



INDIAN AND NORTHERN AFFAIRS CANADA
NUNAVUT REGIONAL OFFICE

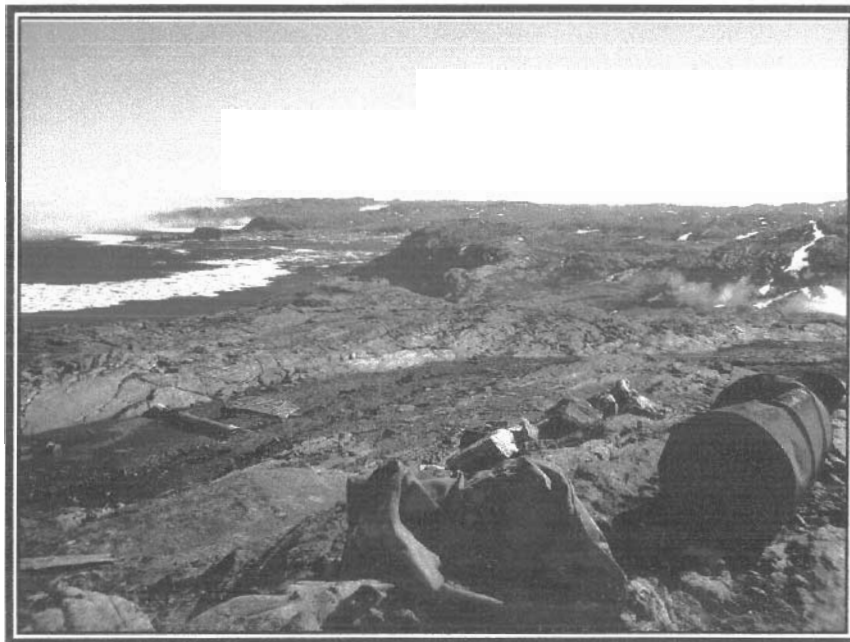


ENVIRONMENTAL SCREENING REPORT

for the

RESOLUTION ISLAND PROJECT

BAF-5 : ABANDONED POLE VAULT MILITARY RADAR STATION



Prepared by:



ᑭᑭᑭᑭᑭᑭ ᑭᑭᑭᑭᑭᑭ
QIKIQTAALUK CORPORATION

March 1998
revision 1 - February 2003

EXECUTIVE SUMMARY

The proposed project to clean up the abandoned military radar station located at Resolution Island in the Canadian Arctic has been screened pursuant to the Canadian Environmental Assessment Act (CEAA). The lead responsible Authority has been identified as Indian and Northern Affairs Canada.

The general objective of the project is to reduce the negative environmental impacts from past occupation that has contributed to soil contamination, in violation of the Canadian Environmental Protection Act (CEPA), as well as to unstable waste dumps. The Project started in 1998 and has been on-going ever since. Revisions to the initial screening report were deemed necessary based on the planning of new clean up activities.

The project involves the removal, containerization and temporary storage of CEPA soils (PCB levels > 50 ppm) for off-site shipping and disposal as well as management of other contaminated soils exceeding generic criteria and remaining drum contents (waste petroleum products). A remote construction camp is operated and managed to accommodate the work crew. For the purpose of assessing socio-economical and environmental impacts, the project has been divided into its major activities. The impacts and recommended mitigative measures are summarized in Table 1.

Community consultations were not conducted as part of the screening but were carried out in Kimmirut in May 1998, prior to the beginning of the clean up activities, as well as in Iqaluit and Kimmirut in September 2000. Various interested parties participated in these consultations.

Based on the information given in this screening report, the proposed project is not likely to cause significant adverse environmental effects and the project may proceed with the assurance that mitigating measures will be implemented.

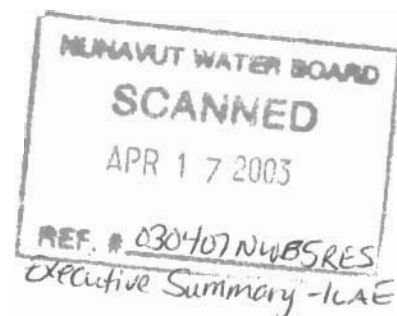


Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.1 Site Access	
<u>Rutting and Erosion</u> Heavy equipment and vehicles can damage soil integrity.	Vehicles or heavy equipment shall not be operated off-roads after heavy rain or melting snow conditions. Such restrictions shall apply until the soil has dried sufficiently so that excessive rutting can be prevented.
Habitat Disturbances Seabirds are known to be vulnerable during their nesting period. Some species may be affected by low-flying aircraft and close approaches by marine vessels.	Pilots shall be advised to maintain an altitude of at least 500 metres above ground or water when passing over areas where birds are concentrated. Pilots shall not be permitted to do low-level flights to observe and/or photograph wildlife.
Habitat Degradation Large volumes of fuel will be required at the site to run both equipment and generators. The fuel is expected to be transported to the site on a barge or supplied by tanker ships. There is the possibility of accidental spillage at the site which would result in the contamination of soils and/or water in the surrounding environment.	Transportation of fuel, as well as any other hazardous materials brought to the site, shall be done in compliance with the Transportation of Dangerous Goods Act and Regulations requirements. Fuel will be kept in double walled steel tanks. Valves on fuel tanks should have receptacles placed beneath them to catch any leaked fuel.
7.2 Construction Camp	
<u>Aesthetic and Safety</u> Solid waste produced at the camp may cause both an aesthetic and safety concern at the site. Animals are attracted to solid waste disposal sites and have the possibility of becoming a nuisance as well as a safety concerns to personnel.	Waste bins used at the site shall be animal proof and emptied on a frequent basis. Non-hazardous combustible wastes are to be burned daily, in a forced air fuel-fired incinerator. Ash and non-combustible non-hazardous wastes should be buried within the upper non-hazardous landfill. Hazardous wastes shall be stored in a proper manner and transported from the site in accordance with the Transportation of Dangerous Goods Act and Regulations.
<u>Health</u> Sewage disposal from the camp may cause a health problem for both humans and wildlife.	A sewage lagoon located near the camp shall be used for the disposal of sewage water. Hazardous materials shall not be discharged in this lagoon. A warning sign shall be posted near the lagoon, and the lagoon shall be fenced off to prevent accidents.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
<u>Habitat Degradation</u> Fuel used in equipment and camp generators is needed in large quantities and must be transported to the site via seallift, and then trucked to the upper site. Fuel spillage can result in both soil and surface water contamination.	A spill contingency plan was prepared for fuel storage as well as any other hazardous liquids used at the site. Fuel storage is to be located at least 12 metres above the high water mark of the nearest water body, on flat stable terrain or in a natural depression and is to be stored and dispensed in accordance with the CCME Environmental Code of Practice for Above ground Storage Tank Systems and fire code requirements. Secondary containment is required for any fuel storage container with a capacity of 4,000 litres or more. Any contamination created at the site should be remediated. Fuel spills shall be reported and cleaned up immediately.
<u>Fire</u> There is the possibility of a fire occurring at the site as a result of camp related activities.	Adequate attention to fire safety and prevention is required by the camp operator and workers. Fire alarms and fire fighting equipment suitable for the size of the camp are maintained on-site. A Fire Emergency Plan is in place.
7.3 Fuel Handling and Storage	
<u>Habitat Loss/Alteration</u> Some habitat loss or alteration may occur if a fuel spill occurs.	Emergency spill equipment including fuel pumps, empty drums, containment booms and other sorbent materials are available on site. Enough equipment are on-site to clean up a 1,000 litre spill at the fuel tank farm or any other fuel storage locations.
<u>Fire</u> There is the possibility of a fire occurring at the site as a result of accidents (i.e., ignition sources).	Smoking is prohibited within 5 metres of the fuel storage facilities. Appropriate signs are posted. Fire-fighting equipment are available for immediate access near the tank farm and at all fuel storage locations.
7.4 Heavy Machinery and Vehicle Management	
<u>Wildlife Stress</u> Wildlife can be affected by vehicle movements although it is expected that this will have a minimal impact.	Mobile equipment and vehicle operators shall not operate vehicles in a manner to disturb any wildlife species.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
<u>Habitat Alteration</u> Some habitat alteration may occur if a spill of maintenance fluids occur.	Vehicle and equipment maintenance and servicing shall be conducted only in designated areas on gravel pads, where special procedures can be implemented to manage fluids, waste, and contain potential spills. Maintenance, fuelling and lubrication of machinery shall be conducted in such a way as to avoid fluid spills. Used fluids (e.g., oils, antifreeze) and filters (e.g., oil, fuel) shall be containerized in separate and appropriately identified drums (or other appropriate containers) and shall be treated as hazardous materials. All storage containers shall be properly sealed after use. Waste fluids shall not be used for dust control.
Health and Safety Because of the topography of the site, there is a concern for accidents involving vehicles on roads.	A speed limit shall be established (tentatively 30 km/hour or less) and enforced by the site superintendent..
7.5 Water Supply	
<u>Fish Habitat Alteration</u> There is a potential for fish habitat alteration from freshwater withdrawal activities.	Water usage shall respect all conditions of the water permits delivered by the Nunavut Water Board.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.6 Asbestos Abatement <u>Health and Safety</u> The buildings contain friable asbestos. The removal of such materials creates a health risk for personnel involved in the asbestos abatement activities.	The removal of the asbestos from any locations is to be treated as an asbestos project and all of the related health and safety requirements adhered to. This will include the removal of all visible asbestos. The Safety Act and Occupational Health Regulations (Nunavut) require that workers handling asbestos material wear respiratory equipment approved by the Canada Standards Association, as well as other safety equipment including coveralls, gloves, eye protection and head gear. All personnel who work on the asbestos material must be trained for the use of protective equipment and safe handling and disposal of the asbestos. Warning signs should be posted at the site informing staff that asbestos removal is occurring and ensure that personnel not working with the asbestos should not be near the working site.
7.7 Demolition of Work <u>Health and Safety</u> There is a safety concern for workers involved in demolition activities.	A health and safety program that meets the standards and requirements of applicable regulatory agencies shall be implemented. The construction safety measures of the National Building Code shall be respected and enforced.
7.8 Construction and Maintenance of Roads <u>Permafrost Degradation</u> Cut and fill operations required to provide the sub-granular base for the road access to the S1/S4 beach area may disrupt the permafrost.	Disturbed soil that disrupts natural drainage patterns or exposes permafrost in ice rich soils shall be repaired.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
<u>Habitat Degradation</u> Installation of culverts in the stream and subsequent covering by gravel might, or installation of a boulder layer cause stirring of bottom sediments and generate an increase in water turbidity downstream. This could cause impacts to the stream aquatic habitats as well as fish habitats in the ocean downstream.	These impacts should be temporary (i.e., only during the construction and removal of the road and culverts), however, during these activities, a silt fence shall be installed to limit the spreading of sediments and turbidity downstream. The use of a bridge would eliminate the need for mitigation measures.
7.9 Excavation of Contaminated Soil <u>Rutting and Erosion</u> Unstable areas such as steep slopes and streams may be encountered during the excavation phase. These areas are more prone to rutting, erosion and environmental damage.	Excavation work shall be minimized in the vicinity of watercourses. Heavy machinery, vehicles and equipment shall not be operated in waterways. Waste, excavated fill and/or debris shall not be disposed in waterways. Suitable barriers such as silt fences shall be installed if required to separate work areas from waterways. All unstable areas requiring excavation shall be identified and procedures shall be implemented to minimize surface rutting.
<u>Contamination of "Clean" Areas</u> There is a risk that excavation activities contribute to the contamination of non-contaminated areas including fish habitat. Furthermore, equipment and machinery used during contaminated soil excavation and handling will require cleaning, and this will produce hazardous materials (solids and fluids) that can have a negative environmental impact if not managed properly.	Hazardous material management areas shall be located at a minimum distance of 30 metres from the nearest water body. CEPA soils screening procedures shall be implemented in such a way as to prevent the spreading of contaminated dust. Movement of heavy machinery, vehicles and equipment within the hazardous material management areas shall be controlled to prevent the dispersion of potentially hazardous dust and materials into the environment. Wash water resulting from the cleaning (i.e., decontamination) of equipment and heavy machinery used in the hazardous waste management areas shall be recovered and treated as per regulations.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
<u>Permafrost Degradation</u> Material and equipment will have to be stored temporarily within each hazardous material management area for the duration of the excavation activities.	Storage areas shall be sited in locations where the natural surface drainage will not be affected and where ponding can be avoided. Materials shall not be stored on unprotected ground. Gravel pads or other appropriate methods shall be constructed to protect ice-rich soil from damages.
7.10 Construction of Engineered Landfills	
<u>Rutting and Erosion</u> Use of heavy equipment and machinery can damage soil integrity, especially in unstable areas.	Heavy equipment operations shall be limited to pre-determined work areas. Activities outside these areas shall be minimized, and conducted only when the soil is sufficiently dry so that excessive rutting can be prevented.
<u>Surface Water Runoff/Sediment Movement</u> Heavy equipment traffic and large movements of granular material may generate high sediment loads in surface water runoff.	Landfill sites shall be located at a minimum distance of 30 metres from the nearest water body. Silt fences shall be installed in drainage ditches in order to prevent migration of sediments to streams and water bodies.
<u>Habitat Loss/Alteration</u> Habitat will be lost and altered through the excavation and removal of top soil, as well as by backfilling over vegetated areas.	Upon landfill closure, the area shall be covered with granular material, graded and reshaped to match the surrounding topography and minimize erosion. Vegetation will eventually colonize this new surface area.
7.11 On-site Treatment of Hydrocarbon Contaminated Soils	
<u>Contamination of "Clean" Areas</u> Treatment activities may potentially contribute to the contamination of non-contaminated areas. Dry contaminated soil particles and dust may be spread by wind. Furthermore, runoff water draining from the soil may be contaminated.	The landfarming treatment pad shall be located at a minimum distance of 30 metres from the nearest water body. The soil moisture level shall be kept at an optimal level to promote biodegradation, therefore this soil moisture will minimize loss of particles to wind. Drainage ditches located around the treatment pad will recover potentially contaminated water. The water will then be tested, and treated if required, before being discharged.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.12 Disposal of Hazardous Materials <u>Health and Safety</u> There is a safety concern for workers involved in the handling of hazardous waste.	Every possible precaution shall be taken when hazardous materials and contaminated soils are handled, hauled or transported to ensure that such materials do not come into contact with site personnel. Protective clothing shall always be used by site workers when hazardous materials including contaminated soils are handled. All clean up personnel shall be informed and shall comply with requirements of the Workplace Hazardous Materials Information System (WHMIS) program and the Hazardous Waste Operations and Emergency Response (HAZWOPER) program.
<u>Habitat Degradation</u> Spill of hazardous materials during off site shipping could cause severe impacts to terrestrial and/or fish habitats.	Any unknown waste that may require off-site shipping shall be characterized to determine whether it must be considered as a transport hazard according to regulations. All provisions from the Transportation of Dangerous Goods Act (TDGA), the International Maritime Dangerous Goods (IMDG) Regulations, and the International Air Transport Association (IATA) Dangerous Goods Regulations shall be respected.
7.13 Temporary Storage of CEPA Soils <u>Contamination of "Clean" Areas</u> There is an environmental concern with the release of contaminated soils in non-contaminated areas during transportation to storage facilities.	Spillage of material during transportation between the excavation site and the storage/stockpile location shall be minimized, if not avoided.
7.14 Disposal of Non-hazardous Materials <u>Aesthetic and Safety</u> Non-hazardous waste may cause both an aesthetic and safety concern at the site if not managed properly. Non-hazardous waste can be scattered by wind or animals and thereby becoming a safety concern to personnel as well as wildlife.	Waste to be placed in non-hazardous landfills shall be compacted and rapidly covered with a layer of granular fill.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.15 Landfill Closure <u>Safety and Health</u> Because of the nature of work involved and potential hazardous material exposure, there is a concern for the health and safety of workers.	<i>The impact of these operations is similar to that of the section 7.12 and 7.14 and the mitigative measures identified in these sections apply.</i>
7.16 Development of Granular Borrow Areas <u>Wildlife Avoidance</u> Blasting rock produces a high decibel noise which may alarm wildlife causing some avoidance and resident bird populations may be vulnerable to noise during their nesting period in May and June. This operation will only be required over short periods during the project. Therefore, avoidance by wildlife should not be permanent. <u>Safety Hazard</u> The transportation and handling of explosives is a safety concern for workers.	<i>Blasting shall be limited to the time of the season when nesting is mostly over (i.e., July and August).</i> <i>Handling, storage and transportation of explosives shall be conducted according to applicable laws and regulations. The handling of explosives shall be restricted to authorized and licensed personnel. Blasting shall be conducted in such a way as to minimize dispersal of material, and prevent dispersed materials from reaching fuel or hazardous material storage locations. A buffer zone of 300 metres shall be respected.</i> <i>No mitigative measures were considered necessary.</i>
<u>Habitat Loss/Alteration</u> Habitat may be lost through the removal of vegetation from blasting operations. However, the bedrock areas to be blasted are relatively free of vegetation.	

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
<u>Environmental Disturbances</u> Quarrying activities may create environmental impacts to the immediate surroundings of the borrow pits.	A quarry permit issued under the INAC Territorial Quarrying Regulations shall be obtained. The permit shall have site-specific provisions for environmental protection. These conditions are provided to minimize the extraction process impacts on water quality, drainage, erosion and ecosystems. All terms and conditions of the quarry permit shall be respected, including borrow area recontouring and clean up before abandonment.
<u>Disruption of Drainage</u> Drainage may be impacted during excavation of the borrow areas. Sediments may be deposited into streams, thereby disrupting natural drainage of the area.	Borrow pits shall be protected from erosion and ponding by proper grading.
<u>Permafrost Degradation</u> Excavation of the borrow areas will remove the insulating ground cover and expose the sides and the bottom of the excavations to direct sunlight. This may result in erosion and slumping of the pit side walls. Damage to permafrost in the immediate vicinity of the pits is unavoidable. The areas are, however, surrounded by bedrock outcrops and it is likely underlain by bedrock as well. The excavations may therefore extend to surface bedrock in some areas, eliminating the concern for permafrost degradation.	Final grading of any non-bedrock side walls will be required to address slumping and erosion of the pits the following summer.
7.17 Migration Barriers	
<u>Safety and Health</u> Because of the nature of the work involved to remove existing containment booms, there is a concern that workers may be exposed to potentially hazardous materials.	The impact of these operations is similar to that of the section 7.12 and 7.14 and the mitigative measures identified in these sections apply.
<u>Habitat Loss/Alteration</u> Habitat will be lost through the removal of vegetation from excavation of trenches. However, the surface of land to be excavated to construct migration barrier is relatively small.	No mitigative measures were considered necessary except that movement of heavy machinery required to excavate trenches shall be restricted to the close vicinity of excavation areas.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
TABLE OF CONTENTS	xi
LIST OF ABBREVIATIONS	xiv
1.0 BACKGROUND INFORMATION	1
2.0 PROJECT RATIONALE	3
3.0 SITE DESCRIPTION	4
4.0 PROJECT ACTIVITIES	7
4.1 Site Access	8
4.2 Construction Camp	8
4.3 Fuel Handling and Storage	8
4.4 Heavy Machinery and Vehicle Management	8
4.5 Water Supply	8
4.6 Camp Waste Management	9
4.7 Asbestos Abatement	9
4.8 Demolition Work	9
4.9 Construction and Maintenance of Roads	9
4.10 Excavation of Contaminated Soil	10
4.11 Construction of an Engineered NH Waste Landfill	11
4.12 Construction of an Engineered Lined Landfill	11
4.13 On-site Treatment of Hydrocarbon Contaminated Soils	11
4.14 Disposal of Hazardous Materials	11
4.15 Temporary Storage of CEPA Soils	12
4.16 Disposal of Non-Hazardous Materials	13
4.17 Landfill Closure	13
4.18 Development of Granular Borrow Areas	13
4.19 Migration Barriers	13
4.20 Site Grading	13
4.21 Winterization and Demobilization	14
4.22 Summary of Remedial Work Carried Out	14
5.0 REGULATORY OVERVIEW	17
5.1 General	17
5.2 Federal Jurisdictions	17
5.3 Nunavut Territory Jurisdictions	20
5.4 Permits	21
6.0 BIOPHYSICAL ENVIRONMENT	23
6.1 Physiographic Description	23
6.1.1 Geology	23
6.1.2 Hydrology	23

6.1.3	Topography	23
6.1.3	Meteorology	24
6.2	Biological Description	24
6.2.1	Terrestrial Flora	24
6.2.2	Fauna	26
7.0	POTENTIAL PROJECT IMPACTS AND MITIGATIVE MEASURES	27
7.1	Site Access	27
7.2	Construction Camp	28
7.3	Fuel Handling and Storage	29
7.4	Heavy Machinery and Vehicle Management	30
7.5	Water Supply	31
7.6	Asbestos Abatement	31
7.7	Demolition Work	32
7.8	Construction and Maintenance of Roads	32
7.9	Excavation of Contaminated Soil	33
7.10	Construction of Engineered Landfills	34
7.11	On-site Treatment of Hydrocarbon Contaminated Soils	35
7.12	Disposal of Hazardous Materials	35
7.13	Storage of CEPA Soils	36
7.14	Disposal of Non-hazardous Materials	36
7.15	Landfill Closure	37
7.16	Development of Granular Borrow Areas	37
7.17	Migration Barriers	39
7.18	Cumulative Effects	39
8.0	MONITORING PROGRAM	41
8.1	Rationale	41
8.2	Objectives	41
8.3	Methods	41
8.3.1	Sampling Methods	42
8.3.2	Temporal Considerations	42
8.3.3	Spatial Considerations	42
8.3.4	Site Selection	43
8.4	Recommendations	43
9.0	SCREENING RECOMMENDATION	44
10.0	REFERENCES	45

LIST OF FIGURES

3.1:	Location of the abandoned military radar site (BAF-5) at Resolution Island	5
3.2:	General layout of the Resolution Island abandoned military radar site	6

LIST OF TABLES

1	Summary of Activities, Impacts and Mitigative Measures	ii
4.1	Dew Line Clean up Criteria (DCC) for Contaminated Soil	10
4.2	Hazardous Material Requirements for Disposal	12
5.1	Applicable Permits and Authorizations for the Clean Up at Resolution Island	21

LIST OF ABBREVIATIONS

ASU	Queen's University Analytical Services Unit
CACAR	Canadian Arctic Contaminants Assessment Report
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
CEPA	Canadian Environmental Protection Act
CSO	Contaminated Sites Office
DCC	DEW Line Clean Up Criteria
DEW Line	Distant Early Warning Line
DIAND	Department of Indian Affairs and Northern Development ("Owner")
DND	Department of National Defence
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESG	Environmental Sciences Group
GNWT	Government of Northwest Territories
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTA	Hunters and Trappers Association
IATA	International Air Transport Association
IMDGC	International Marine Dangerous Goods Code
INAC	Indian and Northern Affairs Canada
LDS	Legault Desjardins Simon Consultants Inc.
LRR	Long Range Radar
LSS	Logistic Support Site or Station
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
NFC	National Fire Code
NH	Non Hazardous
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NPC	Nunavut Planning Commission
NTI	Nunavut Tunngavik Inc.
NWB	Nunavut Water Board
NWS	North Warning System
NWT	Northwest Territories
PCB	Polychlorinated Biphenyls
POL	Petroleum Oil and Lubricant
QC	Qikiqtaaluk Corporation
QIA	Qikiqtani Inuit Association
SRR	Short Range Radar
RMC	Royal Military College
RRMC	Royal Roads Military College
TDGA	Transportation of Dangerous Goods Act
USAF	United States Air Force
WHMIS	Workplace Hazardous Materials Information System

1.0 BACKGROUND INFORMATION

After the second world war, a defence detection and communication system consisting of main, auxiliary, and intermediate stations (named BAR-*, PIN-*, CAM-*, FOX-*, and DYE-M)¹ emerged in the Canadian Arctic; these were the Distant Early Warning (DEW) Line Sites. These communication facilities were part of the American military response strategy to prevent a Russian invasion from the North during the cold war. Apart from this DEW Line, other sites were constructed along the eastern part of Baffin Island and Labrador to transmit intercepted northern signals to southern military stations: these sites were part of the Pole Vault Line (named BAF-*)¹. The surveillance and communication station installed at Resolution Island (RI) was one of the major Pole Vault sites (BAF-5).

In March 1985, Canada and the United States signed a Memorandum of Understanding (MOU), an agreement to modernize the North American Air Defence System. The memorandum sets out the requirements for replacement of the Distant Early Warning (DEW) Line with an automated system called the North Warning System (NWS). The Resolution Island site now hosts a Short Range Radar (SRR) station as part of this new radar system.

The SRR sites, including BAF-5, are remotely operated and personnel are no longer required on a full-time basis (on site staff is only required for short periods: maintenance and inspection). Obsolete radar stations such as Resolution Island were abandoned in poor environmental conditions. It should be mentioned that approximately 200 persons occupied this station that was operated from 1956 to 1972.

Environmental assessments of the DEW Line sites were conducted to identify the principal contaminants and determine the impact of these contaminants on the arctic ecosystem (1,2,3). Most of these studies were conducted by the Environmental Sciences Group (ESG) from the Royal Military College (RMC) and the Analytical Services Unit (ASU) from Queen's University in Kingston. Generally, these studies have revealed past waste disposal practices, confirmed contamination sources, and illustrated potential for contaminant migration. Furthermore, the major pollution problems usually found on these old radar sites have been targeted.

Among these studies, many environmental investigations were conducted at Resolution Island (9).

¹ The symbol * refers either to a letter (A to E) or a number (1 to 5) which corresponds to a radar site location.

Most of the site-specific problems were characterized through an extensive monitoring program performed by ESG and ASU (4,5,6,7). These environmental studies were predominantly carried out during summer seasons from 1993 to 1997 and they documented the implications for clean up activities.

An engineering site investigation was also conducted to collect the information required to complete clean up design drawings and specifications. This investigation included the establishment of temporary benchmarks, surveys of contaminated areas and proposed landfill areas for non-hazardous (NH) materials, identification of requirements for the Canadian Environmental Protection Act (CEPA) soil storage facilities and granular borrow areas. The engineering site survey and investigation was carried out during the summer of 1997 with the objectives of more accurately determining soil volumes from known contaminated areas and verifying overall site conditions. The need for extended monitoring and for previously proposed project activity modifications was also identified.

Since then, clean up activities were carried out every summer season. Works conducted to date have been reported elsewhere² and are summarized in section 4.22. A revision to the initial Environmental Screening Report submitted in February 1998 was required since more stringent clean up criteria that generates additional clean up activities are to be implemented by INAC.

² Resolution Island 2001 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 2002.

Resolution Island 2000 Scientific Investigations, prepared by Queen's University ASU for DIAND, November 2000.

Resolution Island 1999 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 2000.

Resolution Island 1998 Scientific Investigations, prepared by Queen's University ASU for DIAND, January 1999.

Resolution Island 1997 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 1998.

Summary of 2002 Activities Resolution Island Project, prepared by Sinanni Inc. and Qikiqtaaluk Corporation for Indian and Northern Affairs Canada (INAC), November 2002.

Summary of 2001 Activities Resolution Island Project, prepared by Sinanni Inc. and Qikiqtaaluk Corporation for INAC, December 2001.

Summary of 2000 Activities Resolution Island Project, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, November 2000.

Summary of 1999 Activities Resolution Island Project, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, December 1999.

Summary of 1998 Activities Clean up of Resolution Island, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, November 2000.

2.0 PROJECT RATIONALE

Previous studies have shown that approximately 5,000 m³ of soils are contaminated with polychlorinated biphenyls (PCB) exceeding the CEPA criteria (concentrations > 50 ppm). These soils are mainly located in the S1/S4 valley, the S1/S4 beach area and the Furniture dump. Part of the floor from two buildings (S1-A and S3-A) were also found to exceed the CEPA criteria for PCBs: at one sampling location, concentration was as high as 60,000 ppm. Furthermore, approximately 10,000 m³ of soil exceed the Canadian Council of Ministers of the Environment (CCME) for Residential/Parkland land use. Apart from PCBs, other contaminants of concerns are mainly mercury, cobalt, copper, lead and petroleum hydrocarbons. Some of these contaminated soils are located near the ocean and pose a more direct threat to marine habitats.

Furthermore, most buildings contain asbestos. Approximately 2500 linear metres of pipe insulation (< 150 mm outside diameter) and 500 m² of tiles were found in buildings at the upper site. Some of the buildings are in poor conditions and pose a health and safety problem for workers and visitors.

Approximately 4,000 drums are present on site, some of which still contain their original contents. Finally, some landfills are still leaching contaminants, thus requiring excavation and sorting to remove the sources.

The primary clean up requirements for the Resolution Island site (BAF-5) are as follows:

- ⇒ asbestos abatement (completed);
- ⇒ demolition work (on-going);
- ⇒ road construction to contaminated areas (on-going);
- ⇒ excavation and containerization of CEPA soils and other contaminated soils (on-going);
- ⇒ construction of permanent migration barriers (to do);
- ⇒ drum collection, handling and shredding (on-going);
- ⇒ POL incineration (on-going);
- ⇒ collection and disposal of debris (on-going); and
- ⇒ closure of existing landfills (on-going).

3.0 SITE DESCRIPTION

Resolution Island, BAF-5 (Inuit name: Tujjaat - "place where birds land") is situated at the southeastern tip of Baffin Island approximately 310 km southeast of Iqaluit and just outside of Frobisher Bay (61° 35' N and 64° 40' W). The radar site occupies a surface of approximately 3 square kilometres (km²). Figure 3.1 illustrates the general location of the Island where BAF-5 was constructed.

The main station is located on the summit of Cape Warwick, 360 m above sea level, at the northeastern end of the Island overlooking Brewer Bay. This area is where the construction camp and the new SRR station are found. The upper site also contains areas of environmental concerns such as the S1/S4 valley, the furniture dump (completed) and the PCL dump. The S1/S4 beach area, another important site of environmental concern, is situated down gradient from the S1/S4 valley, at the bottom of the cliff near the ocean.

From the upper site, a gravel road leads to the airstrip and to the former freshwater lake. For the clean up project at Resolution Island, this area, including the remote antenna hill, does contain some areas of environmental concerns: the airstrip dump, the northslope dump, the maintenance dump and petroleum hydrocarbon contaminated soil. The road goes further to the beaching area and gives access to beach landfills which contain areas of lead and mercury contamination. Furthermore, a new road constructed to provide access to the S1/S4 beach area still need to be completed. Figure 3.2 gives a general layout of the abandoned military radar station found at Resolution Island.

Access to the Island is by sea via Brewer Bay, by air using a helicopter or a Twin Otter aircraft via the runway located northwest of the summit.

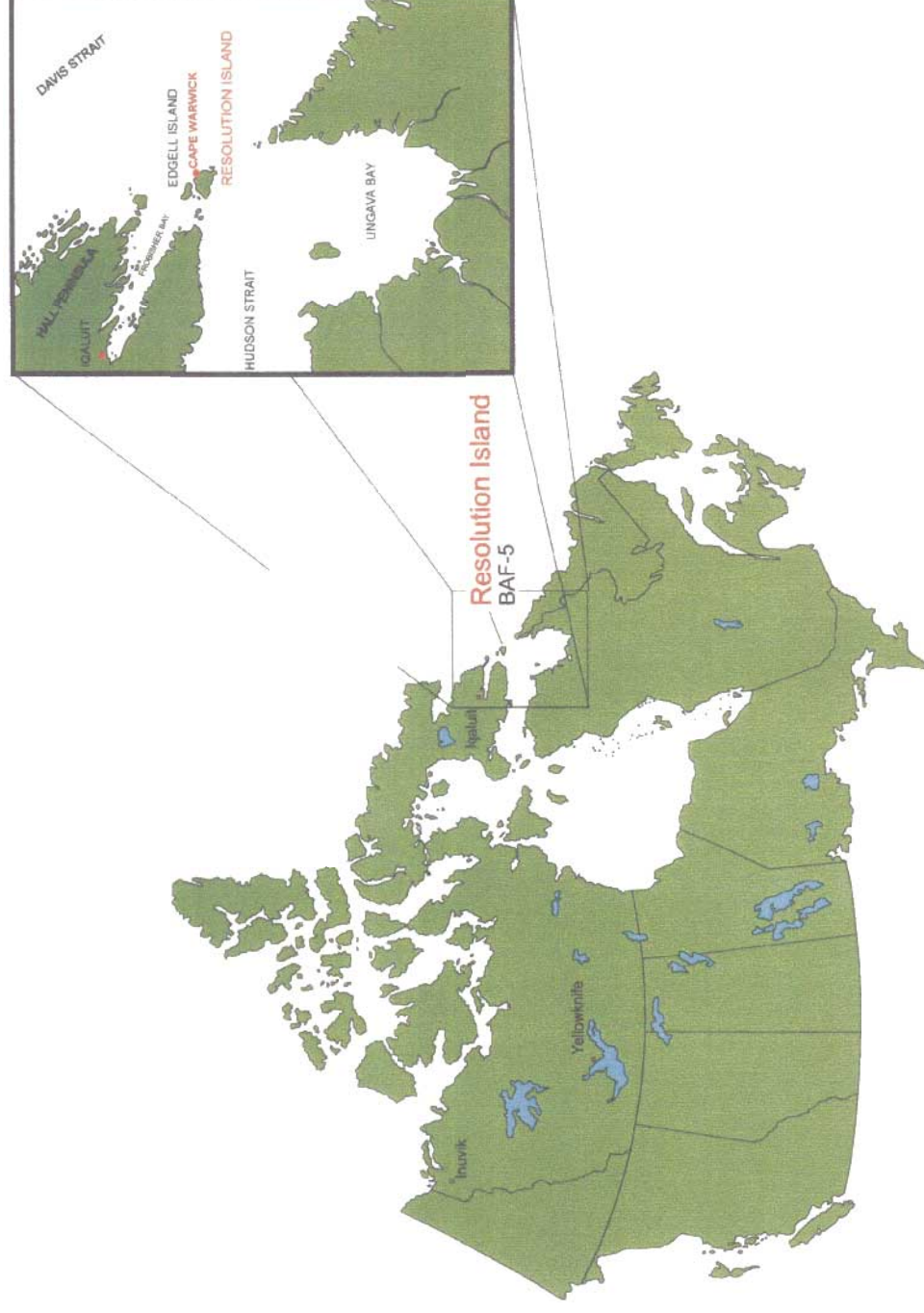


Figure 3.1: Location of the abandoned military radar site (BAF-5) at Resolution Island.