstrip and fuel cache site. It was reportedly used as a base and airstrip from 1954 to 1956 by Spartan Air Services, who was contracted by the Federal Government to take aerial photographs of the region. The Site is located approximately 6 km to the northeast of Pelly Lake, within the Kivalliq region of Nunavut (7327399 N and 407062 E). The nearest communities are Baker Lake (250 km southeast of Pelly Lake) and Gjoa Haven (350 km northeast of Pelly Lake). The Site is uninhabited and located on Crown land. Throughout the years, various materials and structures were left at the Site, the Remedial Action Plan (RAP) indicates several dilapidated structures, 49 x 1,000-gallon fuel tanks, 710 barrels of petroleum products (including oil lubricants, aviation fuel, oil, tar, and soil contaminated with tar, and 101 cans of aviation oil), pieces of equipment, and the remains of a "Mosquito" aircraft. Investigations confirm that the site contains impacted sediment that poses a risk to human and ecological health, as well as hazardous and non-hazardous debris. A limited cleanup was reportedly conducted in 1996 but did not remove everything from the Site.

The project that is the subject of the environmental impact assessment (EIA) is the remediation of the Site (the "Project"). The Project will involve the demolition of buildings, removal of hazardous and non-hazardous debris, the excavation and packaging of lead impacted sediments exceeding the ecological component values (70 mg/kg) from the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health for agricultural land use (CCME 1999).

Following the Remedial Options Analysis and the community engagement sessions, the recommended remediation option are excavation and southern off-site disposal of all impacted sediments, hazardous debris and non-hazardous debris with the exception of large non-hazardous debris that will be left on-site and unpainted wood debris that will be burned on-site. Due to challenging access to the site, equipment requirements will be kept to a minimum.

The proposed work is anticipated to be completed in two stages encompassing two summers and one winter. Phase 1 will occur over 8-12 weeks in Summer 2025 with the mobilization of the project team and equipment, execution of the remedial works and demobilization of equipment. Phase 2 will occur over 4-8 weeks in Winter 2026 with the demobilization of waste materials and extend into Summer 2026 with a final inspection and removal of any remaining items. Personnel and staff will be housed during Summer 2025 on Site in a temporary camp and water, wastewater

and waste management will be required. It is anticipated that the site cleanup will require approximately 12 to 15 workers on Site completing the cleanup activities. Wildlife monitors, equipment operators and labourers will be sourced from local communities where possible.

In the short term, species and their habitats are expected to be impacted. The majority of this impact will be in the form of disturbance from the presence of humans and machinery and the accompanying noise, dust and activity. There is the possibility of more serious impacts from spills, fires, erosion and sedimentation and encounters with wildlife, however, these will be mitigated by the development of a comprehensive set of management plans developed, reviewed, and approved prior to commencing work.

Ultimately, any short term negative impacts are anticipated to be offset by an overall improved environment and habitat to support species in their medium and long-term future.

The execution of the remedial plan will be competitively procured, with the contractor making final decisions regarding the implementation strategy. The scope of the project described below is the anticipated approach to be used based on the proponent's knowledge of site access, site conditions and remedial activities required. If the scope changes significantly, the EIA will be updated to address any new or different impacts and associated mitigation measures.

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1 INTRODUCTION

1.1 PROJECT PURPOSE

The Pelly Lake Former Airstrip and Fuel Cache is part of the Federal Contaminated Sites Action Plan (FCSAP) program. The objective of FCSAP is to reduce environmental and human health risks from known federal contaminated sites and associated federal financial liabilities, while focusing on the highest priority sites. The Pelly Lake site is on the Federal Contaminated Sites Inventory (FCSI) list and was identified as a medium priority for action. Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) is the custodian for the Site and is the proponent for the project. Public Service and Procurement Canada (PSPC) is supporting CIRNAC through the procurement and project management of the remediation project and have commissioned BluMetric to complete this Environmental Impact Assessment (EIA) of the proposed project.

The Pelly Lake Remediation Project meets the definition for a project proposal under Nunavut Planning and Project Assessment Act (NuPPAA) and is not exempt from the screening requirement under the regulation. Project proposals are provided to Nunavut Impact Review Board (NIRB) as part of the overall project approval process and this EIA was undertaken in accordance with NIRB's guidelines (NIRB, 2020).

1.2 PROJECT LOCATION AND LAND TENURE

The Pelly Lake Site (the Site) is located approximately 6 km to the northeast of Pelly Lake, within the Kivalliq region of Nunavut (7327399 N and 407062 E). The nearest communities are Baker Lake (250 km southeast of Pelly Lake) and Gjoa Haven (350 km northeast of Pelly Lake). The main area of the Site is situated on a flat area approximately 200 metres above sea level (masl). The Site is uninhabited and located on Crown land. The location of the Site is presented in **Figure 1 (Site Location Map)**.

1.3 SITE HISTORY

The Site is a former airstrip and fuel cache site. It was reportedly used as a base and airstrip from 1954 to 1956 by Spartan Air Services, who were contracted by the Federal Government to take aerial photographs of the region. Later, a land use permit was granted to Bathurst Inlet Developments Ltd. in 1993 (unknown end date) to rehabilitate the two airstrips at the Site and operate a fuel cache.

Throughout the years, various materials and structures were left at the Site, the Remedial Action Plan (RAP) indicates several dilapidated structures, 49 x 1,000-gallon fuel tanks, 710 barrels of petroleum products (including oil lubricants, aviation fuel, oil, tar, and soil contaminated with tar, and 101 cans of aviation oil), pieces of equipment, and the remains of a "Mosquito" aircraft. Three small lakes are present at the Site and several debris areas are located around these lakes. A limited cleanup was reportedly conducted in 1996 but did not remove everything from the Site.

The Site is currently abandoned but it is assumed that the local population may periodically use it for camping during hunting and trapping activities in the region. A Site Plan is presented on **Figure 2 (Site Features Map).**

1.4 PREVIOUS STUDIES – PROJECT CONTEXT

1.4.1 Archaeological Assessment

Final Report, Archaeological Investigations at KW018-Pelly Lake, Kivallik Region, Nunavut, Archaeological Impact Assessment. **BluMetric Environmental Inc., December 2022 (BLM 2022a)**

The Archaeological Impact Assessment (AIA) conducted by BluMetric (BLM 2022b) found no archaeological sites at the Site. Recent historical and modern sites were also documented for anthropological purposes. This work noted that archaeological surveys conducted in the region in the 1970s confirm Early Pre-Inuit and fur trade era Inuit occupation with traces of typical inland caribou hunting activities. With the onset of the commercial fur trade, the area became used for not only traditional subsistence activities but also commercial trapping for fur bearing animals. In 1949, a Catholic mission was set up on an island in Garry Lake, not far from the Site, attracting families to remain year-round. The priest vanished in 1956, soon after Spartan Air Services pulled out from KW018-Pelly Lake, resulting in the loss of two reliable sources of food and supplies. A year later caribou shortages led to famine, and the survivors were relocated.

1.4.2 Borrow Source Assessment and Site Access Evaluation

Pelly Lakes Remediation Site, NU. Terrain Mapping and Geotechnical Assessment Report. **Trek Geotechnical, December 15, 2022 (Trek 2022)**

The geotechnical investigation provided a summary of terrain mapping and ground truthing along with geotechnical recommendations for borrow development, Site access, staging areas and construction. A summary of the borrow material findings are summarized in **Table 1**, however key findings included:

- Material suitable for granular fill, common fill, bedding sand and rip rap were identified on site. Processing would likely be required for granular fill and rip rap.
- Suitable borrow areas for low permeability material were not identified and there was no viable source of organics for revegetation identified.
- Construction of long-term facilities (i.e., above-grade hazardous or non-hazardous landfills and landfarms) can be considered for the Site with the placement of non-hazardous waste into excavations and backfilling with common fill can be undertaken. Suitable staging areas were also identified.
- It was recommended that any borrow area be kept to as small a footprint as possible given the likelihood of permafrost degradation caused by borrow development. Borrow areas must be regraded to promote drainage and match the existing landscape. Erosion protection may be required in areas where higher over land flows are anticipated.

Table 1: Summary of the Borrow Material Assessment

Material Description	Borrow Source	Available Volume (m^3)
Granular Fill	1	2,600
	2	4,700
	5	600
Common Fill	1	2,600
	2	4,700
	3	1,330
	5	600
	8	900
	10	530
	11	2,000
Bedding Sand	4	5,800
	6	4,500
	7	1,380
Rip Rap	1	230
	2	470
	12	650

The Site is in a remote and land locked location. In 2022, access was gained using a DHC-6 Twin Otter aircraft. A questionnaire was provided to the pilots during the field investigation to assess whether the Site could be accessed using a larger aircraft. The full findings of the assessment are provided in Appendix G of the Phase III ESA (BluMetric, 2023a); however, key findings include:

- The existing runway has a structure consisting of loose sand with trace gravel and trace cobble overlying sand, is relatively level and clear of debris.
- The existing airstrip is suitable for DHC-6 Twin Otter or possibly a DC-3 aircraft equipped with skis.

- Although a Cat Train could likely access the site in the winter months, it did not appear to be practical given that the terrain between the Site and the nearest community (Baker Lake) is kettled, exhibits steep side slopes in many areas and there are several streams, rivers and lakes that prohibit access during the summer months.

Subsequent to the field program, BLM contacted various contractors to explore access options for the Site. While overland access is possible, the potential for impacts to wildlife and archaeological features, complex permitting requirements, anticipated high cost, and prolonged project timeframe were deemed prohibitive from both a cost and logistics perspective. Overland access was not considered further. Follow on discussions with charter companies and contractors confirmed the assessment regarding overland access, but also identified the possibility of landing aircraft similar in size to the DC-3 on an ice strip on one of the lakes in the area. This would require the development of a short winter hauling trail (approximately 15 km) for access from the airstrip to the main Pelly Lake Site and winter ice strip.

1.4.3 Community Consultation

Pelly Lake Former Airstrip Remediation – Community Engagement Minutes. **BluMetric Environmental Inc., May 18 2023. (BLM 2023d)**

A community engagement meeting was held in Baker Lake on May 18, 2023. A total of 27 community members signed into the meeting along with young adults and children. The meeting included a presentation which provided an overview of the project, work completed to date, and remediation/risk management options. Discussion was encouraged throughout the presentation and a period of questions and answers was held following the presentation.

The discussion provided local insight pertaining to the remediation of the Site. During the community engagement session, CIRNAC committed to the removal of all hazardous material from the Site for off-site disposal. CIRNAC acknowledged the community's request to remove all non-hazardous debris but clarified that the non-hazardous debris posed a low risk to human health and the environment. CIRNAC committed to removing non-hazardous debris as long as it was logistically feasible to do so. The community members acknowledged that the cost and logistics associated transporting heavy equipment to the Site and debris from the Site would be high. Community members also brought forth ideas for site access including a winter ice landing strip with a haul trail to the Site. The winter ice strip would allow larger aircraft to access the Site which could cut the number of flights necessary to haul the waste away. A community member also noted the soft conditions of the soil at the site. The soft conditions could pose challenges to the movement of larger equipment at the site.

A member of the community identified the possibility of a burial on site. BluMetric's archaeologists met virtually with the interested party and provided maps, photographs, and descriptions of areas on site. An approximate area of the burial site has been identified and will be protected during any future remedial work.

1.5 PREVIOUS STUDIES – ENVIRONMENTAL CONDITION OF THE PROPERTY

1.5.1 Environmental Site Assessments

Phase III Environmental Site Assessment, Pelly Lake Former Airstrip and Fuel Cache Site. Pelly Lake, Nunavut. **BluMetric Environmental Inc., March 2023. (BLM 2023a)**

Several studies have been completed for the Site and are listed in **Table 2**. These studies identified several Areas of Environmental Concern (AECs) and/or Areas of Potential Environmental Concern (APECs) and associated COCs that were investigated in the summer of 2022 with the goal of confirming presence/absence of impacts and delineating known impacts.

Table 2: Summary of Previous Site Studies

Previous Study/Assessment	Reference
Limited Phase I Environmental Site Assessment, Site Number KW018, Pelly Lake, Nunavut. Water and Earth Science Associates Ltd., February 2006.	WESA 2006a
Limited Phase II Environmental Site Assessment, Site Number KW018, Pelly Lake, Nunavut. Water and Earth Science Associates Ltd., April 2006.	WESA 2006b
Summary of Records Review and Gap Analysis, Pelly Lake Former Airstrip and Fuel Cache Site, Pelly Lake, Nunavut. BluMetric Environmental Inc., August 2022.	BLM 2022b

Soil impacts were partially or wholly delineated through the Phase III ESA sampling program however delineation of sediment was not achieved. Estimated quantities of contaminated soil and sediment, including co-mingled contaminants, were documented in the Phase III ESA work (BLM 2023a). These are detailed in **Table 3.**

Table 3: Summary of Impacts to Soil and Sediment

Summary of the Phase III ESA Findings (BLM 2023a)		
Impact Group	**Area of Impacts**	**Estimated Quantity of Impacted Media**
AEC 1 – Campsite Area Pond	POND1 (surface water): aluminum, cadmium, copper, iron, lead	Surface Water: Surface Area: 3,298 cubic metres (m2) Depth: unknown Volume: N/A
	POND2 (sediment): copper, lead	Sediment: Surface Area: 32.9 m2 Depth: 0.3 m Volume: 9.9 m3
	POND3 (sediment): PAH (acenaphthene, acenaphthylene, dibenz[a,h]anthracene)	Surface Area: 17 m2 Depth 0.3 m Volume: 5.1 m3
AEC 2 – Campsite Area	CAMP5 (soil): PHC F2 and F3	Surface Area: 82 m^2 Depth: 1.0 m Volume: 82 m^3
	CAMP11 (soil): PHC F2 and F3	Surface Area: 173 m^2 Depth: 0.6 m Volume: 103.8 m^3
AEC 3 – Site #1	S1-1 (soil): PHC F3 and F4	Surface Area: 34.5 m2 Depth: 0.6 m Volume: 20.7 m3
	S1-2 (soil): PHC F3 and F4	Surface Area: 35.5 m^2 Depth: 0.6 m Volume: 21.3 m^3
	S1-3 (soil): PHC F3 and F4	Surface Area: 76 m^2 Depth: 0.6 m Volume: 45.6 m^3
	DF-1 (soil): Dioxins and Furans TEQ	Surface Area: 29 m^2 Depth: 0.9 m Volume: 26.1 m^3
AEC 4 – Site #2	S2-1 (soil): PHC F3	Surface Area PS11: 21.4 m^2 Depth PS11: 0.9 m Volume PS11: 19.3 m^3 Surface Area PS12: 42.8 m^2 Depth PS12: 0.6m Volume PS12: 25.7 m^3 Total Volume: 45 m^3

Summary of the Phase III ESA Findings (BLM 2023a)		
Impact Group	**Area of Impacts**	**Estimated Quantity of Impacted Media**
	S2-2 (soil): PHC F1	Surface Area: 212 m^2 Depth: 0.9 m Volume: 190.8 m^3
	GW (groundwater): metals (aluminum, cadmium, copper, iron, lead, manganese, zinc)	Surface Area: unknown Depth: N/A Volume: N/A
Estimated volume of contaminated soil		**535.3 m^3**
Estimated volume of contaminated sediment		**15 m^3**

Note:

The total estimated volume of soil contaminated with PHC is 509.2 m^3 and dioxins and furans is 62.1 m^3.

As part of the Phase III ESA, a limited hazardous and non-hazardous building material assessment (LHBMA) was also completed. Three building material samples were collected from a debris area east of AEC 4 with results confirming that the material was not asbestos containing. Liquid samples were collected from a tank and two barrels and results indicated that the tank sample (T1) and one barrel sample (B1) were significantly diluted with water, but that barrel sample (B2) contained high concentrations of petroleum hydrocarbons (PHCs) fractions F2 through F4.

During the field program a debris inventory was created for each AEC. Using this inventory and the topographic drone survey, a volume estimate for on-site debris was created. A 25% void space was applied to the debris piles as the survey does not factor it in. Based on this approach, the estimated total volume of on-site debris is approximately 172.77 m^3. From the survey, the estimated total number of barrels on-site is 710 and tanks is 49.

1.5.2 Human Health and Ecological Risk Assessment

Human Health and Ecological Risk Assessment, Pelly Lake Former Airstrip and Fuel Cache Site, Nunavut. **BluMetric Environmental Inc., May 2023 (BLM 2023b)**

The Human Health and Ecological Risk Assessment (HHERA) was carried out using data collected in 2022, as part of the 2023 Phase III ESA conducted by BLM. The objective of the HHERA was to evaluate whether COCs identified during the Phase III ESA pose unacceptable risks to humans and/or ecological receptors.

The Human Health Risk Assessment (HHRA) assessed aluminum, cadmium, copper, iron, lead, PHC F1, F2, F3, and F4, and dioxins and furans in soil for the direct contact pathway (i.e., humans directly touching soil). COCs identified in surface water included aluminum, cadmium, copper, iron, and lead, and in sediment included copper, lead, and PAHs. Exposures routes assessed

including inadvertent ingestion, dermal contact and inhalation for soil and ingestion for surface water.

Following COC screening, soil showed no risk for human health on Site and a qualitative HHRA was conducted for the Site for lead and iron in surface water. As people do not live at the Site, they are not drinking the water every day. Furthermore, the lead and iron exceedances were found in the very shallow drainage ditch that leads to the Campsite Area Pond which is unlikely to be used as a source of drinking water. Based on this, the exceedances in surface water for lead and iron at the Campsite Area Pond (AEC 1) were not considered to be a human health risk). As there are no federal or provincial sediment quality guidelines for the protection of human health, and human contact with sediments is considered to be minimal at the Site, risk to human health from sediment was not discussed in the HHRA.

The Ecological Risk Assessment (ERA) evaluated the risk to plants, wildlife, the aquatic community, and Species at Risk (SAR) that would forage at the Site. A qualitative evaluation was undertaken for wildlife and SAR as the maximum measured concentrations at the Site were below ecological guidelines and therefore wildlife and SAR were not considered at risk.

Petroleum hydrocarbons (PHCs) were identified in soil for the assessment of vegetation. The results of the ERA showed that there are no risks to vegetation due to the presence of PHCs in soil as they are spatially limited across the Site and there was little to no vegetation observed to be growing in the areas where the guidelines were exceeded. Lead and iron in sediment were considered to be the only COCs for the Campsite Area Pond. While aquatic communities are not expected to be at risk in the Campsite Area Pond, there is the potential for localized effects in aquatic communities and it was recommended that remedial activities at the Site focus on the area of impacted sediment (shallow drainage channel entering Campsite Area Pond).

2 PROJECT RATIONALE

Although the Phase III ESA (BLM 2023a) completed for the Pelly Lake Site identified four AECs with identified soil and/or sediment and/or surface water impacts, the HHERA (BLM 2023b) completed for the Site identified no human health or ecological risks associated with most of the AECs. The exception was the potential for localized effects in aquatic communities resulting from lead exposure from the impacted sediment. It was recommended that remedial activities at the Site focus on the area in the shallow drainage channel entering Campsite Area Pond.

The Site also contains both hazardous and non-hazardous debris that pose a health and safety risk to wildlife and any visitors to the Site. The remedial strategy was informed by discussion with the community, in which the preference for removing all debris was stated. However, it was also acknowledged that the cost and logistics associated with transporting heavy equipment and debris to complete this remediation option would be high. See 2.4 below for details.

2.1 SUMMARY OF ITEMS REQUIRING REMEDIAL ACTION

Based on the findings of the Phase III ESA and the HHERA and feedback during the community engagement session, the areas requiring remedial action are categorized into Impacted Sediment **(Table 4)**, Hazardous Waste **(Table 5)** and Non-Hazardous Waste **(Table 6)**. The volumes of waste are outlined below, details are available in **Appendix A** and their locations are documented in **Figures 3** and **4a-e**.

Table 4: Impacted Sediment

Impacted Sediment	Estimate Volume of Sediment
Total Estimated Volume of Contaminated Sediment	6.1 m^3

Table 5: Hazardous Waste

Type of Waste	Estimate Volume of Waste
Total Debris	0.10 m^3
Total Paint	0.52 m^3
Total Liquid and Drum/Tank Residues	6.64 m^3

Note: Includes the full barrel of liquid at Site#2 Fuel Cache

Table 6: Non-Hazardous Waste

Type of Waste	Estimate Volume of Waste
Wood Debris	45.9 m^3
Metal Debris	70.8 m^3
Construction Debris	15.3 m^3
Household Debris	0.3 m^3
Tanks	27.5 m^3
Barrels	13.2 m^3
Total Liquid	0.35 m^3

2.2 ALTERNATIVES CONSIDERED

A Remedial Options Assessment (ROA) was completed in 2023 (BLM 2023c). The available remediation and risk management options for the Site were pre-screened for regulatory requirements, community acceptance, material availability, allowance for traditional land use, preservation of areas of historic value and climate resilience and only those passing the pre-screening were subject to the more detailed evaluation using a Remedial and Risk Management evaluation matrix. This allowed the evaluation to focus only on options that met the feasibility requirements specified by the client and project stakeholders.

The options passing the pre-screening moved to the Remedial and Risk Management evaluation matrix. This matrix scored the remedial options against five criteria: effectiveness, ease of implementation, anticipated socio-economic benefit, anticipated cost and anticipated carbon footprint generating a numerical score to identify the preferred approach. The full methodology can be found in the ROA (BluMetric, 2023c).

A summary of the results can be found in **Table 7** with details found in the ROA (BluMetric, 2023c).

Table 7: Summary of ROA Results

Waste Type	Remedial and/or Risk Management Options Evaluated	Preferred Remedial Option
Impacted Sediment	1) Excavation and southern, off-site disposal 2) Excavation and disposal on-site 3) Signage and long term monitoring	Excavation and southern, off-site disposal
Hazardous Waste	1) Southern, off-site disposal 2) On-site disposal 3) Consolidate waste and long term monitoring	Southern, off-site disposal
Non-hazardous Debris	1) Southern, off-site disposal 2) On-site disposal 3) Consolidate waste and long term monitoring	Southern, off-site disposal

2.3 REMEDIATION STRATEGY

The remediation strategy was informed by previous studies including the Phase III ESA (BLM 2023a), the HHERA (BLM 2023b), the ROA (BluMetric 2023c) and the community engagement (BluMetric 2023d) and was documented in the Remedial Action Plan (RAP) (BluMetric 2023e).

The proposed work is anticipated to be completed in two stages encompassing two summers and one winter. Phase 1 will occur over 8-12 weeks in Summer 2025 with the mobilization of the project team and equipment, execution of the remedial works and demobilization of equipment. Phase 2 will occur over 4-8 weeks in Winter 2026 with the demobilization of waste materials and

extend into Summer 2026 with a final inspection and removal of any remaining items. Details are provided below, and proposed work areas are shown on **Figure 5**.

Personnel and staff will be housed during Summer 2025/Winter 2026 on Site in a temporary camp and water, wastewater and waste management will be required. It is anticipated that the site cleanup will require approximately 12 to 15 workers to be on Site completing the cleanup activities. Workdays are expected to be 10 hours on site with 2 hours of additional time for travel and safety/administrative meetings that may occur on site or in the community. Wildlife monitors, equipment operators and labourers will be sourced from local communities where possible.

Due to challenging access to the Site, equipment requirements will be kept to a minimum and are assumed to include: a drum crusher, drum and tank cleaning equipment, ATVs, trailers, and hand tools.

Stage 1 (Summer 2025):

- Maintenance of the airstrip and on site trails;
- Mobilization of personnel, equipment, materials and support facilities, including fuel by fixed wing aircraft;
- Construction of a temporary construction camp including camp, fuel storage area, staging areas and establishment of water intake;
- Excavation of impacted sediment;
- Inspection of large debris/equipment to be left on site and removal of all hazardous materials (e.g. paint, oils, fuel);
- Collection, cleaning and crushing of barrels/dismantling of tanks;
- Collection and sorting of debris;
- Burning of unpainted/untreated wood debris;
- Excavation of borrow material (aggregate) and regrading as required;
- Segregation, consolidation, packaging and containerization of all impacted sediment, debris (hazardous and non-hazardous) and equipment for shipment;
- Deconstruction of the temporary camp and packaging for removal. The temporary camp will be re-established for the winter demobilization program.

Weekly or biweekly shipments are expected throughout the duration of Summer 1. Demobilization by air of hazardous wastes and other items equipment may occur in Stage 1 depending on the size and type of aircraft available and ability to land on site.

Stage 2 (Winter /Summer 2026):

- Construction of a temporary construction camp including camp, fuel storage area, staging areas and establishment of water intake;
- Construction of a winter access trail and ice strip;
- Demobilization (winter) by fixed wing aircraft of all consolidated materials on site including, but not limited to, fuel, equipment, materials, hazardous waste, non-hazardous waste, and contaminated sediment;
- Deconstruction of the temporary camp (including all waste and fuel) and packaging for removal.
- Final inspection and collection of any remaining small debris will occur following spring thaw.

A Site-Specific Environmental Health and Safety Plan and Management Plans will be developed for the project that will include (but are not limited to):

- On-site Contingency and Emergency Response Plan;
- Spill Contingency Plan;
- Fire Safety Plan;
- Wildlife Encounter and Management Plan;
- Fuel Management Plan;
- Historical, Archaeological and Cultural Resources Plan;
- Wildlife Protection Plan;
- Erosion Sediment and Drainage Control Plan;
- In Stream or Near Water Works Work Methodology Plan;
- Mobilization and Demobilization Plan; and
- Airstrip and Site Access Road Upgrading and Maintenance Plan.

2.3.1 Impacted Sediment

The impacted sediment will be removed and disposed of off site. This was the preferred outcome in the ROA and the community engagement session. Due to the relatively small volume of impacted sediment (6.1 m^3), impacted material will be removed by hand and packaged in suitable containers or drums for shipment off site. If possible, the impacted sediment will be removed at the end of Phase 1. Alternatively, it will be shipped off site with the other materials in Phase 2 (winter).

2.3.2 Hazardous Materials

The hazardous materials requiring removal include:

- Hazardous Debris – 0.10 m^3;
- Total Lead Paint – 0.52 m^3;
- Liquid (Fuel, Fuel Residues and Vehicle Fluids) – 6.63 m^3.

The hazardous liquid waste to be removed from site is assumed to one drum of known PHCs, the estimated volume of fluids that remain in the machinery and vehicles on site and the sludge resulting from the cleaning of the fuel drums and tanks.

The hazardous materials will be collected and placed into suitable containers or drums for shipment off site. If possible, the hazardous materials will be removed at the end of Phase 1. Alternatively, it will be shipped off site with the other materials in Phase 2 (winter). A summary of hazardous debris to be removed is found in **Table 8**.

On-site treatment and discharge of water produced during tank and drum cleaning was assumed and would need to be permitted through a water license.

Table 8: Summary of hazardous debris to be removed from Site.

Item #	Area Description	APEC ID	Hazardous Debris				
			Batteries (m^3)	Vehicle Fluids (m^3)	Lead Paint (m^3)	Liquid and Drum/Tank Residues (m^3)	Total Volume (m^3)
1	Campsite Food Cache	1	-	-	-	0.3	0.3
2	Immediately West of the Food Cache	1	-	-	-	-	0
3	Northwest of Food Cache	1	0.1	-	-	-	0.1
4	West of Food Cache	1	-	0.01	0.25	-	0.31
5	North of Food Cache – 1	1	-	-	-	-	0
6	North of Food Cache – 2	1	-	-	-	-	0
7	Southeast of Food Cache	1	-	0.01	-	-	0.01
8	Site #1 Fuel Cache (South Pile)	2	-	-	-	-	0
9	Site #1 Fuel Cache (Middle Pile)	2	-	-	-	0.7	0.7
10	Site #1 Fuel Cache (North Pile)	2	-	-	-	1.2	1.2
11	North of Site #1 Fuel Cache	2	-	-	-	-	0
12	West of Site #1 Fuel Cache	2	-	0.01	0.15	-	0.21
13	Site #1 Drum Pile (S)	2	-	-	-	-	0
14	Site #2 Fuel Cache	3	-	-	-	2.8	2.8
15	East of Site #2 Fuel Cache	3	-	-	-	-	0
16	Southwest of Site #2 Fuel Cache	3	-	-	0.12	-	0.1
17	Drinking Water Lake	4	-	-	-	-	0
18	Landing Lakes	5	-	-	-	0.1	0.1
19	Empty Fuel Drums Throughout the Site	n/a	-	-	-	1.3	1.3
Total Debris			**0.10**	**0.03**	**0.52**	**6.40**	**7.05**

Note: Totals may not add up due to rounding.

2.3.3 Non-Hazardous Debris

A significant volume of non-hazardous debris is present on site. Details are provided in **Table 9**.

Clean wood debris (unpainted and/or untreated) will be burned on-site. Following incineration, ashes will be collected and placed into suitable containers or drums for shipment off site. If possible, the ash will be removed at the end of Phase 1. Alternatively, it will be shipped off site with the other materials in Phase 2 (winter).

Large non-hazardous debris that will remain on-site includes the old D4 bulldozer, and a large steel cart with an old turbine aircraft engine on. These items will be inspected for any remaining fuels/liquids within the equipment and the paint will be tested for lead and PCBs. If there are any liquids within the large equipment, they will be drained, placed into suitable containers or drums for shipment off site. If the paint contains lead or PCBs, it will be scraped off and placed into suitable containers or drums for shipment off site. If possible, any hazardous materials will be removed at the end of Phase 1. Alternatively, it will be shipped with the other materials in Phase 2 (winter).

All remaining non-hazardous debris on site will be packaged and consolidated for removal. Removal of non-hazardous materials is planned Phase 2 (Winter). During the staging period all debris will be packed in mega bags, on skids, or equivalent for removal by aircraft.

Table 9: Summary of Non-hazardous Debris Quantities Grouped by Management Strategy

Item #	Area Description	APEC ID	Non-Hazardous				
			Total Debris for Removal			Total Debris Managed on Site	
			Metal (m^3)	Other[1] (m^3)	Water Tank (m^3)	Burnable Wood (m^3)	Items Staying Onsite (m^3)
1	Campsite Food Cache	1	3.4	1.3	-	4	-
2	Immediately West of the Food Cache	1	0.5	0.25	-	13	-
3	Northwest of Food Cache	1	4.1	-	-	9.9	-
4	West of Food Cache	1	0.6	-	-	-	16.7
5	North of Food Cache – 1	1	0.2	1	-	4	-
6	North of Food Cache – 2	1	6.6	-	-	10	-
7	Southeast of Food Cache	1	2.6	0.66	-	-	-
8	Site #1 Fuel Cache (South Pile)	2	3.2	-	-	-	-
9	Site #1 Fuel Cache (Middle Pile)	2	3.2	-	-	-	-
10	Site #1 Fuel Cache (North Pile)	2	5.5	-	-	-	-
11	North of Site #1 Fuel Cache	2	2	7	-	2.7	-
12	West of Site #1 Fuel Cache	2	-	-	-	-	25
13	Site #1 Drum Pile (S)	2	0.1	-	-	-	-
14	Site #2 Fuel Cache	3	20.4	-	0.3	-	-
15	East of Site #2 Fuel Cache	3	2.7	7	-	2	-
16	Southwest of Site #2 Fuel Cache	3	12	-	-	-	-
17	Drinking Water Lake	4	0.2	-	-	-	-
18	Landing Lakes	5	0.9	-	-	-	-
Total Debris by Material			**68.3**	**17.2**	**0.3**	**45.6**	**41.7**
Total Debris for Removal and/or On-Site Management			**85.9 m^3**			**87.3 m^3**	

Notes: Non-Hazardous Waste = tar paper, household items, glass, tires, and tubing; Totals may not add up due to rounding.

3 PROJECT APPROVAL AND PERMIT REQUIREMENTS

3.1 APPLICABLE LEGISLATION

The applicable federal land territorial legislation that applies to the project includes, but is not limited to, the list in **Table 10** below.

Table 10: Summary of Applicable Legislation

Federal References and Codes	Territorial References and Codes
Abandoned Military Site Remediation Protocol (Indian and Northern Affairs Canada (INAC), 2008). Canada Labour Code Part II-Occupational Health and Safety (R.S. 1985, c.L-2). Canada Occupational Health and Safety Regulations (SOR/86-304). Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2008). Canadian Environmental Protection Act, S.C. 1999 (S.C. 1999, c.33) a.SOR/2002-318. Canadian General Standards Board (CGSB), CAN/CGSB-1.205-2003, Sealer for Application to Asbestos-Fibre-Releasing Materials. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (Canadian Council of Ministers of the Environment; CCME, 1999). Canadian Standards Association (CSA), Signs and Symbols for the Workplace CAN-Z321-96 (R2006). CSA-S350-M1980, Code of Practice of Safety in Demolition of Structures. Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 1999). Environment Canada Technical Document for Batch Waste Incineration, EC, 2010. Export and Import of Import of Hazardous Waste and Hazardous Recyclable Material Regulations (EIHWHRMR) (SOR/2005-149) a. SOR/2021-25.	Environmental Guideline: Ambient Air Quality, (Nunavut) 2023. Environmental Guideline for the Burning and Incineration of Solid Wastes (Nunavut) October 2010, Revised January 2012. Environmental Guideline for Contaminated Site Remediation, (Nunavut) Revised March 2009. Environmental Guideline: Dust Suppressants, (Nunavut) March 2023. Environmental Guideline: General Management of Special and Hazardous Waste, (Nunavut) March 2023. Environmental Guideline: Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities, (Nunavut) April 2002. Revised April 2011. Environmental Guideline: Management of Contaminated Sites. (Nunavut). April 1999, Revised December 2014. Environmental Guideline: Spill Contingency Planning and Reporting Regulations, (Nunavut) March 2023. Environmental Guideline for Waste Batteries (Nunavut), January 2002, Revised January 2011. Environmental Guideline for Waste Lead and Lead Paint (Nunavut), November 2001, Revised April 2014. Environmental Guideline for Used Oil and Waste Fuel (Nunavut), June 2012.

Federal References and Codes	Territorial References and Codes
Guidelines for Canadian Drinking Water Quality (Health Canada) August 2024. Hazardous Waste Worker Training Manual: Canadian LIUNA Contractors Training Council, 1992. Health Canada / Workplace Hazardous Materials Information System (WHMIS 2015), Safety Data Sheets (SDS). Fisheries Act (R.S.C., 1985, c. F-14). Interprovincial Movement of Hazardous Waste Regulations (SOR/2002-301). Migratory Birds Convention Act (S.C. 1994, c.22). Motor Vehicle Safety Act (S.C. 1993, c.16). National Building Code of Canada, 2020. National Fire Code of Canada, 2020. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: National Institute for Occupational Safety and Health (NIOSH) Publication No. 85-115. Territorial Lands Act (R.S.C. 1985), including Territorial Quarrying Regulations (C.R.C, c. 1527). Territorial Land Use Regulations (C.R.C., c.1524). Territorial Quarrying Regulations (C.R.C., c. 1527). Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34) Transportation of Dangerous Goods Regulations (SOR/2001-286) a.SOR/2011-60. Treasury Board Hazardous Substances Directive, Procedure 4-3 – Occupational Exposure to Asbestos. Species at Risk Act (S.C. 2002, c. 29). Storage Tank System for Petroleum Products & Allied Petroleum Products Regulations (SOR / 2008-197).	Environmental Guideline for Waste Asbestos (Nunavut), January 2002, Revised January 2011. Environmental Guideline for Waste Solvents (Nunavut), January 2002, Revised January 2011. Environmental Guideline for Used Oil and Waste Fuel (Nunavut), June 2012. Environmental Protection Act (Nunavut) (R.S.N.W.T. 1988, c. E-7) a. 1998, c.21, c.24. Fire Prevention Act, R.S.N.W.T. (NU) 1988, c.F-6. Guidelines for Spill Contingency Planning (INAC) April 2007. Mine Health and Safety Act – Environmental Tobacco Smoke Worksite Regulations, (Nunavut) November 2003. Northwest Territories & Nunavut Codes of Practice for Asbestos Abatement, 2018. Northwest Territories and Nunavut, Working with Lead Guideline, May 2017, WSCC. Nunavut Labour Standards Act, RSNWT. 1988, c.L-1. Nunavut Safety Act, R.S.N.W.T. 1988, c S-1. Nunavut Waters and Surface Rights Tribunal Act (S.C. 2002, c.10). Occupational Health and Safety Regulations, NU, Reg 003-2016. Public Health Act, R.S.N.W.T. (Nunavut) 1988, c.P-12. Spill Contingency Planning and Reporting Regulations (R-068-93), July 1993 (Nunavut). Transportation of Dangerous Goods Regulations, NU Reg 009-2017. Wildlife Act (S.N.U, 2003, c.26).

3.2 AUTHORIZATIONS AND APPROVALS

The scope of the project triggers the three known authorizations listed in **Table 11** below.

Table 11: Summary of Authorizations Required

License/Permit/ Authorization	Regulatory Authority
Land Use Permit	**CIRNAC** Tracey McCaie Manager, Lands Administration 867-975-4280 Tracey.mccaie@rcaanc-cirnac.gc.ca
Quarry Permit	
Water Licence	**Nunavut Water Board** Richard Dwyer, Manager of Licensing Tel.: 867-360-6338 ext. 27; richard.dwyer@nwb-oen.ca

4 DETAILED PROJECT DESCRIPTION

The remedial program will be competitively procured, with the contractor making final decisions regarding the implementation strategy. The scope of the project elements described below is the anticipated approach to be used based on the proponent's knowledge of site access, site conditions and remedial activities required. If the scope changes, the EIA will be updated to address any new or different impacts and associated mitigation measures.

4.1 SCHEDULE

The remediation project is expected to take approximately 1.5 years to complete. The proposed work is expected to be complete over two phases encompassing two summers and one winter.

Phase 1 will occur over 8-12 weeks in Summer 2025 with the mobilization of the project team and equipment, execution of the remedial works and demobilization of equipment. If possible, hazardous materials will be removed at this time.

Phase 2 will occur over 4-8 weeks in Winter 2026 with the demobilization of waste materials. Phase 2 will extend into Summer 2026 with a final inspection and removal of any remaining items. Details are provided below, and proposed work areas are shown on **Figure 5**.

4.2 MOBILIZATION

Mobilization of the camp and all the necessary equipment needed to complete the remedial work will occur in Phase 1 (Summer 2025, July - September) from Baker Lake, Nu. The camp and equipment will be mobilized via a small, fixed wing aircraft on the existing landing strip at the Site. Some improvements to the airstrip may be required to facilitate the landing of larger aircraft during the summer months but the assumption is that only small aircraft will be able to access the site.

4.3 TEMPORARY CAMP AND PERSONNEL

It is assumed that the Camp in Summer 2025 will be located at the eastern end of the current airstrip due to the flat topography of the area and proximity of the work. The Camp in Winter 2026 will be established near the vicinity of the winter ice strip. The Camp facilities shall consist of, but not be limited to:

- Approved toilet facilities
- Camp wastewater collection, treatment, and disposal systems.
- Waste, refuse, and garbage collection and disposal system.
- Camp fire prevention, alarm and firefighting system.
- Camp and site facilities safety and security service.
- Meals and catering service.
- Shower/wash facilities.
- Sleeping facilities.
- Janitorial services.
- First Aid facilities and service.

The camp will include all Utilities and services required for camp facilities including, but not limited to, heating, electricity, lighting, fuel, potable water and camp hygiene wash water systems.

4.4 EQUIPMENT, FUEL AND HAZARDOUS MATERIALS

Assumed equipment, fuel, and hazardous materials to be used on Site during the Project have been summarized in **Table 12** and **Table 13** below. Due to challenging access to the site, equipment requirements will be kept to a minimum and are assumed to include: a drum crusher, drum and tank cleaning equipment, ATVs, trailers, and hand tools. The Contractor will comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding employee training, use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS), as required by WHMIS.

Table 12: Summary of Equipment Requirements

Type and Estimated Number	Model (example only)	Proposed Use
3 – ATVs & trailers	Honda	Summer transportation – wildlife monitors & staff
3 – Snowmobiles & sleds	Honda	Winter transportation – wildlife monitors & staff
1 – Barrel crusher	DC5000	Summer 2025 remediation
1 – Tank cleaning equipment	-	Summer 2025 remediation
3 – Acetylene Torch	-	Summer 2025 remediation
3 – Metal Saws	Stihl TS700	Summer 2025 remediation
Outfitted, Tent Camp	Weatherhaven or Equivalent	Accommodation camp
2 – Diesel generator	80 kw	Camp power/electrical heating
2 - Barrel pumps	-	Fuel transfer
1 – Water pump	2" Honda water pump	Non-potable water supply
1 – Incinerator	Cyclonator	Solid waste disposal
1 – Small forklift/Pump cart	-	Loading aircraft

Table 13: Summary of Anticipated Fuel Requirements

Fuel Type	Estimated Quantity	Proposed Use
Gasoline	2,050 L	Vehicles
Diesel	10,000 L	Generator fuel
Aviation Fuel	121,600 L	Aircraft fuel
Hydraulic Oil and Motor Oil	50 L each	Equipment and vehicle maintenance
Grease	25 tubes	Equipment and vehicle maintenance
Propane	45kg tank	Camp heating and cooking
Acetylene	800 cubic feet	Cutting metal debris
Oxygen	1600 cubic feet	Cutting metal debris

The fuel storage area will be located adjacent to the construction camp. It will be lined with an oil-resistant membrane and protected by either geotextile or plywood. Berms will be built around the perimeter of the storage area. Drums containing fuel will be stored in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded.

When not in use, drums will be covered with tarpaulins to prevent water from pooling. Refuelling and fuel transfer will be done only by qualified personnel. An electric ULC-approved mobile fuel pump with an automatic shut-off will be used for refuelling equipment directly from the drums. The refuelling will not be permitted within 30m of a watercourse. Drip pans, and spill kits (booms and pads) will be present during refuelling activities. Emergency spill equipment will include at least two fuel pumps, empty 200 litre barrels and absorbent material sufficient to clean up a 1000 litre spill at all fuel storage sites.

4.5 Borrow Requirements

It is estimated that approximately 6.1 cubic metres of compacted and slightly mounded soil may be needed to fill the excavated sediment area. A bulking factor of 1.3 for the borrow material has been assumed for the backfill area of the sediment. A total of approximately 7.9 cubic metres may be required to backfill the excavated sediment area. Possible sources are detailed on **Figure 6**.

The summer program will take place using small ATVs and on foot. As such, it is not anticipated that a significant amount of borrow material will be required for regrading related to on site trails and access. The borrow sources presented on **Figure 6** represent potential areas where material may be sourced, and the majority of material required will likely be sourced from one or two of these potential locations.

The temporary camp, laydown and storage areas are anticipated to be located at the eastern end of the airstrip in an area that is already flat and compact. Borrow requirements are therefore expected to be minimal during the summer program. The winter trails and ice landing strip will be constructed using snow and ice. As such, the need for borrow material is not anticipated for the winter program.

4.6 Access Trails and Laydown Areas

All equipment, machinery, camp materials and supplies will be mobilized to site via small, fixed wing aircraft landing on the existing landing strip at the Site. It is assumed that the summer laydown area for waste and equipment will be established adjacent to the Camp.

All waste to be removed from the Site will be collected and consolidated in the laydown area and labelled to meet all governing regulations. The on-site waste will be accessed on foot or on All-Terrain Vehicle (ATV). The terrain at the site is composed primarily of sand and gravel and may be loose in areas. ATV tires may need to be equipped with low pressure tires. Additional portable mats or pads may be required to facilitate access to debris areas so that material can be consolidated and transported to the laydown area.

From the Site laydown area, the waste will be transported to the staging area adjacent to the ice landing strip during the winter months (location to be determined). A winter access trail (location to be determined) will be constructed from the Site to the proposed ice landing strip location during the winter months. Based on a preliminary review of nearby lakes that could accommodate the ice landing strip, the winter access trail will have a length of approximately 15 kilometres. The access trail will be constructed on snow and ice. Sleds, towed by snow machines or other small, tracked vehicles, will be used to transport all waste and other materials from the

Site to a winter staging area adjacent to the proposed ice landing strip to facilitate final demobilization.

From the staging area, the waste will be hand-loaded using ramps onto the fixed wing aircraft, or if possible, with pump carts/a small forklift and shipped to Baker Lake, Nunavut. The waste will be staged in Baker Lake until it is able to be transported via barge to barging ports in either Quebec or Manitoba. The hazardous and non-hazardous wastes will then be shipped over land to one or more appropriate waste facilities. The transportation of hazardous materials must follow the transportation of hazardous goods regulations.

4.7 IMPACTED SEDIMENT

Impacted sediments are anticipated to be limited to the drainage channel itself. Prior to the removal of contaminated sediments, a silt curtain will be installed downstream to limit sandy fines from entering the water body. A downstream sump will also be installed to collect/pump the sediment laden water into a sediment bag at a suitable discharge location. All sediment designated for removal will be excavated from the Site using hand tools and placed in a suitable container for transport off site. The contaminated sediment will be transported to the staging area to await shipment to the south for disposal in a licensed waste facility.

In the event that the excavation of sediments at AEC1 (**Figure 3**) results in a change in function of the drainage channel or in a change in the direction of flow, regrading and/or the placement of clean backfill material (comparable to native sediments) should be applied to match the pre-existing conditions.

In the event that backfilling is deemed required, the new backfill material should be washed in isolation from flowing water, to remove some of the finer material and to ensure that it effectively settles and remains in place. During the washing stage, a downstream sump will be established, and the sediment laden water will be transferred to a sediment bag at a suitable discharge location. A silt curtain will be installed downstream to limit sandy fines from entering the water body.

4.8 DEMOLITION

Demolition of the wood structure, lined with sheet metal, and containing tar paper in the roofing will be conducted by trained workers.

Removal of suspected lead-based paint from the carts and bulldozer on site will be conducted by trained workers certified in lead abatement work. The removal of the lead-based paint should be carried out using methods that reduce the generation of lead dust or the dispersion of lead paint chips. The removed lead-based paint will be stored in acceptable containers for hazardous materials.

The Contractor will be required to provide a supervisor who has experience with lead abatement and barrel and tank cleaning procedures. All hazardous, lead-based paint, and non-hazardous waste would be separated into acceptable approved containers, clearly labelled, and transported to the laydown area.

4.9 Surface Debris

The surface debris will be separated into non-hazardous waste and hazardous waste. The non-hazardous waste will be separated into untreated/unpainted wood (see 4.1.1) and other materials. The other materials will be broken down, if needed.

Non-hazardous materials will be placed into approved acceptable containers (e.g., clean drums, megabags, shipping crates) and then transported to the laydown area in preparation for winter hauling to the ice landing strip. The hazardous materials will be placed into approved acceptable containers (e.g., drums, overpacks, megabags) and then properly labelled and transported to the laydown area. During Phase 2, the material will be hauled to a staging area adjacent to the ice landing strip in preparation for transportation.

4.10 Drums and Tanks

Drums and tanks that contain liquid would be separated from the other surface debris and the liquids will be consolidated in new lined drums to minimize the number of drums and tanks containing liquid as well as the potential for leaks. This procedure will be carried out ensuring containment measures are taken so that no liquid is spilled into the environment. Drums and tanks containing liquid organic wastes are considered hazardous and will need to be stored and consolidated in approved containers with spill containment during their storage in the staging area prior to transport.

The drums will be washed and crushed on site and the tanks will be cleaned, cut up using hand tools, and consolidated prior to placement in the staging area. It is assumed that the cleaning of drums and tanks will result in approximately 2 L of sludge per drum and 100 L of sludge per tank. On-site treatment and discharge of water produced during tank and drum cleaning was assumed and would need to be permitted through the water license. Vapor testing will be done before

cutting and the drums and tanks management will be completed by qualified personnel. Empty drums and tanks on the Site will be classified as non-hazardous once cleaned.

The hazardous materials will be placed into approved acceptable containers (e.g., drums, overpacks, megabags) and properly labelled. All materials will be transported to the laydown area for storage. During Phase 2, the materials will be hauled to a staging area adjacent to the ice landing strip in preparation for transportation.

4.11 Wood Waste

Clean wood is generally described as any wood that is unpainted and/or untreated wood material. All clean wood will be burned on-site as outlined in the AMSRP guidelines (Indian and Northern Affairs Canada, 2009) and the Nunavut Department of Environment – Environmental Guidelines for the Burning and Incineration of Solid Waste (Nunavut Department of Environment, 2012). Burning will be carried out by trained personnel in a controlled area (i.e. burn pad). The Contractor will be responsible for providing a supervisor familiar with safe burning operations.

All ash material will be collected and packaged in acceptable containers and moved to the laydown area for storage. During Phase 2, the materials will be hauled to a staging area adjacent to the ice landing strip in preparation for transportation.

4.12 Debris to Remain on Site

Non-hazardous materials that are too large to ship off site and that are unable to be cut into smaller pieces will be cleaned of all hazardous materials, drained of all liquids, and left on site. These include a D4 bulldozer and a metal cart with an aircraft engine on top.

Some of the large waste is assumed to be coated in lead-based paint which will be removed, packaged, and transported to the laydown areas pending shipment off site. Any waste liquids will similarly be removed, packaged, and will be stored in a special laydown area with spill protection. During Phase 2, the materials will be hauled to a staging area adjacent to the ice landing strip in preparation for transportation.

4.13 Camp Waste

Combustible camp waste will be disposed of by incineration. Non-combustible waste will be collected, packaged in appropriate containers, and shipped off-site for disposal along with all other debris collected during the remediation program. There will be no on-site sewage treatment systems. All waste materials will be shipped off Site for disposal. It is expected that on average 1.5 kg/person/day for a total of 1145 kg will be generated during the on-site components of the remediation.

4.14 Water Management

It is assumed that drinking water will be brought to camp as bottled water.

It is assumed that non-potable water for personal hygiene and dust suppression will be pumped from the former Drinking Water Lake. Domestic water use associated with the camp is estimated to be 7 – 10 m^3/day.

Remedial activities will require water for cleaning and processing tanks and drums, as well as decontamination of equipment as required. Remedial water use is estimated to be up to 20 m^3/day (for up to 9 days), and this volume is not anticipated to be required over the full duration of the remedial program.

The volume of water required is assumed to be in the range of 0 - 50m^3/day for both domestic and remedial use and based on the quantity of water used, an Authorization would be required. However due to the deposit of wastewater from processing tanks and drums a Type B Water License from the Nunavut Water Board is required. Contractors will be required to use a pump that is contained within a rigid containment unit with a liner to contain any leaks. The intake will feature a mesh screen specifically designed to prevent fish from being drawn into the pump during pumping operations.

Grey water sump will be located away from water supplies and drainage areas. Self-contained toilets will be used for blackwater (no on-site discharges). There will be no on-site sewage treatment systems.

Any water resulting from equipment decontamination or drum processing water will be treated on site if feasible and discharged to a sump and/or will placed in containers to be removed for off-site disposal.

4.15 EQUIPMENT FUEL AND HAZARDOUS MATERIALS

Equipment, fuel, and hazardous materials anticipated to be used on Site during the Project have been summarized in **Table 14** below. The Contractor will provide more specific information on the types, quantities, and the MSDS sheets for all fuel and chemicals on site, upon contract award. The Contractor will comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding employee training, use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS), as required by WHMIS.

Emergency spill equipment will include at least two fuel pumps, empty 200 litre barrels and absorbent material sufficient to clean up a 1000 litre spill at all fuel storage sites. Spill mats or pans to be used under mobile fuelling containers and a spill kit is to be maintained at the refuelling area.

Table 14: Summary of Anticipated Fuel Requirements

Fuel Type / Est. Quantity (L)	Equipment	Storage & Handling
Gasoline (~1000)	ATVs, snowmobiles, small equipment (generators, etc.)	- Barrels containing fuel will be stored in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded. - Fuel storage area to be constructed with secondary containment - Storage location to be approved by AHJ
Aviation Fuel (TBD)	Fixed Wing Aircraft	
Propane & Compressed gas	Camp facilities (cooking) Metal Cutting	
Diesel (~10,000)	Camp facilities (generators/heating)	

4.16 SITE CLOSURE AND DEMOBILIZATION

All materials removed from Site will be shipped by fixed wing aircraft. Initial demobilization is expected to occur at the end of Phase 1 (Summer 1). This is expected to include the dismantling, decontamination and removal from site of all Contractor's equipment and transportation of labour from site. If possible, hazardous materials will also be shipped at this time.

A second demobilization will occur in Phase 2 (Winter 1). This will include the removal of all remaining materials on site including the camp facilities and all hazardous/non-hazardous debris scheduled for shipment.

It is assumed that an ice landing strip will be constructed on a nearby lake (up to 15 km away) to allow for larger aircraft landing (location to be determined). An ice/snow winter access trail (location to be determined) would need to be constructed between the Site and an ice landing strip for transportation of non-hazardous debris. The estimated weight of waste on site is approximately 100 m^3 (94,500 kg). Based on this, it is assumed that approximately 21 trips are needed to transport the waste materials off Site using Basler DC3T aircraft or approximately 10 loads using a Lockheed Electra L-188 aircraft. Both aircraft have been identified as potential options for landing on an ice landing strip near the site.

4.17 Off Site Disposal

It is assumed that waste materials shipped off site will be shipped to Baker Lake, where they will be temporally stored until they can be loaded onto a barge for shipment south. The final destination for the waste materials will be determined by the contractor but will be a licensed waste facility.

4.18 Workforce and Human Resources

Based on the scope of work and specified site requirements, a work force of approximately 12 to 15 persons will be required, including a site superintendent/foreman, cook and cook's helper/camp attendant, equipment operators, wildlife monitors, medic, and general labourers. Workdays are expected to be 10 hours on site with 2 hours of additional time for travel and safety/administrative meetings that may occur on site. Wildlife monitors, equipment operators and labourers will be sourced from local communities where possible. The contractor will define the exact schedule, including the duration of work and rotation length.

Contractors will be asked to include an Inuit Participation Plan as part of their submissions. The successful contractor will hire local Inuit labour and utilize local Inuit companies, where possible to complete the work. This may include positions of Equipment Operators, Wildlife Monitors and Labourers. Potential local Nunavut Subcontractors include transportation, camp resupply, and HR support. There are also proposed training opportunities associated with the project including Emergency response, First Aid, Transportation of Dangerous Goods, Fire Safety, Asbestos, and Lead paint abatement.

5 SITE DESCRIPTION

5.1 SITE LOCATION

The Site is situated on a flat area approximately 200 metres above sea level (masl), falling to an elevation of approximately 180 masl within 1 km to the southwest of the Site and within 2 km to the northeast of the Site. A small unnamed lake is present on the downslope southern portion of the Site and several unnamed lakes are present to the east of the Site. The Site is uninhabited and is located on Crown land.

5.2 CLIMATE

No weather station is present near the Pelly Lake Site, and the closest weather station is the Environment Canada Station at Robertson Lake, Nunavut, approximately 125 km southwest of Site. The daily average temperatures varied between -31.9°C in February 2021 and 9.2°C in August 2021 (data corresponding to the period from January to December 2021 (Government of Canada 2022). The average yearly precipitation has not been recorded. The total amount of precipitation received in 2021 was 207.7 millimetres (mm). Daily average temperatures were above 0°C during four months of the year in 2021 (June - September). Precipitation in the form of snow can occur at any time throughout the year, although it is less likely in July and August.

5.3 GEOLOGY

The Site is located on a glacial outwash plain (Canadian Geoscience Map 274, 2015). West of the camp area, this consists of ice-contact sediments, which are described as mainly sand with gravel, moderately to well sorted, massive to stratified, 2 to 15 m thick. East of the camp area are outwash sediments, described as sand with gravel, moderately to well sorted and stratified, and greater than 2 m thick. The primary surficial geology observed during the Phase III ESA was sand, with gravel and cobbles observed in areas to the east of the eastern airstrip.

The previous Phase II ESA for the Site (WESA, 2006) describes the bedrock beneath the Site consisting of archeaen gneiss granite, as indicated on the map titled "Geology – Northeastern District of Mackenzie, NWT" (GSC, 1963). Additionally, the Geological Survey of Canada also confirmed the bedrock beneath the Site consists of Archean gneiss rock, describing it as Archean undivided gneiss (de Kemp, et al. 2006). The area of the Site is generally flat and plateaus above the surrounding area of hummocky terrain and rolling hills. The Site is located within a zone of continuous permafrost (90% - 100% of this zone is underlain by permafrost) (Heginbottom, J.A., 1995).

Soil and geological conditions were confirmed during the 2022 site visit. Field staff recorded ground conditions as predominantly sand with gravel with cobbles. Trace organic material was also noted in the top 0-15 centimetres (cm) of several locations at APEC 1, 2 and 3. No permafrost was encountered during the environmental test pitting, completed to a maximum of 1 meter below ground surface (mbgs). The geotechnical test pitting reported permafrost between 0.9 and 1.2 mbgs but was not present at all test pit locations. Locations where permafrost was indicated were to the southeast, west and northwest of APEC 2 (Site #1), outside of the main runway area but on the sandy plateau.

5.4 HYDROGEOLOGY

Groundwater was not observed in any of the test pits excavated during the BluMetric field investigation but was present in the two piezometers installed at APEC 3 (Site #2). Regional groundwater flow is expected to be influenced by permafrost which generally follows regional topography. Regional groundwater is inferred to flow generally northward, with local groundwater flow direction influenced by local topography, as many hills, valleys and lakes are present in the area.

Permafrost in the area is classified as continuous with low (<10%) ground ice content in the upper 10-20 m of the ground (Geological Survey of Canada (GSC), 1995). Neither permafrost nor bedrock was encountered in any of the environmental test pits dug at the Site, however permafrost was encountered at approximately 0.9 to 1.2 m depth in several of the geotechnical test pits. The permeability of the sandy soils present at the Site is expected to be relatively high. Evidence of a confining layer above the permafrost was not observed, therefore surface water is anticipated to infiltrate through the upper layers to reach the permafrost that defines the active layer (the layer that thaws in warmer months and freezes in colder months). Infiltrated surface water and groundwater is expected to readily flow through the active layer of these soils.

5.5 SURFACE WATER

Pelly Lake is a large lake that is located approximately 6 km southwest of the Site. There are also many lakes located in the area, some of which are interconnected. The Campsite Area is located approximately 10 m from an inland pond (Campsite Area Pond) that drains northward to the smaller of the lakes in the Landing Lakes Area approximately 570 m to the north of the Site. Runoff from the Campsite Area is anticipated to flow into the pond, as indicated by drainage channels observed on the eastern slope of the pond.

Drinking Water Lake is located approximately 650 m west of the Campsite Area Pond. An inlet stream flows into the lake from the north end and an outlet stream flows southeastward from the southeast end of the lake. The area identified as Site #2 (APEC 3) is located approximately 450 m to the northwest of Drinking Water Lake. Runoff from Site #2 is anticipated to flow into Drinking Water Lake, as indicated by drainage channels observed in the area.

5.6 VEGETATION

The Pelly Lake Site is within the Southern Arctic Ecozone and the Garry Lake Lowland Ecoregion, which can be characterized as a gently sloping plain with a low Arctic ecoclimate and shrub tundra vegetation. The Project Site and surrounding area are characterized as a mosaic of sand and gravel glacial deposits with thinly dispersed vegetation that is primarily composed of sedges, dwarf shrubs, herbaceous plant species, lichens, and mosses (inferred from Site photographs and drone imagery). There are multiple lakes and ponds present at the Site and surrounding area that are bordered by sedges and dwarf shrubs but do not appear to support aquatic or emergent vegetation (inferred from Site photographs and drone imagery). There are no vascular plant or moss SAR expected to occur within the Pelly Lake area (**Appendix B**). Rare plants have not been recorded in the region; however, detailed inventories have not been conducted.

A Site visit and environmental investigation was conducted during August 2022, where vegetation was sampled to determine the uptake of contaminants of concern to inform future risk assessment work. A partial list of vegetation present at the Site (based on identifications from Site photographs), is provided below:

- Black Crowberry (*Empetrum nigrum*);
- Dwarf Birch (*Betula pumila glandulifera*);
- Labrador Tea (*Rhododendron* (*Ledum*) *palustre*);
- Cloudberry (*Rubus chamaemorus*);
- Arctic Cranberry (*Vaccinium vitis-idaea*);
- Willows (*Salix* species);
- Sedges (*Carex* species);
- Lichens;
- Mosses.

5.7 Mammal, Avian, and Fish Species

Many characteristic Arctic tundra mammal and bird species including barren-ground caribou (*Rangifer tarandus groenlandicus*), muskox (*Ovibos moschatus*), grizzly bear (*Ursus arctos horribilis),* Arctic fox (*Vulpes lagopus*), Arctic wolf (*Canis lupus arctos*), wolverine (*Gulo gulo*), ermine (*Mustela erminea*), Arctic hare (*Lepus arcticus*), Arctic ground squirrel (*Spermophilus parryii*), brown lemming (*Lemmus sibiricus*), gyrfalcon (*Falco rusticolus*), snow geese (*Chen caerulescens*), Canada goose (*Branta canadensis*), willow ptarmigan (L*agopus lagopus*) and rock ptarmigan (*Lagopus mutus*), are likely to inhabit the Site and surrounding area. Wildlife species observed during the August 2022 Site visit included barren-ground caribou, Arctic hare, Arctic ground squirrel, brown lemming, Canada goose (*Branta canadensis*), and ptarmigan species. Other evidence of wildlife (bones or tracks) observed during the August 2022 Site visit included Arctic wolf, barren-ground caribou muskox and a bear species (most likely grizzly bear).

Given the size of the Project Site and the existing habitat conditions available, larger mammals including barren ground caribou, muskox, and grizzly bear likely only occupy the area seasonally in search of forage (e.g., lichen, sedges, herbaceous plants, berries), and/or small mammal prey (e.g., Arctic hare, brown lemming), water or resting places. Similarly, wolverines are a wide-roaming species and likely only occasionally occupy the site in search of prey or carrion, however, the substrates and habitat characteristics present at the site and surrounding area (e.g., eskers, sand and gravel banks and debris) may provide suitable winter denning habitat. Polar bears (*Ursus maritimus*) may very rarely pass through the Site if animals are forced inland due to loss of sea ice during summer. The Project area is located at the southern border of the species' range, and therefore the occurrence of polar bears is expected to be very low. Smaller mammals including Arctic hare, Arctic ground squirrel and brown lemmings can be expected to inhabit the Project Site and surrounding area during all seasons. Arctic ground squirrels may burrow within the eskers, gravel or sandy banks and lakeshores present at the site and surrounding area.

A diversity of migratory bird species can be expected to utilize habitats within the Project Site and surrounding area for breeding and/or staging during spring to fall. The Pelly Lake area is known to support large flocks of moulting Canada geese (*Branta canadensis*) and snow geese (Latour *et al.*, 2008). Pre-moulting flocks can be expected to arrive around mid-June and to begin to depart in mid-August when animals have regained their ability to fly (Latour *et al.*, 2008). Geese feed on sedge meadows and use water to avoid predation. Moulting geese are sensitive to disturbance. The study area is in migratory birds Zone N9, which has a nesting period of May 15 to August 17 (ECCC, 2018).

Numerous fish species including burbot (*Lota lota*), northern pike (*Escox lucius*), slimy sculpin (*Cottus cognatus*), longnose sucker (*Catostomus catostomus*), Arctic char (*Salvvelinus alpinus*), Arctic grayling (*Thymallus arcticus*), lake cisco (*Coregonus artedi*) and lake whitefish (*Coregonus clupeaformis*) are likely present in ponds and lakes within the Project Site and surrounding area.

All wildlife in Nunavut and their habitat are protected from direct harm and/or harassment unless for regulated or traditional harvest and/or protection of life and property under the Nunavut *Wildlife Act* (2003). Migratory birds are protected under the *Migratory Birds Convention Act* (1994). Fish and fish habitat are protected under the federal *Fisheries Act*. SAR and their habitat are protected under the federal *Species at Risk Act* (2002). Mammal and bird SAR with potential to utilize the Project Site and surrounding area are discussed in Section 5.9 and outlined in Appendix 1 (Government of Canada, 2023a). There are no fish SAR expected to occur within the Pelly Lake area (Government of Canada, 2023b).

5.8 Soil and Aquatic Invertebrates

The Project Site provides minimal habitat for soil invertebrate communities, due to the presence of permafrost that limits soil structure and depth. Soil invertebrates include organisms such as worms, springtails, spiders, and insects. As a result, soil invertebrates are uncommon in terrestrial Arctic ecosystems (Danks *et al.*, 1997).

Aquatic invertebrates in northern areas include a wide range of species, primarily larvae of insect species such as Dragonflies/Damselflies (Order Odonata), Mayflies (Order Ephemeroptera), Stoneflies (Order Plecoptera), and Midges (Order Diptera). There is no information available to base estimates of their abundance or species diversity. Aquatic invertebrates in northern areas generally prefer warm, shallow water habitats. Flying adults lay eggs in water, at various times during the summer (depending on the species). The eggs hatch into larvae that may spend multiple years maturing into adults that emerge from the water at various times during the summer. It can be expected that species of aquatic invertebrates are present in the waterbodies present at the Project Site. There are no soil or aquatic invertebrate SAR expected within the Pelly Lake area (Government of Canada, 2023a).

5.9 Species At Risk

Species at Risk (SAR) are identified by both the federal government and the Nunavut government. The *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) is an independent body of experts that uses criteria to critically evaluate and recommend status rank for each species in Canada. Following this, a federal government Minister then decides whether to place the species on Schedule 1 of the *Species at Risk Act* (SARA) after a consultation process. Once a species has

been placed on Schedule 1 of *SARA*, it is legally a SAR. A species can be at risk within Nunavut, while not being at risk within Canada as a whole; however, no such species have been identified by the Government of Nunavut.

There are 28 non-marine animal and plant SAR known to occur in Nunavut, which are provided in Appendix B (Government of Canada, 2023b). Marine species were omitted from this assessment because marine habitats do not occur within the Project Site or surrounding area. First, each species was evaluated to determine whether it may be present in the vicinity of the Pelly Lake area. Following this, it was determined whether a species may occur at the site or surrounding area, based on existing habitat conditions. Some SAR species are unlikely to occur in the vicinity of the Site and are noted as "nil" occurrence in Appendix 1. There are nine SAR potentially present at the Site, including one insect species, four bird species, and four mammal species **(Table 15**).

Table 15: Species at Risk Potentially Present at the Project Site

Species Common Name	COSEWIC Status	SARA Status	SARA Schedule 1	Species Habitat Description
Transverse Lady Beetle	Special Concern	Special Concern	Schedule 1	Within species range but has not been documented in the Pelly Lake region. Species live on the foliage of herbs that are infested with aphids, which may be present at the site.
Harris's Sparrow	Special Concern	No Status	No schedule	Within species breeding range. Harris's sparrows feed on seeds, berries, and insects and nests in small, isolated wooded areas with trees or tall shrubs that may be present in the surrounding area.
Lesser Yellowlegs	Threatened	No Status	No Schedule	Within species breeding range. The waterbodies present in the Project area may provide suitable breeding and foraging habitat.
Red-necked Phalarope	Special Concern	Special Concern	Schedule 1	Within species breeding range. Quality habitats are ponded areas dominated by grasses and sedges, emergent aquatic vegetation, and open freshwater. The water bodies present in the Project area may provide suitable breeding and foraging habitat.
Short-eared Owl	Threatened	Special Concern	Schedule 1	Within species breeding range. Short-eared owls predate on small rodents and birds, nest in dense vegetation on the ground and may utilize human disturbed sites. The Project area may provide suitable hunting and breeding habitat.
Barren-ground Caribou	Threatened	No status	No Schedule	Within species range. Vegetation within the Project area may provide suitable forage during summer and fall seasons.
Grizzly Bear	Special Concern	Special Concern	Schedule 1	Within species range. Grizzly bears forage on berries, herbaceous plants, mammals, waterfowl, and eggs that may be present in the Project area during spring, summer, and fall.
Polar Bear	Special Concern	Special Concern	Schedule 1	Within species range. Polar bears may be forced inland during summer due to loss of sea ice. During summer, polar bears consume berries, caribou, waterfowl, and eggs that may be present in the Project area.
Wolverine	Special Concern	Special Concern	Schedule 1	Within species range. Wolverine prey on mammals that may be present at the site during all seasons. The eskers, sand and gravel banks and debris present in the Project area may provide suitable denning habitat.

5.10 Site Specific Land Use

5.10.1 Past

The Site had never been visited by archaeologists prior to 2022, but surveys conducted in the region in the 1970s confirm Early Pre-Inuit and fur trade era Inuit occupation with traces of typical inland caribou hunting activities. The main group living here were Hanningayurmiut, with Hanningayuq being the name for the Pelly and Garry lakes area. Three other Inuit groups are known to have historically used the area for fishing and caribou hunting: Kivallirmiut, Innuinait and Netsinglingmiut. With the onset of the commercial fur trade, the area became used for not only traditional subsistence but also commercial trapping for fur bearing animals. In 1949, a Catholic mission was set up on an island in Garry Lake, not far from the Site.

The Site itself is a former airstrip and fuel cache site. It was reportedly used as a base and airstrip from 1954 to 1956 by Spartan Air Services, who was contracted by the Federal Government to take aerial photographs of the region. A few Hanningayurmiut families living at the airstrip location and near the mission were relocated to Baker Lake, Whale Cover, Rankin Inlet, Gjoa Haven and Cambridge Bay following a starvation event in 1958. Later, a land use permit was granted to Bathurst Inlet Developments Ltd. In 1993 (unknown end date) to rehabilitate the two airstrips at the Site and operate a fuel cache.

Throughout the years, various materials and structures were left at the Site. Three small lakes are present at the Site and several debris areas are located around these lakes. A limited cleanup was reportedly conducted in 1996 but was focused upon the Mosquito airplane crash site.

5.10.2 Present

The Site is currently abandoned but it is still visited occasionally in winter by people from Baker Lake and Gjoa Haven for hunting and trapping.

5.11 Cultural Features and Special Places

No ecological features were identified at the Site. No archaeological features were identified during the archaeological investigation; however, details of a suspected burial site have been provided to the Proponent. The location of the suspected burial is sensitive and cannot be shared in a public document but will be provided to the Contractor.

6 PROJECT/ENVIRONMENTAL INTERACTIONS - PHYSICAL

6.1 DESIGNATED ENVIRONMENTAL AREAS

No Designated Environmental Areas are located in the vicinity of the Site nor where work is planned, therefore not applicable.

6.2 PERMAFROST, GROUND STABILITY

6.2.1 Anticipated Impacts to Permafrost

Information collected during the Phase III Environmental Site Investigations indicate the near surface soils at the site consist of sand with gravel and cobbles. Test pits were excavated as part of the environmental program, as well as at locations along the runway and on the edges of the north and south fluvial terraces. No permafrost was encountered in the environmental test pits, the deepest of which was 0.9 m, but the geotechnical test pitting reported permafrost between 0.9 and 1.2 mgs at some locations.

There is localized sediment excavation to a shallow depth (<0.5 m) and no planned excavation of soil taking place as part of the remediation. There is a low likelihood of impacting permafrost at the site.

6.2.2 Proposed Mitigation Measures

Impacts to permafrost will be mitigated by limiting the excavation depth of any potential borrow areas to above the permafrost. With minimal equipment on site, most excavation will be manual which will be less likely to disturb permafrost at the Site.

6.3 HYDROLOGY/LIMNOLOGY, WATER QUALITY

6.3.1 Anticipated Impacts to Water Quality

Overall, positive impacts are expected with regards to water resources. The removal of contaminated sediment will improve aquatic ecosystem health, while the removal of debris will improve habitat and address health and safety risks associated with the Site.

The potential exists for contamination from onsite hazardous waste and spills during equipment refueling and maintenance, or through equipment leaks that can migrate to surface and groundwater impacting water quality.

Disturbance of soil, on Site transportation routes, and excavation of impacted sediment and borrow can result in sediment migrating to local surface water environments resulting in impacts to water quality and habitat.

The Site has a relatively small footprint, so these impacts are anticipated to occur on a local scale, and the risk of occurrence is expected to be low with mitigation measures in place.

6.3.2 Proposed Mitigation Measures

Mitigation measures are proposed to reduce or avoid adverse effects to surface water and groundwater that may occur as a result of Project remediation activities. The potential effects to surface water and groundwater have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for Project impacts to surface and groundwater.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of surface and groundwater.
- An Erosion and Sediment Control plan will be developed and implemented prior to commencing work. At a minimum, this plan will outline where and how erosion and sediment control will be erected and discuss minimum requirements for maintenance and monitoring including that all disturbed areas, including borrow areas, are restored to a stable or pre-disturbed state using the Best Available Technology Economically Achievable (BATEA) upon completion of the work and/or de-commissioning. It will include specific information pertaining to erosion and sediment control measures to be applied during the removal of impacted sediment including the establishment of a downstream sump to capture sediment laden water and in-filling the excavation with suitable material that is compacted and re-contoured as much as possible to resemble its pre-disturbed state. See mitigation measures for fish and aquatic species (6.6.2) for further details.

- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. At a minimum, these plans will:
  - Define minimum distance (100 m) between refueling and storage areas to identified water bodies and environmentally sensitive areas
  - Address the methods of storage of fuel and other materials (including waste materials) including, but not limited to, the use of liners and secondary containment
  - Include standard refueling, storage and transportation procedures for fuel, hazardous material and waste materials
  - Identify required signage and labeling requirements for fuel, hazardous materials and waste materials
  - Identify required spill response equipment and clean up materials including volumes and their locations on site
  - Include standard inspection schedules and protocols
  - Define spill reporting requirements
  - Identify staff qualifications and training

6.4 CLIMATE CONDITIONS

6.4.1 Anticipated Impacts

Greenhouse gases (GHG)) from Project activities have the potential to affect human health and climate change. Burning of fossil fuels through the use of generators, equipment and the flights required to mobilize personnel and materials to and from the Site will result in GHG emissions from the project work.

6.4.2 Proposed Mitigation Measures

Several mitigation measures will be put in place to reduce/minimize GHG emissions and include the use of an on-Site camp rather than off-site accommodations to reduce travel emissions, minimal/no use of heavy machinery at Site, optimization of waste removal flights, turning off engines when machinery is not in use, an effective burn plan for on-Site waste, and proper disposal of organic wastes. The short timeframe of this project will reduce the overall impacts of the above-mentioned contributors.

6.5 ESKERS AND OTHER UNIQUE OR FRAGILE LANDSCAPES

No eskers nor unique/fragile landscapes located in the vicinity of the Site or where the work is planned, therefore not Applicable.

6.6 SURFACE AND BEDROCK

6.6.1 Anticipated Impacts

Movement of materials, ATVs and other small vehicles and the landing of aircraft is anticipated to disturb the surface soils at the Site as the airstrip is located there. Some debris is also partially buried in sand which will be disturbed in areas slated for remediation.

6.6.2 Proposed Mitigation Measures

The Erosion and Sediment Control will be protective of the surface soils at the site and travel routes will be chosen to minimize the creation of erosion channels and disruption of the landscape in areas not slated for remedial work. Disturbed areas will be graded to maintain the surrounding elevation to minimize the development of erosion channels. The impacted areas will be small compared to the overall Site which will mitigate the overall impact.

6.7 SEDIMENT AND SOIL QUALITY

6.7.1 Anticipated Impacts

The Project may impact soils through loss of soil or reduced soil quality through mixing resulting from the transfer of soil for regrading and soil compaction related to equipment use on site. Soil compaction and disturbance is likely to have occurred previously when the site was operational.

Contamination by onsite hazardous waste and spills during equipment refueling and maintenance, or through equipment leaks can affect soil pH and contaminant levels, and in turn reduce overall soil quality. Potential sources of spills include equipment malfunctions or operator error, resulting in contamination of the soils.

Impacts to soils as a result of the Project are expected to be limited to the Site's relatively small footprint. Any impacts are expected to be on a local scale, and occurrence is expected to be low with mitigation measures in place. Although the excavation of borrow will impact the landscape, the area impacted will be relatively small.

6.7.2 Proposed Mitigation Measures

Mitigation measures are proposed to reduce or avoid adverse effects to soils and landforms that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for Project impacts to soils and landforms.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of soils and landforms.
- The camp and laydown areas will be located on durable surfaces, such as gravel or sand that is consolidated and can withstand repeated, heavy use.
- Wherever possible, existing trails will be used during project activities and only ATVs will be used on Site and no heavy equipment will be available.
- Disturbance of slopes prone to natural erosion will be avoided.
- Access trails from the main camp area to areas of remediation and/or debris may need to be enhanced using the on-site material. The winter access trail will be developed in snow conditions and will not require the same grading and compacting that summer trails may need to facilitate ATV use.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. See 6.2.3 above for details.
- An Erosion and Sediment Control plan will be developed and implemented prior to commencing work. See 6.2.3 above for details.
- All disturbed areas, including borrow areas, are restored to a stable or pre-disturbed state using the Best Available Technology Economically Achievable (BATEA) upon completion of the work and/or de-commissioning.

6.8 Tidal Processes

Site located inland far from ocean, therefore not applicable.

6.9 AIR QUALITY

6.9.1 Anticipated Impacts

Anticipated air quality impacts related to the project include emissions from the use of equipment such as ATVs, generators, burning of clean wood waste and the camp waste incinerator for the Site. The use of aircraft on Site will also impact air quality. Some dust may be generated during debris removal as well.

6.9.2 Proposed Mitigation Measures

Several mitigation measures will be put in place to reduce/minimize impacts to air quality and include the minimal/no use of heavy machinery at Site, turning off engines when machinery is not in use, an effective burn plan for on-Site waste, and layout of the camp to minimize impacts to air quality of Site personnel when operating the incinerator. The number of flights will be minimized by providing on-site accommodations and optimizing cargo for waste demobilization flights. Any dusty conditions which could impact air quality in the breathing zones of Site personnel will be mitigated by the use of appropriate personal protective equipment (PPE). The short timeframe of this project will reduce the overall impacts of the above-mentioned contributors to impacted air quality at the Site.

6.10 NOISE LEVELS

6.10.1 Anticipated Impacts

Noise generated from the project will include increased aircraft, ATV and generator noise which may disrupt wildlife at the Site.

6.10.2 Proposed Mitigation Measures

No heavy machinery will be present on Site which will limit the impacts of noise levels during the remediation of the Site. On-site accommodations means that fewer flights will be needed and that will reduce the noise associated with aircraft that could be used to fly personnel to and from the Site. Wildlife Management plans will include procedures to minimize the disruption of species that may be encountered at the Site during the period of work. Noise will be isolated to specific areas of the Site and will be considered to be short term.

7 PROJECT/ENVIRONMENTAL INTERACTIONS - BIOLOGICAL

7.1 VEGETATION

7.1.1 Anticipated Impacts on Vegetation

Vegetation at the Site may have been affected by contamination from the abandoned materials and debris. Considering this, it is expected that the removal of debris from the Site will result in positive, long-lasting impacts on local vegetation. Potential effects to vegetation (including rare plants) as a result of Project remediation activities includes habitat loss and/or alteration, introduction and/or spread of invasives, changes in hydrology, erosion and contaminants.

Habitat loss includes the direct removal of vegetation and soil at the Site as a result of on-site activities. Habitat alteration includes changes in soil compaction and composition, changes in microclimate (moisture, exposure, temperature), and changes in vegetation structure and composition, which may be caused by project activities including driving of machinery, the construction of a camp, and the access trail. Habitat fragmentation includes changes in patch size and distribution of available habitats for plant species as a result of remediation activities.

The introduction of invasive plant species has the potential to occur at locations disturbed by Project activities including remediation sites, the temporary camp, and the access trail, which may spread into the surrounding areas. Changes in hydrology and erosion have the potential to occur if Project remediation activities result in changes to sedimentation or local topography such as gradient and slope orientation, which can impact vegetation structure and composition. Finally, contamination includes accidental spills that may arise during Project activities including removal of contaminated material and driving of machinery.

Potential effects to vegetation are summarized in **Table 16**. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for vegetation anticipated and there are no residual negative effects anticipated. The Project access trail is not expected to have significant negative effects on vegetation because it is scheduled for construction and usage during frozen conditions where snow will protect vegetation from heavy equipment damage. The extent of anticipated vegetation biomass and soil loss or alteration at the site as a result of Project remediation activities is expected to be extremely small in relation to the habitat available in the surrounding area. Importantly, the potential negative effects to vegetation can be mitigated with appropriate measures, which are outlined in Section 6.4.2.

Table 16: Potential Effects of the Project Activities on Vegetation

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance
Habitat loss and/or alteration	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No
Habitat fragmentation	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No
Introduction/ spread of invasives	Negative	Temporary /short	Local	Minor	Continuous	Low	No	Yes	No
Changes in Hydrology	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No
Erosion	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No
Contaminant Exposure	Negative	Temporary /short	Local	Minor	Continuous	Low	No	Yes	No
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes

7.1.2 Proposed Mitigation Measures

Mitigation measures are proposed to reduce or avoid adverse effects to vegetation that may occur as a result of Project remediation activities. The potential effects to vegetation have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for Project impacts to vegetation.

- Pre-work meetings will be conducted to discuss the environmental requirements.
- A Project Construction Representative (PCR) will be present during all Project activities. The PCR's role will include ensuring that the Environmental Protection Plan, Erosion Sediment and Drainage Control Plan, Fuel Management Plan, and In Stream or Near Water Works Work Methodology Plan measures are implemented appropriately. Wherever feasible, potential negative effects to vegetation will be minimized by containing machinery to previously disturbed areas, establishing and enforcing speed limits, and ensuring effective planning to limit the extent of vehicle movements.
- Machinery will not be driven on banks and slopes, within 30 m of riparian areas and waterbodies and in well-vegetated areas. The PCR will place buffers around these areas to prevent machinery from driving on them and minimize negative impacts.
- Where feasible, potential effects of vegetation habitat loss and/or alteration and/or fragmentation will be minimized by selecting sites where vegetation is absent or minimal for the camp, staging and storage areas, and borrow areas.
- Potential effects of vegetation habitat loss and/or alteration and/or fragmentation will be minimized by limiting the size of borrow areas, staging and storage areas and the temporary camp as much as feasible.
- If vegetation is present at borrow areas, vegetated surface material will be stockpiled, and replaced after excavation is complete.
- Potential effects of erosion or changes in hydrology will be minimized by selecting a winter access route that avoids soil disturbance of slopes and the banks of streams and waterbodies. The PCR will visit the site during summer months to provide input into route selection.
- Wherever feasible, driving in wet conditions or muddy areas will be avoided. Sharp turns, sudden braking or acceleration that may cause rutting and damage to vegetation will be avoided.
- During winter, sharp turning, skidding, and rutting in snow on the access trail that may result in damage to vegetation will be avoided.
- The establishment and spread of invasive plant species will be prevented by having the PCR inspect all machinery and vehicles prior to mobilization to site, and upon arrival at the Project Site. Vehicles must be clean of all dirt, mud, non-native plants, and their seeds. Any vehicles found to not be clean upon arrival to Site will be segregated, cleaned and the wastewater containerized for off-site disposal.

- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. See 6.2.3 above for details.
- The PCR will visit the location to conduct post-work monitoring and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.
- Equipment with low tire pressure will be used during site preparation and operation.
- Spill response materials and equipment will be kept on-site at all times during Project activities.
- Equipment will be regularly inspected for leaks throughout the duration of the Project.
- Dust control best management practices will be implemented on-site as required, including limiting activities during periods of high wind periods.
- All hazardous materials will be transported in accordance with regulatory requirements under the Transportation of Dangerous Goods Act (Government of Canada 1992).
- Burning of debris on-site will follow the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012).

7.2 WILDLIFE

7.2.1 Anticipated Impacts to Mammals

Potential effects to mammals as a result of Project activities include habitat loss and/or alteration, habitat fragmentation, habitat displacement, loss or disruption to movement, contaminant exposure and direct mortality. Habitat loss includes the removal of vegetation, soil and debris from the Site that may be used by mammal species for breeding foraging, security, thermal cover and/ or hibernation (e.g., the removal of den sites). Habitat alteration includes the reduction of specific values provided to mammal species by a habitat (e.g., changes to soil or snow compaction, vegetation composition and structure), which may be caused by Project activities including the removal of contaminated material, driving of machinery, the construction of a camp, and the access trail. Habitat displacement includes the temporary loss of habitat due to behavioral responses by mammal species as a result of sensory disturbances, which may be caused by noise from machinery and human presence. Loss or disruption of movement includes changes to the landscape that result in barriers to wildlife species dispersal and/or seasonal or daily movements, which may be caused by Project activities including the removal of contaminated material, the construction of a camp, and the access trail. Contamination includes accidental spills that may arise during Project activities including the removal of contaminated material and the use of machinery. Finally, direct mortality includes collisions with machinery and/or entrapment in equipment or debris and may also include exposure to contaminants.

Potential effects to mammal species including SAR are summarized in **Table 17**. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for mammal species anticipated and there are no residual negative effects anticipated. The existing habitat available at the Site is extremely small in relation to the habitat available in the greater surrounding area. For most mammal species including the SAR that may be present, the Site likely only represents a small portion of individuals home ranges and most animals including barren-ground caribou, grizzly bear and wolverine can be expected to avoid or move out of the Project Site during remediation activities. Importantly, the potential negative effects to mammal species can be mitigated with appropriate measures, which are outlined in Section 6.5.2.

Table 17: Potential Effects of the Project Activities on Mammals

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance
Habitat loss and/or alteration	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Habitat fragmentation	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Habitat displacement	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Loss or disruption to movement	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Direct Morality	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes

7.2.2 Proposed Mitigation Measures

Mitigation measures are proposed to reduce or avoid adverse effects to mammal species including SAR that may occur as a result of Project remediation activities. The potential effects to mammal species have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for the potential impacts to mammal species. A Wildlife Encounter and Management Plan and a Wildlife Protection Plan will be developed and implemented that will detail mitigation measures.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include bear awareness, wildlife encounters and considerations for SAR. Signage and bulletins will be posted at the temporary camp, alerting workers to the issues regarding working in polar bear, grizzly bear, barren-ground caribou, and wolverine habitat.
- The PCR will be present during all Project activities. The PCR's role will include determining the presence of mammals including SAR and providing guidance and assistance to ensure that Wildlife Encounter and Management Plan and Wildlife Protection Plan measures are implemented appropriately.
- A wildlife monitor will be hired for the duration of the project. The wildlife monitor's role will include assessing the presence of wildlife in or near the project area during project activities and advising on appropriate actions to reduce interactions. Work will cease if bears or caribou are spotted on the Site until they have moved through the area.
- A wildlife monitor will conduct pre-work surveys at the Project site and immediate surrounding area to identify and avoid physical destruction of mammal habitat features including burrows, trails, wallows, and mineral licks. If mammal habitat features are identified during pre-work surveys, the PCR will work with off-site experts and regulators to apply appropriate no-work buffers and minimize human-use in these areas.
- A wildlife monitor will conduct pre-work surveys during winter within suitable habitat (i.e., south-facing slopes, hillsides, steep banks, loose substrate) to identify and avoid destruction and/or disturbance to grizzly bear, wolverine, wolf, and fox dens along the winter access route. If active dens are located, the PCR will work with off-site experts and regulators to apply appropriate no-work buffers including 500 m for grizzly bear and 500 m for wolverine dens (after February 1).
- Project activities along the winter access route will not occur if there is inadequate snow cover to protect the soil and vegetation from damage.
- If large mammals including polar bears, grizzly bears, barren-ground caribou, or muskox are observed approaching the site or Project activities area, vehicles/equipment will be stopped to allow the animal(s) to move through the area undisturbed and without stress.

- Employees and contractors will not be permitted the following activities:
  - Recreational use of all-terrain vehicles
  - Recreational hunting/shooting/firearms
  - Dogs
  - Feeding or harassing wildlife
- Construction and remediation materials such as cables, wires, and fencing will be properly stored to avoid entanglement hazards for wildlife.
- Wildlife attractants including food, garbage, and fuel will be managed adequately. All attractants must be stored in wildlife-proof containers or incinerated. All combustible waste will be collected, contained, and incinerated. Non-combustible waste will be collected, contained, and stored in wildlife-proof containers.
- If feasible, the temporary camp and all potential attractants (e.g., fuel) will be secured within a portable electric fence to prevent access by dangerous wildlife and SAR including grizzly bear, polar bear, wolf, and wolverine.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. See 6.2.3 above for details.
- Aircraft flights will fly at a minimum altitude of 600 m above ground level except for takeoff and landing (Mining and Petroleum Environmental Research Group [MPERG], 2008)
- Spill response materials and equipment will be kept on-site at all times during Project activities.
- Equipment will be regularly inspected for leaks throughout the duration of the Project.
- Dust control best management practices will be implemented on-site as required, including limiting activities during periods of high wind periods.
- All hazardous materials will be transported in accordance with regulatory requirements under the Transportation of Dangerous Goods Act (Government of Canada 1992).
- Burning of debris on-site will follow the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012).

7.3 Avian Species

7.3.1 Anticipated Impacts to Avian Species and Protected Species

Potential effects to bird species as a result of Project activities include habitat loss and/or alteration, habitat fragmentation, habitat displacement, loss or disruption to movement, contaminant exposure and direct mortality. Habitat loss includes the removal of vegetation, soil and debris from the Site that may be used by bird species for breeding foraging, security, and thermal cover

(e.g., the removal of nest sites). Habitat alteration includes the reduction of specific values provided to bird species by a habitat (e.g., changes to vegetation composition and structure), which may be caused by Project activities including the removal of contaminated material, driving of machinery, the construction of a camp, and the access trail. Habitat displacement includes the temporary loss of habitat due to behavioral responses by bird species as a result of sensory disturbances, which may be caused by noise from machinery and human presence. Loss or disruption of movement includes changes to the landscape that result in barriers to wildlife species dispersal and/or seasonal or daily movements, which may be caused by Project activities including the removal of contaminated material and the construction of a camp. Contamination includes accidental spills that may arise during Project activities including the removal of contaminated material and the use of machinery. Finally, direct mortality includes collisions with machinery and/or entrapment in equipment or debris and may also include exposure to contaminants.

Potential effects to bird species including SAR are summarized in **Table 18**. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for bird species anticipated and there are no residual negative effects anticipated. The existing habitat available at the Site is extremely small in relation to the habitat available in the greater surrounding area. Most bird species including the SAR can be expected to be temporarily displaced/avoid or move out of the Project site during remediation activities. Nevertheless, if remediation activities occur during the nesting season for the region (May 15 to August 17; ECCC, 2018), a PCR will work with off-site experts to identify species of nesting birds and place appropriate no-work buffers around active nests if encountered to ensure compliance with the requirement of the *Migratory Birds Convention Act* (1994) and the *Species at Risk Act* (2002). Further, if the remediation activities are to occur during June 15 - August 15 when moulting geese may be present and vulnerable to disturbance, the wildlife monitor at the Site will establish deterrents to reduce the chances that geese are occupying the Site during Project activities. In the event that remediation activities cannot be completed without disturbing/ destroying nests or burrows associated with migratory birds or species of special concern, a wildlife officer from the Government of Nunavut and ECCC will be consulted for additional guidance and/or to obtain a permit authorizing the removal of nests or disruption of habitat Importantly, the potential negative effects to bird species can be mitigated with appropriate measures, which are outlined in Section 6.7.2.

7.3.2 Proposed Mitigation and Monitoring Measures

Mitigation measures are proposed to reduce or avoid adverse effects to bird species including SAR that may occur as a result of Project remediation activities. The potential effects to bird species have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for the potential impacts to bird species. A Wildlife Protection Plan will be developed and implemented that will detail mitigation measures.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for bird species, including migratory birds and SAR.
- The PCR present during all Project activities. The PCR's role will include providing guidance and assistance to ensure that Wildlife Protection Plan measures are implemented appropriately.
- Since project activities will need to occur during the breeding bird window for the region (May 15 to August 17), the project team will endeavour to identify and avoid physical destruction of bird nests by having a wildlife monitor conduct pre-work surveys at the Project site and immediate surrounding area. If bird nests are identified during pre-work surveys, have a wildlife monitor apply appropriate no-work buffers and minimize human-use in these areas.
- Since Project activities will occur during the period when moulting geese species may be present and unable to fly (June 15-August 15), a wildlife monitor will visit the Site during the Pre-mobilization Site Visit and install appropriate deterrents to minimize the chances that moulting geese will be present at the Project Site during Project activities.
- If geese are observed within the Project activities area, vehicles/equipment will be stopped to allow the animal(s) to move through the area undisturbed and without stress.
- Employees and contractors will not be permitted the following activities:
  - Recreational use of all-terrain vehicles
  - Recreational hunting/shooting/firearms
  - Dogs
  - Feeding or harassing birds
- Construction and remediation materials such as cables, wires, and fencing will be properly stored to avoid entanglement hazards for wildlife.
- Wildlife attractants including food and garbage will be adequately managed. All attractants must be stored in wildlife-proof containers or incinerated. All combustible waste will be collected, contained, and incinerated. Non-combustible waste will be collected, contained, and stored in wildlife-proof containers.

- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. See 6.2.3 above for details.

Table 18: Potential Effects of the Project Activities on Avian Species

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance
Habitat loss and/or alteration	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Habitat fragmentation	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Habitat displacement	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Loss or disruption to movement	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No
Direct Morality	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes

7.4 FRESHWATER AQUATIC SPECIES

7.4.1 Anticipated Impacts to Fish and Aquatic Species

Transfer of contaminants to fish species and aquatic invertebrates may occur through direct contact with contaminated water or sediments, or by feeding on contaminated plants and insects. Considering this, it is expected that the removal of contaminated soil and debris from the Site will result in positive, long-lasting (I.e., residual) impacts on fish and aquatic species and their habitats.

Potential effects to fish and aquatic invertebrate species as a result of Project activities include habitat loss and/or alteration, changes in hydrology, erosion and sedimentation, contaminant exposure and direct mortality. Habitat loss includes the removal of (riparian and aquatic) vegetation, soil and debris from the Site that provide the conditions required for fish species for breeding, foraging, security, and cover. Habitat alteration includes the reduction of specific values provided to fish species by a habitat (e.g., changes to habitat structure and cover, changes in nutrient concentrations and/or food supply), which may be caused by project activities including the removal of riparian vegetation, removal of contaminated material and debris, driving of machinery and the drawing of water. Changes in hydrology includes changes in channel morphology or shoreline morphometry, which may arise during Project activities including the placement of materials or structures in water, the removal of contaminated material and the use of machinery. Changes in erosion and sedimentation includes changes to bank stability and exposed soils, which may arise during Project activities including the placement of materials or structures in water, the removal of contaminated material and the use of machinery. Exposure to contaminants includes accidental spills that may arise during Project activities including the removal of contaminated material and the use of machinery. Finally, direct mortality includes mortality of fish/eggs/ova from collisions with machinery and/or entrapment in equipment or debris and may also include exposure to contaminants.

Potential effects to fish species are summarized in **Table 19**. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for fish or aquatic invertebrate species anticipated and there are no residual negative effects anticipated. Any time that work occurs near or within water there is potential to affect fish and/or fish habitats, either at the Site where the works are being completed or further downstream. There is an estimated 6.1 m^3 of contaminated sediment for removal that is associated with a stream, which is considered 'low' or 'nil' quality habitat for fish species (inferred from site photographs). Fish species are not expected to utilize the stream location where the excavation of contaminated sediments Project activities are proposed, however, it is possible at higher water levels that fish species may rarely access the channel at low frequency. A Fish Capture and Release Plan (fish salvage/rescue) will be developed

and implemented to protect fish that may be present within the excavation area. There is also potential for increased turbidity and contaminants to affect downstream fish if sediment is deposited into the stream or if deleterious substances enter the channel during Project activities. Mitigation measures for potential impacts include re-contouring and stabilizing the excavation area immediately following remediation activities and implementing Erosion and Sedimentation Plan measures, as appropriate, during remediation activities. Importantly, the potential negative effects to fish and aquatic species and their habitat can be mitigated with appropriate measures, which are outlined in Section 6.6.2.

Table 19: Potential Effects of the Project Activities on Fish

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of Effect	Reversibility	Mitigations Available	Significance
Habitat loss and/or alteration	Negative	Temporary/ short	Local	Minor	Intermittent	Low	Yes	Yes	No
Changes in Hydrology	Negative	Temporary/ short	Local	Minor	Intermittent	Low	Yes	Yes	No
Erosion and Sedimentation	Negative	Temporary/ short	Local	Minor	Intermittent	Low	Yes	Yes	No
Contaminant exposure	Negative	Temporary/ short	Local	Minor	Intermittent	Medium	No	Yes	No
Direct Morality	Negative	Temporary/ short	Local	Minor	Intermittent	Low	No	Yes	No
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes

7.4.2 Proposed Mitigation and Monitoring Measures

Mitigation measures are proposed to reduce or avoid adverse effects to fish and aquatic species that may occur as a result of Project remediation activities. The potential effects to fish and aquatic species have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for the potential impacts to fish and aquatic (i.e., benthic invertebrate) species. A Fish Capture and Release Plan, Spill Prevention and Spill Response Plan, Near Water Works, and Erosion and Sedimentation Plan will be developed and implemented that will detail mitigation measures.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements.
- The PCR will be present during all Project activities. The PCR's role will include monitoring hazards, determining the presence of fish, and providing guidance and assistance to ensure measures to mitigate potential effects on fish and fish habitat are appropriately applied.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. See 6.2.3 above for details.
- Surface water flows will be managed to prevent sediment and contaminants from entering riparian habitats or waterbodies.
- All equipment working near the stream or waterbody will be properly maintained and free of leaks, and all equipment will be washed prior to coming onto the worksite.
- Prior to the removal of contaminated sediments, a downstream sump will be established and the sediment laden water will be collected/pumped to a sediment bag at a suitable discharge location, to minimize potential effects of erosion and sedimentation and introduction of contaminants.
- Potential effects of erosion and changes in hydrology will be minimized by implementing Erosion and Sedimentation Plan measures to prevent any movement of sediment into the stream to avoid harm to fish and aquatic invertebrates.
- Potential effects of erosion or changes in hydrology by avoiding driving machinery on banks and slopes, within 30 m of riparian areas and waterbodies, except where necessary for remediation activities.
- Potential effects of erosion or changes in hydrology will be minimized by selecting a winter access route that avoids soil disturbance of slopes and the banks of streams and waterbodies. The PCR will visit the site during summer months to provide input into route selection.
- Potential effects of contamination will be minimized by housing the pump used for drawing water in a self-contained unit with liner to contain any potential leaks.

- Mortality or harm to fish will be avoided by using a ¼ inch mesh filter specifically designed to prevent fish from being drawn into the pump during pumping operations.
- For winter work, ice conditions will be checked to ensure it is sufficiently thick for vehicles and machinery, to minimize the risk of any disturbance to aquatic resources during Project activities.
- The PCR will visit the location to conduct post-work monitoring and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.

7.5 WILDLIFE PROTECTED AREAS

No protected areas are located in the vicinity of the Site nor where work is planned, therefore not applicable.

8 PROJECT/ENVIRONMENTAL INTERACTIONS – SOCIO-ECONOMIC

8.1 ARCHAEOLOGICAL AND CULTURAL FEATURES

Given the scope of work, and considering the duration, extent, magnitude, and frequency of the remediation activities, the reversibility of the effects, and the mitigation measures available, there are no significant negative impacts for cultural features anticipated and there are no residual negative effects anticipated.

8.1.1 Impacts to Cultural Sites and Special Features

No archaeological sites were identified during the archaeological investigation, however, a member of the community shared with the Proponent the location of a possible burial site in the vicinity. There is a risk of disturbance of the burial site from equipment use on site.

8.1.2 Impacts on Traditional Users

Overall, positive impacts are expected with regards to traditional use with the removal of contamination and debris from the Site.

Although traditional use is expected to be limited at this Site, short term negative impacts in the form of limited access and disturbance of target species could negatively impact hunting, trapping and other traditional land use in the vicinity of the remedial project. Local communities indicated that use of the site is infrequent which minimizes the impact to traditional users. These impacts are

limited to the relatively small footprint of the project site and the immediate area and will last for a total of approximately 10-16 weeks over 1.5 years.

8.1.3 Proposed Mitigation and Monitoring Measures

Mitigation measures are proposed to reduce or avoid adverse effects to cultural features that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for Project impacts to cultural features.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of cultural resources.
- Prior to commencing work, the community member who shared the suspected burial site location will be notified of the timing of the planned work.
- The location of the suspected burial site will be shared with the Contractor and a buffer will be established around the suspected burial site and it will be identified as a "no go zone" for staff.
- The PCR will be present during work activities and will ensure the mitigation measures are put in place.
- If any potential cultural sites and/or special features are identified during the course of the project, work will stop, and the PCR will reach out to Government of Nunavut Department of Culture and Heritage for directions on how to manage the discovery. Avoidance will be the preferred method of mitigation, with buffers established and access limited to any identified areas.
- Communities will be notified of the anticipated project schedule and discouraged from visiting. Wildlife monitors will be involved in the project and will assist with ensuring the project team are aware of the presence of wildlife in the area and advise on the prevention or minimization of impacts to them.

8.2 EMPLOYMENT

It is anticipated that there will be short term positive impacts to local communities (e.g. Baker Lake, Gjoa Haven). Contractors bidding on the project will be required to submit an Inuit Participation Plan and will likely be hiring local Inuit labour and utilizing local Inuit companies, where possible, to complete the work. This may include positions of Equipment Operators, Wildlife Monitors and Labourers. Potential local Subcontractors include transportation, camp resupply, and HR support. There will also be capacity building training opportunities associated with the project.

Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations of public safety.

8.3 Community Wellness

The project is anticipated to have a positive impact on community wellness as the community will work collaboratively with all project stakeholders to complete the project. By providing employment opportunities for local community members on the Site, community members will be directly involved in the cleanup and will result in the removal of contaminants from a site that the community has raised concerns over in the past.

8.4 Community Infrastructure

The Site is located over 200km from the nearest community and therefore any impacts to Community Infrastructure are not applicable.

8.5 Human Health

The risks to public health are low during the course of the project as the site is infrequently visited. The remedial work planned will reduce the risk of impacts to members of the public in the long term by removing chemical hazards (hazardous debris) and physical health and safety risks (non-hazardous debris) from the Site.

8.5.1 Proposed Mitigation and Monitoring Measures

Mitigation measures are proposed to reduce or avoid socio-economic impacts that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated. The mitigation measures outlined in this section provide mitigations for Project impacts.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations of public safety.
- In order to mitigate public health and safety risks, communities will be notified of the anticipated project schedule and discouraged from visiting.
- Staff will be informed that visitors must be approved and signed in with the Site Superintendent upon arrival.

9 MANAGEMENT AND OPERATIONAL PLANS

The development of management plans and associated staff training will be critical to ensuring that impacts from the Project are anticipated and minimized. These management plans will ensure work is completed in a manner consistent with applicable legislation and regulations and will tackle the potential areas of impact identified in the EIA, as well as how to quickly and effectively address impacts that are unavoidable. They will be reviewed and approved by the Proponent prior to commencing work and submitted to appropriate Authorities Having Jurisdiction (AHJs). Management Plans required to support the Project include:

- On-site Contingency and Emergency Response Plan;
- Spill Contingency Plan;
- Fire Safety Plan;
- Wildlife Encounter and Management Plan;
- Fuel Management Plan;
- Wildlife Protection Plan;
- Erosion Sediment and Drainage Control Plan;
- In Stream or Near Water Works Work Methodology Plan;
- Mobilization and Demobilization Plan;
- Airstrip and Site Access Route Upgrading and Maintenance Plan;
- Environmental Protection Plan;
- Waste Management Plan;
- Burn Plan;
- Site-Specific Health and Safety Plan.

The Contractor, PCR, PSPC, CIRNAC, and a wildlife monitor will conduct pre-work surveys of the Site to help establish the location of ecologically sensitive areas and associated buffers, as well as assisting in defining appropriate locations for the camp, laydown, and staging areas, on site trails, borrow sources and buffer zones to minimize impacts.

A PCR will be on site throughout the project. The PCR will be responsible for conducting pre-work meetings with workers to discuss the environmental requirements and complete awareness training. The PCR will also be responsible for ensuring that the environmental requirements of the project are applied as intended including, but not limited to, the implementation of buffer zones and management plans. Upon completion of the project, the PCR will conduct post-work monitoring and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.

10 RESIDUAL IMPACTS

The project involves the removal of all impacted sediment, the majority of the site debris and all equipment and materials used to support the remedial plan. The material remaining on Site will be stripped of any hazardous materials (e.g. fuel, oils, leaded paint). The risk remaining from these materials is considered negligible. No negative residual impacts are expected.

11 CUMULATIVE ENVIRONMENTAL EFFECTS

11.1 PAST AND EXISTING STRESSORS

Since the 1950s when the Site was abandoned, its use has been relatively limited. A land use permit was granted to Bathurst Inlet Developments Ltd. in 1993 (unknown end date) to rehabilitate the two airstrips at the Site and operate a fuel cache. The site may be used occasionally as a campsite during hunting and trapping visits from Baker Lake or Gjoa Haven.

11.2 RESULTING CONTRIBUTION

This project involves the removal of all impacted sediment and the majority of debris on Site. Clean (unpainted and untreated) wood waste will be burned, and the ash removed. Any large equipment that cannot be removed from Site will be cleaned and consolidated into a single location if possible. The overall goal is to enhance the quality of habitats and wildlife and to remove human health and ecological health risks at the Site.

11.3 EFFECTS ON RENEWABLE RESOURCES

While natural resources will be used (e.g., borrow, water) and impacted (e.g., borrow sources, wildlife, vegetation) during the course of work, the impacts will be limited to the 10-16 weeks over 1.5 years. Further, the intent of the project is to improve the natural environment and thus is anticipated to have a positive long-term effect on fish and wildlife species and their habitat.

With proper mitigation measures in place, no negative cumulative impacts are anticipated to natural resources.

11.4 Effects on Heritage Values

No archaeological sites requiring protection have been identified on Site, however, a suspected burial site has been identified. With the implementation of a buffer and "no go zone", no negative impacts are expected.

11.5 Mitigation Measures

No negative cumulative impacts have been identified and no unique mitigation measures have been developed to address cumulative impacts.

12 KNOWLEDGE DEFICIENCIES

The source of information pertaining to the presence of wildlife, habitat, and SAR on Site is limited to literature reviews and information provided from the environmental investigation team who visited the site in 2022. No formal surveys have been conducted. The inclusion of pre-work surveys conducted by the PCR and Wildlife Monitor to confirm the details of ecologically sensitive areas (ie. 30 m riparian buffer, wetted areas, slopes) and protected species, as well as to investigate and advise on appropriate buffers/locations for key site work areas will help fill this data gap and reduce the potential for impacts. Additionally, consultation and incorporation of Traditional Ecological knowledge (TEK) has been initiated at the onset of the project but remain limited. Ongoing engagement will continue throughout the project and the support of the Wildlife Monitor in the management of the project's impacts will allow for further incorporation of TEK.

13 PUBLIC CONCERNS

The community engagement documented in BLM 2023d identified the communities' preference is to remove all debris from the site. While the majority of the material will be removed, there will remain some large items left on site that could pose a limited physical risk to the ecosystem and humans. A Pre-Construction Meeting to discuss work planned and employment opportunities and a Post-Construction Meeting to share results of the program will provide further opportunity for community feedback.

Overall, the remediation project is anticipated to provide a desirable outcome to the local communities who may periodically visit the Site.

14 CONCLUSIONS AND RECOMMENDATIONS

The intent of this project is to improve the environment at the Site. Currently, sediment impacted with contaminants poses a risk to ecological health while hazardous and non-hazardous materials, such as abandoned buildings, equipment, barrels, and their contents also pose risks to both humans and wildlife. The project will involve the excavation and removal of impacted sediment, burning of all untreated/unpainted wood and the removal of the majority of the hazardous and non-hazardous materials and debris on Site. Some large pieces of equipment will be left on site, but all hazardous materials will be removed from them to reduce the future risks. The work planned will have a positive impact to the Site and surrounding habitat in the long term.

For the Project's duration, the Site will not be accessible to the local community, resulting in impacts to traditional use. However, these are anticipated to be offset by an improved environment and habitat to support key species of interest. Furthermore, the removal of health and safety risk and contamination will prevent future potential injury to visitors.

In the short term, species and their habitats are expected to be impacted. The majority of this impact will be in the form of disturbance from the presence of humans and machinery and the accompanying noise, dust and activity. There is the possibility of more serious impacts from spills, fires, erosion and sedimentation and encounters with wildlife, however, these will be mitigated by the development of a comprehensive set of management plans developed, reviewed, and approved prior to commencing work. These will include fuel and spills management, emergency response, wildlife management, erosion and sedimentation control among others and will be designed to proactively anticipate and reduce impacts and effectively address any contraventions. Ultimately, the negative impacts are anticipated to be offset by an overall improved environment and habitat to support species in the future.

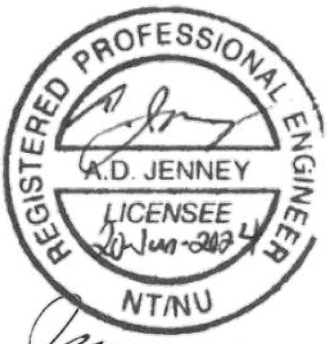
15 CLOSURE AND STATEMENT OF LIMITATIONS

The observations and results obtained during this investigation are representative of the conditions encountered at the sampling locations during the site investigation only. The conditions that BluMetric interprets to exist at, between, and beyond sampling points may differ from those that actually exist. The statements made in this report are based solely on the information obtained to date as part of the above referenced investigation. BluMetric has used its professional judgment in analyzing this information and formulating its conclusions. No other warranty or representation expressed or implied, as to the accuracy of the information or recommendations is included or intended in this report.

BluMetric Environmental Inc. makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information.

BluMetric Environmental Inc. accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,
BluMetric Environmental Inc.



Stephen Anderson, M.Sc.
Environmental Scientist, BluMetric

Andrea Jenney, P.Eng. (NAPEC)
Environmental Engineer, BluMetric

Leah Andresen, M.Sc. R.P.Bio.
Biologist, Ecofor

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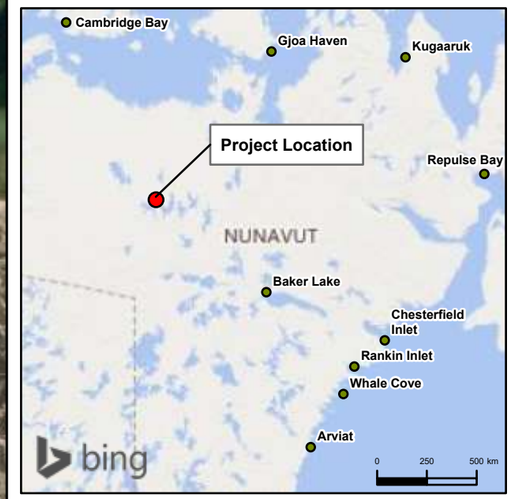
FIGURES

LEGEND

- Approximate Alignment of Airstrip
- Intermediate Contour (0.5 m)
- Major Contour (1 m)



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REFERENCES

N W E S

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Pelly Lake Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Site Location Map

BluMetric™ Environmental

4916 49th Street,
PO Box 11086
Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
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PROJECT #	DATE
220515	**November 02, 2023**

DRAWN	CHECKED	FIG NO.	REV
MB	**JK**	**01**	**0**

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LEGEND

- Approximate Alignment of Airstrip
- Stream outline
- Direction of Stream Flow

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

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N W E S

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PROJECT

Environmental Impact Assessment Pelly Lake Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Site Features

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PROJECT #	DATE
220515	November 02, 2023

DRAWN	CHECKED	FIG NO.	REV
MB	JK	02	0

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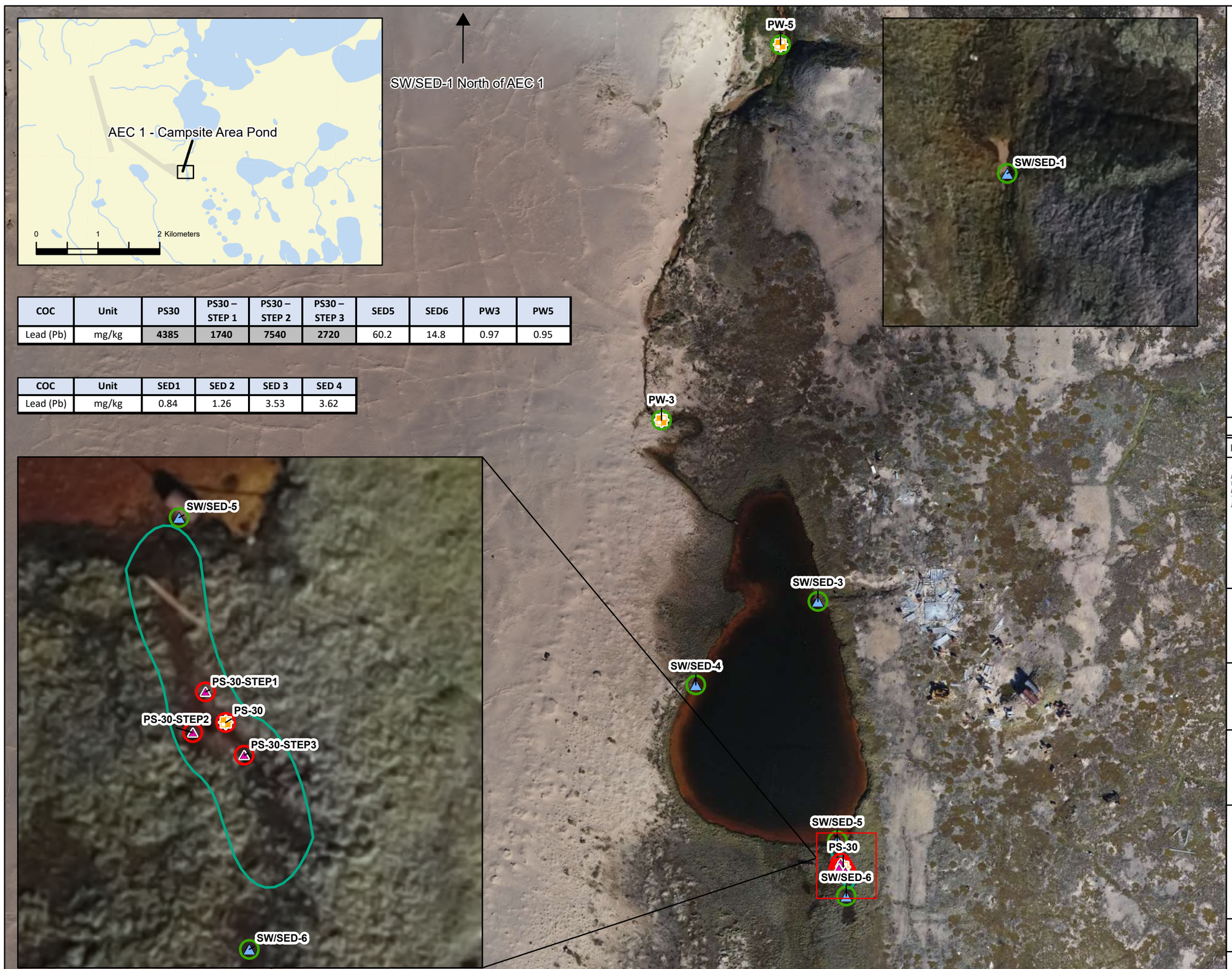
SW/SED-1 North of AEC 1

COC	Unit	PS30	PS30 – STEP 1	PS30 – STEP 2	PS30 – STEP 3	SED5	SED6	PW3	PW5
Lead (Pb)	mg/kg	**4385**	**1740**	**7540**	**2720**	60.2	14.8	0.97	0.95

COC	Unit	SED1	SED 2	SED 3	SED 4
Lead (Pb)	mg/kg	0.84	1.26	3.53	3.62



LEGEND

- Extent of sediment impacts exceeding the Probable Effects Level
- Surface Water Sample Location
- Historic Sediment
- Historical Sediment/Surface Water
- Stepout Sediment
- Sample Below Guidelines
- Sample Above Guidelines

Parameter	Probable Effects Level
Lead	91.3
All units are in mg/kg	
Bold and grey indicates value exceeded guideline value	

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES

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1:781

CLIENT

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PROJECT

Environmental Impact Assessment Pelly Lake Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Impacted Sediment

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Yellowknife, NT, X1A 1P3
TEL: (867) 873-3500
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PROJECT #	DATE
220515	**March 06, 2023**

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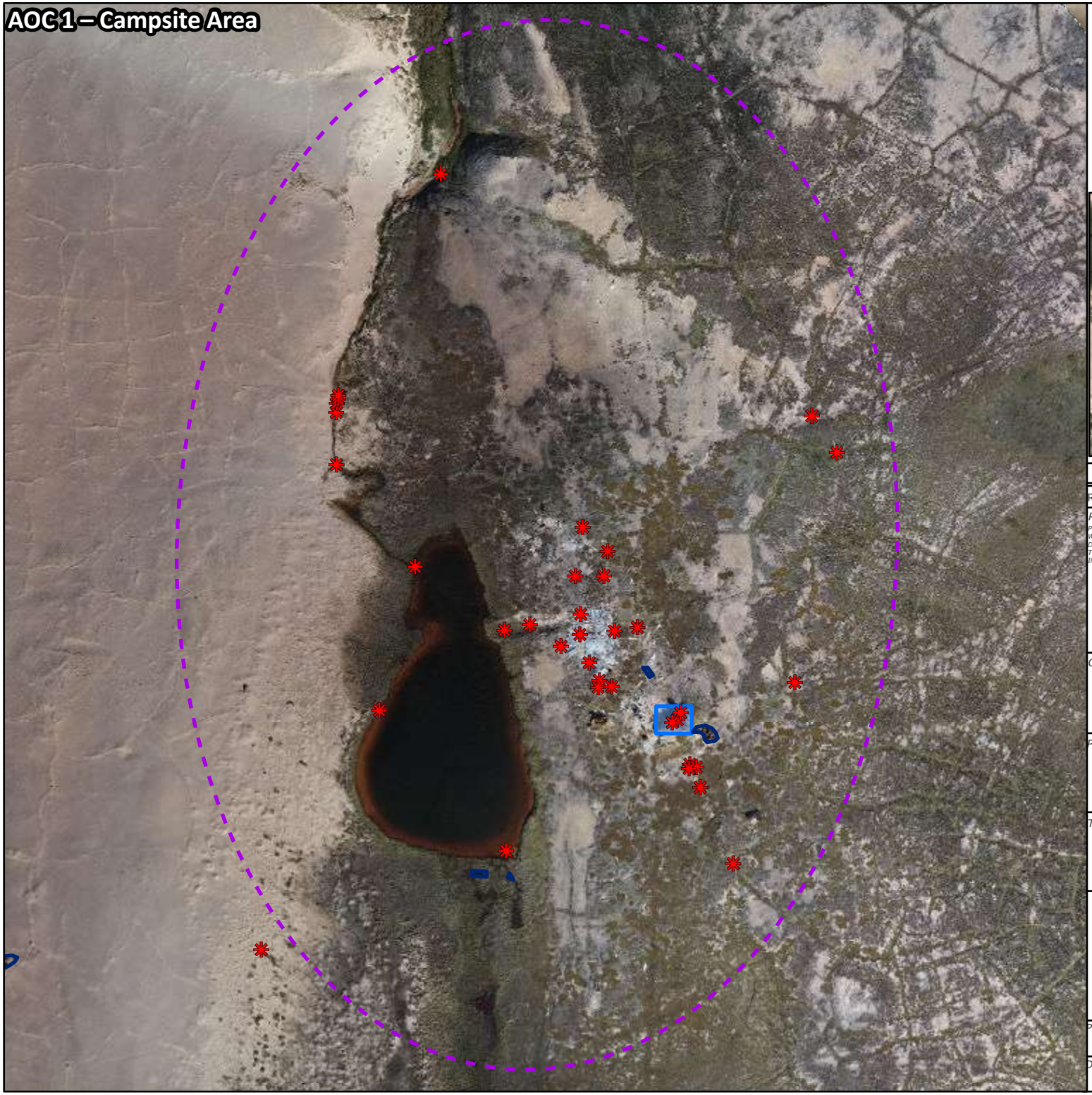
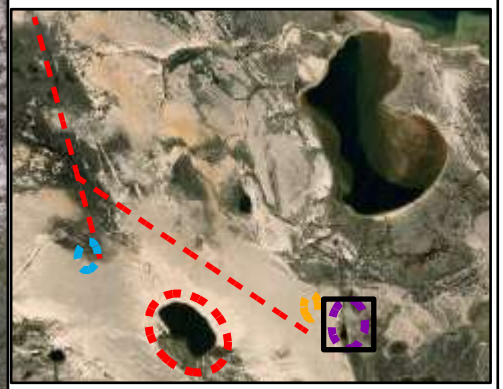


LEGEND

- Approximate Alignment of Airstrip
- Barrel/Tank Sample Location
- Barrel Areas
- Building

Area of Concern

- AOC 1 - Campsite Area
- AOC 2 - Site #1
- AOC 3 - Site #2
- AOC 4 - Drinking Water Lake



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REFERENCES

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assesment, Pelly Lake Former Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Debris in AOC 1 - Campsite Area

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4916 49th Street,
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Yellowknife, NT, X1A 1P3
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PROJECT #	DATE		
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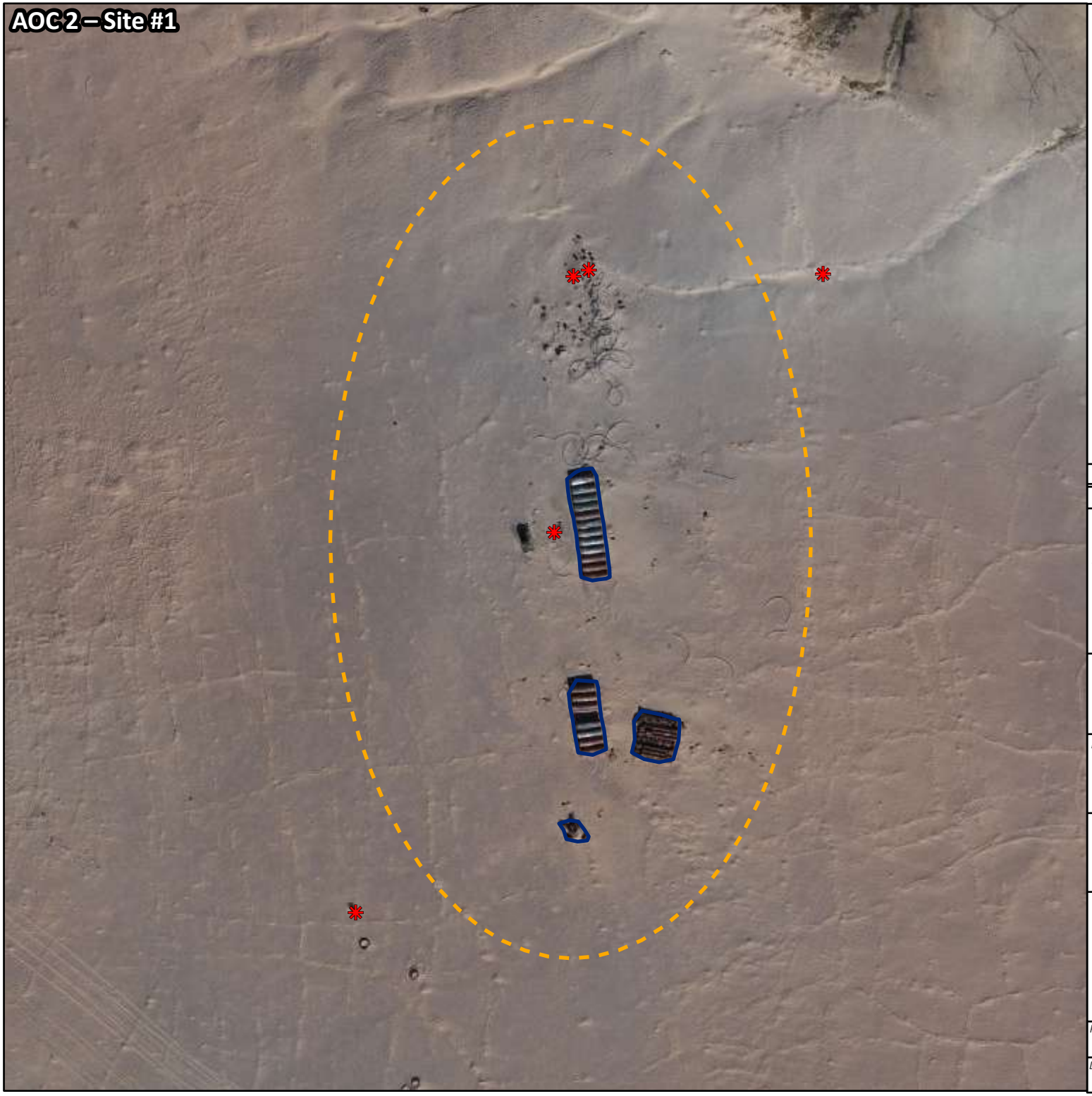
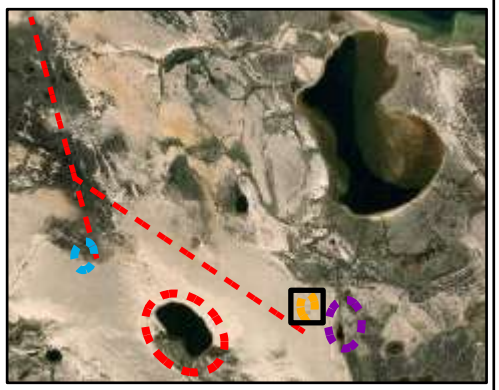


LEGEND

- Approximate Alignment of Airstrip
- Barrel/Tank Sample Location
- Barrel Areas
- Building

Area of Concern

- AOC 1 - Campsite Area
- AOC 2 - Site #1
- AOC 3 - Site #2
- AOC 4 - Drinking Water Lake



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REFERENCES

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CLIENT

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PROJECT

Environmental Impact Assessment, Pelly Lake Former Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Debris in AOC 2 - Site #1

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220515	November 02, 2023

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MB	JB	04b	0

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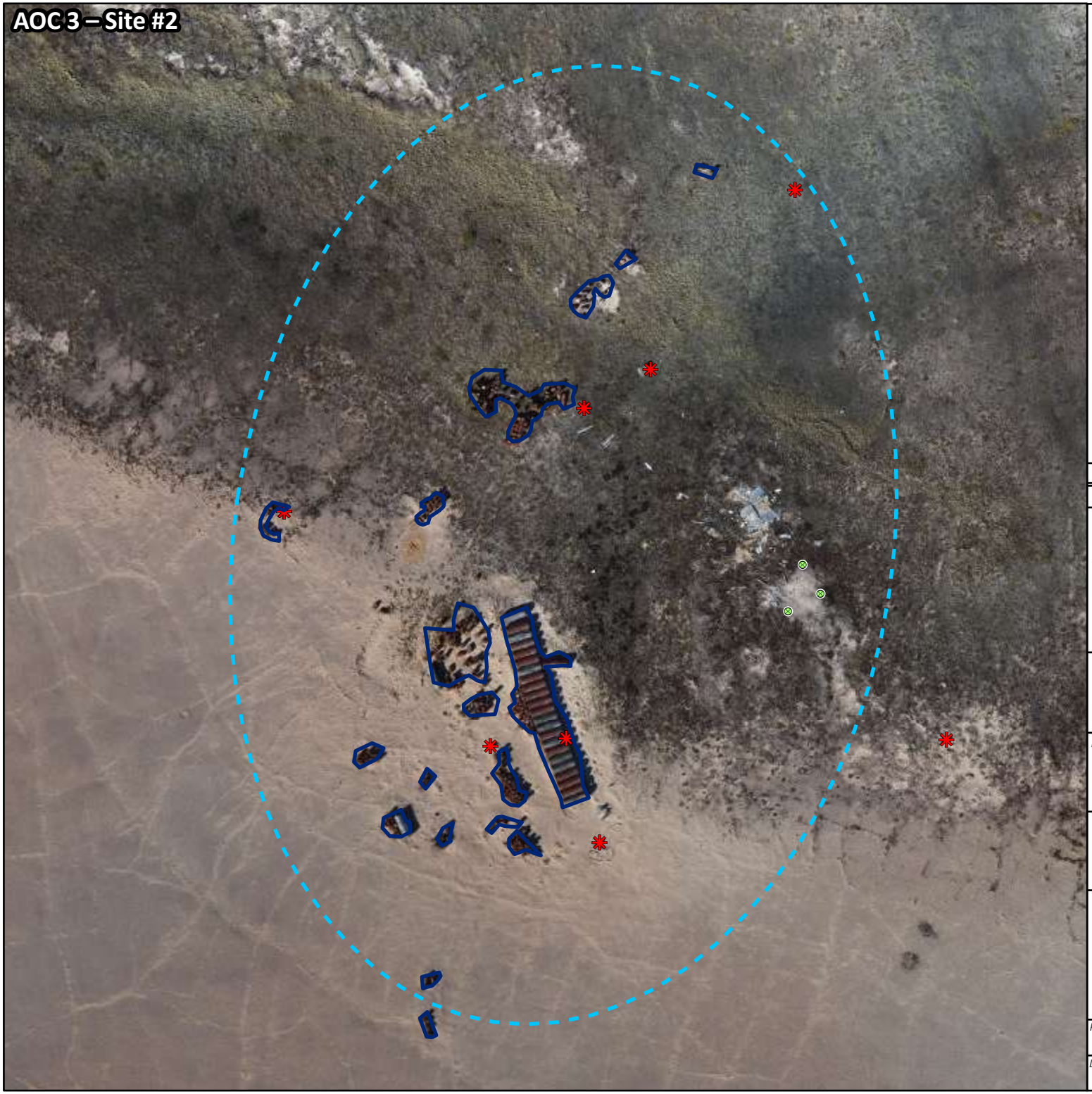
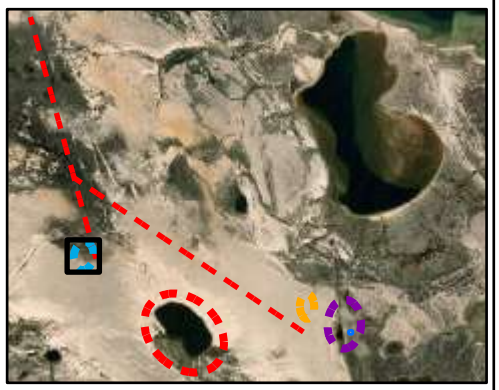


LEGEND

Approximate Alignment of Airstrip
Barrel/Tank Sample Location
Barrel Areas
Building

Area of Concern
AOC 1 - Campsite Area
AOC 2 - Site #1
AOC 3 - Site #2
AOC 4 - Drinking Water Lake



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CLIENT

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PROJECT

Environmental Impact Assessment, Pelly Lake Former Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Debris in AOC 3 - Site #2

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PROJECT #	DATE
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DRAWN	CHECKED	FIG NO.	REV
MB	JB	04c	0

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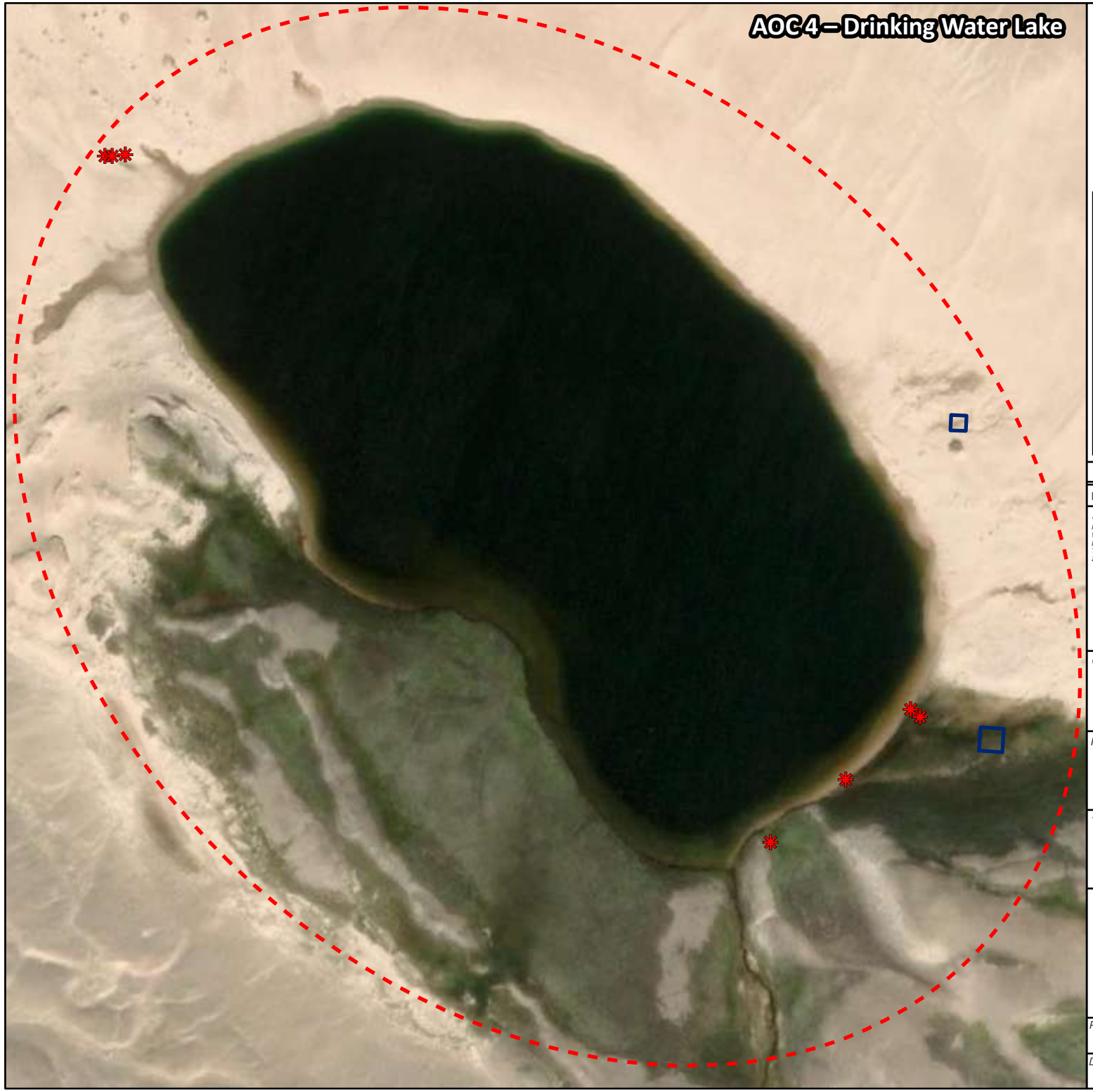
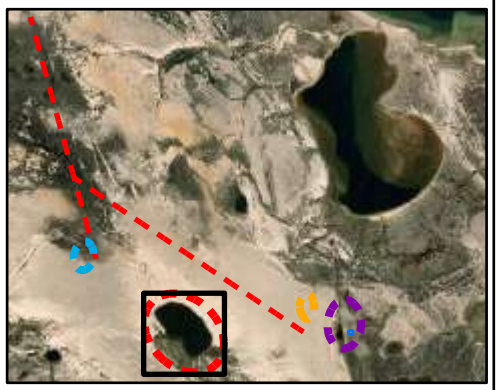


LEGEND

- Approximate Alignment of Airstrip
- Barrel/Tank Sample Location
- Barrel Areas
- Building

Area of Concern

- AOC 1 - Campsite Area
- AOC 2 - Site #1
- AOC 3 - Site #2
- AOC 4 - Drinking Water Lake



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REFERENCES

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment, Pelly Lake Former Airstrip and Former Fuel Cache Site, Nunavut

TITLE

Debris in AOC 4 - Drinking Water Lake

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TEL: (867) 873-3500
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220515	November 02, 2023

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MB	JB	04d	0

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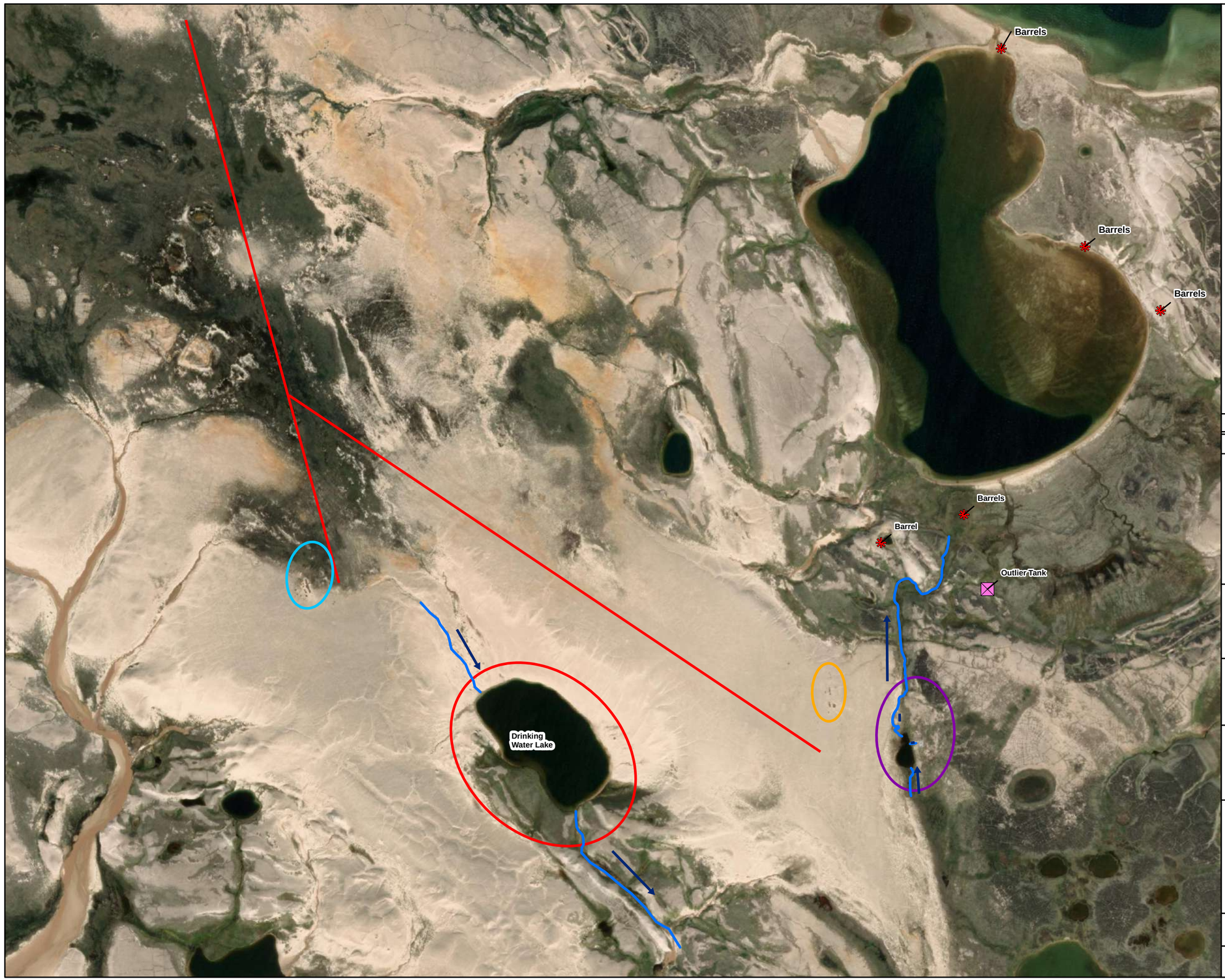

LEGEND

Areas Of Concern

- AOC 1 - Campsite Area
- AOC 2 - Site #1
- AOC 3 - Site #2
- AOC 4 - Drinking Water Lake
- Barrels
- Outlier Tank
- Approximate Alignment of Airstrip
- Stream outline
- Direction of Stream Flow

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES

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N W E S

0 160 320 Meters

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CLIENT

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Procurement Canada

PROJECT

Environmental Impact Assessment
Pelly Lake Airstrip and
Former Fuel Cache Site, Nunavut

TITLE

Debris Outside AOCs

BluMetric™ Environmental

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TEL: (867) 873-3500
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PROJECT #	DATE
220515	December 06, 2023

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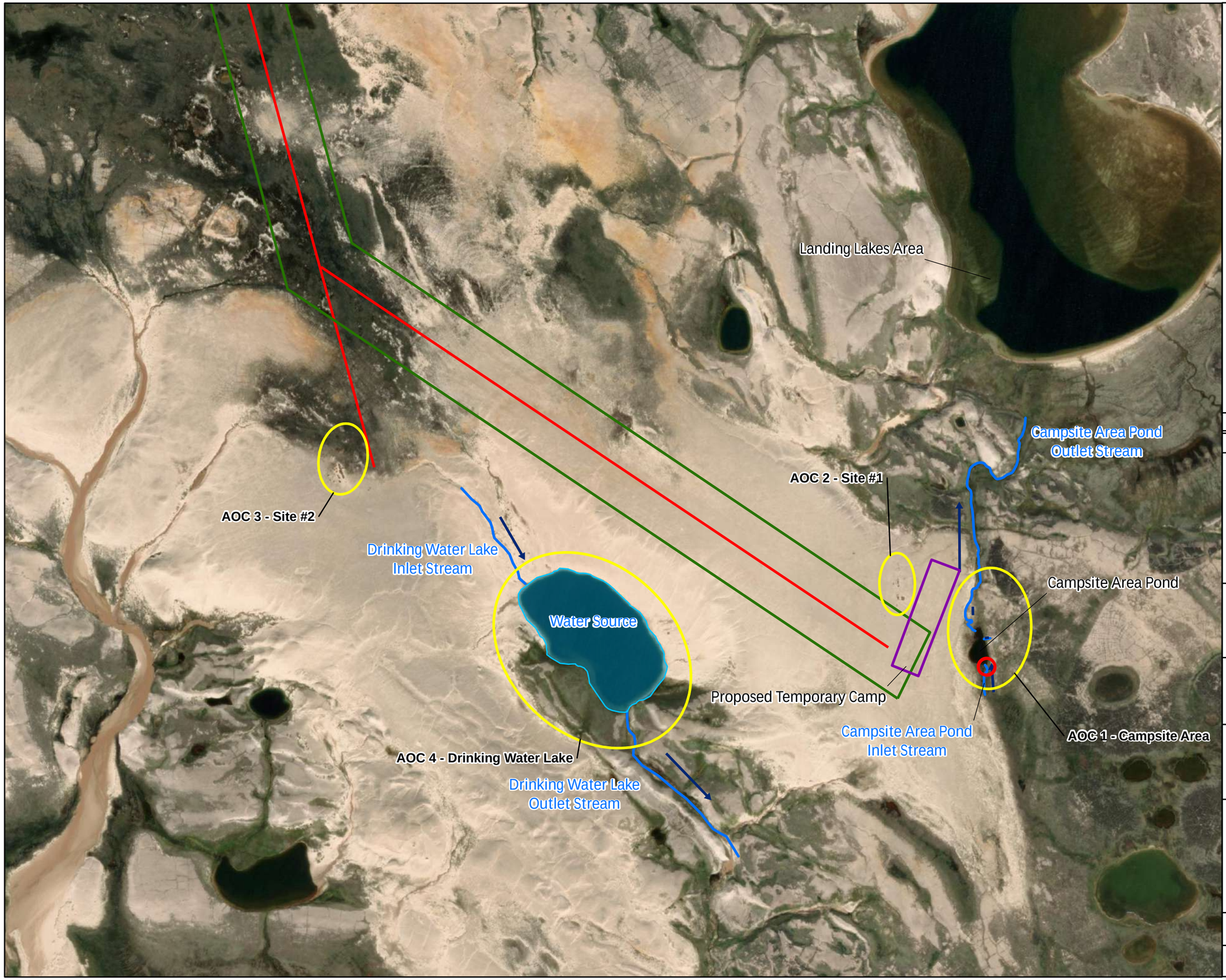

LEGEND

- Impacted Sediment Sample
- Approximate Alignment of Airstrip
- Stream outline
- Direction of Stream Flow
- Approximate Boundaries of Airstrip (From Air Photographs)
- Areas of Concern
- Proposed Temporary Camp including Fuel Storage and Staging Areas
- Water Source

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES

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PROJECT

Environmental Impact Assessment
Pelly Lake Airstrip and
Former Fuel Cache Site, Nunavut

TITLE

Proposed Work Areas

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TEL: (867) 873-3500
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PROJECT #	DATE
220515	December 04, 2023

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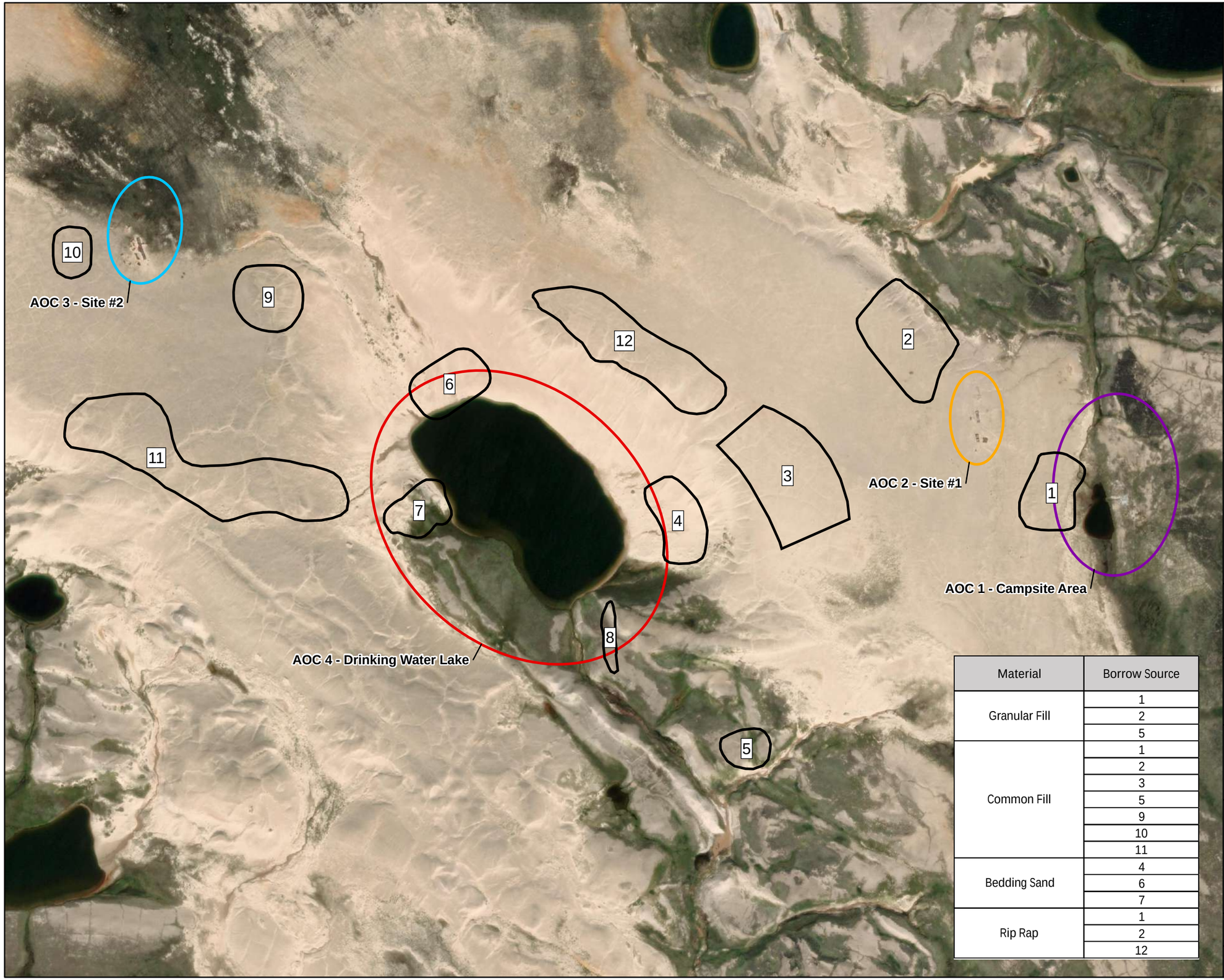

LEGEND

- Approximate Alignment of Airstrip
- Borrow Sources
- AOC 1 - Campsite Area
- AOC 2 - Site #1
- AOC 3 - Site #2
- AOC 4 - Drinking Water Lake

Material	Borrow Source
Granular Fill	1
	2
	5
Common Fill	1
	2
	3
	5
	9
	10
	11
Bedding Sand	4
	6
	7
Rip Rap	1
	2
	12

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

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N W E S

0 100 200 Metres

1:5,000

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Pelly Lake Airstrip and
Former Fuel Cache Site, Nunavut

TITLE

Potential Borrow Source Locations

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PROJECT #	DATE
220515	December 04, 2023

DRAWN	CHECKED	FIG NO.	REV
MB	JB	06	0

APPENDIX A

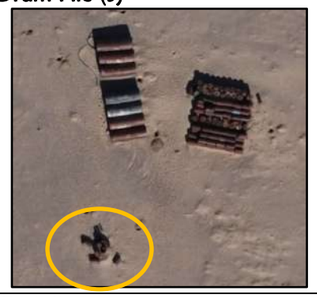
Limited Building Material Investigation and Debris Inventory

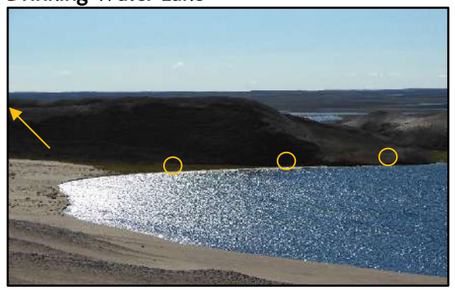
Appendix A: Debris Piles Descriptions and Inventory

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	Campsite Food Cache 	1	Constructed of wood and metal (walls, ceiling, roof and floors) and built into the mound of soil with the entrance facing west. The walls consist of unpainted boards and are lined with sheet metal. The wood and metal is not painted. The roof appears to have been covered in black tar paper in poor condition (partially buried in the gravel to the side of the structure). There appears to be a sheet of plywood lying in front of the structure that may have been the door. The floor has collapsed exposing bare earth, and the structure itself has partially collapsed). There are three tanks on the roof. **Area: 9 m²** **Volume: 20.9 m³** **Adjusted volume without void space: 8.7 m³**	Liquid and Drum/Tank Residues – 0.3 m³ **Total: 0.3 m³**	Plywood and boards 4 m³ Metal debris 2 m³ Tar paper 1.3 m³ Three tanks, cut up 1.4 m³ **Total: 8.7 m³**
2	Immediately West of the Food Cache 	1	No structure remains. Wooden debris, a metal structure, household items, and empty barrels (approximately 7) remain in this area. **Area: 15 m²** **Volume: 15.1 m³** **Adjusted volume without void space: 13.75 m³**	none	Wood debris 13 m³ Metal Debris 0.39 m³ Household items 0.25 m³ Empty barrels, crushed 0.11 m³ **Total: 13.75 m³**
3	Northwest of the Food Cache 	1	No structure remains. Wooden debris, an old generator, a battery, rubber hose, household items, soda cans, and overturned empty barrels (approximately 6) are present in this area. **Area: 54 m²** **Volume: 41.1 m³** **Adjusted volume without void space: 14.1 m³**	Car batteries (3 units) 0.10 m³ **Total: 0.10 m³**	Cylinders (Two 0.8 m³ tanks, two 0.5 m³ tank, and two 0.002 m³ tank) 2.6 m³ Machine parts and generator 1.4 m³ Wood debris 9.9 m³ Empty barrels, crushed 0.09 m³ **Total: 14 m³**
4	West of the Food Cache 	1	No structure remains. CAT bulldozer and metal debris (including approximately two empty barrels) remain in this area. **Area: 25 m²** **Volume: 26 m³** **Adjusted volume without void space*: 17.58 m³** *void space estimated at 2/3 of volume for equipment	Possible liquids inside bulldozer 10 L Assumed lead-based paint, estimated thickness 0.01 m. **Total Liquids: 0.01 m³** **Total Paint: 0.25 m³**	Empty barrels, crushed 0.031 m³ Steel debris 0.6 m³ CAT bulldozer, dismantled 16.7 m³ **Total: 17.3 m³**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	North of the Food Cache – 1 	1	No structure remains. Wooden debris, household items, glass bottles, and overturned empty barrels (approximately 13) are present in this area. **Area: 54 m²** **Volume: 7.6 m³** **Adjusted volume without void space: 5.2 m³**	none	Wooden debris, household items, glass bottles = 5 m³ Empty barrels, crushed 0.2 m³ **Total: 5.2 m³**
6	North of the Food Cache – 2 	1	No structure remains. Wooden debris, household items, glass bottles, and overturned empty barrels (approximately 2) are present in this area. **Area: 54 m²** **Volume: 17 m³** **Adjusted volume without void space: 16.63 m³**	none	Cylinders (Two 0.8 m³ tanks, two 0.5 m³ tank, and two 0.002 m³ tank) 2.6 m³ Metal debris 4 m³ Wood debris 10 m³ Empty barrels, crushed 0.03 m³ **Total: 16.63 m³**
7	Southeast of the Food Cache 	1	Debris from overturned Jeep remain in this area. **Area: 10 m²** **Volume: 4.9 m³** **Adjusted volume without void space: 3.3 m³** *void space estimated at 2/3 of volume for equipment	Possible liquids inside Jeep 10 L **Total: 0.01 m³**	Jeep debris 3.3 m³ **Total: 3.3 m³**
8	Site#1 Fuel Cache (South Pile) 	2	111 barrels (unlabeled and empty) in the large cache, and approximately 44 more barrels scattered in surrounding areas to the south, southeast and southwest. **Area: 60 m² (for the cache), plus 22 m² for the scattered barrels** **Volume: 22.8 m³ (for the cache), plus 9 m³ for the scattered barrels** **Adjusted volume without void space: 2.3 m³ and 0.9 m³**	none	155 empty fuel barrels, crushed 3.2 m³ **Total: 3.2 m³**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
9	**Site#1 Fuel Cache (Middle Pile)** 	2	7 x 1,000 gallon tanks (empty, unlabeled) **Area: 57 m²** **Volume: 31.8 m³** **Adjusted volume without void space: 3.2 m³**	Liquid and drum/tank residues – 0.7 m³ **Total: 0.7 m³**	7 x 1,000 fuel tanks (empty, unlabeled), cut up 3.2 m³ **Total: 3.2 m³**
10	**Site#1 Fuel Cache (North Pile)** 	2	12 x 1,000 gallon tanks (empty, unlabeled), plus 7 barrels (empty, unlabeled) blown onto runway west of this area **Area: 80 m² (tanks) plus 3.5 m² for barrels** **Volume: 54.6 m³ (tanks) plus 1.4 m³ for barrels.** **Adjusted volume without void space: 5.46 m³ (tanks) plus 0.14 m³ for barrels**	Liquid and drum/tank residues – 1.2 m³ **Total: 1.2 m³**	12 x 1,000 gallon fuel tanks (empty), cut up 5.4 m³ 7 fuel barrels (Contents: empty) 0.14 m³ **Total: 5.5 m³**
11	**North of Site#1 Fuel Cache** 	2	No structure remains. Metal debris, household items, glass bottles, and overturned empty barrels (approximately 2) are present in this area. **Area: 30 m²** **Volume: 12.1 m³** **Adjusted volume without void space: 11.7 m³**	none	2 empty barrels 0.03 m³ Steel framing 2 m³ Metal Debris 0.7 m³ Wood debris 2 m³ Tubing 7 m³ **Total: 11.7 m³**
12	**West of Site#1 Fuel Cache** 	2	Metal cart with engine. **Area: 15 m²** **Volume: 45 m³** **Adjusted volume without void space: 25 m³**	Possible liquids inside engine 10 L Assumed lead-based paint, estimated 0.01 m thick. **Total Liquids: 0.01 m³** **Total Paint: 0.15 m³**	Steel cart 12 m³ Engine 13 m³ **Total: 25 m³**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
13	**Site#1 Drum Pile (S)** 	2	6 barrels (unlabeled and empty) in a small cache. **Area: 3 m²** **Volume: 1.2 m³** **Adjusted volume without void space: 0.09 m³**	None	6 empty fuel barrels, crushed 0.09 m³ **Total: 0.09 m³**
14	**Site#2 Fuel Cache** 	3	352 barrels, 26 tanks, plus another 9 barrels scattered to the south, and 23 scattered to the north, 32 toward the airstrip to the northeast and 1 to the east. One tank sample (approximately 15 cm liquid present, sample T1) and two barrel samples (samples B1 and B2) were collected in this area. Sample B2 had a very high concentration of F2 and is assumed to be fuel (location presented on **Figure 7**). B1 and T1 did not contain fuel and are assumed to be mostly water. Total tanks: 26 Total barrels: 417 **Area: 156 m² (tanks) plus 208.5 m² (barrels)** **Volume: 118.2 m³ (tanks) plus 85.5 m² (barrels)** **Adjusted volume without void space: 11.8 m³ (tanks) plus 8.6 m³ barrels**	205 L of fuel present in 1 barrel (B2). Liquid and drum/tank residues – 2.8 m³ **Total Liquid and drum/tank residues: 3.0 m³**	417 empty barrels, crushed 8.6 m³ metal 1 full barrel (Contents: diluted fuel/water) 205 L liquid 26 empty tanks: 11.8 m³ (metal) 1 tank (Contents: diluted fuel/water) 140 L liquid **Total Liquid: 0.345 m³** **Total Debris: 20.4 m³**
15	**East of Site#2 Fuel Cache** 	3	No structure remains. Wooden and metal debris, household items, and broken glass are present in this area. Three samples were collected for analysis of Asbestos Containing Materials (ACM) from the surfaces of the collapsed building and were negative for ACM (samples A01a, A01b, and A01c). **Area: 54 m²** **Volume: 12.1 m³** **Adjusted volume without void space: 11.7 m³**	none	Two empty barrels 0.03 m³ Steel framing 2 m³ Metal Debris 0.7 m³ Wood debris 2 m³ Tubing 7 m³ **Total: 11.7 m³**
16	**Southwest of Site#2 Fuel Cache** 	3	Metal cart. **Area: 12 m²** **Volume: 18 m³** **Adjusted volume without void space: 12.12 m³**	Assumed lead-based paint, estimated 0.01 m thick. **Total Paint: 0.12 m³**	Steel cart 12 m³ **Total: 12 m³**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
17	**Drinking Water Lake** 	4	15 barrels (unlabeled and empty) scattered around the shoreline and above the banks of Drinking Water Lake **Area: 7.5 m²** **Volume: 3.1 m³** **Adjusted volume without void space: 0.23 m³**	none	15 empty fuel barrels 0.23 m³ **Total: 0.23 m³**
18	**Landing Lakes** 	5	27 barrels and 1 x 1,000 L tank (unlabeled and empty) scattered around the shoreline and to the southwest of the Landing Lakes Area **Area: 18 m²** **Volume: 5.5 m³ (barrels) plus 4.5 m³ (tank)** **Adjusted volume without void space: 0.87 m³**	Liquid and drum/tank residues – 0.1 m³ **Total: 0.1 m³**	27 emptybarrels 0.42 m³ 1 empty tank 0.45 m³ **Total: 0.87 m³**
19	**Empty Fuel Drums throughout the site**	N/A	Empty fuel drums throughout the site	Liquid and drum/tank residues – 1.3 m³ **Total: 1.3 m³**	N/A
			Total Volume Estimates	**Total Debris: 0.10 m³** **Total Paint: 0.52 m³** **Total Liquids and Drum/Tank Residues: 6.64 m³**	**Total (debris): 172.77 m³** **Total (liquid): 0.345 m³**

Notes: Tank volume (1000 gallon/4546 L) assumed to be 4.546 m3 whole and 0.4546 m3 crushed (90% volume reduction)
Barrel volume (205 L) assumed to be 0.205 m3 whole and 0.0155 m3 crushed (90% volume reduction)

APPENDIX B

Species at Risk in Nunavut

COSEWIC = Committee on the Status of Endangered Wildlife in Canada. **SARA** = Species at Risk Act.

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Study Area		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Insects							
Transverse Lady Beetle	*Coccinella transversoguttata*	Special Concern	Special Concern	Schedule 1	Possible	Species range includes study area; suitable habitat is present.	COSEWIC (2016)
Freshwater Fish							
Fourhorn Sculpin	*Myoxocephalus quadricornus*	Data Deficient	Special Concern	No schedule	Nil	Species range includes study area; suitable cold, deep freshwater lake habitat absent.	COSEWIC (2003a)
Birds							
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011a)
Buff-breasted Sandpiper	*Tryngites subruficollis*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2012c)
Common Nighthawk	*Chordeiles minor*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2018)
Eskimo Curlew	*Numenius borealis*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2009)
Harlequin Duck	*Histrionicus histrionicus, Eastern population*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2013)
Harris's Sparrow	*Zonotrichia querula*	Special Concern	No Status	No schedule	Possible	Within species breeding range. Species nests in small, isolated wooded areas with trees or tall shrubs that may be present adjacent to the study area.	COSEWIC (2017)
Horned Grebe	*Podiceps auritus, Western population*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2009b)
Hudsonian Godwit	*Limosa haemastica*	Threatened	No Status	No Schedule	Nil	Species range does not include study area.	COSEWIC (2019)
Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2001)
Lesser Yellowlegs	*Tringa flavipes*	Threatened	No Status	No Schedule	Possible	Within species breeding range. The wetlands that are present in the study area provide suitable breeding habitat.	COSEWIC (2020)
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007)
Peregrine Falcon anatum/tundrius	*Falco peregrinus anatum/tundrius*	Not at Risk	Special Concern	Schedule 1	Nil	Species range does include study area, but suitable cliff habitats for nesting do not occur at or near the study area.	COSEWIC (2007a)

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Study area		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Red Knot islandica subspecies	*Calidris canutus islandica*	Not at Risk	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007b)
Red Knot rufa subspecies	*Calidris canutus rufa*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007b)
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern	Special Concern	Schedule 1	Possible	Within species breeding range. The wetlands present in the study area may provide suitable breeding habitat.	COSEWIC (2014)
Ross's Gull	*Rhodostethia rosea*	Threatened	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2021)
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2006)
Short-eared Owl	*Asio flammeus*	Threatened	Special Concern	Schedule 1	Possible	Within species breeding range. The open habitat within the study area may provide suitable breeding habitat.	COSEWIC (2008a)
Terrestrial Mammals							
Barren ground Caribou	*Rangifer tarandus groendlandicus*	Threatened	No status	No Schedule	Possible	Within species range. Vegetation within the study area may provide suitable forage during the summer season.	COSEWIC (2011b); COSEWIC (2016a)
Dolphin and Union Caribou	*Rangifer tarandus*	Endangered	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Torngat Mountains Caribou	*Rangifer tarandus*	Endangered	No Status	No Schedule	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Peary Caribou	*Rangifer tarandus pearyi*	Threatened	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Grizzly Bear	*Ursus arctos, Western population*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. The study area may provide suitable forage.	COSEWIC (2002)
Polar Bear	*Ursus maritimus*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. Species may inhabit study area if forced inland due to loss of sea ice.	COSEWIC (2008b)
Wolverine	*Gulo gulo*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. The study area may provide suitable forage.	COSEWIC (2014d)
Plants							
Porsild's Bryum	*Haplodontium macrocarpum*	Threatened	Threatened	Schedule 1	Nil	Species range does include study area, and suitable mountainous and rocky habitats with continuous seepage do not occur at or near the study area.	COSEWIC (2017a)

APPENDIX C

Summary of Impacts

Activity: Summer Airstrip Use

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Small area; low impact, minimum to no work planned to the air strip, use of small planes
Permafrost		
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency plans in place
Climate Conditions	**NN**	Small impact; fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	Sediment and Erosion Control Plan
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NN**	Short term impact
Noise levels	**NN**	Short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NN**	Short term impact
Wildlife (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan, pre-work dens survey, Wildlife Monitor present at all times, Short term impact
Birds (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan, Nesting survey on arrival, Wildlife Monitor present at all times, Short term impact
Aquatic species (including habitat, migration, and spawning)		
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Education and installation of buffer
Employment		
Community wellness		
Community infrastructure		
Human health		

Legend: Identification of Environmental Impacts
P = Positive
NN = Negative / Non-mitigatible
NM =Negative / Mitigatible
UN = Unknown
Leave blank all items not applicable to this project

Activity: Camp and Laydown Areas Development/Use (incl. fuel/haz mat storage)

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Minimal use of equipment and no heavy equipment, small camps and laydown areas, travel routes selected by PCR, and camp and laydown areas constructed on stable and already disturbed lands
Permafrost		
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; fuel use will be restricted to at least 100m from water bodies
Climate Conditions	**NN**	Small impact from fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	Sediment and Erosion Control Plan
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NN**	Use of a equipment; isolated and short term impact
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NM**	Camp and laydown Areas including fuel/chemical storage will be preferentially instlaled in an area with little/no vegetation
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan in place.
Birds (including habitat and migration patterns)	**NM**	A nest sweep will occur prior to commencing work; avoidance of nests planned through site inspections and buffers
Aquatic species (including habitat, migration, and spawning)	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; fuel and hazardous materials will be stored a minimum of 100m from water body
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Education and installation of buffer
Employment		
Community wellness		
Community infrastrcture		
Human health		

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Activity: Borrow Areas

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Minimal use of equipment, no heavy equipment, limited borrow material required. Borrow areas selected by PCR to avoid sensitive areas.
Permafrost	**NM**	Shallow excavation; low impact; no heavy machinery
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; borrow will preferentially be used from areas at least 30m from a water body
Climate Conditions	**NN**	Small impact from fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	Sediment and Erosion Control Plan
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NN**	Use of a equipment; isolated and short term impact
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NM**	Borrow will be preferentially taken from sources that have little/no vegetation; if vegetated areas cannot be avoided, vegetation will be stored and reestablished
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan in place.
Birds (including habitat and migration patterns)	**NM**	A nest sweep will occur prior to commencing work. Avoidance of nests planned through site inspections and buffers.
Aquatic species (including habitat, migration, and spawning)	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; borrow will preferentially be used from areas at least 30m from a water body
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Education and installation of buffer
Employment		
Community wellness		
Community infrastrcture		
Human health		

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Activity: Site Clean Up and Remediation

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Minimal use of equipment, no heavy equipment. Small work areas, travel routes, camp and laydown areas selected by PCR and constructed on previously disturbed areas where possible.
Permafrost		
Hydrology / limnology		
Water Quality	**P**	Short term mitigatable impacts during sediment removal; removal of contaminants and hazardous materials from the site will have a positive impact
Climate Conditions	**NN**	Small impact from fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	No major excavations, Sediment and Erosion Control Plan, no heavy equipment use.
Sediment and soil quality	**P**	Removing contaminated sediment and hazardous materials from the site
Tidal processes and bathymetry		
Air quality	**NN**	Use of a equipment; isolated and short term impact
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NM**	Limited machinery, no-work buffer zones for sensitive areas, previously disturbed or areas with no/minimal vegetation will be selected for camp, laydowns, or travel routes. Vegetation will be stockpiled when possible, equipment with low tire pressure will be used.
Wildlife (including habitat and migration patterns)	**P**	Disturbance of terrestrial mammals at risk (polar bear, artic wolf and caribou) could occur if individuals are located within the Site or its surroundings while remediation work is conducted. Isolated and short term impacts. Wildlife Management Plan. Long term impact is positive due to removal of contaminants.

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Birds (including habitat and migration patterns)	**P**	A nest sweep will occur prior to commencing work. Avoidance of nests planned through site inspections and buffers. Long term impact is positive due to removal of contaminants.
Aquatic species (including habitat, migration, and spawning)	**P**	The majority of waste will be disposed off-site. Fuel Management, Spills Contingency, Erosion/Sediment control plans in place. Specific mitigation identified for sediment removal and water intake. Long term impact is positive due to removal of contaminants.
Wildlife protected areas		

SOCIO-ECONOMIC	**Identification of Environmental Impacts**	**Comments**
Archaeological and cultural historic sites	**NM**	Education and installation of buffer
Employment	**P**	Provides local opportunities
Community wellness	**P**	Engagement in cleaning up the Site
Community infrastrcture		
Human health	**P**	Removing contaminants from the site reduces human risk of exposure

Activity: Water Intake

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability		
Permafrost		
Hydrology / limnology	**NM**	Water consumption is limited and intake monitored to minimize impacts to surface water body
Water Quality	**NM**	Pump will have secondary containment for leaks. Spills Management Plan in place.
Climate Conditions		
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology		
Sediment and soil quality	**NM**	Pump will have secondary containment for leaks. Spills Management Plan in place.
Tidal processes and bathymetry		
Air quality	**NN**	Use of a equipment; isolated and short term impact
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation		
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan will be in place.
Birds (including habitat and migration patterns)	**NM**	Nest sweep to be conducted prior to commencing work. Buffers will be established as required.
Aquatic species (including habitat, migration, and spawning)	**NM**	Pump will have secondary containment for leaks. Mesh installed on intake pipe. All waste will be disposed off-site. Spills contingency plan in place.
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites		
Employment		
Community wellness		
Community infrastrcture		
Human health		

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Activity: Winter Trail Development/Use

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability		
Permafrost		
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency plans in place
Climate Conditions	**NN**	Small impact; fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology		
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NN**	Short term impact
Noise levels	**NN**	Short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NM**	Use only snow covered trails; staff training to minimize impacts from reckless driving
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan, pre-work dens survey, Wildlife Monitor present at all times, Short term impact
Birds (including habitat and migration patterns)		
Aquatic species (including habitat, migration, and spawning)	**NM**	Fuel Management, Spills Contingency plans in place
Wildlife protected areas	**NM**	Avoidance of dens with a pre-work survey and identification of suitable habitat

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Education and installation of buffer
Employment		
Community wellness		
Community infrastructure		
Human health		

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Activity: Winter Airstrip Development/Use

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability		
Permafrost		
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency plans in place
Climate Conditions	**NN**	Small impact; fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology		
Sediment and soil quality		
Tidal processes and bathymetry		
Air quality	**NN**	Short term impact
Noise levels	**NN**	Short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation		
Wildlife (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan, pre-work dens survey, Wildlife Monitor present at all times, Short term impact
Birds (including habitat and migration patterns)		
Aquatic species (including habitat, migration, and spawning)		
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites		
Employment		
Community wellness		
Community infrastructure		
Human health		

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BluMetric Environmental Inc.

1682 Woodward Drive
Ottawa, Ontario
Canada K2C 3R8
Tel: 877.487.8436
Fax: 877.487.8436
Ottawa@blumetric.ca

4 Cataraqui Street
The Tower, The Woolen Mill
Kingston, Ontario
Canada K7K 1Z7
Tel: 877.487.8436
Kingston@blumetric.ca

3B - 209 Frederick Street
Kitchener, Ontario
Canada N2H 2M7
Tel: 877.487.8436
Kitchener@blumetric.ca

825 Milner Avenue
Toronto, Ontario
Canada M1B 3C3
Tel: 877.487.8436
Toronto@blumetric.ca

6-410 Falconbridge Road
Sudbury, Ontario Canada
P3A 4S4
Tel: 877.487.8436
Sudbury@blumetric.ca

260-15 Taschereau Street
Gatineau, Quebec
Canada J8Y 2V6
Tel: 877.487.8436
Gatineau@blumetric.ca

200-1500 Du College Street
Saint-Laurent, Quebec
Canada H4L 5G6
Tel: 877.487.8436
Montreal@blumetric.ca

4916 – 49th Street
Yellowknife, NT
Canada X1A 1P3
Tel: 877.487.8436
Yellowknife@blumetric.ca

Whitehorse, Yukon
Canada Y1A 2J8
Tel: 877.487.8436
Whitehorse@blumetric.ca

www.blumetric.ca