UMA Engineering Ltd.
2540 Kensington Road NW
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March 28, 2008 Project Number: DYE-M (3.6)

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

Dear Ms. Beaulieu:

Re: 2007 Annual Report: Water Use License #1BR-DYE0409

UMA Engineering Ltd. is pleased to submit this annual report as per the requirements of Part B.1 of water use license 1-BR-DYE0409. The report was prepared on behalf of Defence Construction Canada and the Department of National Defence.

Water Usage

The following table provides a summary of the water usage from the Summer Water Supply Lake and the waste water discharged from the treatment plant to the sewage lagoon. None of the water was returned to the source.

Month	Quantity of Water Extracted from Summer Water Supply Lake (m^3)	Quantity of Waste Water Deposited from the Plant to the Lagoon (m^3)
May	30.5	
June	42.5	
July	151.5	37.2
August	26.5	145.8

Sewage Effluent Monitoring

Three effluent samples were collected from the camp sewage lagoon by the Environmental Services Group (ESG), on August 18, 2007 and submitted to RMC Analytical Services Group in Kingston, ON for analysis. The following table provides a summary of the results. There was no sewage effluent discharged from the sewage lagoon in 2007.

Phyllis Beaulieu
Licensing Manager
Nunavut Water Board
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Parameter	Units	Allowable Maximum Average Concentration	07-30660 (August 18, 2007)	07-30661 (August 18, 2007)	07-30662 (August 18, 2007)
			Coordinates: 563309 E, 7386880 N		Coordinates: 563334 E, 7386885 N
pH	pH units	6.0 to 9.0	7.71	7.71	Not analysed
Oil & Grease	-	None visible	None visible	None visible	Visible sheen - biological
Total Suspended Solids (TSS)	mg/L	180	140	**220**	170
Biological Oxygen Demand	mg/L	120	72	68	61
Faecal Coliforms	CFU/dL	10,000	**Too numerous to count (3,000,000)**	**Too numerous to count (3,000,000)**	**To numerous to count (13,000,000)**

*A copy of the laboratory report are attached.

Summary of Completed Work in 2007

The majority of the work at the DYE-M site focused on granular material extraction and construction of the Upper Site Tier II Soil Disposal Facility and the Upper Site Non-Hazardous Waste Landfill. Some removal of debris and contaminated soil and demolition occurred in 2007. A new camp was set up beside the existing one to accommodate more workers at site in 2008. The work plan for 2008 is to continue with the clean up program as described in the 2003 Project Description.

Demolition: Asbestos removal and PCB paint removal was completed in Module Train C, the overhead walkway between Module Train B and abandoned power house, the P&E Building and Switching Centre. Demolition of various structures occurred including the POL line from the lower site to the beach and the pumphouse at the beach. Demolition is currently an on-going task.

Landfarm: Construction of the landfarm was completed. Approximately 1,300 m^3 of hydrocarbon impacted soils were placed in the facility in 2007. Nutrient application and one tiling event occurred in 2007. It is anticipated that the facility will continue to be in use for at least another two years.

At the beginning of the 2007 season, the temporary containment berm began cracking due to the excess pressure from the water contained by the landfarm. The berm was reinforced and the buttress was extended to provide extra support. Additional details are provided in the attached report.

Tier II Soil Disposal Facilities: Construction at the Upper Site Tier II Facility was completed and the facility will be ready to accept Tier II impacted soils in 2008. Lower Site Tier II facility was completed in 2006 and approximately 350 m^3 of Tier II impacted soil from lower site area contaminated soil excavations was placed in 2007.

Non-Hazardous Waste Landfills: The Lower Site Non Hazardous Waste Landfill (NHWL) was completed in 2006 and received approximately 568 m^3 of non-hazardous debris and Tier I impacted soils from the lower site

Phyllis Beaulieu
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March 28, 2008

in 2007. Some crushing and compacting of debris also occurred at the landfill. The Upper Site Non Hazardous Waste Landfill was completed to existing elevation and is ready to accept non-hazardous debris; however, there are some boulders remaining in the footprint of the facility that will need to be removed in 2008.

Contaminated Soil Removal: Contaminated soil removal is on-going.

Landfill Remediation: Not started.

Debris Removal: Debris removal is on-going.

Community Meetings

Community meetings were held by the contractor in the winter in Arctic Bay, Pangnirtung, Iqaluit, Qikiqtarjuaq, and Clyde River.

Spill Incidences

There were four spill events reported to the spill report line in 2007. They were reported on June 29 (two were reported on this day) July 9, and July 26. Copies of the spill reports are attached, including a follow-up report to the INAC Inspector regarding a spill reported on June 29.

The overall site plans were provided in the application submission to the NWB and are not included; however, two additional figures are being submitted showing the updated camp layout and sewage lagoon.

We trust the information provided is consistent with the requirements of Water Use License #1BR-DYE0409. 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: Site Figures, Photographs, Laboratory Reports, Inspection Report & Response, Spill Reports, Landfarm Reports

cc: Douglas Craig, DCC

NWB Annual Report **Year being reported:** 2007

License No: 1BR-DYE0409 **Issued Date:** May 6, 2004
Expiry Date: May 31, 2009

Project Name: DYE-M, Cape Dyer DEW Line Clean Up

Licensee: Defence Construction Canada

Mailing Address:
Suite 1720, Constitution Square
350 Albert Street
Ottawa, ON K1A 0K3

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):
UMA Engineering Ltd. on behalf of Defence Construction Canada
2540 Kensington Road NW
Calgary, AB T2N 3S3

General Background Information on the Project (*optional):

Licence Requirements: the licensee must provide the following information in accodance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): Water Supply Lakes

Water Quantity:	
150/day	Quantity Allowable Domestic (cu.m)
	Actual Quantity Used Domestic (cu.m)
	Quantity Allowable Drilling (cu.m)
	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- [x] Solid Waste Disposal
- [x] Sewage
- [ ] Drill Waste
- [x] Greywater
- [ ] Hazardous
- [ ] Other:

Additional Details:
See attached.

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

See attached spill reports.

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

Revisions to the Abandonment and Restoration Plan

No Abandonment and Restoration (AR) Plan submitted or approved

Additional Details:

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

See attached.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Details attached

Additional Details:

See attached figures.

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Details attached

Additional Details:

See attached figures.

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

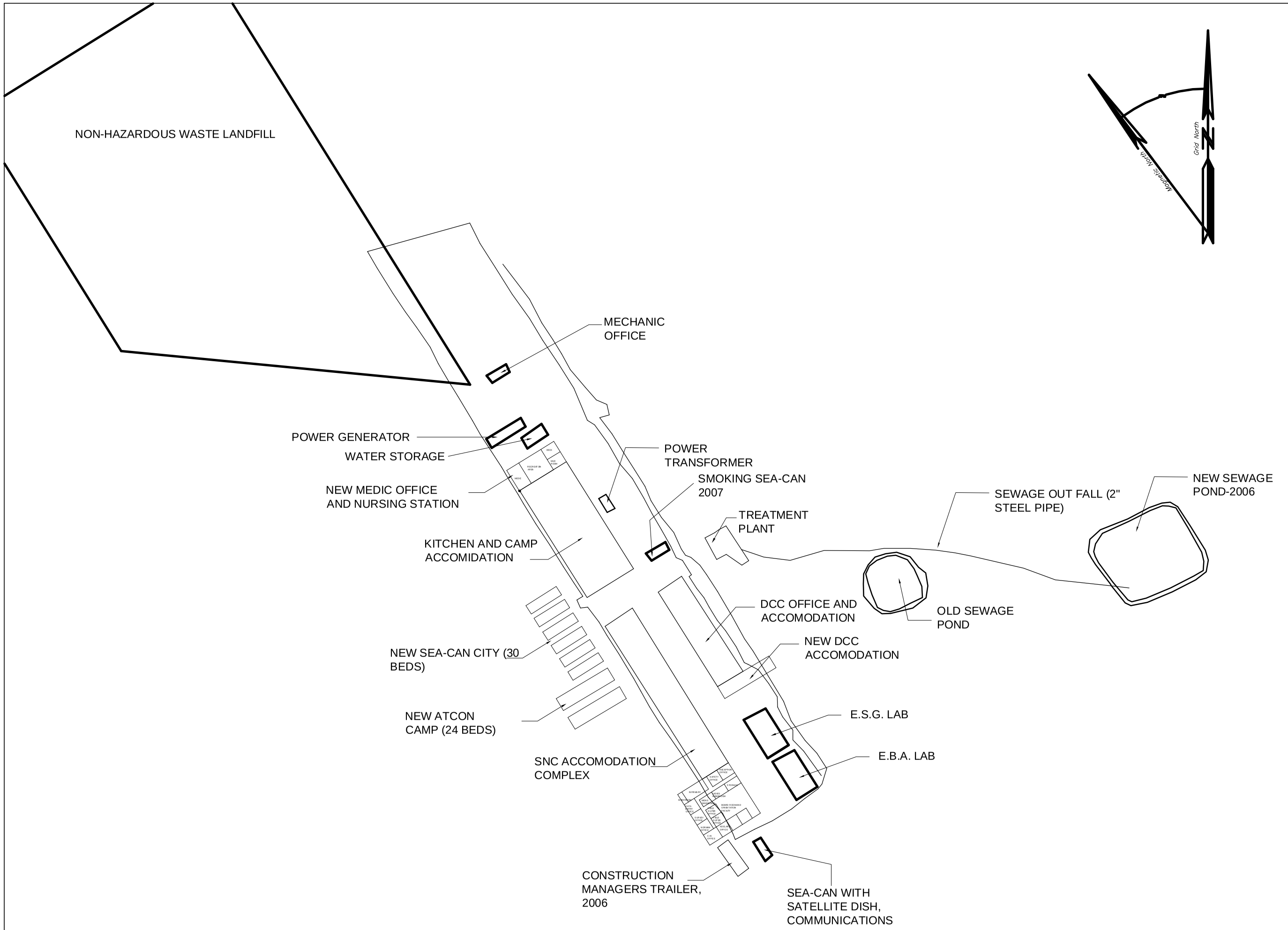
Inspection Report received by the Licensee (Date):

Additional Details: (Dates of Report, Follow-up by the Licensee)

A copy of the inspection report and response from the Licensee are attached.

Any additional comments or information for the Board to consider

Date Submitted:	March 31, 2008	
Submitted/Prepared by:	Eva Schulz	
Contact Information:	**Tel:**	403-270-9200
	Fax:	403-270-0399
	email:	eva.schulz@uma.aecom.com



NOTE: 1.

No.	REVISION	BY	CH	ENG.	DATE

ORIENTATION

STAMP

SNC-LAVALIN

ENGINEERS & CONSTRUCTORS

CLIENT:

DEFENSE CONSTRUCTION CANADA

DESIGN	SNC	PROJ. DIR.:	DK
DRAWN	DW	PROJ. MGR.:	AK
CHECK		DISC1-LINE1 DISC1-LINE2	
APPROVED		APPROVED ENG.:	

DRAWING TITLE:

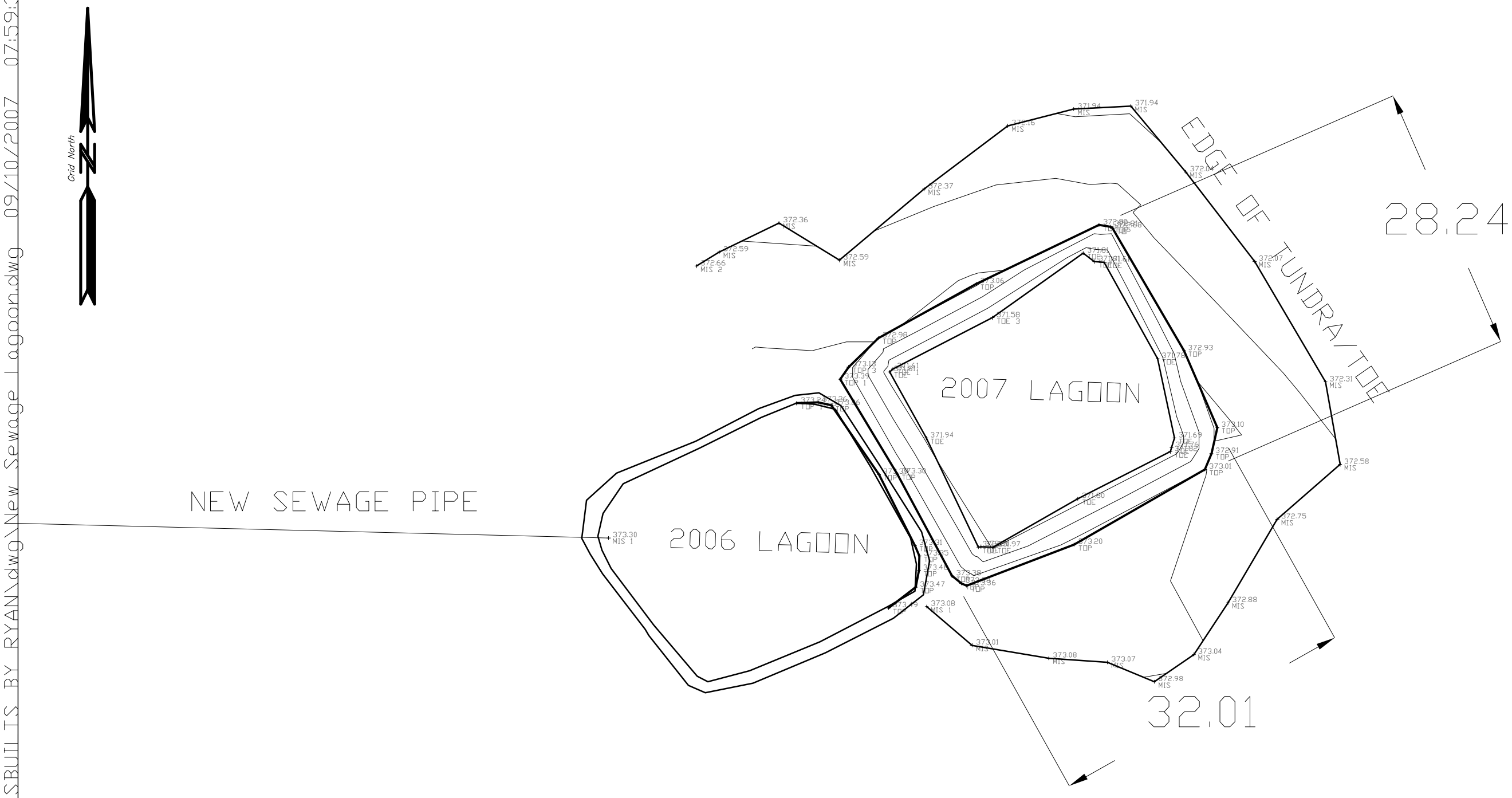
CAPE DYER NEW CAMP DESIGN, 2007

SCALE: N.T.S.

CLIENT DRAWING NUMBER: 0000

SNC-LAVALIN DRAWING NUMBER:

REV. 00



NOTE: 1.

No.	REVISION	BY CH	ENG.	DATE

ORIENTATION

STAMP

SNC-LAVALIN

ENGINEERS & CONSTRUCTORS

CLIENT:

DEFENSE CONSTRUCTION CANADA

DESIGN	SNC	PROJ. DIR.:	DK
DRAWN	RD	CONST. MGR.:	DW
CHECK		DISC1-LINE1 DISC1-LINE2	
APPROVED		APPROVED ENG.:	

DRAWING TITLE:

NEW SEWAGE LAGOON

SCALE: NTS

CLIENT DRAWING NUMBER: 0000

SNC-LAVALIN DRAWING NUMBER: 332509-0000-0041-0135

REV. 00

C:\Cape Dyer\ASBUILTS BY RYAN\dwg\New Sewage Lagoon.dwg 09/10/2007 07:59:34 AM EDT

Photo 13
Sloughing of east landfarm berm near northeast corner. Note water level approximately 0.3 m below berm crest. Photo taken June 27, 2007.

Photo 14
Completion of buttress to stabilize east landfarm berm. Photo taken June 29, 2007.

Photo 15
Completed Landfarm buttress extension. Photo taken September 8, 2007.

Photo 16
Sloughing of Type 5 material at the Lower Site Tier II Disposal Facility, north berm. Photo taken June 25, 2007.

Photo 17
Removing partially buried debris from with the Upper Site tier II Disposal Facility footprint. Photo taken July 3, 2007.

Photo 18
Placing Type 4 material in west key trench at Upper Site Tier II Disposal Facility. Note boulder field adjacent to the trench location has been removed. Photo taken July 28, 2007.

Photo 19
Upper Site Tier II Disposal Facility. Bedrock exposed during excavation of the east key trench. Photo taken August 17, 2007.

Photo 20
Upper Site Tier II Disposal Facility. Water impounding in southwest corner of the key trench excavation. Area dewatered prior to placing Type 4 granular fill. Photo taken August 7, 2007.

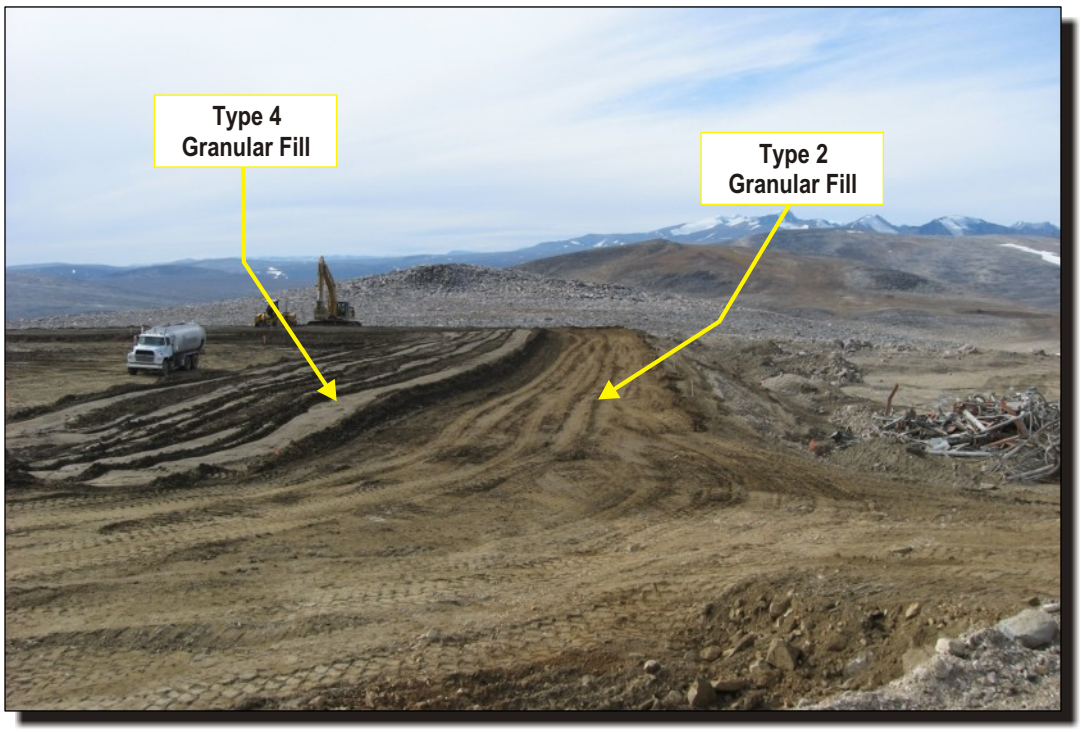


Photo 21
Upper Site Tier II Disposal Facility. Type 2 granular fill placed concurrently with Type 4 granular fill placement. Photo taken August 19, 2007.

Photo 22
Upper Site Tier II Disposal Facility. Placing Type 5 material on the interior slopes. Photo taken August 17, 2007.

Photo 23
Placing Type 5 cover material at the Upper Site Tier II Disposal Facility. Excavator working off a thicker pad to support weight of the excavator. Photo taken August 30, 2007.

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: 16943
Site: Dye-M
Client Login No: 07-124
Samples Received: 20-Aug-07
Date of analysis: 29-Aug-07
Method No: ASG 039
Date Reported: 30-Aug-07
Sheet: 1 of 1

RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS

Sample I.D.	Sample Type^	Unit	Total Suspended Solids
30660	SW	mg/L	140
30661	SW	mg/L	220
30662	SW	mg/L	170

LABORATORY QA/QC

Blank	Control	mg/L	< 1

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

The results reported here relate only to the items tested.

Prepared By: _____
Stephanie Trickey ; Analyst

Authorization: _____
Julie McDonald ; Laboratory Manager

Test Report I.D.: TSS16943r1.xls

RMC ANALYTICAL SERVICES GROUP - GROUP DES SERVICES ANALYTIQUES CMR
Royal Military College, PO Box 17000 Stn. Forces, Kingston, ON, K7K 7B4
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Client: **ESG**
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Dept. of Chem. / Chem. Eng., RMC
P.O. Box 17000, Stn. Forces
Kingston, Ontario K7K 7B4

ASG Login No: 16943
Site: Dye-M
Client Login No: 07-124
Samples Received: 20-Aug-07
Date of analysis: 22-Aug-07
Method No: ASG 042
Date Reported: 28-Aug-07

RESULTS OF BOD ANALYSIS

Sample I.D.	Unit	BOD
30660	mg/L	72
30661*	mg/L	68
30662	mg/L	61

*Averaged result of duplicates

LABORATORY QA/QC

Sample I.D.	Unit	BOD
30661; duplicate	mg/L	72; 64
Blank	mg/L	< 3
Control	mg/L	126
Control Target	mg/L	165

The results reported here relate only to the items tested.

Prepared By: _____
Stephanie Trickey, Analyst

Authorization: _____
Julie McDonald, Laboratory Manager

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: 16943
Site: Dye-M
Client No: 07-124
Samples Received: 20-Aug-07
Date of analysis: 21-Aug-07
Date Reported: 29-Aug-07
Sheet: 1 of 1

RESULTS OF MICROBIOLOGICAL ANALYSIS

Sample Identification	Method: ASG 044 **Fecal Coliforms** (CFU/100 mL)
30660*	TNTC , (3000000)
30661*	TNTC , (3000000)
30662*	TNTC , (13000000)

* Ran as regular samples and produced unusable results;
diluted samples following day which were past the optium filtration time.

LABORATORY QA/QC

Sample Identification	Method: ASG 044 **Fecal Coliforms** (CFU/100 mL)
Blank	0

The results reported here relate only to the items tested.

Authorization: _____
Julie McDonald, Lab Manager

Prepared By: _____
Stephanie Trickey, Analyst

Test Report I.D: BacT16943r1.xls

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

INAC, Nunavut District
P.O. Box 2200
Qimuggjuk Building
Iqaluit, NU, X0A 0H0

Submitted Via E-Mail
Our File: 1BR-DYE0409
Your File:_____
CIDM #185424

November 27, 2007

Douglas Craig, M.Sc.
Environmental Officer
DEW Line Clean Up
Defence Construction Canada
Constitution Square, Suite 1720, 350 Albert St.,
Ottawa, Ontario
K1A 0K3
Phone: (613) 998-7288
Fax: (613) 998-0468

RE: Water License Inspections- Dye M Clean Up - July 11th and August 22nd , 2007

The Water Resources Officer (WRO) appreciates the assistance and cooperation provided Ms. Asha-Rani Boucher-Sharma, Site supervisor - Defence Construction Canada, who accompanied the Inspector during both the first and second inspections of the site and Mr. Douglas Craig, Environmental Officer for Defence Construction Canada (DCC) who was present for the second inspection.

The following report is based on observations made at the time of the inspections at Dye –M on July 11th 2007 and then again on August 22nd in follow up. Items outlined during the first Inspection with Ms. Boucher-Sharma were then reviewed with Mr. Craig on an on-going basis until the inspection of the 22nd of August. A review of the terms and conditions of the water license was completed with both parties following the individual inspections.

Immediately following the inspection (s) an Industrial Water Use Inspection Report outlining the concerns of the inspector was signed off by the parties with the Inspector.

Part A: Scope and Conditions

No issues were found with respect to the location of the camp as it relates to the information contained within the current license. The current license was issued May 6th , 2004 to Defence Construction Canada subject to the submission of a Spill Contingency Plan, Monitoring Program and Quality Assurance / Quality Control Plan for sampling.

The license, as issued, is a Type "B" license classed as Camp Mobilization, Operation, Site Remediation and Associated Uses.

Part B: General Conditions

The issues of water use fees and security were not included within the context of this inspection.

A review of the Nunavut Water Board FTP – Public Registry was conducted during the writing of this report. An annual report for the 2006 annum, completed by UMA Engineering was located. This report is a requirement under the terms and conditions of the Water License. The annual report must include but should not be limited to those items listed in Section 1 (i) through (vi) of this Part.

Upon review of the report it was noted that a portable sewage treatment unit was present onsite. The unit was to provide primary treatment of effluent before discharging to the lagoon, however, the unit was not functioning properly. Consequently the results of some sampled parameters collected during the active period of the camp were in excess of the allowable license limits. The Licensee is required to ensure that equipment is functioning properly and that violations of this nature are avoided in the future.

Additionally, as per section 1(iv) of this Part, the Annual Report was to include as-built drawings of structures constructed including but limited to the *" Water Supply and Solid Waste Disposal Facilities, including all associated structures;"* A review of the Report could not located the As-Built drawings as required. The Licensee is directed to submit these drawings as an addendum to the 2007 annual report.

The proponent is reminded that an annual report is required to be filed by March 31st 2008 for the year ending December 31st 2007. The annual report **must** include but not be limited to those items listed in Section 1 (i) through (xvi) inclusive, of this part as well as any information required by the Inspector.

Failure to file a complete report as outlined in the license is a violation of the Act and will subject the licensee to the enforcement measures and penalties provided for under the Act.

The licensee is reminded that it is the responsibility of the licensee to ensure that any documentation submitted by the licensee to the Nunavut Water Board is acknowledged by the Manager of Licensing.

Part C: Conditions Applying To Water Use

At the time of the inspection the licensee was allocated the use of 150 Cubic meters of water per day for all purposes. Water of all uses is to come from the designated Water Supply Lake.

The Inspector is satisfied that the Licensee has undertaken the required measures to prevent the deposition of dust or Sediment into the Water Supply Lakes.

During the period of inspection the Inspector noted that the source for water intake, the location sampled, had an obvious flow and current. When questioned, the licensee stated the water intake is a freshet or melt stream from higher elevations and this was the intake location for the water. The Inspector seeks clarification from the Nunavut Water Board on the use of this stream as the water source.

Part D: Conditions Applying to Sewage Disposal

During the inspections of the camp the following items were noted and brought to the attention of either Ms. Boucher-Sharma during the first inspection or Mr. Douglas Craig during the period of the second inspection.

- Inspection of the Sewage Lagoon and surrounding area conducted during the August 22nd 2007 inspection revealed seepage from the sewage lagoon and flow path leading away from the lagoon. The inspector noted signs of algae growth, a green color and a smell of sewage emanating from the flow outside the lagoon. This water was sampled.
- Dried matter / slurry commonly found in lagoon systems was found in a pathway leading away from a previously used lagoon indicating a past release originating from within the lagoon system. No record of a spill or release was available during the inspection.

Part E: Conditions Applying To Solid Waste Disposal

Evidence of open burning was found and documented during both inspection visits. It should be noted that during the period of the second inspection the Inspector was told that the material being burned was old explosives found on site and that this was the recommended procedure for disposal.

During the period of both inspections a walk around the site confirmed the locations and construction of both the Solid Waste Disposal Facilities and the Land Farm Facilities.

(It should be noted that immediately prior to visiting the site the first time the Inspector received two spill Reports from the spill line detailing two spill events at the site.)

Spill #1 – June 29th, 2007 a report of a hydrocarbon spill within the land farm possibly originating from a fuel tanker over wintered in the containment area. Estimated volume on the spill report was approximately 3000 Litres on the form.

Spill #2 - July 8th, 2007 a storage tank containing hydrocarbon contaminated water failed releasing approximately 52,000 Litres over 2,200 square meters of ground. This occurred outside a contained area.

During the period of the first inspection on July 11th, 2007 the Inspector noted the presence of a pump on the wall of the Land Farm Facility. Further investigation noted evidence of a discharge hose running over the side of the bank and exiting the Land Farm facility. Additionally, it was noted during the inspection that stress cracks and sloughing of the North-east corner of the containment were visible and photographed.

Further discussion with the Licensee and representatives of the contractor on site noted the following information;

1. Water volumes within the containment area had reached an elevation that it was believed that the integrity of the earthen berm wall was in question.
2. Hydrocarbons (free product) were noted on the water to a depth of 4 cm in some places.
3. Water pumps were installed and in conjunction with resident underflow dams approximately 12,700 cubic meters of hydrocarbon contaminated contact water was pumped out of the containment area.
4. No spill report was filed for the release of the contact water from within the containment area however a note was included in the report noted above (Spill #1) that water from within the land farm was being pumped out as a precaution.
5. Sampling had been conducted throughout the event and subsequently carried on after the release.
6. Additional sampling was ordered by the inspector.

The Licensee was required to provide the Inspector written reports on the incidents and additional sampling was required. All of the above were complied with and results of sampling did not conclusively prove hydrocarbon contamination from the release existed beyond the land farm facility.

It is the responsibility of the licensee to take steps to ensure this does not occur again. If the licensee proposes to make such changes such that they make material effect on the approved terms and conditions of the current Water License, then the licensee is reminded to submit those changes as modifications to the Nunavut Water Board for approval subject to Part H of the current License.

The proponent is reminded to include in the 2007 annual report due on March 31st 2008 a list of hazardous materials (Polychlorinated Biphenyls) shipped out of the camp, and the location of the approved treatment facility to which they were sent. All of the foregoing is required information to be included in the annual report. Shipping and receiving invoices are not required so long as the records are available for inspection during the 2008 inspection season.

Part F: Conditions Applying to the Undertaking

During the period of Inspection the licensee was referred to Section 1 of this Part. The licensee stated that the current construction parameters were all in accordance with the issued license and plans submitted to the Nunavut Water Board. These Plans were not found on a search of the Nunavut Water Board FTP site.

The Licensee is reminded that the activities of the contractor conducting the work on site must conform to the terms and conditions of the issued Water License.

Part G: Conditions Applying To Spill Contingency Planning

A review of the Water Board FTP site could not locate the approved 2003 Spill Contingency Plan which as per Section 2 of this part was to have been revised within 30 days of the issuance of the current license.

If the required Plan has been submitted to the Nunavut Water Board for approval, the Licensee is directed to provide a copy of the plan as well as a copy of the approval from the Nunavut Water Board to the Inspector within 30 days of receipt of this Inspection Report.

The licensee is reminded that it is the responsibility of the licensee to ensure that any documentation submitted by the licensee to the Nunavut Water Board is acknowledged by the Manager of Licensing.

If an approved plan is not completed, the Licensee is directed to provide, as an addendum to the 2007 Annual report, due on March 31st 2008 a revised copy of the 2003 Spill Contingency plan that includes, but is not limited to, those items found in section 2 (i through iv) of this Part.

The Licensee is reminded that as per Section 5 (iii) of this Part the Licensee is required to submit a detailed report on each spill occurrence no later than 30 days following the initial event.

Part H: Conditions Applying to Modifications

No mention of modifications to the existing license was discussed during the period of inspection. The licensee is reminded that all modifications need to be consistent with the terms and conditions of the existing license and if not then will require the Nunavut Water Boards approval as set out in Section (1) of this Part.

The Licensee is reminded that Section 3 of this Part requires that the licensee provide as-built drawings, stamped by an engineer within 90 days of completion of any approved modifications.

Part I: Conditions Applying To Abandonment And Restoration

As noted in the current License issued by the Nunavut Water Board the licensee is required to submit Abandonment and Restoration Plans 6 months prior to the completion of on site activities.

Part J: Conditions Applying To Monitoring Programs

As per Section 1 of this Part the Licensee was to submit for approval a monitoring program to the Nunavut Water Board within 6 months of the issuance of the current license. A review of the Nunavut Water Board FTP site could not locate the required Monitoring program or an approval from the Nunavut Water Board.

Additionally, as outlined in Section 5 of this Part the Licensee was to have submitted a Quality Control/ Quality Assurance Plan to the Nunavut Water Board for approval 30 days prior to sampling. This plan could also not be located on the Nunavut Water Board FTP site.

If the required Plan(s) has been submitted to the Nunavut Water Board for approval, the Licensee is directed to provide a copy of the Monitoring and (QA/QC) plans as well as a copy of approvals from the Nunavut Water Board to the Inspector within 30 days of receipt of this Inspection Report.

The licensee is reminded that it is the responsibility of the licensee to ensure that any documentation submitted by the licensee to the Nunavut Water Board is acknowledged by the Manager of Licensing.

If an approved Monitoring plan is not completed, the Licensee is directed to provide, as an addendum to the 2007 Annual report, due on March 31st 2008 a Monitoring plan to the Nunavut Water Board for approval that includes, but is not limited to, those items found in Section 1 (i through v) of this Part.

The Licensee is reminded that failure to file a the required Plans as outlined in the license is a violation of the Act and will subject the licensee to the enforcement measures and penalties provided for under the Act.

Non-Compliance:

During the inspection a number of items were noted and discussed with Ms. Boucher-Sharma during the first inspection and then with Mr. Douglas Craig. These issues required corrective action to be undertaken prior to the date of the next inspection. The submission of a record showing these activities had been completed was requested.

Specifically these concerns were;

- Open burning of garbage and hazardous materials noted during the first inspection – Addressed
- Location of the treatment facility where hazardous wastes generated or marshalled on site are to be shipped.
- Submission of a plan to address erosion of berm wall at the Land farm's Northeast corner and northern perimeter wall.
- Lack of secondary containment at fuel transfer areas.
- Submission of spill reports to Inspector – Addressed.
- Report on sewage release from lagoon site.
- Plan to address the needed increase in Lagoon capacity. If a new lagoon is to be constructed an application for modifications is to be submitted to the Nunavut Water Board for approval and must include a reclamation plan for the existing lagoon sites.
- Installation of metering system to accurately record water use.

Andrew Keim
Inspector's Name

_____
Inspector's Signature

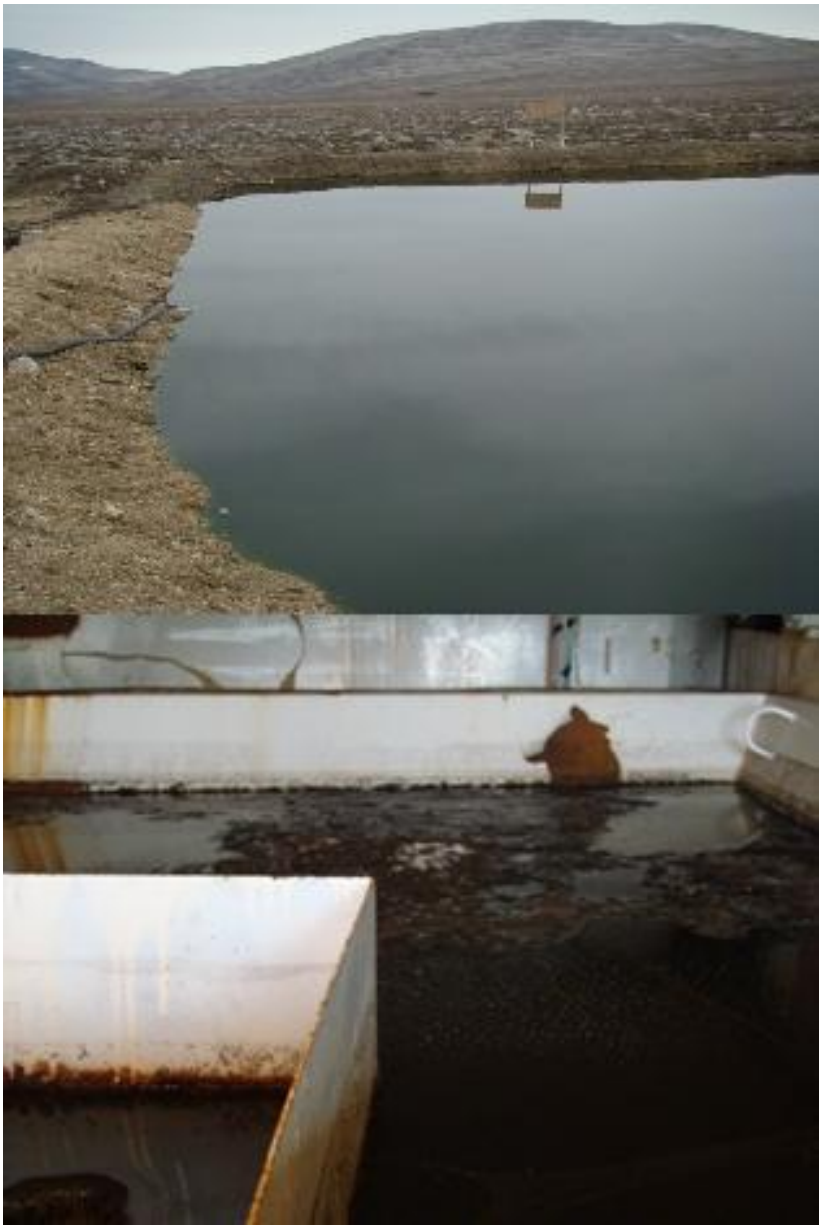
Attached under separate cover;
Photos taken during Inspection of July 2nd, 2007

Cc:
Peter Kusugak – Manager Field Operations Section- Indian and Northern Affairs Canada
Phyllis Beaulieu – Manager licensing – Nunavut Water Board


32


Sternlight


Sterilight




PTI

Defence Construction Canada
Construction de Défense Canada

January 14, 2008

Andrew Keim
Water Resources Officer
INAC Nunavut Regional Office
P.O. Box 2200
Iqaluit, Nunavut X0A 0H0

RE: DYE-M Water Use Licence Inspection Report

Mr. Keim:

The DEW Line project team has reviewed the inspection report dated November 27, 2007, which summarized findings and observations from inspections conducted on July 11th and August 22nd, 2007. Each issue raised has been addressed, and in some instances, more information is requested.

Part B: General Conditions

It is acknowledged that a non-functioning portable sewage treatment unit is onsite. However the water use licence does not make any reference to this unit, and its operation is not required.

As-built drawings are engineering drawings that are created upon the completion of a structure. Since DYE-M is a work in progress, as-builts have not yet been created. Upon completion, all required as-builts will be provided.

Part C: Conditions Applying to Water Use

It is unclear what the issue is with respect to the water supply source observed during the August 22nd inspection. There are three water supply sources that the project has authorization to draw from, and the observed source is one of them.

Part D: Conditions Applying to Sewage Disposal

It is acknowledged that there was some minor seepage from the active lagoon cell (referred to as Cell-2006). As a mitigating measure, a new cell (Cell-2007) was created adjacent to the seepage. The old cell (Cell-2004) was pumped into Cell-2007 and backfilled, therefore maintaining a two cell lagoon system. In order to prevent any similar seepage in the future, the berms of the new cell were compacted, and the level of Cell-2006 was reduced by pumping some effluent into Cell-2007. Cell-2004, once empty, was backfilled to grade.

There are no reports or information available regarding the source of the dried matter you referred to.

Part E: Conditions Applying to Solid Waste Disposal

While there are no regulations or guidelines in the Territory on Nunavut that prohibit or provide direction on incineration operational requirements, it is acknowledged that an incineration system is required according to our site permits. The Water Use Licence simply states that "*camp solid waste will be incinerated*". While the rationale for requiring incineration equipment is questioned, DCC will comply with this requirement. The only exception, as noted in your report, is that unexploded ordinances (UXOs) will continue be dealt with in accordance with advice from our UXO experts. This may take the form of burning in an open vessel, following any required deactivation of the material.

DCC was reminded that steps must be taken to ensure that a recurrence of the landfarm incident from 2007 does not occur. The following mitigation measures have been taken:

- A buttress was constructed along the outside slope of the east berm to improve structural integrity. The buttress was designed by the project Geotechnical Engineer.
- Water collected in the landfarm over the 2007 season was tested and discharged prior to closing the site in September.
- Fuel will not be permitted to be stored in the facility.
- Geotechnical personnel will be conducting regular inspections of the landfarm berms throughout each season. Any issues raised will be addressed.

Part F: Conditions Applying to the Undertaking

It is noted in the inspection report that construction plans could not be located on the Nunavut Water Board FTP site. DCC cannot control what is on the NWB FTP site, and maintains that all required construction plans have been submitted to the Board.

Part G: Conditions Applying the Spill Contingency Planning

All applications to the NWB for Water Use Licences contain a chapter pertaining to the DCC Spill Contingency Plan. As noted, the 2003 Spill Contingency Plan was approved. A revised plan will be included in the 2007 Annual Report.

Part H: Conditions Applying to Modifications

Any modifications that may be required at the site will be conducted in accordance with the licence.

Part I: Conditions Applying to Abandonment and Restoration

The entire DEW Line Cleanup project is an Abandonment and Restoration undertaking. That being said, our application to the NWB for our initial licence contained a section on abandonment and restoration. When the DYE-M site is nearing completion, any changes to the A&R plan will be provided, with reference to the initial submission.

Part J: Conditions Applying to Monitoring Programs

All applications to the NWB for Water Use Licences contain a chapter pertaining to the monitoring program that will be initiated following site closure. A copy of the monitoring plan for DYE-M is attached.

The Quality Control/Quality Assurance (QA/QC) Plan has been submitted to the NWB. A copy is attached.

Non-Compliance:

- Open burning. Addressed in Part E, above.
- The Location of the treatment facility(s) where hazardous wastes will be shipped cannot be provided prior to contracts being developed with the particular Disposal Facilities. It is unclear why this information is requested.
- Measures to address erosion of the landfarm berm were discussed in Part E, above. If more information is required, please let me know.
- Effort will be made to ensure that secondary containment is in place at all fuel transfer areas.
- As mentioned in Part D, there is no information available that can explain the dried matter you observed near the lagoon cells. It is possible that an overflow occurred at some time, but this would be speculation as there is no documentation to support this.
- Mitigation measures to address the seepage from the 2006 lagoon cell resulted in the development of a new cell adjacent to it. Since the old cell was pumped out and backfilled, we have maintained a two cell lagoon system as authorized in our Water Use Licence. The two current lagoon cells are expected to be sufficient for the expanded camp. If a third cell is required at some point in the future, an application for amendment will be made.
- The metering system to measure water use is a count of truck volumes.

We trust the information provided is sufficient. Please feel free to contact me if you require anything further.

Douglas Craig, M.Sc.
Environmental Officer
DEW Line Clean Up
Defence Construction Canada
Constitution Square, Suite 1720, 350 Albert St.,
Ottawa, Ontario
K1A 0K3
Phone: (613) 998-7288
Fax: (613) 998-0468

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NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **June - 29 - 2007**	REPORT TIME **12:10 pm**	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR **Detected June 12, 2007**	OCCURRENCE TIME **unknown**		

C	LAND USE PERMIT NUMBER (IF APPLICABLE) **N2003X0039**	WATER LICENCE NUMBER (IF APPLICABLE) **NWB5DYE0409**
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION **DYE-Main DEW Line Site**	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES **66** MINUTES **40** SECONDS **00**	LONGITUDE DEGREES **61** MINUTES **21** SECONDS **18**
F	RESPONSIBLE PARTY OR VESSEL NAME **Defence Construction Canada**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **350 Albert Street, Suite 1720, Ottawa, ON K1A 0K3**
G	ANY CONTRACTOR INVOLVED **SNC-Lavalin Inc.**	CONTRACTOR ADDRESS OR OFFICE LOCATION **2200 Lakeshore Boul. W., Toronto, ON M8V 1A4**

H	PRODUCT SPILLED **Fuel oil #2**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **unknown (est. 200-2000 L)**	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE **under investigation**	SPILL CAUSE **under investigation**	AREA OF CONTAMINATION IN SQUARE METRES **800 (on meltwater in landfarm)**
J	FACTORS AFFECTING SPILL OR RECOVERY **meltwater inside landfarm area**	DESCRIBE ANY ASSISTANCE REQUIRED **none required**	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT **none known**

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

The landfarm is a large, bermed area used to remediate hydrocarbon contaminated soils. At the end of last season, the contractor parked several mobile fuel tanks inside the landfarm for safety precautions. This spring, an oil sheen/product was observed floating on the surface of the meltwater inside the landfarm. Samples were taken to determine the source of the product (we are awaiting test results). The product may be from the deposited contaminated soil, or possibly a leak from one of the fuel tanks. In the meantime, to prevent the sheen/product from overflowing the berm,the water level is being reduced by pumping out the water (intake from beneath surface) and running it through a filter system prior to discharge. There is no sheen visible in the discharge water, and as an added precaution, it is being discharged into coiled, oil-absorbent booms. The DCC Associate Project Manager and an engineering and environmental consultant will be investigating the issue during a planned visit to the site this weekend, and will provide more information on this issue.

L	REPORTED TO SPILL LINE BY **Douglas Craig**	POSITION **Environmental Officer**	EMPLOYER **DCC**	LOCATION CALLING FROM **Ottawa**	TELEPHONE **(613) 998-7288**
M	ANY ALTERNATE CONTACT **Eva Shulz**	POSITION **Env. Scientist**	EMPLOYER **UMA**	ALTERNATE CONTACT LOCATION **Calgary**	ALTERNATE TELEPHONE **(403) 270-9220**

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR June 29, 2007	REPORT TIME 12:05 pm	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____ - _____
B	OCCURRENCE DATE: MONTH – DAY – YEAR June 28, 2007	OCCURRENCE TIME		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) N2003X0039	WATER LICENCE NUMBER (IF APPLICABLE) NWB5DYE0409		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION DYE-Main DEW Line Site	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 66 MINUTES 40 SECONDS 00	LONGITUDE DEGREES 61 MINUTES 21 SECONDS 18		
F	RESPONSIBLE PARTY OR VESSEL NAME Defence Construction Canada	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 350 Albert Street, Suite 1720, Ottawa, ON K1A 0K3		
G	ANY CONTRACTOR INVOLVED SNC-Lavalin Inc.	CONTRACTOR ADDRESS OR OFFICE LOCATION 2200 Lakeshore Boul. W., Toronto, ON M8V 1A4		
H	PRODUCT SPILLED Motor oil and transmission fluid	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 30-50 litres	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE D-8 Bulldozer	SPILL CAUSE Large rock punctured tank/lines	AREA OF CONTAMINATION IN SQUARE METRES 50	
J	FACTORS AFFECTING SPILL OR RECOVERY none	DESCRIBE ANY ASSISTANCE REQUIRED none	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT slippery surface in area	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

While working on the outer,east berm of the landfarm, a D-8 dozer backed over a large rock and lost traction. Another dozer working on the berm tried to push the stuck dozer out, and in the process, the oil and transmission storage tanks/lines were damaged. It was reported that approximately 30-50 litres of combined motor oil/transmission fluid was released to ground.

Absorbant pads and booms were placed on the ground and in strategic locations to prevent the product from migrating with meltwater. Soil samples will be taken from the area to determine the extent of migration, and any contaminated soil will be excavated and placed into the landfarm for remediation.

L	REPORTED TO SPILL LINE BY Douglas Craig	POSITION Environmental Officer	EMPLOYER DCC	LOCATION CALLING FROM Ottawa	TELEPHONE (613) 998-7288
M	ANY ALTERNATE CONTACT Eva Shulz	POSITION Env. Scientist	EMPLOYER UMA	ALTERNATE CONTACT LOCATION Calgary	ALTERNATE TELEPHONE (403) 270-9220

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR July 9, 2007	REPORT TIME 14:00	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____ - _____
B	OCCURRENCE DATE: MONTH – DAY – YEAR July 8, 2007	OCCURRENCE TIME N/A		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) N2003X0039	WATER LICENCE NUMBER (IF APPLICABLE) NWB5DYE0409		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION DYE-Main DEW Line Site	REGION ☒ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES 66 MINUTES 36 SECONDS 03	LONGITUDE DEGREES 61 MINUTES 34 SECONDS 37		
F	RESPONSIBLE PARTY OR VESSEL NAME Defence Construction Canada	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 350 Albert Street, Suite 1720, Ottawa, ON K1A 0K3		
G	ANY CONTRACTOR INVOLVED SNC-Lavalin Inc.	CONTRACTOR ADDRESS OR OFFICE LOCATION 2200 Lakeshore Boul., West, Toronto, ON M8V 1A4		
H	PRODUCT SPILLED Hydrocarbon contaminated water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 52,000 litres	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Storage Tank	SPILL CAUSE under investigation	AREA OF CONTAMINATION IN SQUARE METRES 2,200 square metres	
J	FACTORS AFFECTING SPILL OR RECOVERY none known	DESCRIBE ANY ASSISTANCE REQUIRED none	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT none known	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

A storage tank containing hydrocarbon-contaminated water experienced a breach whereby an estimated volume of 52,000 litres of contaminated water was released to ground, covering an estimated area of 2,200 square metres. The discharged water originated from overland water flow into hydrocarbon-contaminated soil excavations, and was being held in the tank awaiting treatment. Remaining contaminated water has been pumped from the failed tank and surrounding area into another temporary holding tank. Oil-absorbent socks have been applied to the areas where the contaminated water pooled. DCC will arrange for soil testing to delineate the affected area, and will be excavating any contaminated soil (above criteria for hydrocarbons) to the landfarm. Samples of the discharged water and impacted soil near the breach have been collected and submitted for analyses.

L	REPORTED TO SPILL LINE BY Douglas Craig	POSITION Environmental Officer	EMPLOYER DCC	LOCATION CALLING FROM Ottawa	TELEPHONE (613) 998-7288
M	ANY ALTERNATE CONTACT Nahed Farah	POSITION Assoc. Proj. Manager	EMPLOYER DCC	ALTERNATE CONTACT LOCATION Ottawa	ALTERNATE TELEPHONE (613) 998-7917

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **July 26, 2007**	REPORT TIME **3:00 pm**	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____ - _____
B	OCCURRENCE DATE: MONTH – DAY – YEAR **July 18, 2007**	OCCURRENCE TIME **unknown**		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) **N2003X0039**	WATER LICENCE NUMBER (IF APPLICABLE) **NWB5DYE0409**		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION **DYE-Main DEW Line Site located near Cape Dyer**	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES **66** MINUTES **35** SECONDS **39**	LONGITUDE DEGREES **61** MINUTES **34** SECONDS **22**		
F	RESPONSIBLE PARTY OR VESSEL NAME **Defence Construction Canada**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **350 Albert Street, Suite 1720, Ottawa, ON K1A 0K3**		
G	ANY CONTRACTOR INVOLVED **SNC-Lavalin**	CONTRACTOR ADDRESS OR OFFICE LOCATION **2200 Lakeshore Boul. W., Toronto, ON M8V 1A4**		
H	PRODUCT SPILLED **Sewage water**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **estimated 25 litres**	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE **Sewage piping**	SPILL CAUSE **Loose fitting on sewage piping**	AREA OF CONTAMINATION IN SQUARE METRES **est. 20 square meters**	
J	FACTORS AFFECTING SPILL OR RECOVERY **spill clean-up complete**	DESCRIBE ANY ASSISTANCE REQUIRED **none required**	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT **none**	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

A fitting on the piping between the camp and the sewage pump became loose, releasing an estimated volume of 25-litres of sewage water to the ground. Due to recent rains, the area also had some ponded water (puddles) into which the sewage water mixed.

A volume of approximately 100-litres (combined sewage and ponded surface water) was transferred to the active camp lagoon, and the impacted area was covered with clean fill. There are no ditches or streams in the vicinity of the loss.

A regular inspection of the sewage system and associated equipment will reduce the probability of a recurrence.

L	REPORTED TO SPILL LINE BY **Douglas Craig**	POSITION **Environmental Officer**	EMPLOYER **DCC**	LOCATION CALLING FROM **Ottawa**	TELEPHONE **613.998.7288**
M	ANY ALTERNATE CONTACT **Nahed Farah**	POSITION **Assoc. Proj. Manager**	EMPLOYER **DCC**	ALTERNATE CONTACT LOCATION **Ottawa**	ALTERNATE TELEPHONE **613.998-7287**

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Defence Construction Canada
Construction de Défense Canada

July 20, 2007

Andrew Keim
Water Resources Officer
INAC Nunavut Regional Office
P.O. Box 2200
Iqaluit, Nunavut X0A 0H0

RE: DYE-M Landfarm water discharge report

Mr. Keim:

Please find included in this report a summary of the discharge event, as well as the requested information on the series of events that necessitated the emergency discharge of the water from within the landfarm.

Summary:

The issue currently being reported pertains to the Cape Dyer DEW Line Site known as DYE-M. This site is in the process of being decommissioned, with a completion target date of 2011.

As part of the clean up process, large quantities of fuel-contaminated soils are transported to and treated in a bermed facility called a landfarm. The goal of this treatment is to reduce the hydrocarbon concentration of the soil to a value of less than 2500 ppm TPH. During this process, nutrients are added and the soils are worked to facilitate the degradation of the hydrocarbons. The footprint of the landfarm at DYE-M is large, covering approximately 94,000 m^2. At the end of the 2006 construction season, six mobile fuel tankers were placed within the landfarm for over-winter storage.

In the second week of June of this year, Defence Construction Canada (DCC) and its scientific advisor, Environmental Sciences Group (ESG), arrived on-site at DYE-M. As part of the normal site inspection process, it was noted that there was a significant volume of meltwater accumulating in the landfarm, and a sheen indicative of petroleum hydrocarbon products was visible covering a large part of the surface in the northern corner of the landfarm. Investigation into the source of the hydrocarbon sheen on the water within the landfarm is on-going. By June 29th, 2007, while there had not been definitive proof that a spill had occurred, a spill report was made to the NT-NU Spill Report Line. As part of the spill report, DCC indicated that the water level in the facility was exceedingly high, and in order to prevent the floating petroleum hydrocarbon product from escaping the bermed perimeter of the facility (either by overflowing the berm or due to berm collapse), the water from within the landfarm was being pumped out. Note that the intakes of all pumps were drawing from beneath the surface; therefore floating product was not pumped out of the facility. It is estimated that up to 12,700 cubic meters of water was pumped out in total. Since it was imperative that the water

was pumped out to prevent potential escalation of impacts, it was not possible to ensure the wastewater met the discharge parameters outlined in the DYE-M construction specifications. Recently obtained water quality test data indicate that the oil and grease content of the discharge water ranged from 4.9-20.6 mg/L (with a median value of five tests being 7.2 mg/L). This information suggests that up to 90-L of hydrocarbon product was released to the tundra, versus the approximately 3000-L that is now believed to have been part of the floating volume of fuel oil. Four drums of fuel oil have been recovered from the landfarm surface (approximately 750 litres), with the rest remaining on the surface of the landfarm where it will be remediated with the hydrocarbon-contaminated soils.

Issue:

On Wednesday, July 11, 2007, Mr. Andrew Keim of Indian and Northern Affairs Canada (INAC) visited the DYE-M site for the purposes of investigating two spill incidents; one that occurred at the landfarm, as discussed above. It was Mr. Keim's assertion that pumping out the contact water from the landfarm should have constituted an additional report to the Spill Report Line.

Position:

DCC maintains that the initial spill report for the landfarm incident provided appropriate notification that water was pumped from the landfarm. Further data pertaining to the water quality parameters and volume of the discharged water were to be included in our follow-up report, which Mr. Keim has requested be submitted by August 10th, 2007 (30 days from his visit).

2007 Landfarm Activities

Please find below a chronology of events that describe the situation at the landfarm, the necessity of reducing the volume of water contained within the landfarm, and all relevant data and information known at each noted timeframe.

June 10th

- ESG/DCC team arrived on site
- It was observed by DCC that the snow inside the landfarm was melting, and the water level was increasing inside the berms.
- The six fuel tankers were observed in the landfarm. The contractor, SNC Lavalin Environmental (SLEC), reported that they were currently drawing fuel from tanks outside of the landfarm.

June 11th

- During a site inspection by ESG and DCC, hydrocarbon product/sheen was found on the ponded water inside the landfarm in the northern corner, next to the berms (**Figure 1**). The observation of a sheen is not considered abnormal, given that this is a treatment facility for hydrocarbon-contaminated soils.

- A water sample (07-30000) was collected from the ponded water and was shipped to a CAEAL accredited laboratory for analyses of all discharge parameters except oil and grease. Because a sheen had been noted on the surface of the water, the guideline for oil and grease included in the site specifications (i.e. no visible sheen and less than 5 mg/L) has already been exceeded. Results are presented in **Table 1**.
- Concern was expressed by all parties on site regarding the overall *level of water in the landfarm*. Overflow pipes were plugged by the contractor, SNC Lavalin (SLEC) to prevent discharge until receipt of wastewater results; however, it was acknowledged that there might be a need to discharge water earlier in order to preserve the integrity of landfarm berms. If the berms failed, there was a greater potential impact from hydrocarbon contamination, as the floating product would be released.
- A tour was conducted of the landfarm by SLEC/DCC/ESG. SLEC indicated that a wastewater treatment system should be on-site soon.

June 12th

- Product was blown by wind into the western corner of the landfarm and covered a 12 m by 12 m area. The depth seen on the surface ranged from a sheen up to a maximum depth of 4 cm along the west edge. An accurate estimate of the volume was not possible.
- SLEC started the construction of a water treatment unit using a two-tank system and absorbent pads to treat water from the landfarm.

June 13th

- A sample of free product in the landfarm was collected to submit for analysis to determine fuel type. Results not available at this time.

June 15th

- It was decided by DCC to open the overflow pipes to allow water to discharge in order to protect berm stability. Heavy precipitation had raised the level of water in the landfarm. The intakes for the overflow pipes were well below the surface of the water at this point, preventing sheen/product from being discharged. In addition, oil-absorbent booms were placed around the intake section of the overflow pipes (**Figures 2 and 3)**

Misc. notes from week of June 10-16:

- ESG reported to DCC that a phase-separated sample, taken from the landfarm, appeared to be fuel.
- ESG investigated the six tankers located within the landfarm, but found no observable leaks.
- DCC contacted UMA regarding the gravity of the situation of the rising water in the landfarm and discussed the associated risk to the stability and integrity of the berms. An agreement was reached that if it starts raining heavily again, the overflow pipes should be unplugged. During this week, UMA also suspected that the sheen may be the result of heavily contaminated soils within the landfarm.

June 17th

- SLEC reported that Sanexen's wastewater treatment system (using activated carbon) would be flown to the site in the near future. SLEC expressed concern that not all equipment for the unit was shipped to Iqaluit from Montreal (expecting 7000 lbs but only found 1000 lbs in Iqaluit).
- The SLEC on-site treatment system almost ready to start processing landfarm water.

June 19th

- The SLEC treatment system (an oil/water separator with oil-absorbent pads/booms) was completed.
- A water sample (07-30033) was collected by ESG from the SLEC treatment system at the landfarm and submitted for oil and grease analyses (**Table 1**). It is suspected that this sample was not representative of the actual discharge, as the result indicates a concentration greater than the values obtained from the ponded water from the landfarm.

June 20th

- Use of the SLEC water treatment system was initiated because of rainfall accumulations and high water levels within the landfarm. Precipitation continued to fall, and was forecasted to persist for the next few days.
- Water was released from the landfarm overflow pipes as it could not be pumped through the SLEC treatment system fast enough to compensate for rainfall accumulations. Absorbent booms and pads were placed at the discharge of the overflow pipes, and ESG collected a sample of the discharge (07-30051). Refer to Table 1 for test results.
- DCC and ESG continued to investigate the source of contamination. SLEC stated that they would try to find records on whether Tanker No. 2 was full or empty at the end of 2006 season.

June 22nd

- SLEC conducted measurements of the depths of fuel in each tanker in the landfarm. Tanker No. 2 did not contain any fuel.
- SLEC re-sealed the emergency overflow pipes at the landfarm.
- The SLEC site manager stated that he believed that all of the tanks were full when they were placed in the landfarm at the end of the 2006 season.
- Absorbent booms were placed at the culvert located downgradient from the landfarm.

June 24th

- The SLEC site manager now states that based on verbal communication with a worker that was on-site at the end of the 2006 season, he now believes that Tanker No. 2 was emptied to fill the equipment and the fuel truck before SLEC departed from site in September 2006.

June 25th

- SLEC reported that the Sanexen wastewater treatment plant had not yet been delivered to site, nor were there Sanexen personnel on-site. Activated charcoal for the treatment system would be put on the barge in Montreal and come up with the sealift. SLEC stated they would continue to use their treatment system on-site until then.

June 26th

- Additional wastewater samples were collected from ponded water within the landfarm (07-30150), and from the effluent from the SLEC water treatment unit (07-30151).
- ESG submitted a proposal for the collection of soil samples from test pits to be excavated in the vicinity of the SLEC tankers to investigate a potential spill. DCC approved the investigation.

June 27th

- Soil samples (07-30152 to 07-30183, inclusive) were collected from test pits excavated around the SLEC tankers stored in the landfarm.
- Due to the imminent failure of the northwest landfarm berm, water was again being pumped out of the landfarm. The emergency overflow pipes were also opened.

June 29th

- DCC contacts the NT-NU Spill Report Line to report a suspected fuel spill within the landfarm (**Attachment 1**). Even though the source had not been conclusively determined, there was a strong suspicion that a spill may have occurred within the landfarm. ***The information provided to the Spill Line includes notification that as a precaution, the water from within the landfarm was being pumped out***.
- ESG reported results from wastewater samples collected from the landfarm and effluent from the SLEC treatment plant received to date (**Table 1**).

June 30th

- Dave Mitchell (UMA), Nahed Farah (DCC) and Kat White (ESG) arrived on site, and inspected the landfarm.
- Fuel was noted on the ice located beneath Tanker No. 2.
- Product in landfarm was blown by the wind into a narrow ditch (located inside of landfarm) next to the eastern berm of the landfarm. Booms were placed to contain product within the ditch.

Misc. notes from week of June 24-30:

- From Sunday (June 24th) to Wednesday (June 27th), water inside the landfarm facility was discharged using a 2-inch pump and an oil/water separator. The water was discharged from 7h00 to 18h00 every day. Water was also being discharged through the overflow pipes.
- Intermittent rainstorms kept the water level within the landfarm facility at a level that compromised the structural integrity of the berms.
- On Wednesday, EBA observed that a section of the facility's east berm had started to slough (**Figure 4**). DCC recommended to SLEC that they discharge water throughout the night.
- Thursday (June 28th) morning, seeing that the water level had not sufficiently dropped, DCC recommended that SLEC use all their pumping capacity to discharge water.
- Thursday afternoon, the EBA Geotechnical engineer observed the formation of a crack on top of the east berm (**Figure 5**), and indicated that the risk of berm failure was imminent unless immediate action was taken to reduce the hydraulic pressure on the berm. DCC/EBA recommended that SLEC take action to discharge the water at the maximum capacity, and to stabilize the berm. SLEC placed material behind the berm to stabilize it. Three pumps (two 2" and one 4" lines) were utilized to reduce the water volume. Absorbent booms were placed at the pump discharges.
- DCC continues to investigate SLEC's statement that Tanker No. 2 was left empty at the end of the 2006 season after all equipment had been fuelled.

July 1st

- Additional soil samples were collected under Tanker No. 2 (07-30305 to 07-30308, inclusive).

July 2nd

- SLEC began removing free product off surface of landfarm by skimming using a shop vacuum, and then pouring the liquid into 45-gallon drums.
- ESG reported preliminary results from soil samples collected from the vicinity of the SLEC tankers. Results from samples screened in the field using TPH test kits indicated that surface soil under Tanker No. 2 and within the horseshoe-shaped berm is above the DLCU guideline of 2500 ppm.

July 3rd

- SLEC continued to remove free product from the landfarm using a shop-vacuum, and containerized it in barrels. All barrels filled with product were labeled as being from the landfarm.
- An additional boom was placed on landfarm to help skim product.
- Water pumping at the landfarm was stopped, since water levels were low enough to mitigate the risk of berm failure. A sample (07-30289) was collected from the ponded water remaining in the landfarm.

July 9th

- ESG collected a sample from Tanker No. 2 to be analyzed and compared to the results from the barrel sample collected from the floating free product on June13, 2007.

July 11th

- At the request of INAC, a soil sample (07-30454) was collected in a perceived discharge location. On-site analysis indicated no detectable hydrocarbons present.

Summary statements:

- DCC believes a fuel oil spill of up to 3000-L may have occurred during the past winter, inside of the bermed landfarm perimeter.
- The accumulation of snow and ice over the winter, the water left in the landfarm by the contractor in the fall of 2006, and the high level of rainfall this spring resulted in very high water levels within the landfarm this spring.
- The high water levels put intense hydraulic pressure on the east berm of the landfarm, nearly resulting in failure of the berm (as evidenced by the sloughing and crack formation along the structure).
- The emergency release of the water was required to reduce the pressure on the berm, and prevent a collapse, which would have resulted in a complete discharge of all liquid contents of the landfarm including the free product observed floating product on the surface of the water.
- The mitigation measures as conducted (i.e. emergency release of the water) eliminated the risk of berm failure, and the discharge of up to 3000-L of fuel to the tundra.

Ongoing investigations:

1. ESG has proposed a sampling plan to investigate the potential impacts to soil and water from the landfarm discharge activities. DCC has approved the plan, and the work is expected to be completed in the near future. All investigation results will be forwarded to both INAC and the Spill Report Line (as a follow-up to the initial landfarm spill issue, reported June 29, 2007).

2. DCC, ESG, and SLEC will continue to investigate the source of the floating product in the landfarm. Any findings will be reported to INAC and the Spill Report Line.

If you have any questions or comments, please don't hesitate to contact me as indicated below.

Sincerely,

Douglas Craig, M.Sc.
Environmental Officer
DEW Line Clean Up
Defence Construction Canada
Constitution Square, Suite 1720, 350 Albert St.,
Ottawa, Ontario
K1A 0K3
Phone: (613) 998-7288
Fax: (613) 998-0468

Figure 1. Overview of landfarm facility and surrounding terrain. (included at the end of the report)

Figure 2. Photograph of oil-absorbent booms place around intake of overflow pipes within landfarm.

Figure 3. **Photograph of oil-absorbent booms place around discharge of the overflow pipes external to the landfarm.**

Figure 4. **East berm of landfarm facility exhibiting sloughing on the outer side.**

Figure 5. East berm of landfarm facility exhibiting cracking.

Table 1. Summary of Analytical Results for Water Samples Collected from the DYE-M Lower Site Landfarm

Parameter	Target Criteria[1]	Units	07-30000 (11-Jun)	07-30033 (19-Jun)	07-0051 (20-Jun)	07-30150 (26-Jun)	07-30151 (26-Jun)	07-30289 (4-July)
pH	6-9	pH units	6.35	NA	NA	NA	NA	NA
Total Arsenic	0.100	mg/L	0.006	NA	NA	NA	NA	NA
Dissolved Cadmium	0.010	mg/L	<0.001	NA	NA	NA	NA	NA
Total Chromium	0.100	mg/L	0.087	NA	NA	NA	NA	NA
Dissolved Cobalt	0.050	mg/L	<0.003	NA	NA	NA	NA	NA
Dissolved Copper	0.200	mg/L	0.006	NA	NA	NA	NA	NA
Dissolved Lead	0.050	mg/L	<0.010	NA	NA	NA	NA	NA
Total Mercury	0.600	µg/L	<0.4	NA	NA	NA	NA	NA
Dissolved Nickel	0.200	mg/L	<0.005	NA	NA	NA	NA	NA
Total Zinc	1.0	mg/L	0.089	NA	NA	NA	NA	NA
Oil & Grease	None visible and 5.0 mg/L	mg/L	Visible sheen	20.6	None visible & 7.0	Visible sheen & 7.9	Slight sheen & 7.2	Visible sheen & 4.9
PCBs	50* 5**	µg/L	<3.0	NA	NA	NA	NA	NA

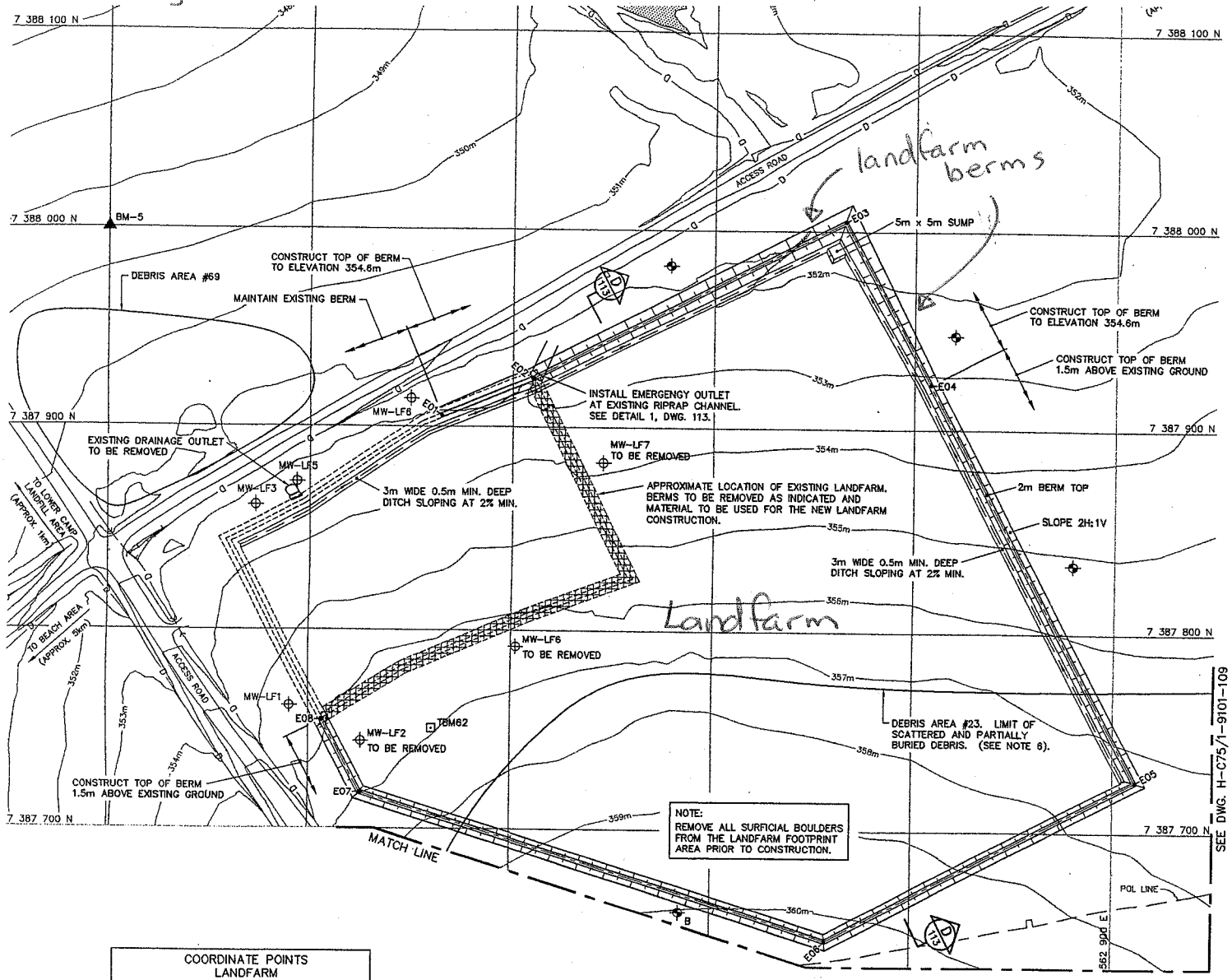
[1] - The target criteria are the DEW Line Clean-up Criteria DLCC, as listed in the submission to the NIRB.

* - When discharging the water to barren land

** - When discharging the water to vegetated land

NA- Sample was not analyzed for the specified parameter

Figure 1



COORDINATE POINTS LANDFARM				
	NO.	COORDINATES		ELEV.
		NORTHING	EASTING	
*	E01	7 387 905.5	562 565.1	354.60
*	E02	7 387 923.6	562 610.0	354.60
	E03	7 388 004.7	562 765.0	354.60
	E04	7 387 922.0	562 808.3	354.60
	E05	7 387 725.6	562 911.1	N/A
	E06	7 387 645.4	562 757.8	N/A
	E07	7 387 718.1	562 525.6	N/A
*	E08	7 387 754.7	562 506.5	N/A

* THESE LOCATIONS ARE APPROXIMATE ONLY. THE LOCATION OF THE EXISTING LANDFARM HAS NOT BEEN SURVEYED AND MAY NOT BE EXACTLY AS SHOWN.

N

General Notes:

1. ALL COORDINATES ARE REFERENCED TO UTM ZONE 20N, NAD83.
2. HORIZONTAL CONTROL REFERENCED TO SURVEY CONTROL MONUMENTS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. ALL NON-HAZARDOUS DEBRIS WITHIN PLAN AREA TO BE PLACED IN LOWER SITE NON-HAZARDOUS WASTE LANDFILL.
5. REFER TO TABLE 02219-1 IN SPECIFICATION FOR DESCRIPTION OF DEBRIS AREAS.
6. ALL SURFACE DEBRIS IS TO BE REMOVED FROM ALL CONTAMINATED SOIL AREAS AND NEW LANDFARM AREA PRIOR TO ANY FILL PLACEMENT OR EXCAVATION TAKING PLACE.
7. FOR MONITORING WELL INSTALLATION DETAILS SEE DWG. H-C75/1-9101-191. EXACT LOCATIONS TO BE FIELD DETERMINED BY THE ENGINEER.
8. FOR PERMANENT SURVEY CONTROL (BENCHMARK) INSTALLATION DETAILS, SEE DWG. H-C75/1-9101-191. LOCATIONS TO BE APPROVED BY THE ENGINEER.

Legend:

- EXISTING MONITORING WELL LOCATION
- E01 COORDINATE POINT
- PROPOSED MONITORING WELL LOCATION (3)
- B PROPOSED BACKGROUND MONITORING WELL LOCATION (1)
- BODY OF WATER
- BM-5 PROPOSED PERMANENT BENCHMARK LOCATION (1). (SEE NOTE 8).

No.	DATE	REVISION	REVISION	APP

R. MERCHANT — LICENSEE — N.W.T. — 2003-12-16

THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS and GEOPHYSICISTS OF THE NORTHWEST TERRITORIES
PERMIT NUMBER P 007
UMA ENGINEERING LTD.

UMA — SEE

SCALE – ECHELLE 20 10 0 20 40 60m

PROJECT – PROJET
DYE–M CAPE DYER

DEW LINE CLEAN UP

TRADE – METIER	DATE
SITING	2003–12–16

SUBJECT – SUJET
LOWER SITE
LANDFARM AREA
PLAN

PRODUCTION	CONCURRENCE – ASSENTIMENT	
DESIGNED ETUDIE BWF/CH		DES OFF AGENT CONCEPT
DRAWN DESSINE IC/CAE		SECT HD CHEF SECT
CHECKED VERIFIE RRM		DES MGR GEST CONCEPT
COORDINATION	REVIEWED – REVU	

Northwest Territories | Nunavut | Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **June - 29 - 2007**	REPORT TIME **12:10 pm**	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR **Detected June 12, 2007**	OCCURRENCE TIME **unknown**		

C	LAND USE PERMIT NUMBER (IF APPLICABLE) **N2003X0039**	WATER LICENCE NUMBER (IF APPLICABLE) **NWB5DYE0409**
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION **DYE-Main DEW Line Site**	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES **66** MINUTES **40** SECONDS **00**	LONGITUDE DEGREES **61** MINUTES **21** SECONDS **18**
F	RESPONSIBLE PARTY OR VESSEL NAME **Defence Construction Canada**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **350 Albert Street, Suite 1720, Ottawa, ON K1A 0K3**
G	ANY CONTRACTOR INVOLVED **SNC-Lavalin Inc.**	CONTRACTOR ADDRESS OR OFFICE LOCATION **2200 Lakeshore Boul. W., Toronto, ON M8V 1A4**

H	PRODUCT SPILLED **Fuel oil #2**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **unknown (est. 200-2000 L)**	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE **under investigation**	SPILL CAUSE **under investigation**	AREA OF CONTAMINATION IN SQUARE METRES **800 (on meltwater in landfarm)**
J	FACTORS AFFECTING SPILL OR RECOVERY **meltwater inside landfarm area**	DESCRIBE ANY ASSISTANCE REQUIRED **none required**	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT **none known**

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

The landfarm is a large, bermed area used to remediate hydrocarbon contaminated soils. At the end of last season, the contractor parked several mobile fuel tanks inside the landfarm for safety precautions. This spring, an oil sheen/product was observed floating on the surface of the meltwater inside the landfarm. Samples were taken to determine the source of the product (we are awaiting test results). The product may be from the deposited contaminated soil, or possibly a leak from one of the fuel tanks. In the meantime, to prevent the sheen/product from overflowing the berm,the water level is being reduced by pumping out the water (intake from beneath surface) and running it through a filter system prior to discharge. There is no sheen visible in the discharge water, and as an added precaution, it is being discharged into coiled, oil-absorbent booms. The DCC Associate Project Manager and an engineering and environmental consultant will be investigating the issue during a planned visit to the site this weekend, and will provide more information on this issue.

L	REPORTED TO SPILL LINE BY **Douglas Craig**	POSITION **Environmental Officer**	EMPLOYER **DCC**	LOCATION CALLING FROM **Ottawa**	TELEPHONE **(613) 998-7288**
M	ANY ALTERNATE CONTACT **Eva Shulz**	POSITION **Env. Scientist**	EMPLOYER **UMA**	ALTERNATE CONTACT LOCATION **Calgary**	ALTERNATE TELEPHONE **(403) 270-9220**

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Defence Construction Canada
Construction de Défense Canada

August 10, 2007

Andrew Keim
Water Resources Officer
INAC Nunavut Regional Office
P.O. Box 2200
Iqaluit, Nunavut X0A 0H0

RE: DYE-M Landfarm spill report

Mr. Keim:

This report is a follow-up to the one issued on July 20, 2007, which focused on the water discharged from the landfarm following the high water level and suspected fuel release within the structure.

Since the July 20, 2007 report, the project environmental consultant, ESG, has conducted an investigation to determine 1) the source of the suspected fuel spill, and 2) the impacts to the environment outside the landfarm.

Source of Suspected Fuel Spill:

Two samples of the product collected from within the suspected leaking Tanker No. 2 were compared to a sample collected from the surface of the ponded water observed in the landfarm. The analysis conducted was a "C-scan" analysis, which compares the percentage of each product in different carbon ranges. This analysis is typically used to identify the type of hydrocarbon product. The results of the analysis are shown in Table 1. Based on the results, ESG advised DCC that the fuel in Tanker No. 2 is similar to the fuel spilled in the landfarm. There were lower levels of the lighter fractions in sample 07-30001, however this would be expected due to weathering/exposure. In addition, this would then affect the overall percentages for the remaining fractions.

Based on this analysis, and the observation of hydrocarbon beneath Tanker No. 2, it is the opinion of DCC that the material observed to be floating on the surface of the water in the landfarm this spring was fuel oil that had been spilled from Tanker No. 2.

Impact to Environment outside landfarm:

The investigation, completed July 19, 2007, was targeted toward the drainage channels north of the landfarm and conducted as proposed in memo ESG-DYE-M-153 (provided with our July 20, 2007 report). A total of twenty-six (26) soil samples and five (5) water samples were collected (see attached location diagrams). Of these samples, twenty-four (24) soil and all five (5) of the water samples were analyzed. The soil samples were analyzed for TPH using field test kits, and the results indicated that only one sample (07-30484) exceeded the DEW Line Clean Up Criteria (DLCC) of 2500 ppm, with a result of

3000 ppm. This sample was collected near the overflow pipes from the NE corner of the landfarm. Refer to Table 2 for the soil sample analytical results.

One water sample was collected from the settling pond constructed by the contractor (SNC-Lavalin), into which most water was discharged (Photograph 1). A second sample was collected from ponded water between the landfarm and the road, north of the landfarm. The remaining three samples were collected north of the road along the drainage ditch that crosses beneath the road (Photograph 2), and from the downstream river, near the Lower Camp Landfill. Sheen was observed on ponded water retained by a rock dam (Photograph 3 and Photograph 4); however, water at that location was not deep enough to be sampled. The nearest sample location was 07-30527, which was collected approximately 80 meters northwest of the rock dam. Water samples were analyzed for the wastewater discharge criteria, with the exception of sample 07-30529, which was not analyzed for mercury or PCBs. All results were within the acceptable limits of the wastewater discharge criteria (Table 3). Only one sample (07-30525), which was collected from the settling pond, contained detectable levels of oil and grease, at 3.4 mg/L, but was still below the 5.0 mg/L criterion.

Based on results from the investigation conducted by ESG, the area of impact is limited to the immediate vicinity of the landfarm. With the exception of hydrocarbon sheen observed at one location, there is no evidence of impact in the drainage channels to the north of the landfarm.

If you have any questions or comments on this report, or the investigation in general, please don't hesitate to contact me as indicated below.

Regards,

Douglas Craig, M.Sc.
Environmental Officer
DEW Line Clean Up
Defence Construction Canada
Constitution Square, Suite 1720, 350 Albert St.,
Ottawa, Ontario
K1A 0K3
Phone: (613) 998-7288
Fax: (613) 998-0468

Table 1. C-Scan results

Carbon Range	Sample		
	07-30001	07-30445	07-30454
<11	1.6%	26.7%	31.4%
13-15	39.8%	50.9%	43.0%
13-15	50.3%	20.6%	22.8%
15-17	8.0%	1.8%	2.7%
17-19	0.4%	<0.1%	0.1%
19-21	<0.1%	<0.1%	<0.1%
21-23	<0.1%	<0.1%	<0.1%
23-25	<0.1%	<0.1%	<0.1%
25-27	<0.1%	<0.1%	<0.1%
>27	<0.1%	<0.1%	<0.1%
Total:	**100%**	**100%**	**100%**

07-30001 - sample collected from the surface of the water in the landfarm
07-30445 - sample collected from within tanker No. 2
07-30454 - sample collected from within tanker No. 2

Table 2: Landfarm Investigation Soil Sample Analytical Results

Sample #	Surface/ Reference Tag	Depth	TPH
		[cm]	[ppm]
Hydrocarbon Guideline			***2500***
Investigation Samples			
07-30477		0	110
07-30478	07-30477	60	280
07-30479		0	160
07-30480/81	07-30479	50	265
07-30482		0	160
07-30483	07-30482	50	480
07-30484		0	***3000***
07-30486	07-30484	50	200
07-30487		0	2200
07-30488	07-30487	50	920
07-30489		0	600
07-30490/91	07-30489	50	133
07-30492		0	<26
07-30494	07-30492	0	160
07-30495		50	130
07-30496		0	160
07-30497	07-30496	30	150
07-30498	07-30496	50	<26
07-30499		0	140
07-30500/01		0	142
07-30502		0	90

Table 3: Landfarm Investigation Water Sample Analytical Results

Sample #	Location	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Hg (total)	PCBs	Oil & Grease	pH
		[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	
DYE-M Site Specifications		*0.2*	*0.2*	*0.05*	*0.01*	*0.05*	*1.0*	*0.1*	*0.1*	*0.0006*	*0.005 - 0.05*	*<5.0 & None Visible*	6 - 9
Landfarm Runoff Investigation													
07-30525	Landfarm Runoff	0.006	<0.005	<0.003	<0.001	<0.010	0.024	0.017	<0.003	<0.0004	<0.003	3.4	7.63
07-30526	Landfarm Runoff	<0.005	<0.005	<0.003	<0.001	<0.010	<0.010	<0.005	<0.003	<0.0004	<0.003	<2.0	8.64
07-30527	Landfarm Runoff	<0.005	<0.005	<0.003	<0.001	<0.010	0.016	<0.005	<0.003	<0.004	<0.003	<2.0	7.29
07-30528	Landfarm Runoff	<0.005	<0.005	<0.003	<0.001	<0.010	<0.010	<0.005	<0.003	<0.004	<0.003	<2.0	7.69
07-30529	Landfarm Runoff	<0.005	<0.005	<0.003	<0.001	<0.010	<0.010	<0.005	<0.003	*	*	<2.0	8.23

* = Analysis not requested