May 24, 2006 EBA File: 9600257.001

Nunavut Airports
P.O. Box 560
2nd Floor, Rockland Building
Rankin Inlet, NU X0C 0G0

Attention: Mr. Felipe Salgado, P.Eng.

Dear Mr. Salgado:

Subject: Environmental Site Assessment, Iqaluit Airport, Nunavut

1.0 INTRODUCTION

1.1 GENERAL

Nunavut Airports retained EBA Engineering Consultants Ltd. (EBA) to conduct an Environmental Site Assessment (ESA) along the ditch (south of the buildings) at the Iqaluit Airport, Nunavut. EBA understands that the ditch is to be cleaned out to the original design. Sediments have been deposited over the years, resulting in overflows during spring runoff. The Nunavut Water Board would like to know if there are any potential environmental impacts of removing the sediments from the ditch. The objectives of the present study were to evaluate the soil conditions at the sampled locations along the ditch (south of the buildings) and provide a factual report.

1.2 AUTHORIZATION

Verbal authorization to proceed with the project was provided by Mr. Felipe Salgado, P.Eng., of Nunavut Airports to Mr. Richard Kohler, P.Eng. of EBA on March 21, 2006.

1.3 SCOPE

The initial scope of work for this project was as follows:

- drill 10 shallow boreholes (maximum. 0.6 m in depth) with a Pjonjar Drill along the length of the ditch;
- submit 10 soil samples for testing of hydrocarbons (BTEX, F1 to F4) and metals; and
- write a factual report discussing findings.

Due to frozen ground conditions (see Photos 1 and 2), the sampling points were reduced. Additional analytical parameters were incorporated following an interview with

EBA Engineering Consultants Ltd.
p. 867.920.2287 • f. 867.873.3324
PO Box 2244 • 201, 4916 - 49 Street • Yellowknife, Northwest Territories X1A 2P7 • CANADA

Mr. John Graham, Manager of Iqaluit Airport. The actual scope of this project as implemented along the ditch (south of the buildings) was as follows:

- Determined utility locations upon discussions with Mr. Graham, Manager of the Iqaluit Airport.
- Excavated three (3) test pits along the ditch (south of buildings) using a Caterpillar 420D backhoe and a Caterpillar M322C excavator with a pneumatic hammer attachment, provided by the City of Iqaluit's Public Works Department.
- Submitted one sample from each location to Enviro-Test Laboratories (ETL) of Edmonton for the analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), CCME hydrocarbons F1-F4, and CCME metals analysis. One of the aforementioned soil samples were analyzed for additional parameters including one (1) sample analyzed for CCME Polyaromatic Hydrocarbons (PAH's), and the other for Polychlorinated biphenyls (PCB's).
- Prepared this factual report detailing the findings of the field investigation along the ditch (south of buildings).

2.0 BACKGROUND INFORMATION

EBA understands that the ditch is to be cleaned out to the original design. Sediments have been deposited over the years, resulting in overflows during spring runoff. The Nunavut Water Board would like to know if there are any potential environmental impacts of removing the sediments from the ditch.

Mr. Michael Hine, of EBA, interviewed Mr. John Graham, Iqaluit Airport Manager, to obtain a history of the subject area and develop a sampling plan. During the interview, it was noted that the following areas were of interest.

TABLE 1 POTENTIAL AREAS OF INTEREST

Area	Comments
Northwest of the Nunavut Arctic College.	Old oil drums located on the property (potential hydrocarbon concerns)
South and southwest of the fire hall (around Nunavut Public Works Building)	Fire hall contained maintenance garage with gas tanks (potential hydrocarbon concerns)
Southwest of DND Hangar	Possibility of fuel oil, PCB and asbestos
South, southwest and southeast of the First Air hangar	Hangar burned down in May 2001 (potential PAH concerns)

While it would have been preferred to complete sampling at all areas indicated in Table 1, frozen ground conditions and thick ice above the ground (Photo 1 and Photo 2) only allowed excavation of three (3) testpits along the ditch, south of the buildings.

3.0 FIELD INVESTIGATIONS AND OBSERVATIONS

EBA's representative, Mr. Hine, conducted the following intrusive environmental fieldwork on April 11, 2006, along the ditch, south of the buildings.

- Prior to intrusive testing, Mr. Hine consulted Mr. Graham, Iqaluit Airport Manager, to ensure that the sampling locations are clear of utilities.
- Fieldwork processes along the ditch, south of the buildings, included;
  1. Excavation of three (3) testpits;
  2. Collection of soil samples for laboratory analysis;

Attached Figure 1 shows the test pit locations.

Test pits were excavated using a Caterpillar 420D backhoe to remove snow and ice, and a Caterpillar M322C excavator with a pneumatic hammer attachment to attain sampling depth of approximately 0.5 metres. Test pit locations were based on site historical information obtained during interviews with airport management. Stratigraphies of test pits were logged and soil samples were collected. Selected soil samples were collected and placed in glass jars with Teflon™ lined lids and sent to ETL for analysis of benzene, toluene, ethylbenzene and xylene (BTEX), and petroleum hydrocarbons (F1-F4), metals, PCBs and polyaromatic hydrocarbons (PAHs).

4.0 APPLICABLE REGULATORY CRITERIA

The Government of the Northwest Territories (GNWT) published guidelines for Contaminated Site Remediation in November 2003. These guidelines have been adopted from the Canadian Council of Ministers of the Environment (CCME) soil standards. The following site-specific factors apply to the GNWT soil standards adopted for this ESA:

- Coarse-grained Industrial Land Use soil standards are considered to be most applicable as the site is currently used for industrial purposes;
- Surface (<1.5m. below grade) soil standards have been used for comparison purposes; and
- The eco soil contact pathway is also an applicable standard available for the site.

5.0 CONTAMINATION ASSESSMENT

5.1 PETROLEUM HYDROCARBON ANALYSIS

Three (3) soil samples from the ditch (south of the buildings) were submitted to ETL of Edmonton for analysis of petroleum hydrocarbons. The analytical results are in Table 2. Field analysis indicated that the soils sampled are predominantly coarse-grained.

The analytical results indicated that the hydrocarbon parameters were below the CCME Canada-wide standards for PHC's Industrial Land Use criteria for coarse-grained surface soils. The BTEX, F1-BTEX and F2 values of all three soil samples were below detection limits of the laboratory equipment. While there were detectable levels of hydrocarbon fractions F3 and F4 in all three samples, they were all below applicable criteria.

5.2 METALS ANALYSIS

Three (3) soil samples from the ditch were submitted to ETL of Edmonton for analysis of CCME Metals concentrations. The analytical results are located in Table 2. All parameters of these results were well below CCME standards.

5.3 POLYAROMATIC HYDROCARBONS (PAH'S)

One (1) soil sample (from TP-A) was submitted to ETL of Edmonton for analysis of PAH's. The analytical results are located in Table 2. All parameters were below guidelines.

5.4 POLYCHLORINATED BIPHENYLS (PCB'S)

One (1) soil sample was submitted to ETL of Edmonton for analysis of PCB's. The analytical results are located in Table 2. The concentration was below detection limits of the equipment.

6.0 CLOSURE

This report has been prepared based on the scope of work and is for the use of the Iqaluit airport, which includes distribution as required for the purposes for which this assessment was commissioned. The assessment has been carried out in accordance with generally accepted engineering practice. No other warranty is made, either expressed or implied. Engineering judgement has been applied in developing the recommendations in this report.

Reference should be made to the 'Environmental Report - General Conditions' attached in Appendix A that forms a part of this report.

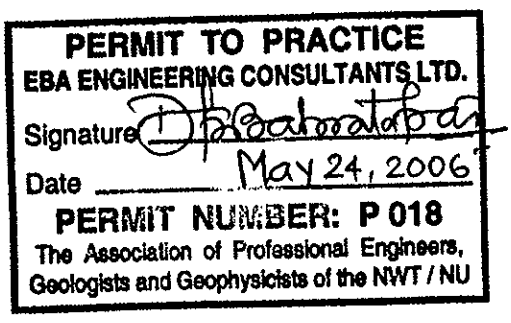
EBA trusts that this report satisfies your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,

EBA Engineering Consultants Ltd.

David Das, Ph.D, P.Eng
Project Director, NWT/Nunavut
Direct Line: 867.766.3728 x121
ddas@eba.ca

Reviewed by:
Richard Kohler, P.Eng. (AB)
Project Director, Airport Services
Direct Line: 403.723.6873
rkohler@eba.ca



TABLES

TABLE 2: IQAUIT AIRPORT: SOIL ANALYTICAL RESULTS

	Test Parameter		Unit	CCME Criteria - Industrial[1]	Iqaluit TP-A	Iqaluit TP-B	Iqaluit TP-C
CCME Hydrocarbons	Benzene		mg/kg	5	<0.005	<0.005	<0.005
	Toluene		mg/kg	0.8	<0.01	<0.01	<0.01
	Ethylbenzene		mg/kg	20	<0.01	<0.01	<0.01
	Xylenes		mg/kg	20	<0.01	<0.01	<0.01
	F1-BTEX[2]		mg/kg	330	<5	<5	<5
	F2[2]		mg/kg	760	<5	<5	<5
	F3[2]		mg/kg	1700	500	140	86
	F4[2]		mg/kg	3300	280	98	29
CCME Metals	An	Antimony	mg/kg	40	<0.2	<0.2	<0.2
	As	Arsenic	mg/kg	12	1.1	0.7	0.6
	Ba	Barium	mg/kg	2,000	30	33	25
	Be	Beryllium	mg/kg	8	<1	<1	<1
	Cd	Cadmium	mg/kg	27	<0.5	<0.5	<0.5
	Cr	Chromium	mg/kg	87	14.4	7.1	11.5
	Co	Cobalt	mg/kg	300	5	4	4
	Cu	Copper	mg/kg	100	16	8	8
	Pb	Lead	mg/kg	600	60	6	7
	Hg	Mercury	mg/kg	50	<0.05	<0.05	<0.05
	Mo	Molybdenum	mg/kg	40	<1	<1	<1
	Ni	Nickel	mg/kg	50	7	6	6
	Se	Selenium	mg/kg	10	<0.2	<0.2	<0.2
	Ag	Silver	mg/kg	40	<1	<1	<1
	Tl	Thallium	mg/kg	1	<1	<1	<1
	Sn	Tin	mg/kg	300	<5	<5	<5
	U	Uranium	mg/kg	-	<40	<40	<40
	V	Vanadium	mg/kg	130	18	16	13
	Zn	Zinc	mg/kg	360	60	30	40
CCME Polyaromatic Hydrocarbons	Naphthalene		mg/kg	22	0.03	-	-
	Quinoline		mg/kg	-	<0.01	-	-
	Phenanthrene		mg/kg	50	0.28	-	-
	Pyrene		mg/kg	100	0.37	-	-
	Benzo(a)anthracene		mg/kg	10	0.22	-	-
	Benzo(b)anthracene		mg/kg	10	0.22	-	-
	Benzo(k)anthracene		mg/kg	10	0.07	-	-
	Benzo(a)pyrene		mg/kg	0.7	0.17	-	-
	Indeno(1,2,3-cd)pyrene		mg/kg	10	0.11	-	-
	Dibenzo(a,h)anthracene		mg/kg	-	<0.01	-	-
	Nitrobenzene d5		mg/kg	-	100	-	-
	2-Fluorobiphenyl		mg/kg	-	106	-	-
	p-Terphenyl d14		mg/kg	-	98	-	-
PCB's	Total PCB's			33	-	<0.05	-

[1] Criteria taken from Canadian Environmental Quality Guidelines for the Protection of Environmental and Human Health, CCME Guidelines, December 2003 update

[2] Eco Soil Contact criteria taken from Canada-wide Standards for Petroleum Hydrocarbons in Soil, CCME Guidelines, 2001

'-' indicates not analysed, no applicable standard, or not applicable

FIGURES

NUNAVUT ARCTIC COLLEGE

NUNAVUT PUBLIC WORKS

RAMP

RAMP

RAMP

(DND)

RAMP

APRON 2
(ABANDONED)

RAMP

(FIRST AIR)

REPLACE GRAVEL

NEW CULVERT

REMOVE UTILIDOR AND
REGRADE EXISTING DITCH

REMOVE UTILIDOR AND
REGRADE EXISTING DITCH

REGRADE GRAVEL
SHOULDERS

REPLACE ASPHALT TAXIWAY

NEW CULVERT

TIE REGRADED
DITCH INTO
EXISTING
GROUND

REGRADE DITCH

Φ20.72

Φ20.67

Φ20.27

Φ20.17

Φ20.00

TP-A

TP-B

TP-C

15m

5m

5m

Φ23.64

Φ23.52

Φ23.32

C
C08

OPE 0.45%

CAUTION:
UNDERGROUND UTILITIES
CROSSING–EXACT
LOCATION UNKNOWN

KENN BOREK
AIR

CANADIAN
HELICOPTERS

943494
NWT LTD.

Φ22.50

AIR
NUNAVUT

Φ22.50

CAUTION: UNDERGROUND
UTILITIES CROSSING–EXACT
LOCATION UNKNOWN

CAUTION: UNDERGROUND
UTILITIES CROSSING–EXACT
LOCATION UNKNOWN

RCMP

EXISTING SLOPE 0.19%

EXISTING SLOPE 0.7%

APRON I

LEGEND:

TP-A – TESTPIT LOCATION

0 25 50 75

Scale: 1: 1500 (metres)

EBA Engineering Consultants Ltd.	CLIENT: GOVERNMENT OF NUNAVUT	PROJECT: DITCH SAMPLING, IQALUIT AIRPORT IQALUIT, NUNAVUT	
DWN. DCH / CHKD. PK		TITLE: SITE PLAN WITH SAMPLING LOCATIONS	
EBA JOB NO. 9600257-001	FILE: 9600257-Fig1.dwg / REVISION NO.: 1	DATE: May 1, 2006	Figure 1

PHOTOGRAPHS

Photo 1
April, 2006 - Sampling at TP-A. Note ice thickness

Photo 2
April, 2006 - Sampling at TP-B

APPENDIX

APPENDIX A EBA TERMS AND CONDITIONS

ENVIRONMENTAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 LIMITATIONS OF REPORT

This report is based solely on the conditions which existed on site at the time of EBA's investigation. The client, and any other parties using this report with the express written consent of the client and EBA, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and EBA, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that EBA is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

2.1 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of this report, EBA may have relied on information provided by persons other than the client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

3.0 LIMITATION OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of EBA providing the services requested, the client agrees that EBA's liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

1. With respect to any claims brought against EBA by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to EBA under this Agreement, whether the action is based on breach of contract or tort;
2. With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless EBA from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by EBA, whether the claim be brought against EBA for breach of contract or tort.

4.0 JOB SITE SAFETY

EBA is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of EBA personnel on site shall not be construed in any way to relieve the client or any other persons on site from their responsibility for job site safety.

5.0 DISCLOSURE OF INFORMATION BY CLIENT

The client agrees to fully cooperate with EBA with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for EBA to properly provide the service, EBA is relying upon the full disclosure and accuracy of any such information.

6.0 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

7.0 EMERGENCY PROCEDURES

The client undertakes to inform EBA of all hazardous conditions, or possible hazardous conditions which are known to it. The client recognizes that the activities of EBA may uncover previously unknown hazardous materials or conditions and that such discovery may result in the necessity to undertake emergency procedures to protect EBA employees, other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed upon. The client agrees to pay EBA for any expenses incurred as a result of such discoveries and to compensate EBA through payment of additional fees and expenses for time spent by EBA to deal with the consequences of such discoveries.

8.0 NOTIFICATION OF AUTHORITIES

The client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

9.0 OWNERSHIP OF INSTRUMENTS OF SERVICE

The client acknowledges that all reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

10.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.