

AECOM 2540 Kensington Road NW Calgary, AB, Canada T2N 3S3 www.aecom.com

403 270 9200 tel 403 270 0399 fax

March 31, 2010

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

Dear Phyllis:

Project No: Water Use License 1BR-LON0813

Regarding: FOX-2, Longstaff Bluff DEW Line Site

AECOM Canada Ltd. is providing the attached annual report form as per Section B.1 of the abovenoted water use license. The report is being submitted on behalf of Defence Construction Canada and the Department of National Defence.

In addition to the annual report form, we are providing a summary of the work completed to date at the site. The following is a summary of the work completed and of the samples collected as part of the wastewater monitoring and sewage effluent monitoring:

#### **Work Completed**

**Landfarm:** The landfarm was constructed and the facility began receiving hydrocarbon-impacted soil. One tilling event was completed in September.

**Tier II Soil Disposal Facility:** Construction of the Tier II Soil Disposal Facility began, but was not completed in 2009.

**Non-Hazardous Waste Landfill:** Construction of the berms for the Non-Hazardous Waste Landfill was completed in 2009.

**Contaminated Soils:** All Type B hydrocarbon contaminated soils were excavated and placed within the landfarm for treatment in 2009. No contaminated soils were removed from the site in 2009.

**Monitoring Well Installation:** All 16 monitoring wells specified for the FOX-2 site were installed in 2009 including 4 at the Landfarm, 4 at the Non-Hazardous Waste Landfill, 4 at the Tier II Disposal Facility and 4 at the Upper Site Landfill.

Demolition: Tanks at the West Beach POL were demolished in 2009.



Debris Removal: On-going.

**Landfill Remediation:** West Beach POL Lobe B – excavated; West Beach Refuel Debris Area Lobe B – excavated.

**Community Consultations:** The results of the community meetings held by DCC were submitted with the Project Description. The contractor typically holds a project start up meeting prior to each season.

Spill Incidences: N/A

**Monitoring Results:** The results of the samples collected and analysed in July and August, as required for the monitoring program, are attached. The reports were prepared by the Environmental Sciences Group from Kingston, ON, who serve as the scientific advisors for the clean up work and are on-site for the duration of the work.

We trust the information provided is sufficient. Please feel free to contact the undersigned if you require any additional information.

Sincerely,

**AECOM Canada Ltd.** 

Eva Schulz, P.Ag.

Eva.Schulz@aecom.com

EMS.

cc: Douglas Craig, DCC

Encl: Annual Report Form; Updated Site Figures; Selected Site Photographs; Monitoring Reports

NWB Annual Report			Year being reported: 2009 ▼			
License No: 1BR-LON0813		3		ed Date: ry Date:	July 19, 2	008 July 31, 2013
			СХРІ	ly Date.		July 51, 2015
	Project Name:		FOX-2, Longstaff Bluff DEW Line Site Clean Up			
	Licensee:	Defence	e Construction Canada			
	Mailing Addre	ess:	Constitution Square, Suite 1700 350 Albert Street Ottawa, ON K1A 0K3			
			ng Annual Report (if di		Name of Lie	censee please clarify
	AECOM	ween the	two entities, if applicable	e):		
	Engineering [	Design Co	onsultant			
General Back	ground Inform	ation on	the Project (*optional):			
Licence Requ	uirements: the	licensee	must provide the foll	owing info	ormation ir	n accodance with
	Part B	▼ Ite	em 1 ▼			
			<del>-</del>			not limited to: methods of ob and hazardous waste mana
	Water Source	(s):	water supply lake			
	Water Quantit		12/day	Quantity	Allowable [	Domestic (cu.m)
			1088.52 cu.m for the season	_		d Domestic (cu.m)
			40/day for industrial	Quantity	Allowable [	Orilling (cu.m)
			n/a	Total Qua	antity Used	Drilling (cu.m)
	-	ement ar /aste Dispo	nd/or Disposal sal			
	Sewage Drill Wa	aste		sewage 8	& greywate	r for 2009 season=403.68 c
	Greywa					
	· Hazard · Other:	ous				_
	Additional De	tails:				
			nagement and disposa	al were pro	ovided with	the application form.
A 11. 4 . 4						
A list of unau	thorized disch Spill No.:	arges an	d a summary of follow	_	ons taken.  the Spill F	Hot-line)
	Date of Spill:		(as i	eponeu l	uie ohiii E	iot-iiiie)
	Date of Notific	ation to a	an Inspector:			
			acts to water, mitigation n	neasures, sh	ort/long term	n monitoring, etc)

Revisions to	the Spill Contingency Plan
	SCP submitted and approved - no revision required or proposed
	Additional Details:
Revisions to	the Abandonment and Restoration Plan
Tto violotio to	AR plan submitted and approved - no revision required or proposed
	Additional Details:
	The entire project is an abandonment and restoration plan.
Progressive	Reclamation Work Undertaken
	Additional Details (i.e., work completed and future works proposed)
	n/a
Results of th	e Monitoring Program including:
	The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each where sources of water are utilized;
	Details attached
	Additional Details:
	The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each where wastes associated with the licence are deposited;
	Details attached   The state of
	Additional Details:
	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 reported.	er use or waste disposal requested by the Board by November	1 of the year beir
No additiona	al sampling requested by an Inspector or the Board	▼
Additional [	Details: (Attached or provided below)	
Any responses or follow-	-up actions on inspection/compliance reports	
	Report received by the Licensee (Date):	▼
Additional I	Details: (Dates of Report, Follow-up by the Licensee)	
Inspection	n Report is attached.	
Any additional comments	s or information for the Board to consider	
Date Submitted:	March 31, 2010	
Submitted/Prepared by:	Eva Schulz	
Contact Information:	Tel: 403-270-9220	
	Fax: 403-270-0399	
	email: eva.schulz@aecom.com	

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J.M

location location



## **GPS Coordinates for water sources utilized**

	UTM Zone 18N, NAD83		
Source Description	Northing	Easting	
Water Supply Lake	7642850	493400	
		_	

## **GPS Locations of areas of waste disposal**

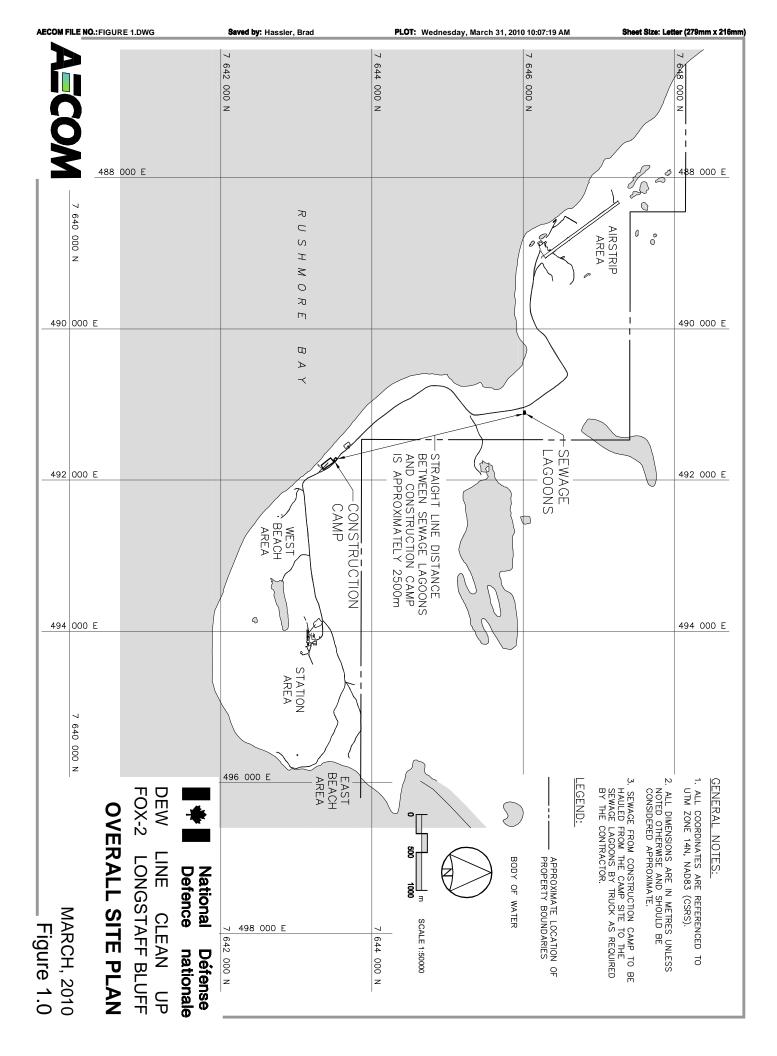
Location Description (type)	UTM Zone 18N, NAD83		
	Northing	Easting	
Landfarm (H01)	7646868.5	489093.5	
Landfarm (H02)	7646692.5	489225.5	
Landfarm (H05)	7646642.7	489130.3	
Landfarm (H06)	7646803.4	489008	
Hangar Non-Hazardous Waste			
Landfill (J10)	7646438.4	489315.9	
Hangar Non-Hazardous Waste			
Landfill (J11)	7646428.2	489353	
Hangar Non-Hazardous Waste			
Landfill (J12)	7646390.1	489341	
Hangar Non-Hazardous Waste			
Landfill (J13)	7646402.4	489304	
Station Non-Hazardous Waste			
Landfill (T10)	7643078.5	494111.5	
Station Non-Hazardous Waste			
Landfill (T11)	7643096.6	494161.4	
Station Non-Hazardous Waste			
Landfill (T12)	7643059	494175	
Station Non-Hazardous Waste			
Landfill (T13)	7643040.9	494125.2	
Tier II Landfill (U10)	7643260.4	494258.2	
Tier II Landfill (U11)	7643254.6	494312.9	
Tier II Landfill (U12)	7643197	494306.8	
Tier II Landfill (U13)	7643202.7	494252.1	
Sewage Lagoon	7646024	491084	

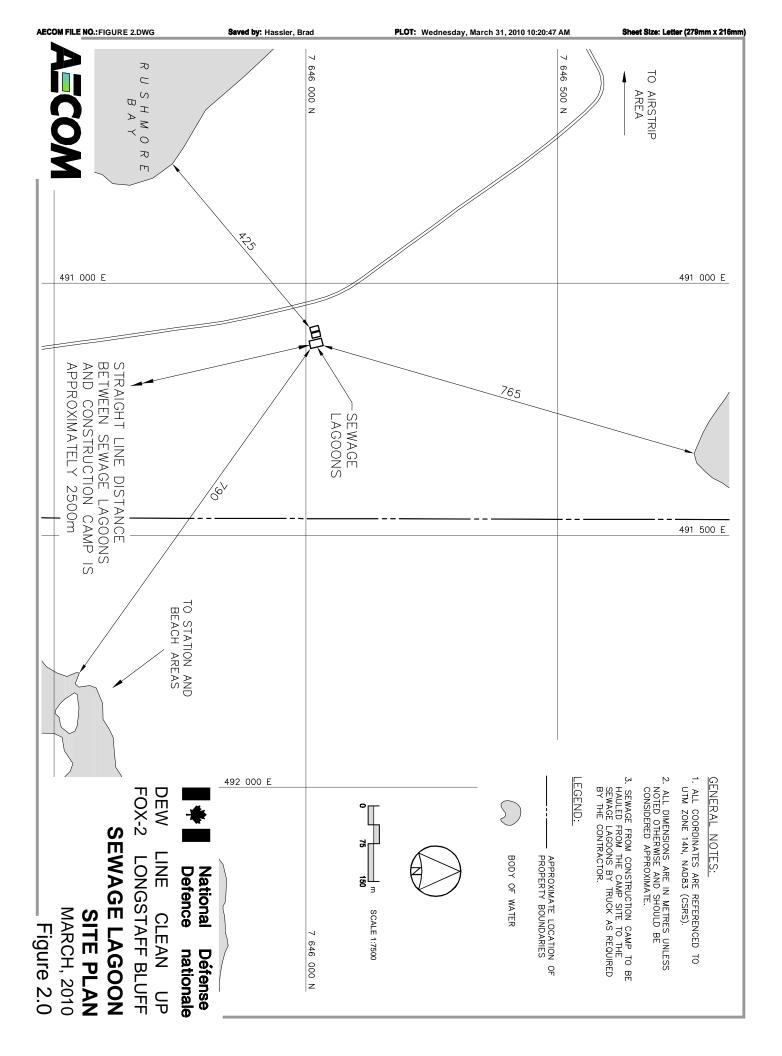


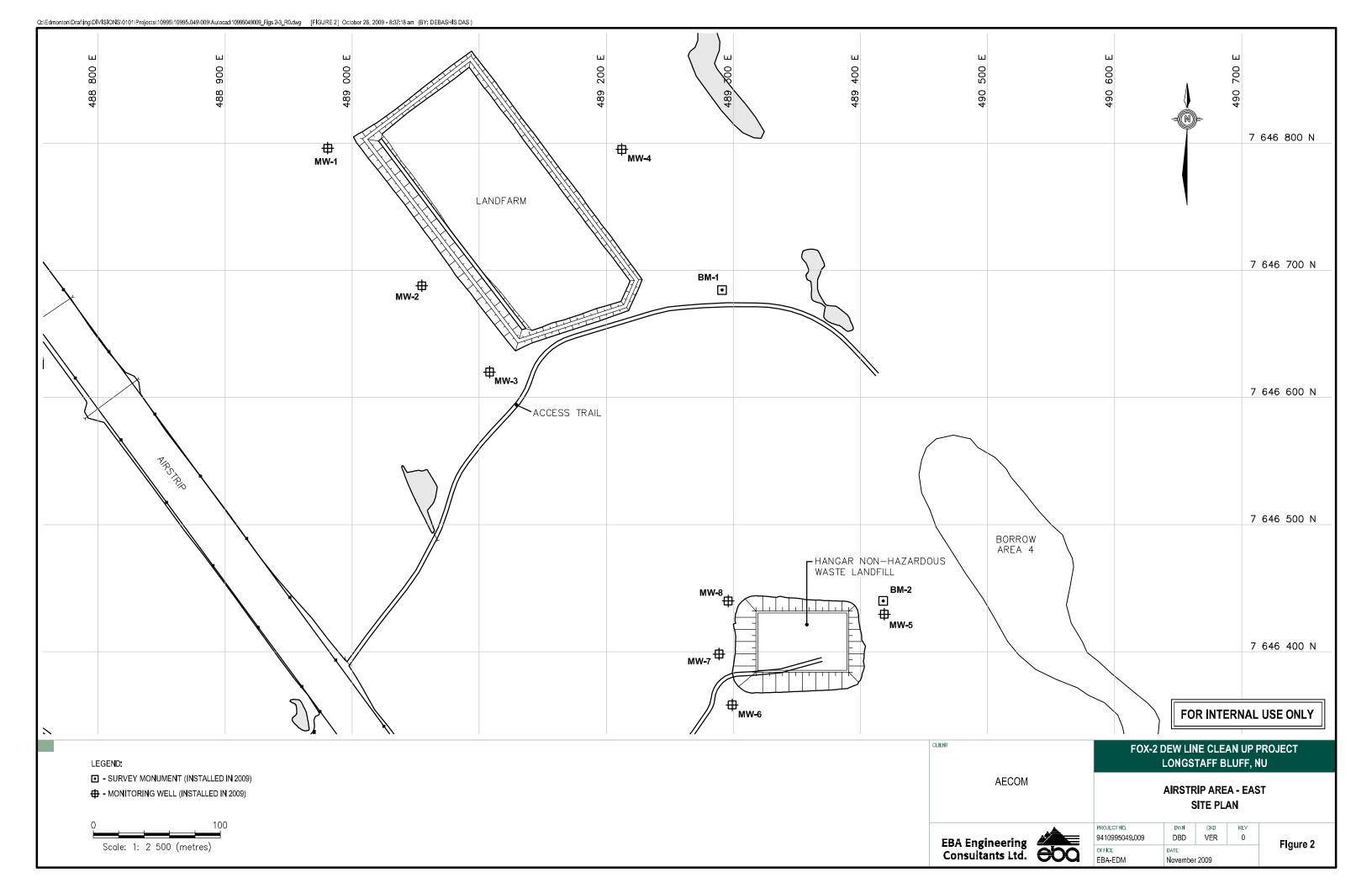


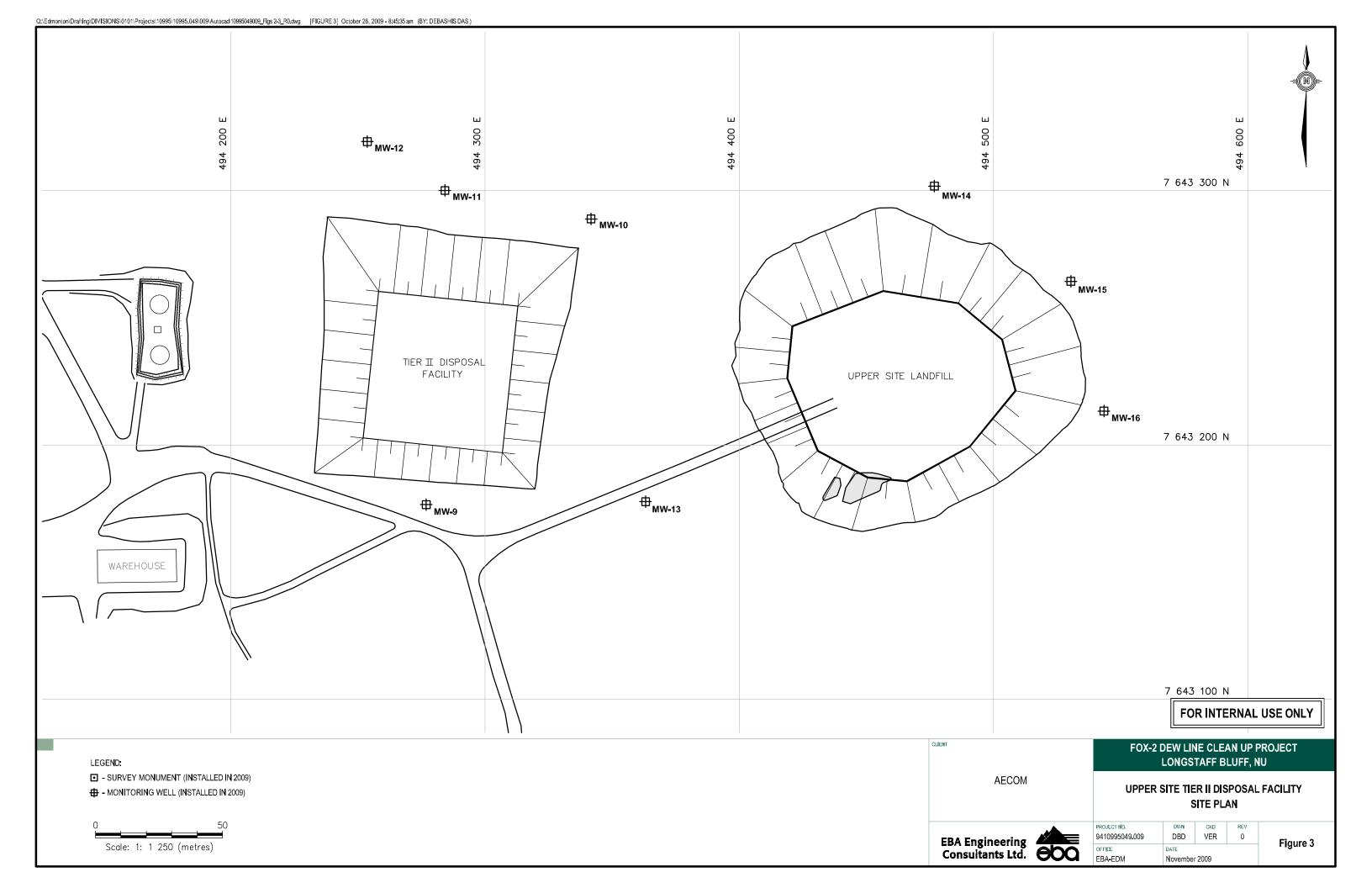
# **Attachments**

**Updated Site Figures** 











# **Attachments**

**Selected Site Photos** 



Photograph 1. Location of Tier II Facility, pre-construction \_\_\_\_\_\_



Photograph 2. Preparation of Tier II Key trench

FOX-2 Photo Log.Docx



# **Attachments**

**Monitoring Reports** 

Tricia Cammaart Environmental Sciences Group The Royal Military College of Canada PO Box 17000 Stn. Forces Kingston, ON K7K 7B4 TAL SCIENCES GRAND INDESTRUCTION OF THE PROPERTY OF THE PROPER

Douglas Craig Environmental Officer Defence Construction Canada DEW Line Cleanup PMO 350 Albert Street, Suite 1720 Ottawa ON K1A 0K3

Friday, August 14, 2009

## RE: July 2009 Monthly Report for Water Use License Number: 1BR-LON0813

The following results of the Monitoring Program (MP) and/or Water Use License are provided by the Environmental Sciences Group to meet the requirements of the above-noted license for FOX-2 (Longstaff Bluff).

#### 1. CAMP SEWAGE LAGOON

A 2 cell sewage lagoon was constructed to service the FOX-2 construction camp in 2009. The sewage lagoon is located approximately 100 m from the contractor's camp, 100 m away from drainage channels, and away from water bodies supporting aquatic life. The GPS coordinates that are required by the Water Use License for the sewage lagoon location are 0491084E 7646024N.

#### 2. SEWAGE EFFLUENT SAMPLES

The Water Use License and MP require that samples from treated sewage lagoon effluent at the point of discharge to the receiving water be collected prior to each discharge event. Seven sewage effluent samples were collected in July 2009 from the FOX-2 sewage lagoon. A summary of the details of these results follows.

Sample Number	Sample Location	<b>GPS Coordinates</b>	Sampling Date
09-37076	QMLP Camp	0491768E	July 22, 2009
		7643478N	
09-37089	QMLP Camp	0491768E	July 23, 2009
		7643478N	
09-37103	QMLP Camp	0491768E	July 29, 2009
		7643478N	
09-37194	QMLP Camp	0491768E	July 30, 2009
		7643478N	
09-37195	QMLP Camp	0491768E	July 31, 2009
		7643478N	
09-37077	Sewage Lagoon Cell A	0491084E	July 22, 2009
		7646024N	
09-37147	Sewage Lagoon Cell A	0491084E	July 29, 2009
		7646022N	-

Laboratory results and photographs are provided in Appendices A and B, respectively.

**LOCATION: QMLP CAMP**GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37076</b> (July 22, 2009)
рН	6.0 to 9.0	pH units	7.57
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	32
BOD	120	mg/L	21
Faecal Coliforms	10,000	CFU/dL	Samples expired
Total Coliforms	-	CFU/ 100 mL	N/A

**LOCATION: QMLP CAMP**GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37089</b> (July 23, 2009)
pН	6.0 to 9.0	pH units	8.35
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	6.5
BOD	120	mg/L	12
Faecal Coliforms	10,000	CFU/dL	Samples expired
Total Coliforms	-	CFU/ 100 mL	Samples expired

LOCATION: QMLP CAMP

GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37103</b> (July 29, 2009)
рН	6.0 to 9.0	pH units	8.07
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	79
BOD	120	mg/L	133
Faecal Coliforms	10,000	CFU/dL	49,000
Total Coliforms	-	CFU/ 100 mL	55,000

LOCATION: QMLP CAMP

GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37194</b> (July 30, 2009)
рН	6.0 to 9.0	pH units	N/A
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	N/A
BOD	120	mg/L	N/A
Faecal Coliforms	10,000	CFU/dL	0
Total Coliforms	-	CFU/ 100 mL	4000

LOCATION: QMLP CAMP

GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37195</b> (July 31, 2009)
pН	6.0 to 9.0	pH units	N/A
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	N/A
BOD	120	mg/L	N/A
Faecal Coliforms	10,000	CFU/dL	62,000
Total Coliforms	-	CFU/ 100 mL	>200,000

The water collected at QMLP camp did not meet water discharge criteria as of July 31, 2009. The water has not been discharged to land in accordance to the water use license, to the discharge location approved by the INAC Environmental Inspector.

**LOCATION: SEWAGE LAGOON CELL A**GPS COORDINATES: 0491084E 7646024N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37077</b> (July 22, 2009)
pН	6.0 to 9.0	pH units	7.77
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	18
BOD	120	mg/L	<3.0
Faecal Coliforms	10,000	CFU/dL	Samples expired
Total Coliforms	-	CFU/ 100 mL	N/A

LOCATION: SEWAGE LAGOON CELL A
GPS COORDINATES: 0491084E 7646024N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37147</b> (July 22, 2009)
pН	6.0 to 9.0	pH units	7.63
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	230
BOD	120	mg/L	140
Faecal Coliforms	10,000	CFU/dL	>200,000
Total Coliforms	-	CFU/ 100 mL	>200,000

The water inside the sewage lagoon cell A did not meet water discharge criteria as of July 22, 2009. The water has not been discharged to land in accordance to the water use license, to the discharge location approved by the INAC Environmental Inspector.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tricia Cammaart

Environmental Sciences Group

Tricia Cammaant

cc: Eva Schulz (UMA)

Daniela Loock, Kat White, Darren White, Alissa Lunney, Cameron King (ESG)

# APPENDIX A LABORATORY RESULTS

Client: ESG ASG Login No: 19506

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

Site: Fox-2
Client Login No: 09-127
Samples Received: 25-Jul-09
Date of analysis: 30-Jul-09
Method No: ASG 042
Date Reported: 30-Jul-09
Page: 1 of 1

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37076*	mg/L	21
37077	mg/L	< 3

<sup>\*</sup>Averaged result of duplicates

Sample I.D.	Unit	BOD
Duplicate; 09-370768	mg/L	21 ; 22
Blank	mg/L	< 3
Control	mg/L	173
Control Target	mg/L	165

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: 19506

Site: FOX-2 Client No: 09-127 Samples Received: 25-Jul-09

Date of analysis: 30-Jul-09 Method No: ASG 037 Date Reported: 30-Jul-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	рН
37076	7.57
37077*	7.77
37089	8.35

<sup>\*</sup>Averaged results of duplicates.

## LABORATORY QA/QC

Sample I.D.	рН
Duplicate ; 37077*	7.77 ; 7.78
Control	7.02
Control Target	7.00

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: 19506 Site: Fox-2 Client Login No: 09-127 Samples Received: 25-Jul-09 Date of analysis: 30-Jul-09 Method No: ASG 039 Date Reported: 30-Jul-09

Sheet: 1 of 1

## **RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS**

Sample I.D.	Sample	Unit	Total
	Type <sup>^</sup>		Suspended Solids
37076*	SE	mg/L	32
37077	SE	mg/L	18
37089	SE	mg/L	6.5
		_	

Blank	Control	mg/L	< 1
Control	Control	mg/L	200
Control Target	Control	mg/L	200
37076*; Duplicate	SE; SE	mg/L	32;32

<sup>^</sup>SW =Surface Water, SI = Sewage Influent SE = Sewage Effluent, GW = Ground Water \*Average result of duplicate

**ESG** Client:

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: 19506

Site: Fox-2 Client Login No: 09-127 Samples Received: 25-Jul-09 Date of analysis: 5-Aug-09 Method No: ASG 042

Date Reported: 6-Aug-09 Page: 1 of

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37089*	mg/L	12

<sup>\*</sup>Averaged result of duplicates

## LABORATORY QA/QC

Sample I.D.	Unit	BOD
Duplicate ; 37089*	mg/L	11 ; 12
Blank	mg/L	< 1
Control	mg/L	145
Control Target	mg/L	165

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: 19562 Site: Fox-2 Client Login No: 09-158 Samples Received: 31-Jul-09 Date of analysis: 4-Aug-09 Method No: ASG 039 Date Reported: 6-Aug-09 Sheet: 1 of 1

#### **RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS**

Ī	Sample I.D.	Sample Type <sup>^</sup>	Unit	Total Suspended Solids
lĪ	37103	SE	mg/L	79
1	37147*	SE	ma/L	230

<sup>\*</sup>Averaged result of duplicates.

Blank	Control	mg/L	< 1
Control	Control	mg/L	210
Control Target	Control	mg/L	200
37147 ; Duplicate	SE; SE	mg/L	220 ; 240

<sup>^</sup>SW =Surface Water, SI = Sewage Influent SE = Sewage Effluent

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: 19562

Site: Fox-2 Client Login No: 09-158 Samples Received: 31-Jul-09 Date of analysis: 5-Aug-09 Method No: ASG 042 Date Reported: 6-Aug-09

Page: 1 of

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37103	mg/L	133
37147*	mg/L	140

<sup>\*</sup>Averaged result of duplicates

## LABORATORY QA/QC

Sample I.D.	Unit	BOD
Duplicate ; 37147*	mg/L	140 ; 140
Blank	mg/L	< 1
Control	mg/L	145
Control Target	mg/L	165

Client: ESG

12 Verite Ave Dept of Chem/Chem Eng RMC, PO Box 17000 Kingston, Ontario 613-541-6000 # 6567 ASG Login No: 19562

Site: Fox-2 Client No: 09-158 Samples Received: 31-Jul-09

Date of analysis: 4-Aug-09 Method No: ASG 037 Date Reported: 4-Aug-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	pН
37103	8.07
37147*	7.63

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
Control	7.01
Control Target	7.00
Duplicate; 37147*	7.64 ; 7.63

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: 19562 Site: FOX-2

Client No: 09-158 Samples Received: 31-Jul-09 Date of analysis: 31-Jul-09 Date Reported: 2-Aug-09 Sheet: 1 of 1

#### **RESULTS OF MICROBIOLOGICAL ANALYSIS**

	Method: ASG 036	Method: ASG 036	Method: ASG 036	Method: ASG 044
Sample Identification	Total			Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
37103	55000	41000	0	49000
37147	> 200000	> 200000	> 200000	> 200000

#### LABORATORY QA/QC

Sample Identification	Method: ASG 036 Total	Method: ASG 036	Method: ASG 036	Method: ASG 044 Fecal
-	Coliforms (CFU/100 mL)	E. coli (CFU/100 mL)	Background (CFU/100 mL)	Coliforms (CFU/100 mL)
Blank	0	0	0	0
Control Sample	47	47	0	39
Control Sample Target	44	44	0	44

<sup>\*</sup> Duplicate analysis completed on dilution not required

Client : ESG

2 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: 19563 Site: FOX-2 Client No: 09-164

Client No: 09-164 Samples Received: 1-Aug-09 Date of analysis: 1-Aug-09 Date Reported: 2-Aug-09 Sheet: 1 of 1

### **RESULTS OF MICROBIOLOGICAL ANALYSIS**

	Method: ASG 036	Method: ASG 036	Method: ASG 036	Method: ASG 044
Sample Identification	Total			Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
37194	4000	0	8000	0

Sample Identification	Method: ASG 036	Method: ASG 036	Method: ASG 036	Method: ASG 044 Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
Blank	0	0	0	0
Control Sample	59	59	0	52
Control Sample Target	51	51	0	51

<sup>\*</sup> Duplicate analysis completed on dilution not required

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: 19564 Site: FOX-2 Client No: 09-181

Samples Received: 1-Aug-09
Date of analysis: 1-Aug-09
Date Reported: 2-Aug-09
Sheet: 1 of 1

## **RESULTS OF MICROBIOLOGICAL ANALYSIS**

	Method: ASG 036	Method: ASG 036	Method: ASG 036	Method: ASG 044
Sample Identification	Total			Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
37195	> 200 000	60 000	0	62 000

Sample Identification	Method: ASG 036 Total	Method: ASG 036	Method: ASG 036	Method: ASG 044 Fecal
-	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
Blank	0	0	0	0
Control Sample	59	59	0	52
Control Sample Target	51	51	0	51

<sup>\*</sup> Duplicate analysis completed on dilution not required

## APPENDIX B PHOTOGRAPHS

Photo 1 (DSCF00929): Sample 09-37076 collected from FOX-2 QMLP construction camp sewage water

sampling.



Photo 2 (DSCF00953): Sample 09-37089 collected from FOX-2 QMLP construction camp.



**Photo 3 (DSC01037):** Sample 09-37103 sampling at QMLP sewage treatment plant.



**Photo 4 (DSC01042):** Sample 09-37194 sampling at QMLP sewage treatment plant.



**Photo 5 (DSC01049):** Sample 09-37195 sampling at QMLP sewage treatment plant.



**Photo 6 (DSCF00934):** Sample 09-37077 collected from FOX-2 sewage lagoon cell A.



Photo 7(DSC01041): Sample 09-37147 collected from FOX-2 sewage lagoon cell A.

Tricia Cammaart **Environmental Sciences Group** The Royal Military College of Canada PO Box 17000 Stn. Forces Kingston, ON K7K 7B4

**Douglas Craig Environmental Officer DEW Line Cleanup PMO** 350 Albert Street, Suite 1720 Ottawa ON K1A 0K3

**Defence Construction Canada** 



Friday, August 14, 2009

## RE: Analytical Results for Wastewater Samples Collected at FOX-2 in July, 2009

The following report summarizes results of the analysis of wastewater samples as per the FOX-2 (Longstaff Bluff) DEW Line Cleanup Project (DLCU) Specifications.

The FOX-2 specifications require that "wash water, melt water collection, rinse water resulting from the cleaning of fuel tanks and pipelines, and/or any other liquid effluent stream" meet the following guidelines prior to their discharge to land (01560.4.1):

Parameter	Maximum Allowable Concentration	Units
pН	6-9	pH units
Total arsenic (As)	0.100	mg/L
Dissolved cadmium (Cd)	0.010	mg/L
Total chromium (Cr)	0.100	mg/L
Dissolved cobalt (Co)	0.050	mg/L
Dissolved copper (Cu)	0.200	mg/L
Dissolved lead (Pb)	0.050	mg/L
Total mercury (Hg)	0.6	μg/L
Dissolved nickel (Ni)	0.200	mg/L
Total zinc (Zn)	1.000	mg/L
Oil & grease	5 mg/L and None visible	mg/L
PCBs	0.050*	mg/L
	0.005**	
Phenols	0.020	mg/L

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

#### Phenols

The wastewater samples collected by ESG at FOX-2 in July, 2009 were not analyzed for phenols but they were analyzed for oil and grease. Research conducted by ESG<sup>1</sup> has determined that a) no federal, territorial or provincial criteria exist for the discharge of

<sup>&</sup>lt;sup>1</sup> Environmental Sciences Group. DEW Line Clean Up Project – Phenols in Wastewater. June, 2007.

wastewater containing phenols to land at a minimum distance of 30-m from natural drainage courses b) the maximum concentration of phenols in DLCU wastewater to date (2.44 mg/L) is below the LC<sub>50</sub> for freshwater fish and crustaceans and below the oral and dermal LD<sub>50</sub>s for rats and rodents and c) phenols in excess of the maximum allowable concentration (MAC) have historically co-occurred with a visible oil & grease sheen and/or with an exceedance of the MAC for oil & grease. This information, and a subsequent decision to not test for phenols, has been presented to the NWB. To date, verbal agreement from the NWB has been received, but the project is awaiting written confirmation of the decision to suspend testing for phenols.

## WASTEWATER SAMPLES

One wastewater sample was collected at FOX-2 and analyzed in July 2009. A summary of the details of these results follows.

Sample Number	Sample Location	GPS Coordinates	Sampling Date
09-36933	Beach POL	0491537E 7643691N	July 8, 2009

A summary of the results for the parameters tested is provided below. Laboratory results and photographs are provided in Appendices A and B, respectively.

LOCATION: BEACH POL GPS COORDINATES: 0491537E 7643691N

Parameter	Maximum Allowable Concentration	Units	Sample # 09-36933
рН	6-9	pH units	7.36
Total Arsenic	0.100	mg/L	< 0.003
Dissolved Cadmium	0.010	mg/L	< 0.001
<b>Dissolved Chromium</b>	0.100	mg/L	< 0.005
<b>Dissolved Cobalt</b>	0.050	mg/L	< 0.003
Dissolved Copper	0.200	mg/L	< 0.005
Dissolved Lead	0.050	mg/L	< 0.010
<b>Total Mercury</b>	0.6	μg/L	< 0.4
Dissolved Nickel	0.200	mg/L	< 0.010
Total Zinc	1.0	mg/L	< 0.010
Oil & Grease	None Visible and 5 mg/L	mg/L	N/A, <2.0
PCBs	50* 5**	μg/L	<3.0
Phenols	20	μg/L	N/A

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

The analytical results for the Beach POL met the wastewater discharge criteria. The water has been discharged to land in accordance to the water use license.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tricia Cammaart

Environmental Sciences Group

Tricia Cammaant

cc: Eva Schulz (UMA)

Daniela Loock, Kat White, Darren White, Alissa Lunney, Cameron King (ESG)

# APPENDIX A LABORATORY RESULTS

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 Client No: 09-093
Samples Received: 13-Jul-09
Date of analysis: 13-Jul-09
Method No: ASG 006
Date Reported: 17-Jul-09
Sheet No: 1 of 1

#### **RESULTS OF PCB IN WATER ANALYSIS**

Sample Type **	Sample I.D.	Unit	Aroclor 1248	Aroclor 1254	Aroclor 1260
W	36933	μg/L	< 3.0	< 3.0	< 3.0

<sup>\*</sup> Average result of duplicate

#### LABORATORY QA/QC

Blank	μg/L	< 3.0	< 3.0	< 3.0
Control Sample	μg/L	< 3.0	< 3.0	18
Control Sample Target	μg/L	< 3.0	< 3.0	16

<sup>\*\*</sup> S = Soil , C = Concrete , PC = Paint Chip , SW = Swab , P = Plant , W = Water

All results corrected for the recovery of the surrogate decachlorobiphenyl

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: 19438

Site: FOX-2 Client No: 09-093

Samples Received: 13-Jul-09 Date of analysis: 15-Jul-09 Method No: ASG 037 Date Reported: 15-Jul-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	рН
09-36933*	7.36

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
09-36933*; Duplicate	7.36 ; 7.36
Control	7.00
Control Target	7.00

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: 19438 Site: Fox-2

Client No: 09-093
Samples Received: 13-Jul-09
Date of analysis: 15-Jul-09
Method No: ASG 021
Date Reported: 15-Jul-09

Sheet: 1 of 1

## **RESULTS OF MERCURY IN WATER ANALYSIS**

Sample I.D.	Unit	Mercury <sup>^</sup>
09-36933*	μg/L	< 0.4

<sup>\*</sup>Results of duplicate analysis.

Sample I.D.	Unit	Mercury <sup>^</sup>
Duplicate ; 09-36933*	μg/L	< 0.4 ; < 0.4
Blank	μg/L	< 0.4
Control Target	μg/L	4.0
Control Sample	μg/L	3.8

12050		Report ID:	Fox-2 W5				
ASG 19438		Date Submitted:	13-Jul-09				
		Date tested:	14-Jul-09				
Fox-2		Date:	15-Jul-09				
09-093		Matrix:	Water				
nalysis							
Results in mg/L							
Cu	Ni	Со	Cd	Pb	Zn	Cr	As
-	-	-	-	-	< 0.010	-	< 0.003
-	-	-	-	-	< 0.010	-	<0.003
-	-	-	-	-	3.0	-	0.84
-	-	-	-	-	3.0	-	0.80
Cu	Ni	Co	Cd	Pb	Zn	Cr	As
<0.005	< 0.010	< 0.003	< 0.001	<0.010	-	<0.005	-
<0.005	< 0.010	< 0.003	< 0.001	< 0.010	-	< 0.005	-
1.6	1.6	1.6	0.80	8.0	-	0.81	-
1.6	1.6	1.6	0.80	8.0	-	0.80	-
	ASG 19438  Fox-2 09-093  allysis  Results in mg/L  Cu	ASG 19438  Fox-2 09-093  allysis  Results in mg/L  Cu Ni	ASG 19438 Date Submitted:  Date tested:  Date:  09-093 Matrix:    Date:   Date	ASG 19438  Date Submitted: 13-Jul-09 Date tested: 14-Jul-09 Date: 15-Jul-09 09-093  Matrix: Water  Results in mg/L  Cu Ni Co Cd	ASG 19438   Date Submitted: 13-Jul-09	ASG 19438   Date Submitted: 13-Jul-09   Date tested: 14-Jul-09   Date: 15-Jul-09   Date: 15-Jul-09	ASG 19438   Date Submitted: 13-Jul-09   Date tested: 14-Jul-09   Date: 15-Jul-09   Date: 15-Jul-09

<sup>^</sup> Acid digestion performed.

<sup>#</sup> Reported at 0.4 µg/L detection limit.

ASU#	12050	Report ID:	Fox-2 W6
Client:	ASG 19438	Date Submitted:	13-Jul-09
		Date tested:	14-Jul-09
Site:	Fox-2	Date:	14-Jul-09
	09-093	Matrix:	water
Preliminary Repor	rt of Analysis		
Sample	Oil & Grease		
	mg/L		
09-36933	<2.0		
Blank	<2.0		
Control	17.0		
Control Target	16.1		

# APPENDIX B PHOTOGRAPHS

**Photo 1 (1):** Sample 09-36933 FOX-2 2009 West Beach, Beach POL, Mogas Tank 2 wastewater sampling facing north.



Tricia Cammaart Environmental Sciences Group The Royal Military College of Canada PO Box 17000 Stn. Forces Kingston, ON K7K 7B4 TAL SCIENCES GROWNOWN CONTRACTOR OF THE PROPERTY OF THE PROPER

Douglas Craig Environmental Officer Defence Construction Canada DEW Line Cleanup PMO 350 Albert Street, Suite 1720 Ottawa ON K1A 0K3

Tuesday, September 29, 2009

## RE: August 2009 Monthly Report for Water Use License Number: 1BR-LON0813

The following results of the Monitoring Program (MP) and/or Water Use License are provided by the Environmental Sciences Group to meet the requirements of the above-noted license for FOX-2 (*Longstaff Bluff*).

## 1. CAMP SEWAGE LAGOON

A 2 cell sewage lagoon was constructed to service the FOX-2 construction camp in 2009. The sewage lagoon is located approximately 100 m from the contractor's camp, 100 m away from drainage channels, and away from water bodies supporting aquatic life. The GPS coordinates that are required by the Water Use License for the sewage lagoon location are 0491084E 7646024N.

## 2. SEWAGE EFFLUENT SAMPLES

The Water Use License and MP require that samples from treated sewage lagoon effluent at the point of discharge to the receiving water be collected prior to each discharge event. Three sewage effluent samples were collected in August 2009 from the FOX-2 sewage lagoon. A summary of the details of these results follows.

Sample Number	Sample Location	<b>GPS Coordinates</b>	Sampling Date
09-37207	QMLP Camp	0491768E	August 6, 2009
		7643478N	
09-37237	QMLP Camp	0491768E	August 12, 2009
		7643478N	
09-37342	QMLP Camp	0491768E	August 14, 2009
		7643478N	

Laboratory results and photographs are provided in Appendices A and B, respectively.

LOCATION: QMLP CAMP

GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37207</b> (August 6, 2009)
pН	6.0 to 9.0	pH units	7.42
Oil & Grease	None Visible	-	None Visible
Total Suspended Solids (TSS)	180	mg/L	35
BOD	120	mg/L	54
Faecal Coliforms	10,000	CFU/dL	430
Total Coliforms	-	CFU/ 100 mL	9300

**LOCATION: QMLP CAMP**GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37327</b> (August 12, 2009)
рН	6.0 to 9.0	pH units	7.47
Oil & Grease	None Visible	-	N/A
Total Suspended Solids (TSS)	180	mg/L	7
BOD	120	mg/L	272
Faecal Coliforms	10,000	CFU/dL	Sample Expired
Total Coliforms	-	CFU/ 100 mL	N/A

LOCATION: QMLP CAMP

GPS COORDINATES: 0491768E 7643478N

Parameter	Allowable Maximum Average Concentration	Units	<b>09-37342</b> (August 14, 2009)
pН	6.0 to 9.0	pH units	7.95
Oil & Grease	None Visible	-	N/A
Total Suspended Solids (TSS)	180	mg/L	69
BOD	120	mg/L	210
Faecal Coliforms	10,000	CFU/dL	Sample Expired
Total Coliforms	-	CFU/ 100 mL	Sample Expired

The water collected at QMLP camp did not meet water discharge criteria. The water has not been discharged to land in accordance to the water use license, to the discharge location approved by the INAC Environmental Inspector. The water has been treated and discharged to the sewage lagoons where it remains.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tricia Cammaart

**Environmental Sciences Group** 

Tricia Cammaant

cc: Eva Schulz (UMA)

Daniela Loock, Kat White, Darren White, Alissa Lunney, Cameron King (ESG)

# APPENDIX A LABORATORY RESULTS

Client: ESG ASG Login No: 19603 12 Verite Ave Site: Fox-2

Site: Fox-2 Client Login No: 09-195

Dept. of Chem. / Chem. Eng., RMC P.O. Box 17000, Stn. Forces Kingston, Ontario K7K 7B4

Samples Received: 8-Aug-09
Date of analysis: 17-Aug-09
Method No: ASG 042
Date Reported: 17-Aug-09

(613) 541-6000 ext 6567 Fax: (613) 541-6596

Page: 1 of 1

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37207*	mg/L	54

<sup>\*</sup>Averaged result of duplicates

## LABORATORY QA/QC

Sample I.D.	Unit	BOD
Duplicate; 37207*	mg/L	54 ; 54
Blank	mg/L	< 3
Control	mg/L	158
Control Target	mg/L	165

Client: ESG

ESG

12 Verite Ave

Dept of Chem/Chem Eng RMC, PO Box 17000 Kingston, Ontario 613-541-6000 # 6567 ASG Login No: 19603

Site: Fox-2 Client No: 09-195 Samples Received: 8-Aug-09

Date of analysis: 12-Aug-09 Method No: ASG 037 Date Reported: 13-Aug-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	pН
37207*	7.42

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
Control	7.02
Control Target	7.00
Duplicate; 37207*	7.42 ; 7.42

Client : ESG 12 Verite Ave

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: Site: Client Login No: Samples Received: Date of analysis: Method No: Date Reported:

## **RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS**

Sample I.D.	Sample Type <sup>^</sup>	Unit	Total Suspended Solids
37207*	W	mg/L	35

<sup>\*</sup> Averaged results of duplicates.

#### LABORATORY QA/QC

Blank	Control	mg/L	<1
Control	Control	mg/L	195
Control Target	Control	mg/L	200
37207 ; Duplicate	W;W	mg/L	32 ; 37

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

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: 19603

Site: FOX-2 Client No: 09-195 Samples Received: 8-Aug-09 Date of analysis: 8-Aug-09 Date Reported: 9-Aug-09 Sheet: 1 of 1

## AMENDED RESULTS OF MICROBIOLOGICAL ANALYSIS

	Method: ASG 036	Method: ASG 036	Method: ASG 036	Method: ASG 044
Sample Identification	Total			Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
37207*	9300	1100	0	430

Sample Identification	Method: ASG 036 Total	Method: ASG 036	Method: ASG 036	Method: ASG 044 Fecal
	Coliforms	E. coli	Background	Coliforms
	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)	(CFU/100 mL)
Blank	0	0	0	0
37207*, Duplicate	8700, 9900	1000 , 1200	0,0	440 , 420
Control Sample	37	37	0	51
Control Sample Target	43	43	0	43

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: 19663 Site: Fox-2 Client Login No: 09-222 Samples Received: 13-Aug-09
Date of analysis: 19-Aug-09
Method No: ASG 037
Date Reported: 20-Aug-09
Sheet: 1 of 1

#### **RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS**

Sample I.D.	Sample	Unit	Total
37237*	Type^ SE	mg/L	Suspended Solids 71

<sup>\*</sup>Average results of duplicates.

#### LABORATORY QA/QC

Blank	Control	mg/L	<1
37237*; Duplicate	W;W	mg/L	66 ; 75
Control	Control	mg/L	180
Control Target	Control	mg/L	200

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

Client: ESG

12 Verite Ave

Dept of Chem/Chem Eng RMC, PO Box 17000 Kingston, Ontario 613-541-6000 # 6567

ASG Login No: 19663

Site: Fox-2 Client No: 09-222 Samples Received: 13-Aug-09 Date of analysis: 19-Aug-09

Method No: ASG 037 Date Reported: 19-Aug-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	рН
37237*	7.47

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
Control	7.01
Control Target	7.00
Duplicate ; 37237*	7.47 ; 7.47

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: 19663

Site: Fox-2 Client Login No: 09-222 Samples Received: 13-Aug-09 Date of analysis: 19-Aug-09 Method No: ASG 042 Date Reported: 19-Aug-09

Page: 1 of 1

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37237*	mg/L	272

<sup>\*</sup>Averaged result of duplicates

## LABORATORY QA/QC

Sample I.D.	Unit	BOD	
Duplicate; 37237*	mg/L	273 ; 272	
Blank	mg/L	< 3	
Control	mg/L	146	
Control Target	mg/L	165	

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: 19683

Site: Fox-2

Client Login No: 09-231 Samples Received: 17-Aug-09 Date of analysis: 24-Aug-09 Method No: ASG 042 Date Reported: 24-Aug-09

Page: 1 of 1

## **RESULTS OF BOD ANALYSIS**

Sample I.D.	Unit	BOD
37342*	mg/L	210

<sup>\*</sup>Averaged result of duplicates

Sample I.D.	Unit	BOD
Duplicate; 37342*	mg/L	209 ; 211
Blank	mg/L	< 3
Control	mg/L	170
Control Target	mg/L	165

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: 19683 Site: Fox-2 Client Login No: 09-231 Samples Received: 17-Aug-09 Date of analysis: 19-Aug-09 Method No: ASG 039
Date Reported: 24-Aug-09
Sheet: 1 of 1

#### **RESULTS OF TOTAL SUSPENDED SOLIDS ANALYSIS**

Sample I.D.	Sample Type^	Unit	Total Suspended Solids
37342*	SE	mg/L	69

<sup>\*</sup>Average results of duplicates.

#### LABORATORY QA/QC

Blank	Control	mg/L	<1
37342*; Duplicate	SE; SE	mg/L	66 ; 72
Control	Control	mg/L	193
Control Target	Control	mg/L	200

<sup>^</sup>SW =Surface Water, SI = Sewage Influent SE = Sewage Effluent

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: 19683

Site: Fox-2 Client No: 09-231 Samples Received: 17-Aug-09 Date of analysis: 20-Aug-09 Method No: ASG 037 Date Reported: 20-Aug-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	рН
37342*	7.95

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
37342*; Duplicate	7.95 ; 7.95
Control	7.00
Control Target	7.00

# APPENDIX B PHOTOGRAPHS

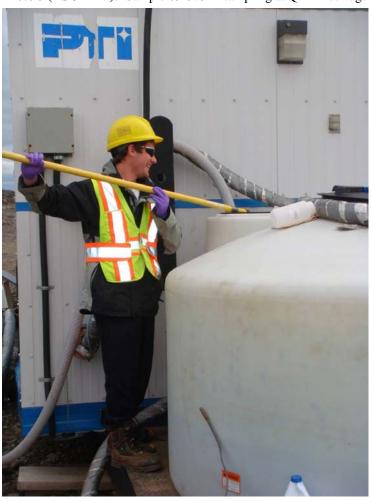
**Photo 1 (DSC\_01075):** Sample 09-37207 collected from FOX-2 QMLP construction camp sewage water sampling.





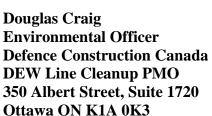


**Photo 3 (DSC-1129):** Sample 09-37342 sampling at QMLP sewage treatment plant.



Tricia Cammaart **Environmental Sciences Group** The Royal Military College of Canada PO Box 17000 Stn. Forces Kingston, ON K7K 7B4

**Douglas Craig Environmental Officer DEW Line Cleanup PMO** 350 Albert Street, Suite 1720





Tuesday, September 29, 2009

# RE: Analytical Results for Wastewater Samples Collected at FOX-2 in August, 2009

The following report summarizes results of the analysis of wastewater samples as per the FOX-2 (Longstaff Bluff) DEW Line Cleanup Project (DLCU) Specifications.

The FOX-2 specifications require that "wash water, melt water collection, rinse water resulting from the cleaning of fuel tanks and pipelines, and/or any other liquid effluent stream" meet the following guidelines prior to their discharge to land (01560.4.1):

Parameter	Maximum Allowable Concentration	Units
pН	6-9	pH units
Total arsenic (As)	0.100	mg/L
Dissolved cadmium (Cd)	0.010	mg/L
Total chromium (Cr)	0.100	mg/L
Dissolved cobalt (Co)	0.050	mg/L
Dissolved copper (Cu)	0.200	mg/L
Dissolved lead (Pb)	0.050	mg/L
Total mercury (Hg)	0.6	μg/L
Dissolved nickel (Ni)	0.200	mg/L
Total zinc (Zn)	1.000	mg/L
Oil & grease	5 mg/L and None visible	mg/L
PCBs	0.050*	mg/L
	0.005**	
Phenols	0.020	mg/L

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

#### Phenols

The wastewater samples collected by ESG at FOX-2 in August, 2009 were not analyzed for phenols but they were analyzed for oil and grease. Research conducted by ESG<sup>1</sup> has determined that a) no federal, territorial or provincial criteria exist for the discharge of

<sup>&</sup>lt;sup>1</sup> Environmental Sciences Group. DEW Line Clean Up Project – Phenols in Wastewater. June, 2007.

wastewater containing phenols to land at a minimum distance of 30-m from natural drainage courses b) the maximum concentration of phenols in DLCU wastewater to date (2.44 mg/L) is below the LC<sub>50</sub> for freshwater fish and crustaceans and below the oral and dermal LD<sub>50</sub>s for rats and rodents and c) phenols in excess of the maximum allowable concentration (MAC) have historically co-occurred with a visible oil & grease sheen and/or with an exceedance of the MAC for oil & grease. This information, and a subsequent decision to not test for phenols, has been presented to the NWB. To date, verbal agreement from the NWB has been received, but the project is awaiting written confirmation of the decision to suspend testing for phenols.

## WASTEWATER SAMPLES

Two wastewater samples were collected at FOX-2 and analyzed in August 2009. A summary of the details of these results follows.

Sample	Sample Location	GPS	Sampling Date
Number		Coordinates	
09-37576	Beach POL	0491533E	August 20, 2009
		7643638N	
09-37668	Hanger Area	0488831E	August 22, 2009
		7646260N	

A summary of the results for the parameters tested is provided below. Laboratory results and photographs are provided in Appendices A and B, respectively.

LOCATION: BEACH POL

GPS COORDINATES: 0491533E 7643638N

Parameter	Maximum Allowable Concentration	Units	Sample # 09-37576
pН	6-9	pH units	7.31
<b>Total Arsenic</b>	0.100	mg/L	0.136
<b>Dissolved Cadmium</b>	0.010	mg/L	< 0.001
<b>Dissolved Chromium</b>	0.100	mg/L	< 0.005
<b>Dissolved Cobalt</b>	0.050	mg/L	< 0.003
Dissolved Copper	0.200	mg/L	< 0.005
Dissolved Lead	0.050	mg/L	< 0.010
<b>Total Mercury</b>	0.6	μg/L	< 0.5
Dissolved Nickel	0.200	mg/L	< 0.005
Total Zinc	1.0	mg/L	0.104
Oil & Grease	None Visible and 5 mg/L	mg/L	9.3 Visible
PCBs	50* 5**	μg/L	<3.0
Phenols	20	μg/L	

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

The analytical results for the Beach POL did not meet the meet the wastewater discharge criteria for Oil and Grease. The water has not been discharged to land in accordance to the water use license.

LOCATION: HANGER AREA

GPS COORDINATES: 0488831E 7646260N

Parameter	Maximum Allowable Concentration	Units	Sample # 09-37668
pН	6-9	pH units	7.48
Total Arsenic	0.100	mg/L	0.021
<b>Dissolved Cadmium</b>	0.010	mg/L	< 0.001
<b>Dissolved Chromium</b>	0.100	mg/L	< 0.005
<b>Dissolved Cobalt</b>	0.050	mg/L	0.004
Dissolved Copper	0.200	mg/L	< 0.005
Dissolved Lead	0.050	mg/L	< 0.010
Total Mercury	0.6	μg/L	< 0.5
Dissolved Nickel	0.200	mg/L	0.013
Total Zinc	1.0	mg/L	0.021
Oil & Grease	None Visible and 5 mg/L	mg/L	2.7 Non Visible
PCBs	50* 5**	μg/L	<3.0
Phenols	20	μg/L	

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

The analytical results for the Hanger Area met the wastewater discharge criteria. The water has been discharged behind the hanger in accordance to the water use license.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Tricia Cammaart

**Environmental Sciences Group** 

Tricia Cammaant

cc: Eva Schulz (UMA)

Daniela Loock, Kat White, Darren White, Alissa Lunney, Cameron King (ESG)

# APPENDIX A LABORATORY RESULTS

Client: ESG

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: 19722 ASG Login No: 19722 Site: Fox-2 Client No: 09-262 Samples Received: 24-Aug-09 Date of analysis: 25-Aug-09 Method No: ASG 015 Date Reported: 28-Aug-09 Sheet No: 1 of 1

#### **RESULTS OF PCB IN WATER ANALYSIS**

Sample Type **	Sample I.D.	Unit	Aroclor 1254	Aroclor 1260
W	37576	μg/L	< 3.0	< 3.0

## LABORATORY QA/QC

Blank	μg/L	< 3.0	< 3.0
Control Sample	μg/L	< 3.0	18
Control Sample Target	μg/L	< 3.0	15

<sup>\*\*</sup> S = Soil , C = Concrete , PC = Paint Chip , SW = Swab , P = Plant , W = Water

All results corrected for the recovery of the surrogate decachlorobiphenyl

ASU#	12201	Report ID:	Fox-2 W13
Client:	ASG 19722	Date Submitted:	24-Aug-09
		Date tested:	25-Aug-09
Site:	Fox-2	Date:	26-Aug-09
	09-262	Matrix:	Water
Preliminary Report of An	alysis		
Sample	Oil & Grease		
	mg/L		
0-37576	9.3		
Blank	< 2.0		
Control	14.7		
Control Target	16.1		

ASU#	12201		Report ID:	Fox-2 W12				
Client:	ASG 19722		Date Submitted:	24-Aug-09				
			Date tested:	25-Aug-09				
Site:	Fox-2		Date:	26-Aug-09				
	09-262		Matrix:	Water				
Preliminary Report of A	nalysis							
Total Metals	Results in mg/L							
SAMPLE	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
09-37576	-	-	-	-	-	0.104	-	0.136
Blank	-	-	-	-	-	< 0.010	-	< 0.003
Control	-	-	-	-	-	3.1	-	0.83
Control Target	-	-	-	-	-	3.0	-	0.84
Dissolved Metals								
SAMPLE	Cu	Ni	Со	Cd	Pb	Zn	Cr	As
09-37576	< 0.005	< 0.005	< 0.003	< 0.001	< 0.010	-	< 0.005	-
Blank	< 0.005	< 0.010	< 0.003	< 0.001	< 0.010	-	< 0.005	-
			1	2.22			0.01	
Control	1.7	1.7	1.7	0.82	8.3	-	0.91	-
Control Target	1.6	1.6	1.6	0.80	8.0	-	0.80	-

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: 19722 Site: Fox-2

Client No: 09-262
Samples Received: 24-Aug-09
Date of analysis: 25-Aug-09
Method No: ASG 021
Date Reported: 25-Aug-09

Sheet: 1 of 1

## **RESULTS OF MERCURY IN WATER ANALYSIS**

Sample I.D.	Unit	Mercury
37576*	μg/L	< 0.5

Sample I.D.	Unit	Mercury
Duplicate; 37576*	μg/L	< 0.5 ; < 0.5
Blank	μg/L	< 0.5
Control Target	μg/L	2.0
Control Sample	μg/L	1.8

<sup>\*</sup> Averaged result of duplicates

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: 19720 Site: Fox-2

Client No: 09-272 Samples Received: 24-Aug-09
Date of analysis: 25-Aug-09
Method No: ASG 015
Date Reported: 28-Aug-09
Sheet No: 1 of 1

## **RESULTS OF PCB IN WATER ANALYSIS**

Sample Type **	Sample I.D.	Unit	Aroclor 1254	Aroclor 1260
W	37668*	μg/L	< 3.0	< 3.0

<sup>\*</sup> Average result of Duplicate

#### LABORATORY QA/QC

Blank	μg/L	< 3.0	< 3.0
Duplicate ; 37668*	μg/L	< 3.0 ; < 3.0	< 3.0 : < 3.0
Control Sample	μg/L	< 3.0	18
Control Sample Target	μg/L	< 3.0	15

<sup>\*\*</sup> S = Soil , C = Concrete , PC = Paint Chip , SW = Swab , P = Plant , W = Water

All results corrected for the recovery of the surrogate decachlorobiphenyl

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: 19722

Site: Fox-2 Client No: 09-262 Samples Received: 24-Aug-09 Date of analysis: 25-Aug-09 Method No: ASG 037 Date Reported: 25-Aug-09

Page: 1 of 1

## **RESULTS OF pH ANALYSIS**

Sample I.D.	pН
37576*	7.31

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	pН
37576*; Duplicate	7.31 ; 7.31
Control	7.00
Control Target	7.00

ASU#	12203	Report ID:	Fox-2 W15
Client:	ASG 19720	Date Submitted:	24-Aug-09
		Date tested:	25-Aug-09
Site:	Fox-2	Date:	26-Aug-09
	09-272	Matrix:	Water
Preliminary Report of Ana	alysis		
Sample	Oil & Grease		
	mg/L		
09-37668	2.7		
Blank	<2.0		
Control	14.7		
Control Target	16.1		
			·

Client:	ASG 19720		Date Submitted:	24-Aug-09					
			Date tested:	25-Aug-09					
Site:	Fox-2		Date:	26-Aug-09					
	09-272		Matrix:	Water					
Preliminary Report of A	Analysis								t
Total Metals	Results in mg/L								
SAMPLE	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	
09-37668	-	-	-	-	-	0.021	-	0.021	
Blank	-	-	-	-	-	< 0.010	-	<0.003	
Control	-	-	-	-	-	3.1	-	0.83	H
Control Target	-	-	-	-	-	3.0	-	0.84	H
Dissolved Metals									
SAMPLE	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	ļ
09-37668	<0.005	0.013	0.004	< 0.001	< 0.010	-	< 0.005	-	ļ
Blank	<0.005	< 0.010	<0.003	< 0.001	< 0.010	-	< 0.005	-	l
Control	1.7	1.7	1.7	0.82	8.3	-	0.91	-	
Control Target	1.6	1.6	1.6	0.80	8.0	-	0.80	-	Γ

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: 19720 Site: Fox-2

Client No: 09-272 Samples Received: 24-Aug-09 Date of analysis: 25-Aug-09 Method No: ASG 021 Date Reported: 25-Aug-09

Sheet: 1 of 1

#### **RESULTS OF MERCURY IN WATER ANALYSIS**

Sample I.D.	Unit	Mercury
37668*	μg/L	< 0.5

## LABORATORY QA/QC

Sample I.D.	Unit	Mercury
Duplicate ; 37668*	μg/L	< 0.5 ; < 0.5
Blank	μg/L	< 0.5
Control Target	μg/L	2.0
Control Sample	μg/L	1.8

<sup>\*</sup> Averaged result of duplicates

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: 19720

Site: Fox-2 Client No: 09-272 Samples Received: 24-Aug-09 Date of analysis: 25-Aug-09 Method No: ASG 037 Date Reported: 25-Aug-09

Page: 1 of 1

# **RESULTS OF pH ANALYSIS**

Sample I.D.	рН
37668*	7.48

<sup>\*</sup> Averaged result of duplicates

Sample I.D.	рН
37668*; Duplicate	7.48 ;7.48
Control	7.00
Control Target	7.00

# APPENDIX B PHOTOGRAPHS

**Photo 1 (DSC\_1179):** Sample 09-37668 FOX-2 2009 August 20 Wastewater sampling at Hangar H-11812A



Photo 2 (DSC\_1161): Sample 09-37576 FOX-2 2009 August 20 Wastewater sampling at Beach POL B-25255B



Photo 3 (DSC\_1160): Sample 09-37576 FOX-2 2009 August 20 Wastewater sampling at Beach POL B-25255B



Candice Casucci Environmental Sciences Group The Royal Military College of Canada PO Box 17000 Stn. Forces Kingston, ON K7K 7B4 TAL SCIENCES GAO

Douglas Craig Environmental Officer Defence Construction Canada DEW Line Cleanup PMO 350 Albert Street, Suite 1720 Ottawa ON K1A 0K3

Friday, November 6, 2009

# RE: Analytical Results for Wastewater Samples Collected at FOX-2 in September, 2009

The following report summarizes results of the analysis of wastewater samples as per the FOX-2 (Longstaff Bluff) DEW Line Cleanup Project (DLCU) Specifications.

The FOX-2 specifications require that "wash water, melt water collection, and rinse water resulting from the cleaning of fuel tanks and pipelines, and/or any other liquid effluent stream" meet the following guidelines prior to their discharge to land (01560.4.1):

Parameter	Maximum Allowable Concentration	Units
pН	6-9	pH units
Total arsenic (As)	0.100	mg/L
Dissolved cadmium (Cd)	0.010	mg/L
Total chromium (Cr)	0.100	mg/L
Dissolved cobalt (Co)	0.050	mg/L
Dissolved copper (Cu)	0.200	mg/L
Dissolved lead (Pb)	0.050	mg/L
Total mercury (Hg)	0.6	μg/L
Dissolved nickel (Ni)	0.200	mg/L
Total zinc (Zn)	1.000	mg/L
Oil & grease	5 mg/L and None visible	mg/L
PCBs	0.050*	mg/L
	0.005**	
Phenols	0.020	mg/L

<sup>\*</sup>Discharge to barren land, \*\*Discharge to vegetated land

## WASTEWATER SAMPLES

No wastewater samples were collected at FOX-2 in September 2009.

We trust that the information provided meets current requirements. Please contact the undersigned if you have any questions or concerns.

Sincerely,

Candice Casucci

Masuri.

**Environmental Sciences Group** 

cc: Eva Schulz (UMA)

Daniela Loock, Kat White, Darren White, Cameron King (ESG)