

UMA Engineering Ltd.
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March 31, 2006

Project Number: CAM-2 (3.6)

Phyllis Beaulieu
 Licensing Manager
 Nunavut Water Board
 P.O. Box 119
 Gjoa Haven, NU X0B 1J0

Dear Ms. Beaulieu:

Re: 2005 Annual Report: Water Use License #NWB5GLA0308

UMA Engineering Ltd. is pleased to submit this annual report as per the requirements of Part B.1 of water use license NWB5GLA0308. The report was prepared on behalf of Defence Construction Canada and the Department of National Defence.

Water Usage

Table 1 provides a summary of the water usage from the Water Supply Lake and the sewage effluent discharged to the sewage lagoon. Please note that the majority of water was used for construction purposes, such as moisture conditioning. Therefore, it would not be reflected in the sewage effluent discharge volumes. No water was returned to the source.

Table 1 – Water Usage

Month	Quantity of Water Extracted (cubic metres)	Quantity of Effluent Discharged (cubic metres)
June	450	220
July	700	273
August	700	273
September	500	132

Monitoring

Sewage Lagoon: A sewage lagoon was constructed in August 2003 to support the construction camp as per the specifications included in the water use license application. Due to the coarse-grained nature of the material available at the CAM-2 site, the effluent in the sewage lagoon infiltrated the ground and there was usually insufficient volume for sampling. Only one sample of sewage effluent was collected during the season on July 20, 2005, the results presented the following table. The laboratory report is attached.

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Table 2 – Sewage Effluent Sample Results

Parameter	Criteria	Sample #05-9596
Oil & Grease	No visible sheen	No visible sheen
Total Suspended Solids	180 mg/L	64 mg/L
Biochemical Oxygen Demand	120 mg/L	312 mg/L
Faecal Coliforms	10,000 CFU/dL	2,420,000 MPN/100 mL

The sewage lagoon area was regraded at the end of the 2005 season as there was no effluent retained.

Total Suspended Solids (as requested by Fisheries and Oceans Canada in the letter of advice dated July 11, 2003): The TSS monitoring program was completed in near-shore areas where construction was occurring, which included the Airstrip Landfill excavation at the CAM-2 site. The Airstrip Landfill was excavated during July and August 2005. Water samples were collected from shore only when TSS loading was suspected, based on visual observations. Detailed observations were recorded and photographs (attached) taken to document impacts of excavation on ocean water quality. Table 3 summarizes the observations.

Table 3 – Summary of Observations During Airstrip Landfill Excavation

Date	Comments
24 June 2005	Berm is intact. Water has ponded behind the berm, but is not discharging to the ocean. The ocean is frozen.
1 July 2005	Ponded water from behind the berm is now discharging to the area around the west end of the berm. Discharge is mixing with overland flow of meltwater. No visual evidence of a sediment plume. Sea-ice is approximately 30 m from shore.
4 July 2005	Ponded water is cloudy. The cloudiness decreases towards the discharge point. No visual evidence of TSS plume.
5 July 2005	Same as July 4.
6 July 2005	Decrease in cloudiness of ponded water. Water level and flow volume have decreased.
7 July 2005	Ponded water was pumped from behind the berm and discharged to the tundra. Former discharge stream is now dry.
8 July 2005	No evidence of TSS plume.
18 July 2005	There is no water discharge from the pond behind the berm. No visual evidence of TSS. Sea-ice remains 30 m from shore.
5 August 2005	Sea ice has retreated. No visual evidence of TSS.
18 August 2005	Airstrip landfill excavation is complete and berm has been removed. No visual evidence of TSS.
21 August 2005	Backfilling of the area is complete.

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In addition, water samples were collected over a period of six days, during which water that ponded behind the berm at the Airstrip Landfill excavation naturally discharged to the ocean. The water samples were collected from three areas: the pond behind the berm; a stream discharging water from this pond into the ocean; and the ocean at the outlet of the discharge stream.

The samples were analyzed in the on-site laboratory using a gravimetric method based on EPA Method 160.2 for TSS analysis. The results are presented in Table 4. The baseline monitoring results indicated that the natural background values at CAM-2 are low (less than 40 mg/L), and that following a storm event, natural levels of TSS can be as high as 700 mg/L. The highest TSS result (138 mg/L) was detected in water samples collected in the pond behind the berm. TSS decreased in samples in the discharge stream compared with samples from the pond. All results for the samples collected in the ocean at the point of discharge for the Airstrip Landfill were below the laboratory method detection limit.

Table 4 – TSS Monitoring Results

Sample #	Date Collected	Results – TSS mg/L
Ponded water behind berm		
05-9037	3 July	92
05-9213	8 July	138
Discharge stream between pond and ocean		
05-9038	3 July	16
05-9040/41	4 July	50
05-9099	5 July	8
05-9103	6 July	<0.5
Ocean at outlet of discharge stream		
05-9039	3 July	<0.5
05-9108	7 July	<0.5
05-9124	8 July	<0.5

Summary of Completed Work

Demolition: Demolition of the module train (including the radome), hangar and warehouse were completed. The demolition debris was placed in the Non-Hazardous Waste Landfill. Those portions of buildings with PCB amended paint were containerized and placed in storage at the Temporary PCB Storage Area.

Non-Hazardous Waste Landfill: The Non-Hazardous Waste Landfill was completed and closed in 2005. Sorting and recompaction of debris in the landfill was completed at the beginning of the 2005 season. The western berm of the landfill was moved in approximately 4-5 metres to reduce the overall capacity of the landfill. The final volume of waste (including intermediate fill) in the NHW Landfill is 5800 m³.

Contaminated Soil Removal: All contaminated soils were excavated in 2005 and placed in the appropriate disposal facilities. Confirmatory samples were collected to confirm all soils were removed to the applicable criteria.

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Debris Removal: All debris was picked up in 2005 and placed in the appropriate disposal facility.

Tier II Soil Disposal Facility: The Tier II Soil Disposal Facility was completed as per the design. Monitoring instrumentation, including monitoring wells and thermistor strings were installed. The total volume of Tier II contaminated soils was less than originally estimated due to a lesser volume of contaminated soil from the sewage outfall area. The final volume of contaminated soil (including intermediate fill) in the Tier II Facility is 4070 m³.

Landfarm: Landfarm operations were completed in 2005. Because of a relatively dry summer at the CAM-2 site, additional tilling events were completed to remediate the soils to the required criteria by the end of the 2005 season and the facility was closed. Approximately 10,775 m³ of soil was treated in the landfarm.

All clean up work has been completed, and the contractor's equipment has been removed from the site. Future work includes closure of the Temporary PCB Storage Area and implementation of the landfill monitoring program, which was submitted to the NWB in March 2005.

We trust the information provided is consistent with the requirements of Water Use License #NWB5GLA0308. Please feel free to contact the undersigned if you have any questions or comments.

Sincerely,

UMA Engineering Ltd.



Eva Schulz, P.Ag.
Environmental Scientist
eva.schulz@uma.aecom.com

Encl. Laboratory Report
TSS Monitoring Photographs

cc: Philip Warren, DCC
Sarah Gagné, NWB

APPENDIX A LABORATORY RESULTS

Notes:

1. Sample 05-9596 was collected from the construction camp sewage lagoon on 20 July 2005.

RMC ANALYTICAL SERVICES GROUP - GROUP DES SERVICES ANALYTIQUES CMR

Royal Military College, PO Box 17000 Stn. Forces, Kingston, ON, K7K 7B4
(613) 541-6000 ext 6684 / Fax (613) 545-8341

Client : ESG

12 Verite Ave
Dept. of Chem. / Chem. Eng., RMC
P.O. Box 17000, Stn. Forces
Kingston, Ontario K7K 7B4
(613) 541-6000 ext 6567
Fax: (613) 541-6596

ASG Login No: 13429

Site: Cam-2

Client Login No: 05-130

Samples Received: 25-Jul-05

Date of analysis: 26-Jul-05

Method No: ASG 039

Date Reported: 27-Jul-05

Sheet: 1 of 1

RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS

Sample I.D.	Sample Type^	Unit	Total Suspended Solids
05-9596*	N/A	mg/L	64

LABORATORY QA/QC

Duplicate : 05-9596	N/A ; N/A	mg/L	71 ; 57
Blank	Control	mg/L	< 2.0

^SW =Surface Water, SI = Sewage Influent SE = Sewage Effluent

* Averaged result of duplicates

The results reported here relate only to the items tested.

Prepared By: _____
Nelson Melo; AnalystAuthorization: _____
Cindy Cowin; Lab Manager

Test Report I.D.: TSS13429r1.xls



Taiga Environmental Laboratory

4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3

Tel: (867)-669-2788 Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 9596

Taiga Sample ID: 252062

Client Project: 05-903
Sample Type: Wastewater
Received Date: 21-Jul-05
Sampling Date: 20-Jul-05
Location: CAM-2-conf-DLCU


Approved By R. Shane Harnish
Quality Assurance Officer

Report Status: FINAL

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Microbiological Analysis</u>						
Coliforms, Total	2420000	1000	MPN/100mL	21-Jul-05	SM9223:B	
Escherichia coli	488000	1000	MPN/100mL	21-Jul-05	SM9223:B	



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Tel: (867)-669-2788 Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 9596

Taiga Sample ID: 252063

Client Project: 05-903

Sample Type: Wastewater

Received Date: 21-Jul-05

Sampling Date: 20-Jul-05

Location: CAM-2-conf-DLCU

Report Status: FINAL


Approved By R. Shane Harnish
Quality Assurance Officer

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
Nutrient Analysis						
Biological Oxygen Demand	312	2	mg/L	21-Jul-05	SM5210:B	

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

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

CCME - Canadian Council of Ministers of the Environment

Report Date: Thursday, July 28, 2005

Print Date: Friday, July 29, 2005

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Photograph 1: Excavation work at the Airstrip Landfill. Note the water ponded in the excavation behind the berm and the proximity of the excavation to the ocean. Photograph taken June 27, facing east.



Photograph 2: Collecting an ocean water sample at the outlet of the discharge stream. Photograph taken July 3, facing south.



Photograph 3: The discharge stream after pumping and discharge of water in the pond. The pond is visible in the background. The ocean can be seen to the right of the berm. Photograph taken July 8, facing east.



Photograph 4: The excavation after pumping. Note that the discharge stream is now dry. Photograph taken July 18, facing east.



Photograph 5: View of the berm at the airstrip landfill excavation. Photograph taken July 28, facing west.



Photograph 6: View of ocean water after removal of the berm at the Airstrip Landfill. There is no visual evidence of TSS. Photograph taken Aug. 18, facing southwest.



Photograph 7: Visual evidence of TSS in the ocean after a storm. Note the brown sediment plume extending approximately 100m from the shoreline. Photograph taken Aug. 29, facing southwest.



Photograph 8: The Airstrip Landfill after completion of excavation and backfilling. TSS after a storm event can be observed in the ocean at the time of this photo. Photograph taken Aug. 29, facing southwest.