Atlantic
Industrial Services
A Division of Envirosystems Inc.

5 December 2012

[redacted]
Director of Public Works
Municipality of The County of Colchester
1 Church Street
Truro, Nova Scotia
B2N 5E7

RE: Approval to discharge Treated Hydraulic Fracturing Wastewater

Dear [redacted]

In response to your letter dated 24 October 2012 requesting further information concerning our application to discharge treated hydraulic fracturing wastewater please find below the additional information you have requested.

You are aware that Nova Scotia Environment has issued us a Pilot Project approval to treat this hydraulic fracturing wastewater to remove the NORM characteristics, we have successfully carried out this work between 18 and 26 October. Also, as was discussed during a meeting between us and Nova Scotia Environment on 15 August 2012, they are prepared to issue us a subsequent approval to proceed with Phase II of this pilot project, provided we have a letter on file from the Municipality of the County of Colchester (Colchester County) approving us to discharge this treated wastewater to the municipal sewer system as part of our normal daily wastewater effluent corresponding to our existing Industrial Approval 2000-015375-A07. It is our understanding that Colchester County is concerned about the potential for Naturally Occurring Radioactive Materials (NORM) to negatively affect your wastewater system but we trust the information provided below confirms no such risk and that these treated wastewaters comply with the Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM).

1. Please refer to Appendix A for a completed Waste Survey Report.
2. Please refer to Appendix B for radiological analysis. To ensure stratification effect was duly captured the contents of the lagoon was recirculated before sampling, in additional to sampling at different depth levels. Also included in Appendix B is the specific gravity and viscosity analysis.
3. Please refer to Appendix C for the MSDS of the two other chemicals known to be contained within hydraulic fracturing wastewater. These two chemicals are a surfactant and friction reducer and at the time of their use comprised less than 0.1% of the total volume of the fracturing fluid. As well, we have included full analysis of the untreated wastewater currently stored in our lagoon L3 and the full

analysis of the wastewater treated to below NORM UDRL which is stored in our lagoon L6. We respectfully request you base your judgement of this wastewater on these most recent analytical properties.

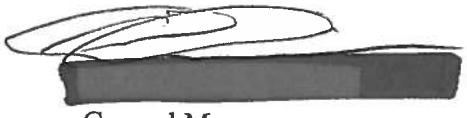
4. In accordance with all documents submitted to NSDOE as part of our Pilot Project Approval the treatment method used to reduce NORM levels to below Health Canada Unconditional Derived Release Limits (UDRL) is thru carbon filtration. See attached schematic in Appendix D. The hydraulic fracturing wastewater was filtered thru 10,000 lbs of activated carbon resulting with all elements well below the UDRL. Once below UDRL limits it is our intent to further process the wastewater thru our existing processes including biological treatment, ultrafiltration and powder activated carbon polishing.
5. The only by-product from the treatment process for NORM is the activated carbon used for filtration. This media will be tested for the NORM solid criteria as referenced in the Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM) and disposed of appropriately at an approved facility based on the analysis results compared to the Unconditional Derived Release Limits (UDRL). Below UDRL will allow for local disposal at industrial landfills and above UDRL will require out of province disposal at approved facilities.

Based on proven treatment methods and supporting analytical data Nova Scotia Environment has issued Atlantic Industrial Services an approval to treat NORM contaminated wastewaters to below UDRL. During the month of October 2012 we have conducted our activities as outlined in our approval and significant analysis of the results has again proven the wastewater has been treated to well below Unconditional Derived Release Limits (UDRL) as published within Health Canada's Guidelines for the Management of Naturally Occurring Radioactive Materials. Further analysis of the treated wastewater demonstrates other wastewater characteristics fall within and often below the levels of our typical processed wastewater effluent that we have been discharging to the Debert sewer system for over 10 years. We trust thru careful examination of the supporting information you will conclude that the discharge of this treated wastewater falls within the acceptability of Municipality of the County of Colchester Sewer Bylaw.

We request your office give consideration to issue Atlantic Industrial Services written approval to continue with our Pilot Project allowing us to discharge the treated wastewater to the Debert sewer system as a component within our existing daily discharged processed wastewater.

If you would like to discuss any of the above details, or schedule a subsequent meeting, please do not hesitate to contact me.

For your Consideration,



General Manager

Appendix A

Waste Survey Report

SCHEDULE-A (Wastewater Survey Report Form)

WASTE SURVEY REPORT

SECTION 1 – GENERAL INFORMATION:

Contact Name of Person Submitting Report (please print)	[redacted]
Company Name, Corporation, Owner Name	Atlantic Industrial Services
Civic Address, Street Name, Community, Postal Code	25 Akerley Blvd Dartmouth NS B3B 1J7
Mailing Address (if different from Above)	
Phone Number (office, cell, etc..)	[redacted]
Email Address	[redacted]
Company Officer Responsible For Effluent Control	[redacted]
Company Officer's Contact Number	[redacted]
Location of Premises (Number, Street, Municipality)	660 McElmon Rd Debert NS

THE INFORMATION CONTAINED IN THIS REPORT IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, COMPLETE AND ACCURATE.

Authorized Representative	[redacted]
Title	General Manager
Date	

SECTION 2 – PRODUCT OR SERVICE INFORMATION:

North American Industry Classification System (NAICS): List all that apply						

BRIEF DESCRIPTION OF MANUFACTURING OR SERVICE ACTIVITIES

Used oil collection, storage and processing.
Industrial wastewater treatment

BRIEF DESCRIPTION OF PRINCIPAL PRODUCTS OR SERVICES RENDERED

Recycled used oil

Number of Employees	Plant: 17	Office: 8	
Number of Shifts Per Day	2	Number of Days Per Week	7
Major Processes (check one)	Batch	Continuous	Both ✓
For Batch process or both - Average Number of Batches Per 24 Hour Day:			
Is the Product Subject to Seasonal Variation (circle one)	(Yes)	No	

IF YES, BRIEFLY DESCRIBE SEASONAL PRODUCTION CYCLE:

Wastewater collection is at a reduced level between November and March due to weather factors.

Is there a Special Clean Up Period (circle one)	Yes	(No)

IF YES, BRIEFLY DESCRIBE CLEAN-UP ACTIVITIES:

SECTION 3 – WASTE CHARACTERISTICS:

List all sources of water supply:				

Type of waste discharged: (check all that apply)	TYPE	AVERAGE FLOW/DAY CUBIC METERS/DAY	
	Sanitary	Estimated: 2	Measured:
	Noncontact Cooling	Estimated:	Measured:
	Contact Cooling	Estimated:	Measured:
	Process	Estimated:	Measured: 136.8
	Other	Estimated:	Measured:

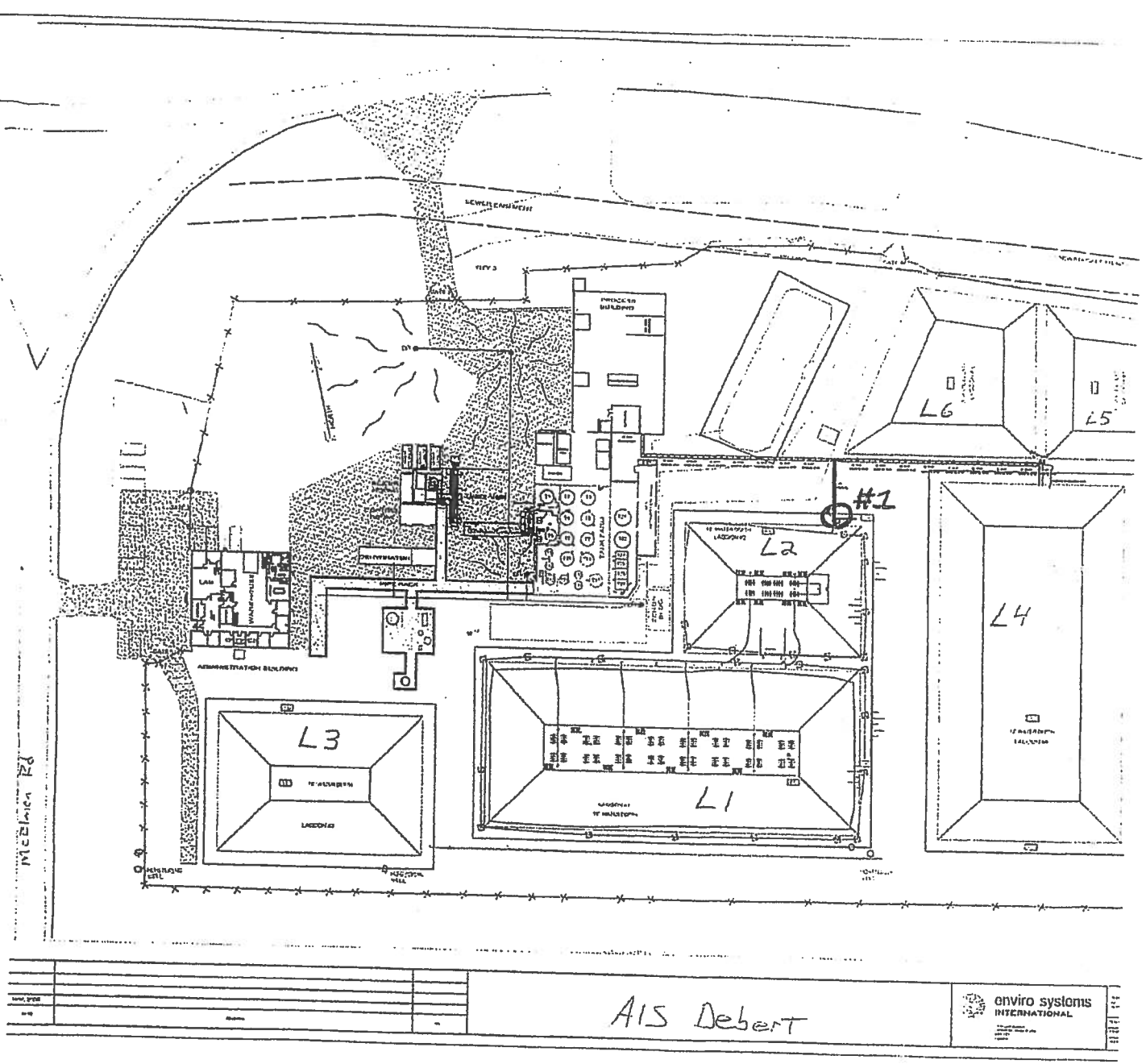
Wastes are discharged to: (check all that apply)	TYPE	AVERAGE FLOW/DAY CUBIC METERS/DAY	
	Sanitary #1	Estimated:	Measured: 136.8
	Sanitary #2	Estimated:	Measured:
	Storm #1	Estimated:	Measured:
	Storm #2	Estimated:	Measured:
	Ground Water	Estimated:	Measured:
	Surface Water	Estimated:	Measured:
Attach additional list if necessary.	Evaporation	Estimated	Measured

SECTION 4 – PHYSICAL LAYOUT:

Please attach with this report on separate sheet or sheets, the following documents:

1. Layout sketch or drawings of property (to scale or approximate) showing buildings, pretreatment works, property boundaries and locations for any new or proposed facilities.
2. Effluent lines and sanitary and storm sewers connections. Please show each sanitary line and storm water line independently and individually as well as number each such sanitary or storm sewer line on the sheet so that they can be related to Pollutant Information Sheets in Section 6 and Section 7.

All processed waste water is released into sanitary sewer connection #1 located on site plan.



SECTION 5 – PRETREATMENT:

Pretreatment devices or processes used for treating wastes or sludge before discharge to the sanitary sewer (check appropriate box):

Device/Process	YES	NO	Device/Process	YES	NO
Air Flotation	✓		Screening	✓	
Centrifuge	✓		Sedimentation	✓	
Chemical Precipitation	✓		Septic Tank		✓
Chlorination		✓	Solvent Separation	✓	
Cyclone		✓	Spill Protection	✓	
Filtration	✓		Sump	✓	
Flow Equalization		✓	Biological Treatment	✓	
0Grease or Oil Separation	✓		Rainwater Diversion or Storage	✓	
Grease Trap		✓	Other Chemical Treatment	✓	
Grit Removal	✓		Other Physical Treatment	✓	
Ion Exchange		✓	Other		
Neutralization, pH Correction	✓		No Pretreatment Provided		
Ozonation		✓			

Type of Process or Device for:		Type of Process or Device for:	
Grease or Oil Separation	waste oil recycling process, dehydration	Biological Treatment	12 million litre capacity aerated Biox ponds
Chemical Treatment	use of alum, lime, ferric chloride	Physical Treatment	Zenon ultrafiltration membrane
Others			

SECTION 6 – POLLUTANT INFORMATION SHEET (CONTROLLED SUBSTANCES)

Please fill out separate sheets under this section for each of the Sanitary and Storm Sewers identified by a number in Section 4 of this report.			
Type of Sewer (circle one)	(Sanitary)	Storm	Sewer Number: #1

Indicate by placing an "X" in the appropriate box for each listed parameter whether it is "suspected to be absent," "known to be absent," "suspected to be present," or "known to be present" and the known or expected concentration in milligrams per litre.

PARAMETER	ABSENT		PRESENT		CONC. (MG/L)
	KNOWN	SUSPECTED	KNOWN	SUSPECTED	
Chlorides			X		
Sulphates			X		
Aluminum			X		
Iron			X		
Fluoride	X				
Phosphorus			X		
Antimony			X		
Bismuth	X				
Chromium	X				
Cobalt	X				
Lead			X		
Manganese			X		
Selenium	X				
Silver	X				
Tin	X				
Titanium	X				
Vanadium	X				
Copper	X				
Cyanide	X				
Nickel	X				
Zinc			X		
Arsenic			X		
Cadmium	X				
Phenolic Compounds			X		
Mercury	X				
BOD			X		
TSS			X		
COD			X		
Oil & Grease (Animal / Veg.)	X				
Oil & Grease (Mineral / Syn.)	X				
Kjeldahl Nitrogen			X		

see attached analysis for our Typical effluent and for the Treated Fracturing wastewater

SECTION 7 – POLLUTANT INFORMATION SHEET (PROHIBITED SUBSTANCES)

Please fill out separate sheets under this section for each of the Sanitary and Storm Sewers identified by a number in Section 4 of this report.			
Type of Sewer (circle one)	Sanitary	Storm	Sewer Number: #1

Indicate by placing an "X" in the appropriate box for each listed parameter whether it is "suspected to be absent," "known to be absent," "suspected to be present," or "known to be present" and the known or expected quantity in Kilograms per Month (Kg/M).

PARAMETER	ABSENT		PRESENT		CONC. (KG/M)
	KNOWN	SUSPECTED	KNOWN	SUSPECTED	
Pesticides		X			
Acute Hazardous Waste Chemicals		X			
Fuels	X				
Hazardous Industrial Wastes	X				
Hazardous Waste Chemicals	X				
Ignitable Wastes	X				
Pathological Wastes	X				
PCB Wastes	X				
Reactive Wastes	X				
Severely Toxic Materials	X				
Waste Radioactive Materials	X				
NORM			X		below UDRL

Information of the Person Submitting this Report			
Signature	[redacted]	Designation	General Manager
Name	[redacted]	Company	Atlantic Industrial Services
Phone Number	[redacted]	Fax Number	[redacted]
Company Address	25 Akerley Blvd Dartmouth NS B3B 1J7		

Appendix B

Radiological Analysis

Specific Gravity & Viscosity Analysis

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02123.0

Date: 29-Nov-2012

Maxxam Analytics Halifax

200 Bluewater Rd
Bedford, N.S, B4B 1G9

Phone: (902) 420-0203
FAX: (902) 420-8612

attn: [redacted]

Client Ref.: [redacted]

2 water samples Sampled: 18-Oct-2012 Received: 23-Oct-2012

Revised Results of Analysis

Sample	Test		Result	Units	Date	Method
PG3960-01R Sample 1 Pre	Ra-228		0.3	Bq/l	08-Nov-2012	GAMMA
PG3961-01R Sample 1 Post	Ra-228	<	0.1	Bq/l	13-Nov-2012	GAMMA
PG3960-01R Sample 1 Pre	Ra-224		0.04	Bq/l	07-Nov-2012	ALPHA
PG3961-01R Sample 1 Post	Ra-224	<	0.01	Bq/l	07-Nov-2012	ALPHA
PG3960-01R Sample 1 Pre	Ra-226		1.84	Bq/l	07-Nov-2012	ALPHA
PG3961-01R Sample 1 Post	Ra-226		0.04	Bq/l	07-Nov-2012	ALPHA
PG3960-01R Sample 1 Pre	Th-232	<	0.01	Bq/l	25-Nov-2012	ALPHA
PG3961-01R Sample 1 Post	Th-232		0.01	Bq/l	25-Nov-2012	ALPHA
PG3960-01R Sample 1 Pre	Th-230	<	0.01	Bq/l	25-Nov-2012	ALPHA
PG3961-01R Sample 1 Post	Th-230	<	0.01	Bq/l	25-Nov-2012	ALPHA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02123.0

Date: 29-Nov-2012

Revised Results of Analysis

Sample	Test		Result	Units	Date	Method
PG3960-01R Sample 1 Pre	Th-228		0.04	Bq/l	25-Nov-2012	ALPHA
PG3961-01R Sample 1 Post	Th-228	<	0.01	Bq/l	25-Nov-2012	ALPHA
PG3960-01R Sample 1 Pre	Pb-210		0.1	Bq/l	28-Nov-2012	GFPC
PG3961-01R Sample 1 Post	Pb-210	<	0.1	Bq/l	28-Nov-2012	GFPC
PG3960-01R Sample 1 Pre	U-238	<	0.03	Bq/l	12-Nov-2012	NAA
PG3961-01R Sample 1 Post	U-238		0.32	Bq/l	12-Nov-2012	NAA
PG3960-01R Sample 1 Pre	Thorium	<	4	ppb	12-Nov-2012	NAA
PG3961-01R Sample 1 Post	Thorium	<	3	ppb	12-Nov-2012	NAA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02123.0

Date: 29-Nov-2012

Methods:	GAMMA	BQ-RAD-GAMMA	gamma-ray spectrometry
	ALPHA	BQ-RAD-ALPHA	alpha-particle spectrometry
	GFPC	BQ-RAD-GFPC	gas-flow proportional counting
	NAA	BQ-NAA-1	neutron activation analysis

Units:	Bq/l	Becquerels per litre
	ppb	micrograms per litre

These results relate only to the samples analysed and only to the items tested.
* The tests included in this report are within the scope of this accreditation.
Uranium was expressed as U-238.

*ISO 17025
For Scope of Accreditation No. 422
Pour la portée d'accréditation no. 422

29-Nov-2012 approved by: [redacted]

Senior Scientist, Division Supervisor

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02168.0

Date: 29-Nov-2012

Maxxam Analytics Halifax

200 Bluewater Rd
Bedford, N.S, B4B 1G9

Phone: (902) 420-0203
FAX: (902) 420-8612

attn: [redacted]

Client Ref [redacted]

2 water samples Sampled: 21-Oct-2012 Received: 23-Oct-2012

Revised Results of Analysis

Sample	Test		Result	Units	Date	Method
PH4509-01R Sample 4 Pre	Ra-228		0.3	Bq/l	23-Nov-2012	GAMMA
PH4510-01R Sample 4 Post	Ra-228		0.4	Bq/l	23-Nov-2012	GAMMA
PH4509-01R Sample 4 Pre	Ra-224	<	0.01	Bq/l	09-Nov-2012	ALPHA
PH4510-01R Sample 4 Post	Ra-224	<	0.01	Bq/l	09-Nov-2012	ALPHA
PH4509-01R Sample 4 Pre	Ra-226		1.91	Bq/l	09-Nov-2012	ALPHA
PH4510-01R Sample 4 Post	Ra-226		1.72	Bq/l	09-Nov-2012	ALPHA
PH4509-01R Sample 4 Pre	Th-232		0.01	Bq/l	25-Nov-2012	ALPHA
PH4510-01R Sample 4 Post	Th-232	<	0.01	Bq/l	25-Nov-2012	ALPHA
PH4509-01R Sample 4 Pre	Th-230		0.06	Bq/l	25-Nov-2012	ALPHA
PH4510-01R Sample 4 Post	Th-230	<	0.01	Bq/l	25-Nov-2012	ALPHA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02168.0

Date: 29-Nov-2012

Revised Results of Analysis

Sample	Test		Result	Units	Date	Method
PH4509-01R Sample 4 Pre	Th-228		0.08	Bq/l	25-Nov-2012	ALPHA
PH4510-01R Sample 4 Post	Th-228		0.04	Bq/l	25-Nov-2012	ALPHA
PH4509-01R Sample 4 Pre	Pb-210		0.2	Bq/l	28-Nov-2012	GFPC
PH4510-01R Sample 4 Post	Pb-210		0.3	Bq/l	28-Nov-2012	GFPC
PH4509-01R Sample 4 Pre	U-238	<	0.03	Bq/l	12-Nov-2012	NAA
PH4510-01R Sample 4 Post	U-238	<	0.03	Bq/l	12-Nov-2012	NAA
PH4509-01R Sample 4 Pre	Thorium		6	ppb	12-Nov-2012	NAA
PH4510-01R Sample 4 Post	Thorium	<	5	ppb	12-Nov-2012	NAA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02168.0

Date: 29-Nov-2012

Methods:	GAMMA	BQ-RAD-GAMMA	gamma-ray spectrometry
	ALPHA	BQ-RAD-ALPHA	alpha-particle spectrometry
	GFPC	BQ-RAD-GFPC	gas-flow proportional counting
	NAA	BQ-NAA-1	neutron activation analysis

Units:	Bq/l	Becquerels per litre
	ppb	micrograms per litre

These results relate only to the samples analysed and only to the items tested.
* The tests included in this report are within the scope of this accreditation.
Uranium was expressed as U-238.

*ISO 17025
For Scope of Accreditation No. 422
Pour la portée d'accréditation no. 422

29-Nov-2012 approved by: [redacted]

Senior Scientist, Division Supervisor

ANALYSIS REPORT

Becquerel
A Maxxam Company

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02185.0

Date: 29-Nov-2012

Maxxam Analytics Halifax

200 Bluewater Rd
Bedford, N.S, B4B 1G9

Phone: (902) 420-0203
FAX: (902) 420-8612

attn: [redacted]

Client Ref [redacted]

2 water samples Sampled: 25-Oct-2012 Received: 26-Oct-2012

Results of Analysis

Sample	Test	Result	Units	Date	Method
PJ0473-01R Sample 8 Pre	Ra-228	0.2	Bq/l	25-Nov-2012	GAMMA
PJ0474-01R Sample 8 Post	Ra-228	0.3	Bq/l	25-Nov-2012	GAMMA
PJ0473-01R Sample 8 Pre	Th-230	< 0.01	Bq/l	28-Nov-2012	ALPHA
PJ0474-01R Sample 8 Post	Th-230	< 0.01	Bq/l	28-Nov-2012	ALPHA
PJ0473-01R Sample 8 Pre	Th-232	< 0.01	Bq/l	28-Nov-2012	ALPHA
PJ0474-01R Sample 8 Post	Th-232	< 0.01	Bq/l	28-Nov-2012	ALPHA
PJ0473-01R Sample 8 Pre	Th-228	0.02	Bq/l	28-Nov-2012	ALPHA
PJ0474-01R Sample 8 Post	Th-228	0.04	Bq/l	28-Nov-2012	ALPHA
PJ0473-01R Sample 8 Pre	Ra-224	< 0.01	Bq/l	09-Nov-2012	ALPHA
PJ0474-01R Sample 8 Post	Ra-224	< 0.01	Bq/l	09-Nov-2012	ALPHA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02185.0

Date: 29-Nov-2012

Results of Analysis

Sample	Test		Result	Units	Date	Method
PJ0473-01R Sample 8 Pre	Ra-226		1.85	Bq/l	09-Nov-2012	ALPHA
PJ0474-01R Sample 8 Post	Ra-226		1.89	Bq/l	09-Nov-2012	ALPHA
PJ0473-01R Sample 8 Pre	Pb-210		0.4	Bq/l	29-Nov-2012	GFPC
PJ0474-01R Sample 8 Post	Pb-210		0.2	Bq/l	29-Nov-2012	GFPC
PJ0473-01R Sample 8 Pre	U-238	<	0.03	Bq/l	12-Nov-2012	NAA
PJ0474-01R Sample 8 Post	U-238	<	0.03	Bq/l	12-Nov-2012	NAA
PJ0473-01R Sample 8 Pre	Thorium	<	5	ppb	12-Nov-2012	NAA
PJ0474-01R Sample 8 Post	Thorium	<	4	ppb	12-Nov-2012	NAA

ANALYSIS REPORT

Becquerel Laboratories Inc.
6790 Kitimat Rd., Unit 4
Mississauga, Ontario
Canada, L5N 5L9

Phone: (905) 826-3080
FAX: (905) 826-4151

Batch: T12-02185.0

Date: 29-Nov-2012

Methods:	GAMMA	BQ-RAD-GAMMA	gamma-ray spectrometry
	ALPHA	BQ-RAD-ALPHA	alpha-particle spectrometry
	GFPC	BQ-RAD-GFPC	gas-flow proportional counting
	NAA	BQ-NAA-1	neutron activation analysis

Units:	Bq/l	Becquerels per litre
	ppb	micrograms per litre

These results relate only to the samples analysed and only to the items tested.
* The tests included in this report are within the scope of this accreditation.

ISO 17025
For Scope of Accreditation No. 422
Pour la portée d'accréditation no 422

29-Nov-2012 approved by: [redacted]

Senior Scientist, Division Supervisor

Maxxam

Your P.O. [redacted]
Your C.O.C [redacted]

Attention: [redacted]
Atlantic Industrial Services
PO Box 185
680 MacElmon Rd
Debert, NS
B0M 1G0

Report Date: 2012/11/08

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: [redacted]
Received: 2012/11/01, 11:22

Sample Matrix: Organic Liquid
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
API Gravity & Density(s) (oil) (1)	3	2012/11/02	2012/11/08		
Viscosity (Kinematic) @ non std T in Oil (1)	3	2012/11/02	2012/11/08		

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford to Edm Ind Subcontract

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

[redacted]

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam

Success Through Science®

Maxxam Job #[redacted]
Report Date: 2012/11/08

Atlantic Industrial Services

Your P.O. [redacted]

RESULTS OF ANALYSES OF ORGANIC LIQUID

Maxxam ID		PL3660	PL3661	PL3662	
Sampling Date		2012/10/31	2012/10/31	2012/10/31	
COC Number		B 168388	B 168388	B 168388	
	Units	**LAGOON #3 TOP**	**LAGOON #3 MIDDLE**	**LAGOON #3 BOTTOM**	**QC Batch**

Subcontracted Analysis					
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	3024358

QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam

Success Through Science

Maxxam Job [redacted]
Report Date: 2012/11/08

Atlantic Industrial Services

Your P.C [redacted]

Package 1	9.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam

Your Project #: B2H1228
Site Location: B2H1228

Attention: BEDFORD CLIENT SERVICE

MAXXAM ANALYTICS
200 BLUEWATER ROAD, SUITE 105
BEDFORD, NS
CANADA B4B 1G9

Report Date: 2012/11/07

Job/Sample	Analysis Type	Well Name/Sample ID	Sample Point
B2A0223/ EX7607	Certificate of Analysis	PL3660 \ LAGOON # 3 TOP	PL3660 \ LAGOON # 3 TOP
B2A0223/ EX7608	Certificate of Analysis	PL3661 \ LAGOON # 3 MIDDL	PL3661 \ LAGOON # 3 MIDDLE
B2A0223/ EX7609	Certificate of Analysis	PL3662 \ LAGOON # 3 BOTTO	PL3662 \ LAGOON # 3 BOTTOM

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

==========

This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Report Distribution

0 Reports(B2A0223)BEDFORD CLIENT SERVICE MAXXAM ANALYTICS 200 BLUEWATER ROAD, SUITE 105 BEDFORD, CANADA

Date of Issue 2012/11/07

All analyses are performed according to internal procedures that are based on current published reference methods.

Maxxam

CERTIFICATE OF ANALYSIS

MaxxID	Client ID	Meter Number	Laboratory Number
			B2A0223:EX7607

Operator Name	LSD	Well ID
MAXXAM ANALYTICS		

Well Name	Initials of Sampler	Sampling Company
	N/A	MAXXAM ANALYTICS

Field or Area	Pool or Zone	Sample Point	Container Identity	Percent Full
		PL3660 \ LAGOON # 3 TOP	PLASTIC BOTTLE	

Test Recovery	Sample Gathering Point	Solution Gas

Test Type	No.	Multiple Recovery	Interval From: / To:	Elevations (m) KB	GRD	Well Fluid Status	Well Status Mode

Production Rates Water m3/d	Oil m3/d	Gas 1000m3/d	Gauge Pressures kPa Source	As Received	Temperature °C Source	As Received	Well Status Type	Well Type
					23.0			

Gas or Condensate Project	Licence No.

Date Sampled Start	Date Sampled End	Date Received	Date Reported	Date Reissued	Analyst
2012/10/31		2012/11/05	2012/11/07	2012/11/07	PS9

PARAMETER DESCRIPTION	Result	unit	Method	MDL
Density Analysis				
API Gravity @ 15 °C	7.0	N/A		
Measured Relative Density @ 15 °C	1.022	N/A	ASTM D4052	
Absolute Density @ 15 °C	1021	kg/m3		0.1
Viscosity Analysis				
Viscosity @ 20°C	1.04	cSt	ASTM D445	0.01

** Information not supplied by client -- data derived from LSD information

Results relate only to items tested

Remarks:

Maxxam

CERTIFICATE OF ANALYSIS

MaxxID	Client ID	Meter Number	Laboratory Number
			B2A0223:EX7608

Operator Name	LSD	Well ID
MAXXAM ANALYTICS		

Well Name	Initials of Sampler	Sampling Company
	N/A	MAXXAM ANALYTICS

Field or Area	Pool or Zone	Sample Point	Container Identity	Percent Full
		PL3661 \ LAGOON # 3 MIDDLE	PLASTIC BOTTLE	

Test Recovery	Interval	Elevations (m)	Sample Gathering Point	Solution Gas
	From:			

Test Type	No.	Multiple Recovery	To:	KB	GRD	Well Fluid Status	Well Status Mode

Production Rates			Gauge Pressures kPa		Temperature °C		Well Status Type	Well Type
Water m3/d	Oil m3/d	Gas 1000m3/d	Source	As Received	Source	As Received		
						23.0		

Gas or Condensate Project	Licence No.

Date Sampled Start	Date Sampled End	Date Received	Date Reported	Date Reissued	Analyst
2012/10/31		2012/11/05	2012/11/07	2012/11/07	PS9

PARAMETER DESCRIPTION	Result	unit	Method	MDL
Density Analysis				
API Gravity @ 15 °C	6.8	N/A		
Measured Relative Density @ 15 °C	1.023	N/A	ASTM D4052	
Absolute Density @ 15 °C	1022	kg/m3		0.1
Viscosity Analysis				
Viscosity @ 20°C	1.11	cSt	ASTM D445	0.01

** Information not supplied by client – data derived from LSD information

Results relate only to items tested

Remarks:

Maxxam

CERTIFICATE OF ANALYSIS

MaxxID	Client ID	Meter Number	Laboratory Number
			B2A0223:EX7609

Operator Name	LSD	Well ID
MAXXAM ANALYTICS		

Well Name	Initials of Sampler	Sampling Company
	N/A	MAXXAM ANALYTICS

Field or Area	Pool or Zone	Sample Point	Container Identity	Percent Full
		PL3662 \ LAGOON # 3 BOTTOM	PLASTIC BOTTLE	

Test Recovery	Sample Gathering Point	Solution Gas

Test Type	No.	Multiple Recovery	Interval From: / To:	Elevations (m) KB	Elevations (m) GRD	Well Fluid Status	Well Status Mode

Production Rates Water m3/d	Oil m3/d	Gas 1000m3/d	Gauge Pressures kPa Source	As Received	Temperature °C Source	As Received	Well Status Type	Well Type
					23.0			

Gas or Condensate Project	Licence No.

Date Sampled Start	Date Sampled End	Date Received	Date Reported	Date Reissued	Analyst
2012/10/31		2012/11/05	2012/11/07	2012/11/07	PS9

PARAMETER DESCRIPTION	Result	unit	Method	MDL
Density Analysis				
API Gravity @ 15 °C	5.7	N/A		
Measured Relative Density @ 15 °C	1.031	N/A	ASTM D4052	
Absolute Density @ 15 °C	1030	kg/m3		0.1
Viscosity Analysis				
Viscosity @ 20°C	1.66	cSt	ASTM D445	0.01

** Information not supplied by client – data derived from LSD information

Results relate only to items tested

Remarks:

Appendix C

Chemicals MSDS

Lagoon L3 analytical, untreated wastewater

Lagoon L6 analytical, treated wastewater

BJ SERVICES COMPANY CANADA
MATERIAL SAFETY DATA SHEET

Region Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **B-4**
Product Use: Gel preservative
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Methanol 000067-56-1	0.5-1.5	200 ppm, skin	250 ppm, skin
Diethylene glycol monomethyl ether 000111-77-3	40-70	NA	NA
Methylene bis(thiocyanate) 006317-18-6	7-13	NA	NA
2-(thiocyanomethylthio) benzothiazole 021564-17-0	7-13	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Ingestion. Eye contact. Skin contact. Skin absorption.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: Inhalation of solution vapor or mist may cause moderate to severe respiratory tract irritation . Exposure to high concentrations may cause central nervous system effects , which may include dizziness, headache and incoordination. Excessive inhalation may cause chemical pneumonitis or pulmonary edema .

INGESTION: HARMFUL OR FATAL IF SWALLOWED. Ingestion may cause severe irritation or burns to the mouth, throat and esophagus. May cause liver and kidney damage. (Product LD50, orl-rat=225 mg/kg)

EYE CONTACT: May cause severe irritation or burns to the eyes. May cause permanent eye damage.

SKIN CONTACT: May cause severe skin irritation. May cause skin burns. May be absorbed through the skin in toxic quantities. (Product LD50, dermal-rabbit=1670 mg/kg)

ACUTE TOXICITY:

Ingredient CAS#	%	LC50 (inhalation)	LD50 (oral)
Methanol 000067-56-1	0.5-1.5	64000 ppm/4 rat	5600 mg/kg rat

Diethylene glycol monomethyl ether 000111-77-3	40-70	NA	4 mL/kg rat
Methylene bis(thiocyanate) 006317-18-6	7-13	NA	55 mg/kg rat
2-(thiocyanomethylthio) benzothiazole 021564-17-0	7-13	NA	750 mg/kg rat

4 FIRST AID MEASURES

INHALATION:
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Only trained personnel should administer oxygen. Get medical attention.

INGESTION:
Rinse mouth with water several times. Give victim plenty of water. DO NOT induce vomiting. Obtain medical assistance immediately.

EYES:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

SKIN:
In case of contact, immediately flush skin with plenty of soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):	64°C (TCC)
LOWER EXPLOSION LIMIT (% v/v):	Not available
UPPER EXPLOSION LIMIT (% v/v):	Not available
AUTO-IGNITION TEMPERATURE:	Not available

SPECIAL HAZARDS:
Combustible. May form flammable/explosive vapor/air mixture.

EXTINGUISHING MEDIA:
Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:
Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:
Oxides of carbon, nitrogen and sulphur. Hydrogen cyanide (under conditions of incomplete combustion).

SENSITIVITY TO STATIC DISCHARGE: Yes (vapor)

SENSITIVITY TO MECHANICAL IMPACT: No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse, if possible, or for disposal. Use only explosion proof transfer equipment.

7 HANDLING AND STORAGE

HANDLING:
Wear specified protective equipment. Use only in a well ventilated area. Use only spark-proof and explosion-proof tools and equipment.

STORAGE REQUIREMENTS:
Keep container tightly closed, in a cool, well ventilated place. Protect from freezing. Keep away from heat. Keep

away from ignition sources. Keep away from incompatible materials.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:
Use only in a well ventilated area. Local exhaust.

PERSONAL PROTECTIVE EQUIPMENT:
Cartridge respirator. Chemical resistant goggles. Face shield. Butyl rubber gloves. Neoprene gloves. Viton gloves. Rubber apron. Rubber boots. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	Clear amber
ODOR:	Mild
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	1.08 @ 25°C
VAPOR PRESSURE:	10 mmHg @ 20°C
VAPOR DENSITY (air = 1):	Not available
EVAPORATION RATE:	Not available
BOILING POINT:	> 100°C
FREEZING POINT:	< -36°C
pH:	5-7 (100 ppm sol.)
SOLUBILITY IN WATER:	Dispersible
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:
Stable under normal conditions of use. Unstable at temperatures above 50°C.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:
Strong acids. Strong alkalis. Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Hydrogen cyanide. Oxides of carbon, nitrogen and sulphur.

HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:

Liver and kidney damage. Dermatitis.

SENSITIZATION:

May cause an allergenic skin response in some individuals.

CARCINOGENICITY:

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC-International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:

Not known.

REPRODUCTIVE TOXICITY:

Diethylene glycol monomethyl ether has shown embryotoxic, teratogenic and reproductive effects in animal studies. There is no evidence to suggest similar effects in humans. This product contains methanol (0.5-1.5%) which has been reported to cause fetotoxicity and teratogenicity in rats and mice when they were exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

12 ECOLOGICAL INFORMATION

No specific information available

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Consult local waste authorities for direction and /or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name:	CORROSIVE LIQUID,TOXIC,N.O.S.
Technical Name(s):	Methylene bis(thiocyanate), 2-(thiocyanomethylthio) benzothlazole
UN No.:	UN 2922
Hazard Class - Primary:	8
Hazard Class - Secondary:	6.1
Packing Group:	II

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name:	CORROSIVE LIQUID,TOXIC,N.O.S.
Technical Name(s):	Methylene bis(thiocyanate), 2-(thiocyanomethylthio) benzothiazole
UN No.:	UN 2922
Hazard Class - Primary:	8
Hazard Class - Secondary:	6.1
Packing Group:	II

MARINE TRANSPORT (IMDG/IMO)

Proper Shipping Name:	CORROSIVE LIQUID,TOXIC,N.O.S.
Technical Name(s):	Methylene bis(thiocyanate), 2-(thiocyanomethylthlo) benzothiazole
UN No.:	UN 2922
Hazard Class - Primary:	8
Hazard Class - Secondary:	6.1
Packing Group:	II
EmS:	F-A, S-B

15 REGULATORY INFORMATION

WHMIS:
B-3 (Combustible liquid)
D-1B (Acute toxicity)
D-2A (See Section 11)
E (Corrosive liquid)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 13/02/2006
REVISIONS: Reformat / (Sections 9 and 11)
PREPARED BY: Chemical Technology Centre
REFERENCES:

Suppliers' Literature.
CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2006.
International Marine Dangerous Goods Code, 2002 Edition, International Maritime Organisation, 2002.
Dangerous Goods Regulations, 47th ed., International Air Transport Association, 2006.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.
Guide to Occupational Exposure Values - 2005, American Conference of Governmental Industrial Hygienists, 2005.

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	19/04/00
2	IX	Updated transport information	15/08/02
3	9 and 11	Reformat/Review. Adjust freeze point value. Add methanol risk phrase to Reproductive Toxicity.	13/02/06

	BJ SERVICES COMPANY CANADA MATERIAL SAFETY DATA SHEET	Region Canada

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **AG-59L**
Product Use: Friction reducer
Chemical Family: Mixture

Supplier:
BJ Services Company Canada
1300, 801 - 6th Avenue SW
Calgary, Alberta, Canada T2P 4E1
Phone: (403) 531-5151

IN CASE OF EMERGENCY CALL: (403) 531-5151 (24 hrs)

2 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS#	%	ACGIH TWA	ACGIH STEL
Acrylamide copolymer 038193-60-1	10-30	NA	NA
Fatty acid esters 091744-20-6	1-5	NA	NA

3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Eye contact. Skin contact.

ACUTE OVEREXPOSURE EFFECTS:

INHALATION: May cause respiratory tract irritation.

INGESTION: May be harmful if swallowed. May cause mild irritation of the gastrointestinal tract.

EYE CONTACT: May cause eye irritation.

SKIN CONTACT: May cause mild skin irritation.

4 FIRST AID MEASURES

INHALATION:
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

INGESTION:
Rinse mouth with water several times. Give victim plenty of water. Do not induce vomiting. Give victim plenty of water. Obtain medical attention immediately.

EYES:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

SKIN:
In case of contact, immediately flush skin with plenty of soap and water. Remove contaminated clothing and launder before reuse. Seek medical attention if irritation persists.

5 FIRE FIGHTING MEASURES

FLASHPOINT (METHOD):	>93.4°C (SFCC)
LOWER EXPLOSION LIMIT (% v/v):	Not available
UPPER EXPLOSION LIMIT (% v/v):	Not available
AUTO-IGNITION TEMPERATURE:	Not available

SPECIAL HAZARDS:
Product may burn in fire conditions.

EXTINGUISHING MEDIA:
Water fog, carbon dioxide, foam, dry chemical.

SPECIAL FIREFIGHTING PROCEDURES:
Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires . Cool exposed containers with water spray.

HAZARDOUS COMBUSTION PRODUCTS:
Oxides of carbon, nitrogen and sulphur. Oxides of sodium.

SENSITIVITY TO STATIC DISCHARGE:	Not Available
SENSITIVITY TO MECHANICAL IMPACT:	No

6 ACCIDENTAL RELEASE MEASURES

Wear specified protective equipment. Remove sources of ignition. Small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal . Large spills - Dike to contain. Prevent from entering sewers or waterways. Recover product to suitable containers or vessel for reuse , if possible, or for disposal. Use only explosion proof transfer equipment.

7 HANDLING AND STORAGE

HANDLING:
Wear specified protective equipment. Use only spark-proof and explosion-proof tools and equipment. Use only in a well ventilated area.

STORAGE REQUIREMENTS:
Keep container tightly closed, in a cool, well ventilated place. Keep away from ignition sources. Keep away from incompatible materials.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS:
Use only in a well ventilated area. Local exhaust.

PERSONAL PROTECTIVE EQUIPMENT:
Cartridge respirator. Chemical resistant goggles. Nitrile gloves. Neoprene gloves. Coveralls.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	White
ODOR:	Mild Hydrocarbon
ODOR THRESHOLD:	Not available
SPECIFIC GRAVITY:	1.0 - 1.1 @ 25°C
VAPOR PRESSURE:	Not available
VAPOR DENSITY (air = 1):	>1
EVAPORATION RATE:	Not available
BOILING POINT:	100°C
FREEZING POINT:	-29°C (pour pt.)
pH:	7 - 8 (5% sol.)

VISCOSITY (C):	1021 - 1129 cP @ 25°C
SOLUBILITY IN WATER:	Soluble
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available

10 STABILITY AND REACTIVITY

STABILITY:
Stable under normal conditions of use.

INCOMPATIBILITY/CONDITIONS OF REACTIVITY:
Strong oxidizers.

HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:
Oxides of carbon, nitrogen and sulphur. Oxides of sodium.

HAZARDOUS POLYMERIZATION:
Will not occur.

11 TOXICOLOGICAL PROPERTIES

CHRONIC EFFECTS:
None known.

SENSITIZATION:
Not known.

CARCINOGENICITY:
None of the components of this product have been listed as carcinogenic by IARC , NTP or OSHA. (IARC-International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

MUTAGENICITY:
Not known.

REPRODUCTIVE TOXICITY:
Not known.

12 ECOLOGICAL INFORMATION

No specific information available

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Disposal should be made in accordance with national and local regulations . Consult local waste authorities for direction and/or approvals prior to disposal.

14 TRANSPORT INFORMATION

TDG

Proper Shipping Name:	NOT RESTRICTED
UN No.:	NA
Hazard Class - Primary:	
Hazard Class - Secondary:	
Packing Group:	

AIR TRANSPORT (ICAO/IATA)

Proper Shipping Name:	NOT RESTRICTED

UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:

MARINE TRANSPORT (IMDG/IMO)
Proper Shipping Name: NOT RESTRICTED
UN No.: NA
Hazard Class - Primary:
Hazard Class - Secondary:
Packing Group:
EmS:

15 REGULATORY INFORMATION

WHMIS:
D-2B (Eye/skin irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

16 OTHER INFORMATION

ISSUE DATE: 07/11/2006
REVISIONS: Section 2
PREPARED BY: Chemical Technology Centre
REFERENCES:

Supplier's Literature.
CCINFO Web Information Service, Canadian Centre for Occupational Health and Safety, 2006.
International Marine Dangerous Goods Code, 2002 Edition , International Maritime Organisation, 2002.
Dangerous Goods Regulations, 47th ed., International Air Transport Association, 2006.
TDG Clear Language Regulations, as published in the Canada Gazette Part II, August 2001.

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	04/10/06
2	2	Update Fatty acid ester CAS #.	07/11/06

Maxxam

Success Through Science

Your P.O. #[redacted]
Your C.O.C. #: N/A

Attention: [redacted]
Atlantic Industrial Services
PO Box 185
680 MacElmon Rd
Debert, NS
B0M 1G0

Report Date: 2012/10/22

CERTIFICATE OF ANALYSIS

MAXXAM JOB [redacted]
Received: 2012/10/12, 09:33

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonaceous BOD	1	N/A	2012/10/17	ATL SOP 00041	Based on APHA 5210B
Chloride	1	N/A	2012/10/18	ATL SOP 00014	Based on SM4500-Cl-
Str. Acid Diss. Cyanide water (4)	1	N/A	2012/10/17	ATL SOP 00040	Based on EPA335.3
Chemical Oxygen Demand (COD)	1	N/A	2012/10/16	ATL SOP 00042	Based on SM5220D
Hexavalent Cr Low Level (Sub fr Bedford) (1)	1	2012/10/12	2012/10/17		
Conductance - water	1	N/A	2012/10/16	ATL SOP 00004/00006	Based on SM2510B
Fluoride	1	N/A	2012/10/16	ATL SOP 00043	Based on SM4500F-C
Glycol in Water (2)	1	2012/10/12	2012/10/18		
Mercury - Total (CVAA,LL)	1	2012/10/19	2012/10/19	ATL SOP 00026	Based on EPA245.1
Metals Water Total MS	1	2012/10/15	2012/10/17	ATL SOP 00059	Based on EPA6020A
Nitrogen Ammonia - water	1	N/A	2012/10/18	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite	1	N/A	2012/10/19	ATL SOP 00016	Based on USGS - Enz.
Nitrogen - Nitrite	1	N/A	2012/10/18	ATL SOP 00017	Based on SM4500-NO2B
Nitrogen - Nitrate (as N)	1	N/A	2012/10/19	ATL SOP 00018	Based on ASTMD3867
Phenols (4-AAP)	1	N/A	2012/10/18	ATL SOP 00039	Based on EPA 420.2
pH	1	N/A	2012/10/16	ATL SOP 00003	Based on SM4500H+B
Sulphate	1	N/A	2012/10/18	ATL SOP 00023	Based on EPA 375.4
Sulphide (3)	1	N/A	2012/10/15	CAM SOP-00455	SM 4500-S G
Total Dissolved Solids (Filt. Residue)	1	N/A	2012/10/16	ATL SOP 00009	EPA 160.1
Total Kjeldahl Nitrogen in Water (3)	1	2012/10/19	2012/10/21	CAM SOP-00454	EPA 351.2 Rev 2
Total Oil and Grease - Water	1	2012/10/15	2012/10/16	ATL SOP 00101	Based on EPA1664
Phosphorus Total Colourimetry	1	2012/10/16	2012/10/17	ATL SOP 00057	Based on EPA365.1
Total Suspended Solids	1	N/A	2012/10/18	ATL SOP 00007	based on EPA 160.2

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford to Burnaby Env
(2) This test was performed by Bedford to Calgary Subcontract
(3) This test was performed by Maxxam Analytics Mississauga

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free 800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

(4) Strong acid dissociable cyanide value may include contribution from thiocyanate.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam

Success Through Science®

Maxxam Job #: [redacted]
Report Date: 2012/10/22

Atlantic Industrial Services

Your P.O. #: [redacted]

RESULTS OF ANALYSES OF WATER

Maxxam ID		PE2308		
Sampling Date		2012/10/11		
COC Number		N/A		
	Units	**LAGOON #3**	**RDL**	**QC Batch**
Calculated Parameters				
Nitrate (N)	mg/L	ND	0.050	2999142
Inorganics				
Carbonaceous BOD	mg/L	ND	5.0	2999190
Total Chemical Oxygen Demand	mg/L	790	200	3002693
Dissolved Chloride (Cl)	mg/L	20000	250	3004262
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.030	0.0020	3004317
Total Dissolved Solids	mg/L	33000	400	2999976
Dissolved Fluoride (F-)	mg/L	0.12	0.10	3003236
Total Kjeldahl Nitrogen (TKN)	mg/L	0.84	0.10	3008640
Nitrate + Nitrite	mg/L	ND	0.050	3004284
Nitrite (N)	mg/L	ND	0.010	3004285
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	3003473
pH	pH	8.90	N/A	3003022
Phenols-4AAP	mg/L	0.38	0.10	3006445
Total Phosphorus	mg/L	0.048	0.020	3002830
Total Suspended Solids	mg/L	1.8	1.0	3004053
Dissolved Sulphate (SO4)	mg/L	23	2.0	3004264
Sulphide	mg/L	ND	0.020	3001038
Conductivity	uS/cm	51000	1.0	3003027
Subcontracted Analysis				
Subcontract Parameter	N/A	ATTACHED	N/A	2999687
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	ND	5.0	3001484

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #[redacted]
Report Date: 2012/10/22

Atlantic Industrial Services

Your P.O. #[redacted]

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		PE2308		
Sampling Date		2012/10/11		
COC Number		N/A		
	Units	**LAGOON #3**	**RDL**	**QC Batch**
Metals				
Total Mercury (Hg)	ug/L	ND	0.013	3007780

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job [redacted]
Report Date: 2012/10/22

Atlantic Industrial Services

Your P.O. #[redacted]

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		PE2308		
Sampling Date		2012/10/11		
COC Number		N/A		
	Units	LAGOON #3	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	ND	50	3001210
Total Antimony (Sb)	ug/L	ND	10	3001210
Total Arsenic (As)	ug/L	ND	10	3001210
Total Barium (Ba)	ug/L	4390	10	3001210
Total Beryllium (Be)	ug/L	ND	10	3001210
Total Bismuth (Bi)	ug/L	ND	20	3001210
Total Boron (B)	ug/L	ND	500	3001210
Total Cadmium (Cd)	ug/L	ND	0.17	3001210
Total Calcium (Ca)	ug/L	479000	1000	3001210
Total Chromium (Cr)	ug/L	ND	10	3001210
Total Cobalt (Co)	ug/L	ND	4.0	3001210
Total Copper (Cu)	ug/L	ND	20	3001210
Total Iron (Fe)	ug/L	ND	500	3001210
Total Lead (Pb)	ug/L	ND	5.0	3001210
Total Lithium (Li)	ug/L	789	20	3001210
Total Magnesium (Mg)	ug/L	220000	1000	3001210
Total Manganese (Mn)	ug/L	70	20	3001210
Total Molybdenum (Mo)	ug/L	ND	20	3001210
Total Nickel (Ni)	ug/L	ND	20	3001210
Total Potassium (K)	ug/L	22200	1000	3001210
Total Selenium (Se)	ug/L	ND	10	3001210
Total Silver (Ag)	ug/L	ND	1.0	3001210
Total Sodium (Na)	ug/L	12400000	10000	3001210
Total Strontium (Sr)	ug/L	16600	20	3001210
Total Thallium (Tl)	ug/L	ND	1.0	3001210
Total Tin (Sn)	ug/L	ND	20	3001210
Total Titanium (Ti)	ug/L	ND	20	3001210
Total Uranium (U)	ug/L	ND	1.0	3001210
Total Vanadium (V)	ug/L	ND	20	3001210
Total Zinc (Zn)	ug/L	ND	50	3001210

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: [redacted]
Report Date: 2012/10/22

Atlantic Industrial Services

Your P.O. #: [redacted]

Package 1	5.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Sample PE2308-01: Elevated reporting limits for trace metals due to sample matrix.

Elevated reporting limits for phenol due to sample matrix.

Results relate only to the items tested.

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. [redacted]
Site Location:

Quality Assurance Report

Maxxam Job Number: [redacted]

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2999190 ZZH	QC Standard	Carbonaceous BOD	2012/10/17		101	%	80 - 120
	Spiked Blank	Carbonaceous BOD	2012/10/17		98	%	80 - 120
	Method Blank	Carbonaceous BOD	2012/10/17	ND, RDL=5.0		mg/L	
	RPD	Carbonaceous BOD	2012/10/17	NC		%	25
2999976 AWM	QC Standard	Total Dissolved Solids	2012/10/16		100	%	80 - 120
	Method Blank	Total Dissolved Solids	2012/10/16	ND, RDL=10		mg/L	
	RPD [PE2308-02]	Total Dissolved Solids	2012/10/16	0.5		%	25
3001038 XQI	Matrix Spike	Sulphide	2012/10/15		99	%	80 - 120
	Spiked Blank	Sulphide	2012/10/15		96	%	80 - 120
	Method Blank	Sulphide	2012/10/15	ND, RDL=0.020		mg/L	
	RPD	Sulphide	2012/10/15	NC		%	20
3001210 DLB	Matrix Spike	Total Aluminum (Al)	2012/10/16		105	%	80 - 120
		Total Antimony (Sb)	2012/10/16		109	%	80 - 120
		Total Arsenic (As)	2012/10/16		105	%	80 - 120
		Total Barium (Ba)	2012/10/16		96	%	80 - 120
		Total Beryllium (Be)	2012/10/16		100	%	80 - 120
		Total Bismuth (Bi)	2012/10/16		111	%	80 - 120
		Total Boron (B)	2012/10/16		100	%	80 - 120
		Total Cadmium (Cd)	2012/10/16		96	%	80 - 120
		Total Calcium (Ca)	2012/10/16		96	%	80 - 120
		Total Chromium (Cr)	2012/10/16		101	%	80 - 120
		Total Cobalt (Co)	2012/10/16		100	%	80 - 120
		Total Copper (Cu)	2012/10/16		NC	%	80 - 120
		Total Iron (Fe)	2012/10/16		114	%	80 - 120
		Total Lead (Pb)	2012/10/16		98	%	80 - 120
		Total Lithium (Li)	2012/10/16		107	%	80 - 120
		Total Magnesium (Mg)	2012/10/16		113	%	80 - 120
		Total Manganese (Mn)	2012/10/16		107	%	80 - 120
		Total Molybdenum (Mo)	2012/10/16		111	%	80 - 120
		Total Nickel (Ni)	2012/10/16		106	%	80 - 120
		Total Potassium (K)	2012/10/16		109	%	80 - 120
		Total Selenium (Se)	2012/10/16		101	%	80 - 120
		Total Silver (Ag)	2012/10/16		108	%	80 - 120
		Total Sodium (Na)	2012/10/16		110	%	80 - 120
		Total Strontium (Sr)	2012/10/16		106	%	80 - 120
		Total Thallium (Tl)	2012/10/16		108	%	80 - 120
		Total Tin (Sn)	2012/10/16		108	%	80 - 120
		Total Titanium (Ti)	2012/10/16		104	%	80 - 120
		Total Uranium (U)	2012/10/16		115	%	80 - 120
		Total Vanadium (V)	2012/10/16		103	%	80 - 120
		Total Zinc (Zn)	2012/10/16		106	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2012/10/16		104	%	80 - 120
		Total Antimony (Sb)	2012/10/16		104	%	80 - 120
		Total Arsenic (As)	2012/10/16		100	%	80 - 120
		Total Barium (Ba)	2012/10/16		91	%	80 - 120
		Total Beryllium (Be)	2012/10/16		98	%	80 - 120
		Total Bismuth (Bi)	2012/10/16		106	%	80 - 120
		Total Boron (B)	2012/10/16		99	%	80 - 120
		Total Cadmium (Cd)	2012/10/16		95	%	80 - 120
		Total Calcium (Ca)	2012/10/16		97	%	80 - 120
		Total Chromium (Cr)	2012/10/16		98	%	80 - 120
		Total Cobalt (Co)	2012/10/16		96	%	80 - 120
		Total Copper (Cu)	2012/10/16		98	%	80 - 120
		Total Iron (Fe)	2012/10/16		110	%	80 - 120
		Total Lead (Pb)	2012/10/16		93	%	80 - 120

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. #
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2F8221

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3001210 DLB	Spiked Blank	Total Lithium (Li)	2012/10/16		103	%	80 - 120
		Total Magnesium (Mg)	2012/10/16		107	%	80 - 120
		Total Manganese (Mn)	2012/10/16		101	%	80 - 120
		Total Molybdenum (Mo)	2012/10/16		104	%	80 - 120
		Total Nickel (Ni)	2012/10/16		103	%	80 - 120
		Total Potassium (K)	2012/10/16		105	%	80 - 120
		Total Selenium (Se)	2012/10/16		101	%	80 - 120
		Total Silver (Ag)	2012/10/16		103	%	80 - 120
		Total Sodium (Na)	2012/10/16		106	%	80 - 120
		Total Strontium (Sr)	2012/10/16		102	%	80 - 120
		Total Thallium (Tl)	2012/10/16		104	%	80 - 120
		Total Tin (Sn)	2012/10/16		105	%	80 - 120
		Total Titanium (Ti)	2012/10/16		102	%	80 - 120
		Total Uranium (U)	2012/10/16		108	%	80 - 120
		Total Vanadium (V)	2012/10/16		100	%	80 - 120
		Total Zinc (Zn)	2012/10/16		102	%	80 - 120
	Method Blank	Total Aluminum (Al)	2012/10/16	ND, RDL=5.0		ug/L	
		Total Antimony (Sb)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Arsenic (As)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Barium (Ba)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Beryllium (Be)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Bismuth (Bi)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Boron (B)	2012/10/16	ND, RDL=50		ug/L	
		Total Cadmium (Cd)	2012/10/16	ND, RDL=0.017		ug/L	
		Total Calcium (Ca)	2012/10/16	ND, RDL=100		ug/L	
		Total Chromium (Cr)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Cobalt (Co)	2012/10/16	ND, RDL=0.40		ug/L	
		Total Copper (Cu)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Iron (Fe)	2012/10/16	ND, RDL=50		ug/L	
		Total Lead (Pb)	2012/10/16	ND, RDL=0.50		ug/L	
		Total Lithium (Li)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Magnesium (Mg)	2012/10/16	ND, RDL=100		ug/L	
		Total Manganese (Mn)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Molybdenum (Mo)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Nickel (Ni)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Potassium (K)	2012/10/16	ND, RDL=100		ug/L	
		Total Selenium (Se)	2012/10/16	ND, RDL=1.0		ug/L	
		Total Silver (Ag)	2012/10/16	ND, RDL=0.10		ug/L	
		Total Sodium (Na)	2012/10/16	ND, RDL=100		ug/L	
		Total Strontium (Sr)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Thallium (Tl)	2012/10/16	ND, RDL=0.10		ug/L	
		Total Tin (Sn)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Titanium (Ti)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Uranium (U)	2012/10/16	ND, RDL=0.10		ug/L	
		Total Vanadium (V)	2012/10/16	ND, RDL=2.0		ug/L	
		Total Zinc (Zn)	2012/10/16	ND, RDL=5.0		ug/L	
	RPD	Total Aluminum (Al)	2012/10/16	1.2		%	25
		Total Antimony (Sb)	2012/10/16	NC		%	25
		Total Arsenic (As)	2012/10/16	NC		%	25
		Total Barium (Ba)	2012/10/16	NC		%	25
		Total Beryllium (Be)	2012/10/16	NC		%	25
		Total Bismuth (Bi)	2012/10/16	NC		%	25
		Total Boron (B)	2012/10/16	NC		%	25
		Total Cadmium (Cd)	2012/10/16	NC		%	25
		Total Calcium (Ca)	2012/10/16	0.4		%	25

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. [redacted]
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2F8221

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3001210 DLB	RPD	Total Chromium (Cr)	2012/10/16	NC		%	25
		Total Cobalt (Co)	2012/10/16	NC		%	25
		Total Copper (Cu)	2012/10/16	NC		%	25
		Total Iron (Fe)	2012/10/16	NC		%	25
		Total Lead (Pb)	2012/10/16	NC		%	25
		Total Magnesium (Mg)	2012/10/16	NC		%	25
		Total Manganese (Mn)	2012/10/16	NC		%	25
		Total Molybdenum (Mo)	2012/10/16	NC		%	25
		Total Nickel (Ni)	2012/10/16	NC		%	25
		Total Potassium (K)	2012/10/16	NC		%	25
		Total Selenium (Se)	2012/10/16	NC		%	25
		Total Silver (Ag)	2012/10/16	NC		%	25
		Total Sodium (Na)	2012/10/16	2.0		%	25
		Total Strontium (Sr)	2012/10/16	3.7		%	25
		Total Thallium (Tl)	2012/10/16	NC		%	25
		Total Tin (Sn)	2012/10/16	NC		%	25
		Total Titanium (Ti)	2012/10/16	NC		%	25
		Total Uranium (U)	2012/10/16	NC		%	25
		Total Vanadium (V)	2012/10/16	NC		%	25
		Total Zinc (Zn)	2012/10/16	NC		%	25
3001484 CDS	Matrix Spike	Total Oil & Grease	2012/10/16		84	%	70 - 130
	Spiked Blank	Total Oil & Grease	2012/10/16		97	%	70 - 130
	Method Blank	Total Oil & Grease	2012/10/16	ND, RDL=5.0		mg/L	
	RPD [PE2308-16]	Total Oil & Grease	2012/10/16	NC		%	40
3002693 CAC	Matrix Spike	Total Chemical Oxygen Demand	2012/10/16		109	%	80 - 120
	QC Standard	Total Chemical Oxygen Demand	2012/10/16		103	%	80 - 120
	Spiked Blank	Total Chemical Oxygen Demand	2012/10/16		108	%	80 - 120
	Method Blank	Total Chemical Oxygen Demand	2012/10/16	ND, RDL=20		mg/L	
3002830 JOA	Matrix Spike	Total Phosphorus	2012/10/17		106	%	80 - 120
	Spiked Blank	Total Phosphorus	2012/10/17		103	%	80 - 120
	Method Blank	Total Phosphorus	2012/10/17	ND, RDL=0.020		mg/L	
	RPD	Total Phosphorus	2012/10/17	0.3		%	25
3003022 SCR	QC Standard	pH	2012/10/16		100	%	80 - 120
	RPD	pH	2012/10/16	0.3		%	25
3003027 SCR	Spiked Blank	Conductivity	2012/10/16		101	%	80 - 120
	Method Blank	Conductivity	2012/10/16	1.0, RDL=1.0		uS/cm	
	RPD	Conductivity	2012/10/16	0		%	25
3003236 TPE	Matrix Spike	Dissolved Fluoride (F-)	2012/10/16		98	%	80 - 120
	Spiked Blank	Dissolved Fluoride (F-)	2012/10/16		96	%	80 - 120
	Method Blank	Dissolved Fluoride (F-)	2012/10/16	ND, RDL=0.10		mg/L	
	RPD	Dissolved Fluoride (F-)	2012/10/16	NC		%	25
3003473 ARS	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2012/10/18		NC	%	80 - 120
	QC Standard	Nitrogen (Ammonia Nitrogen)	2012/10/18		104	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2012/10/18		98	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2012/10/18	ND, RDL=0.050		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2012/10/18	0.2		%	25
3004053 AWM	QC Standard	Total Suspended Solids	2012/10/18		101	%	80 - 120
	Method Blank	Total Suspended Solids	2012/10/18	ND, RDL=1.0		mg/L	
	RPD	Total Suspended Solids	2012/10/18	2.4		%	25
3004262 ALG	Matrix Spike	Dissolved Chloride (Cl)	2012/10/18		98	%	80 - 120
	QC Standard	Dissolved Chloride (Cl)	2012/10/18		102	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2012/10/18		100	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2012/10/18	ND, RDL=1.0		mg/L	
	RPD	Dissolved Chloride (Cl)	2012/10/18	0.7		%	25
3004264 JOA	Matrix Spike	Dissolved Sulphate (SO4)	2012/10/18		NC	%	80 - 120

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. #: [redacted]
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2F8221

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3004264 JOA	QC Standard	Dissolved Sulphate (SO4)	2012/10/18		98	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2012/10/18		101	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2012/10/18	ND, RDL=2.0		mg/L	
	RPD	Dissolved Sulphate (SO4)	2012/10/18	4.3		%	25
3004284 ARS	Matrix Spike	Nitrate + Nitrite	2012/10/19		98	%	80 - 120
	QC Standard	Nitrate + Nitrite	2012/10/19		98	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2012/10/19		98	%	80 - 120
	Method Blank	Nitrate + Nitrite	2012/10/19	ND, RDL=0.050		mg/L	
	RPD	Nitrate + Nitrite	2012/10/19	NC		%	25
3004285 ABU	Matrix Spike	Nitrite (N)	2012/10/18		94	%	80 - 120
	QC Standard	Nitrite (N)	2012/10/18		96	%	80 - 120
	Spiked Blank	Nitrite (N)	2012/10/18		98	%	80 - 120
	Method Blank	Nitrite (N)	2012/10/18	ND, RDL=0.010		mg/L	
	RPD	Nitrite (N)	2012/10/18	NC		%	25
3004317 CRA	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2012/10/17		NC	%	80 - 120
	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2012/10/17		93	%	80 - 120
	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2012/10/17	ND, RDL=0.0020		mg/L	
3006445 CRA	Matrix Spike	Phenols-4AAP	2012/10/18		97	%	80 - 120
	Spiked Blank	Phenols-4AAP	2012/10/18		103	%	80 - 120
	Method Blank	Phenols-4AAP	2012/10/18	ND, RDL=0.0010		mg/L	
	RPD	Phenols-4AAP	2012/10/18	1.8		%	25
3007780 MJL	Matrix Spike	Total Mercury (Hg)	2012/10/19		78 (1)	%	80 - 120
	QC Standard	Total Mercury (Hg)	2012/10/19		79 (2)	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2012/10/19		104	%	80 - 120
	Method Blank	Total Mercury (Hg)	2012/10/19	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2012/10/19	NC		%	25
3008640 AHA	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2012/10/21		NC	%	80 - 120
	QC Standard	Total Kjeldahl Nitrogen (TKN)	2012/10/21		101	%	85 - 115
	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2012/10/21		103	%	85 - 115
	Method Blank	Total Kjeldahl Nitrogen (TKN)	2012/10/21	ND, RDL=0.10		mg/L	
	RPD	Total Kjeldahl Nitrogen (TKN)	2012/10/21	0.2		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Low spike recovery due to possible lab spiking error.
(2) Low recovery due to possible lab spiking error.

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Maxxam

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Your P.O. #: [redacted]
Your C.O.C. #: N/A

Attention: [redacted]
Atlantic Industrial Services
PO Box 185
680 MacElmon Rd
Debert, NS
B0M 1G0

Report Date: 2012/11/14

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B2H1174
Received: 2012/11/01, 11:22

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonaceous BOD	1	N/A	2012/11/07	ATL SOP 00041	Based on APHA 5210B
Chloride	1	N/A	2012/11/07	ATL SOP 00014	Based on SM4500-Cl-
Str. Acid Diss. Cyanide water (4)	1	N/A	2012/11/05	ATL SOP 00040	Based on EPA335.3
Chemical Oxygen Demand (COD)	1	N/A	2012/11/07	ATL SOP 00042	Based on SM5220D
Hexavalent Cr Low Level (Sub fr Bedford) (1)	1	2012/11/02	2012/11/07		
Conductance - water	1	N/A	2012/11/07	ATL SOP 00004/00006	Based on SM2510B
Fluoride	1	N/A	2012/11/06	ATL SOP 00043	Based on SM4500F-C
Glycol in Water (2)	1	2012/11/02	2012/11/09		
Mercury - Total (CVAA,LL)	1	2012/11/13	2012/11/13	ATL SOP 00026	Based on EPA245.1
Metals Water Total MS	1	2012/11/05	2012/11/06	ATL SOP 00059	Based on EPA6020A
Nitrogen Ammonia - water	1	N/A	2012/11/07	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite	1	N/A	2012/11/08	ATL SOP 00016	Based on USGS - Enz.
Nitrogen - Nitrite	1	N/A	2012/11/07	ATL SOP 00017	Based on SM4500-NO2B
Nitrogen - Nitrate (as N)	1	N/A	2012/11/09	ATL SOP 00018	Based on ASTMD3867
Phenols (4-AAP)	1	N/A	2012/11/02	ATL SOP 00039	Based on EPA 420.2
pH	1	N/A	2012/11/07	ATL SOP 00003	Based on SM4500H+B
Sulphate	1	N/A	2012/11/07	ATL SOP 00023	Based on EPA 375.4
Sulphide (3)	1	N/A	2012/11/06	CAM SOP-00455	SM 4500-S G
Total Dissolved Solids (Filt. Residue)	1	N/A	2012/11/07	ATL SOP 00009	EPA 160.1
Total Kjeldahl Nitrogen In Water (3)	1	2012/11/08	2012/11/09	CAM SOP-00454	EPA 351.2 Rev 2
Total Oil and Grease - Water	1	2012/11/06	2012/11/07	ATL SOP 00101	Based on EPA1664
Phosphorus Total Colourimetry	1	2012/11/08	2012/11/14	ATL SOP 00057	Based on EPA365.1
Total Suspended Solids	1	N/A	2012/11/08	ATL SOP 00007	based on EPA 160.2

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford to Burnaby Env
(2) This test was performed by Bedford to Calgary Subcontract
(3) This test was performed by Maxxam Analytics Mississauga

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(4) Strong acid dissociable cyanide value may include contribution from thiocyanate.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

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Maxxam

Success Through Science®

Maxxam Job #: [redacted]
Report Date: 2[redacted]

Atlantic Industrial Services

Your P.O. #: [redacted]

RESULTS OF ANALYSES OF WATER

Maxxam ID		PL3440		
Sampling Date		2012/10/31		
COC Number		N/A		
	Units	**LAGOON # 6 - MIDWAY**	**RDL**	**QC Batch**
Calculated Parameters				
Nitrate (N)	mg/L	ND	0.050	3022490
Inorganics				
Carbonaceous BOD	mg/L	ND	5.0	3023637
Total Chemical Oxygen Demand	mg/L	310	100	3026763
Dissolved Chloride (Cl)	mg/L	5400	120	3026932
Strong Acid Dissoc. Cyanide (CN)	mg/L	ND	0.0020	3025713
Total Dissolved Solids	mg/L	8600	400	3027332
Dissolved Fluoride (F-)	mg/L	ND	0.10	3027014
Total Kjeldahl Nitrogen (TKN)	mg/L	0.21	0.10	3030500
Nitrate + Nitrite	mg/L	ND	0.050	3026942
Nitrite (N)	mg/L	ND	0.010	3026943
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	3027380
pH	pH	7.42	N/A	3028842
Phenols-4AAP	mg/L	0.059 (1)	0.020	3024140
Total Phosphorus	mg/L	0.029	0.020	3029974
Total Suspended Solids	mg/L	ND	1.0	3028249
Dissolved Sulphate (SO4)	mg/L	15	2.0	3026935
Sulphide	mg/L	ND	0.020	3027019
Conductivity	uS/cm	15000	1.0	3028849
Subcontracted Analysis				
Subcontract Parameter	N/A	ATTACHED	N/A	3024349
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	ND	5.0	3026766

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated reporting limit due to sample matrix.

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Maxxam

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Maxxam Job #[redacted]
Report Date: 2012/11/14

Atlantic Industrial Services

Your P.O. #[redacted]

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		PL3440		
Sampling Date		2012/10/31		
COC Number		N/A		
	Units	**LAGOON # 6 - MIDWAY**	**RDL**	**QC Batch**
Metals				
Total Mercury (Hg)	ug/L	ND	0.013	3034036

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: [redacted]
Report Date: 2012/11/14

Atlantic Industrial Services

Your P.O. #: [redacted]

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		PL3440		
Sampling Date		2012/10/31		
COC Number		N/A		
	Units	**LAGOON # 6 - MIDWAY**	**RDL**	**QC Batch**
Metals				
Total Aluminum (Al)	ug/L	113	5.0	3025414
Total Antimony (Sb)	ug/L	1.1	1.0	3025414
Total Arsenic (As)	ug/L	12.4	1.0	3025414
Total Barium (Ba)	ug/L	1330	1.0	3025414
Total Beryllium (Be)	ug/L	ND	1.0	3025414
Total Bismuth (Bi)	ug/L	ND	2.0	3025414
Total Boron (B)	ug/L	ND	50	3025414
Total Cadmium (Cd)	ug/L	ND	0.017	3025414
Total Calcium (Ca)	ug/L	133000	100	3025414
Total Chromium (Cr)	ug/L	ND	1.0	3025414
Total Cobalt (Co)	ug/L	ND	0.40	3025414
Total Copper (Cu)	ug/L	ND	2.0	3025414
Total Iron (Fe)	ug/L	ND	50	3025414
Total Lead (Pb)	ug/L	0.68	0.50	3025414
Total Lithium (Li)	ug/L	196	2.0	3025414
Total Magnesium (Mg)	ug/L	47700	100	3025414
Total Manganese (Mn)	ug/L	11.2	2.0	3025414
Total Molybdenum (Mo)	ug/L	8.7	2.0	3025414
Total Nickel (Ni)	ug/L	ND	2.0	3025414
Total Potassium (K)	ug/L	8400	100	3025414
Total Selenium (Se)	ug/L	ND	1.0	3025414
Total Silver (Ag)	ug/L	ND	0.10	3025414
Total Sodium (Na)	ug/L	3240000	100	3025414
Total Strontium (Sr)	ug/L	5010	20	3025414
Total Thallium (Tl)	ug/L	ND	0.10	3025414
Total Tin (Sn)	ug/L	ND	2.0	3025414
Total Titanium (Ti)	ug/L	ND	2.0	3025414
Total Uranium (U)	ug/L	0.24	0.10	3025414
Total Vanadium (V)	ug/L	ND	2.0	3025414

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: P
Report Date: 2012/11/14

Atlantic Industrial Services

Your P.O. #: [redacted]

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		PL3440		
Sampling Date		2012/10/31		
COC Number		N/A		
	Units	**LAGOON # 6 - MIDWAY**	**RDL**	**QC Batch**
Total Zinc (Zn)	ug/L	17.4	5.0	3025414

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job [redacted]
Report Date: 2012/11/14

Atlantic Industrial Services

Your P.O. #: [redacted]

Package 1	9.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Results relate only to the items tested.

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. #: [redacted]
Site Location:

Quality Assurance Report

Maxxam Job Number: DB2H1174

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3023637 JPA	QC Standard	Carbonaceous BOD	2012/11/07		108	%	80 - 120
	Spiked Blank	Carbonaceous BOD	2012/11/07		96	%	80 - 120
	Method Blank	Carbonaceous BOD	2012/11/07	ND, RDL=5.0		mg/L	
	RPD	Carbonaceous BOD	2012/11/07	NC		%	25
3024140 CRA	Matrix Spike	Phenols-4AAP	2012/11/02		95	%	80 - 120
	Spiked Blank	Phenols-4AAP	2012/11/02		95	%	80 - 120
	Method Blank	Phenols-4AAP	2012/11/02	ND, RDL=0.0010		mg/L	
	RPD	Phenols-4AAP	2012/11/02	NC		%	25
3025414 DLB	Matrix Spike	Total Aluminum (Al)	2012/11/06		99	%	80 - 120
		Total Antimony (Sb)	2012/11/06		98	%	80 - 120
		Total Arsenic (As)	2012/11/06		97	%	80 - 120
		Total Barium (Ba)	2012/11/06		92	%	80 - 120
		Total Beryllium (Be)	2012/11/06		93	%	80 - 120
		Total Bismuth (Bi)	2012/11/06		100	%	80 - 120
		Total Boron (B)	2012/11/06		92	%	80 - 120
		Total Cadmium (Cd)	2012/11/06		95	%	80 - 120
		Total Calcium (Ca)	2012/11/06		95	%	80 - 120
		Total Chromium (Cr)	2012/11/06		93	%	80 - 120
		Total Cobalt (Co)	2012/11/06		95	%	80 - 120
		Total Copper (Cu)	2012/11/06		95	%	80 - 120
		Total Iron (Fe)	2012/11/06		102	%	80 - 120
		Total Lead (Pb)	2012/11/06		93	%	80 - 120
		Total Lithium (Li)	2012/11/06		100	%	80 - 120
		Total Magnesium (Mg)	2012/11/06		102	%	80 - 120
		Total Manganese (Mn)	2012/11/06		97	%	80 - 120
		Total Molybdenum (Mo)	2012/11/06		98	%	80 - 120
		Total Nickel (Ni)	2012/11/06		98	%	80 - 120
		Total Potassium (K)	2012/11/06		103	%	80 - 120
		Total Selenium (Se)	2012/11/06		98	%	80 - 120
		Total Silver (Ag)	2012/11/06		99	%	80 - 120
		Total Sodium (Na)	2012/11/06		NC	%	80 - 120
		Total Strontium (Sr)	2012/11/06		99	%	80 - 120
		Total Thallium (Tl)	2012/11/06		98	%	80 - 120
		Total Tin (Sn)	2012/11/06		99	%	80 - 120
		Total Titanium (Ti)	2012/11/06		101	%	80 - 120
		Total Uranium (U)	2012/11/06		104	%	80 - 120
		Total Vanadium (V)	2012/11/06		97	%	80 - 120
		Total Zinc (Zn)	2012/11/06		95	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2012/11/06		101	%	80 - 120
		Total Antimony (Sb)	2012/11/06		100	%	80 - 120
		Total Arsenic (As)	2012/11/06		99	%	80 - 120
		Total Barium (Ba)	2012/11/06		94	%	80 - 120
		Total Beryllium (Be)	2012/11/06		95	%	80 - 120
		Total Bismuth (Bi)	2012/11/06		103	%	80 - 120
		Total Boron (B)	2012/11/06		94	%	80 - 120
		Total Cadmium (Cd)	2012/11/06		95	%	80 - 120
		Total Calcium (Ca)	2012/11/06		98	%	80 - 120
		Total Chromium (Cr)	2012/11/06		96	%	80 - 120
		Total Cobalt (Co)	2012/11/06		97	%	80 - 120
		Total Copper (Cu)	2012/11/06		97	%	80 - 120
		Total Iron (Fe)	2012/11/06		104	%	80 - 120
		Total Lead (Pb)	2012/11/06		95	%	80 - 120
		Total Lithium (Ll)	2012/11/06		101	%	80 - 120
		Total Magnesium (Mg)	2012/11/06		103	%	80 - 120
		Total Manganese (Mn)	2012/11/06		100	%	80 - 120

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. #: [redacted]
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2H1174

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3025414 DLB	Spiked Blank	Total Molybdenum (Mo)	2012/11/06		102	%	80 - 120
		Total Nickel (Ni)	2012/11/06		102	%	80 - 120
		Total Potassium (K)	2012/11/06		103	%	80 - 120
		Total Selenium (Se)	2012/11/06		99	%	80 - 120
		Total Silver (Ag)	2012/11/06		102	%	80 - 120
		Total Sodium (Na)	2012/11/06		102	%	80 - 120
		Total Strontium (Sr)	2012/11/06		101	%	80 - 120
		Total Thallium (Tl)	2012/11/06		100	%	80 - 120
		Total Tin (Sn)	2012/11/06		100	%	80 - 120
		Total Titanium (Ti)	2012/11/06		106	%	80 - 120
		Total Uranium (U)	2012/11/06		105	%	80 - 120
		Total Vanadium (V)	2012/11/06		98	%	80 - 120
		Total Zinc (Zn)	2012/11/06		100	%	80 - 120
	Method Blank	Total Aluminum (Al)	2012/11/06	ND, RDL=5.0		ug/L	
		Total Antimony (Sb)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Arsenic (As)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Barium (Ba)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Beryllium (Be)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Bismuth (Bi)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Boron (B)	2012/11/06	ND, RDL=50		ug/L	
		Total Cadmium (Cd)	2012/11/06	ND, RDL=0.017		ug/L	
		Total Calcium (Ca)	2012/11/06	ND, RDL=100		ug/L	
		Total Chromium (Cr)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Cobalt (Co)	2012/11/06	ND, RDL=0.40		ug/L	
		Total Copper (Cu)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Iron (Fe)	2012/11/06	ND, RDL=50		ug/L	
		Total Lead (Pb)	2012/11/06	ND, RDL=0.50		ug/L	
		Total Lithium (Li)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Magnesium (Mg)	2012/11/06	ND, RDL=100		ug/L	
		Total Manganese (Mn)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Molybdenum (Mo)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Nickel (Ni)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Potassium (K)	2012/11/06	ND, RDL=100		ug/L	
		Total Selenium (Se)	2012/11/06	ND, RDL=1.0		ug/L	
		Total Silver (Ag)	2012/11/06	ND, RDL=0.10		ug/L	
		Total Sodium (Na)	2012/11/06	ND, RDL=100		ug/L	
		Total Strontium (Sr)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Thallium (Tl)	2012/11/06	ND, RDL=0.10		ug/L	
		Total Tin (Sn)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Titanium (Ti)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Uranium (U)	2012/11/06	ND, RDL=0.10		ug/L	
		Total Vanadium (V)	2012/11/06	ND, RDL=2.0		ug/L	
		Total Zinc (Zn)	2012/11/06	ND, RDL=5.0		ug/L	
	RPD	Total Aluminum (Al)	2012/11/06	NC		%	25
		Total Antimony (Sb)	2012/11/06	NC		%	25
		Total Arsenic (As)	2012/11/06	NC		%	25
		Total Barium (Ba)	2012/11/06	4.6		%	25
		Total Beryllium (Be)	2012/11/06	NC		%	25
		Total Bismuth (Bi)	2012/11/06	NC		%	25
		Total Boron (B)	2012/11/06	NC		%	25
		Total Cadmium (Cd)	2012/11/06	NC		%	25
		Total Calcium (Ca)	2012/11/06	6.3		%	25
		Total Chromium (Cr)	2012/11/06	NC		%	25
		Total Cobalt (Co)	2012/11/06	NC		%	25
		Total Copper (Cu)	2012/11/06	7.0		%	25

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Atlantic Industrial Services
Attention: [redacted]
Client Project #:
P.O. #: [redacted]
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2H1174

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3025414 DLB	RPD	Total Iron (Fe)	2012/11/06	NC		%	25
		Total Lead (Pb)	2012/11/06	NC		%	25
		Total Magnesium (Mg)	2012/11/06	9.7		%	25
		Total Manganese (Mn)	2012/11/06	6.4		%	25
		Total Molybdenum (Mo)	2012/11/06	NC		%	25
		Total Nickel (Ni)	2012/11/06	NC		%	25
		Total Potassium (K)	2012/11/06	6.6		%	25
		Total Selenium (Se)	2012/11/06	NC		%	25
		Total Silver (Ag)	2012/11/06	NC		%	25
		Total Sodium (Na)	2012/11/06	7.9		%	25
		Total Strontium (Sr)	2012/11/06	10.1		%	25
		Total Thallium (Tl)	2012/11/06	NC		%	25
		Total Tin (Sn)	2012/11/06	NC		%	25
		Total Titanium (Ti)	2012/11/06	NC		%	25
		Total Uranium (U)	2012/11/06	NC		%	25
		Total Vanadium (V)	2012/11/06	NC		%	25
		Total Zinc (Zn)	2012/11/06	NC		%	25
3025713 CRA	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2012/11/05		NC	%	80 - 120
	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2012/11/05		96	%	80 - 120
	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2012/11/05	ND, RDL=0.0020		mg/L	
	RPD	Strong Acid Dissoc. Cyanide (CN)	2012/11/05	1.5		%	25
3026763 ZZH	Matrix Spike	Total Chemical Oxygen Demand	2012/11/07		104	%	80 - 120
	QC Standard	Total Chemical Oxygen Demand	2012/11/07		98	%	80 - 120
	Spiked Blank	Total Chemical Oxygen Demand	2012/11/07		105	%	80 - 120
	Method Blank	Total Chemical Oxygen Demand	2012/11/07	ND, RDL=20		mg/L	
	RPD	Total Chemical Oxygen Demand	2012/11/07	NC		%	25
3026766 CDS	Matrix Spike	Total Oil & Grease	2012/11/06		102	%	70 - 130
	Spiked Blank	Total Oil & Grease	2012/11/06		94	%	70 - 130
	Method Blank	Total Oil & Grease	2012/11/06	ND, RDL=5.0		mg/L	
	RPD	Total Oil & Grease	2012/11/06	NC		%	40
3026932 JOA	Matrix Spike	Dissolved Chloride (Cl)	2012/11/07		NC	%	80 - 120
	QC Standard	Dissolved Chloride (Cl)	2012/11/07		101	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2012/11/07		95	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2012/11/07	ND, RDL=1.0		mg/L	
	RPD	Dissolved Chloride (Cl)	2012/11/07	1.2		%	25
3026935 ALG	Matrix Spike	Dissolved Sulphate (SO4)	2012/11/07		NC	%	80 - 120
	QC Standard	Dissolved Sulphate (SO4)	2012/11/07		102	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2012/11/07		94	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2012/11/07	ND, RDL=2.0		mg/L	
	RPD	Dissolved Sulphate (SO4)	2012/11/07	3.5		%	25
3026942 ARS	Matrix Spike	Nitrate + Nitrite	2012/11/08		96	%	80 - 120
	QC Standard	Nitrate + Nitrite	2012/11/08		99	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2012/11/08		102	%	80 - 120
	Method Blank	Nitrate + Nitrite	2012/11/08	ND, RDL=0.050		mg/L	
	RPD	Nitrate + Nitrite	2012/11/08	NC		%	25
3026943 JOA	Matrix Spike	Nitrite (N)	2012/11/07		99	%	80 - 120
	QC Standard	Nitrite (N)	2012/11/07		98	%	80 - 120
	Spiked Blank	Nitrite (N)	2012/11/07		104	%	80 - 120
	Method Blank	Nitrite (N)	2012/11/07	ND, RDL=0.010		mg/L	
	RPD	Nitrite (N)	2012/11/07	NC		%	25
3027014 TPE	Matrix Spike	Dissolved Fluoride (F-)	2012/11/06		97	%	80 - 120
	Spiked Blank	Dissolved Fluoride (F-)	2012/11/06		98	%	80 - 120
	Method Blank	Dissolved Fluoride (F-)	2012/11/06	ND, RDL=0.10		mg/L	
	RPD	Dissolved Fluoride (F-)	2012/11/06	NC		%	25
3027019 XQI	Matrix Spike	Sulphide	2012/11/06		NC (1)	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Atlantic Industrial Services
Attention: [redacted]
Client Proj[redacted]
P.O. #[redacted]
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: DB2H1174

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3027019 XQI	Spiked Blank	Sulphide	2012/11/06		102	%	80 - 120
	Method Blank	Sulphide	2012/11/06	ND, RDL=0.020		mg/L	
	RPD	Sulphide	2012/11/06	0		%	20
3027332 AWM	QC Standard	Total Dissolved Solids	2012/11/07		103	%	80 - 120
	Method Blank	Total Dissolved Solids	2012/11/07	ND, RDL=10		mg/L	
	RPD	Total Dissolved Solids	2012/11/07	NC		%	25
3027380 ARS	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2012/11/07		92	%	80 - 120
	QC Standard	Nitrogen (Ammonia Nitrogen)	2012/11/07		101	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2012/11/07		89	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2012/11/07	ND, RDL=0.050		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2012/11/07	NC		%	25
3028249 AWM	QC Standard	Total Suspended Solids	2012/11/08		103	%	80 - 120
	Method Blank	Total Suspended Solids	2012/11/08	ND, RDL=1.0		mg/L	
	RPD	Total Suspended Solids	2012/11/08	0		%	25
3028842 SCR	QC Standard	pH	2012/11/07		100	%	80 - 120
	RPD	pH	2012/11/07	0.3		%	25
3028849 SCR	Spiked Blank	Conductivity	2012/11/07		98	%	80 - 120
	Method Blank	Conductivity	2012/11/07	ND, RDL=1.0		uS/cm	
	RPD	Conductivity	2012/11/07	0.8		%	25
3029974 JOA	Matrix Spike	Total Phosphorus	2012/11/14		NC	%	80 - 120
	Spiked Blank	Total Phosphorus	2012/11/14		105	%	80 - 120
	Method Blank	Total Phosphorus	2012/11/14	ND, RDL=0.020		mg/L	
	RPD	Total Phosphorus	2012/11/14	1.0		%	25
3030500 C_N	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2012/11/09		NC	%	80 - 120
	QC Standard	Total Kjeldahl Nitrogen (TKN)	2012/11/09		89	%	85 - 115
	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2012/11/09		89	%	85 - 115
	Method Blank	Total Kjeldahl Nitrogen (TKN)	2012/11/09	ND, RDL=0.10		mg/L	
	RPD	Total Kjeldahl Nitrogen (TKN)	2012/11/09	2.6		%	20
3034036 MJL	Matrix Spike	Total Mercury (Hg)	2012/11/13		NC	%	80 - 120
	QC Standard	Total Mercury (Hg)	2012/11/13		98	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2012/11/13		102	%	80 - 120
	Method Blank	Total Mercury (Hg)	2012/11/13	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2012/11/13	NC		%	25

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) The recovery in the matrix spike was not calculated (NC). Spiked concentration was less than 2x that native to the sample.

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Maxxam

Success Through Science®

Your Project #: [redacted]
Your C.O.C. #: [redacted]

Attention: BEDFORD CLIENT SERVICE
MAXXAM ANALYTICS
200 BLUEWATER ROAD, SUITE 105
BEDFORD, NS
CANADA B4B 1G9

Report Date: 2012/11/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: [redacted]
Received: 2012/11/03, 10:40

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chromium, Hexavalent	1	N/A	2012/11/06	BBY6SOP-00015	SM-3500Cr B

* Results relate only to the items tested.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

[redacted]

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This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam

Success through Sciences

Maxxam Job #: [redacted]
Report Date: 2012/11/06

MAXXAM ANALYTICS
Client Project #: [redacted]

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		EX7546		
Sampling Date		2012/10/31		
	UNITS	LAGOON # 6 - MIDWAY (PL3440-14R)	RDL	QC Batch
Metals				
Hex. Chromium (Cr 6+)	mg/L	0.0031	0.0010	6321133

RDL = Reportable Detection Limit

Maxxam Job #: [redacted]
Report Date: 2012/11/06

MAXXAM ANALYTICS
Client Project #: [redacted]

Package 1	3.7°C
Package 2	3.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam

Success through Science

Maxxam Job #: [redacted]
Report Date: 2012/11/06

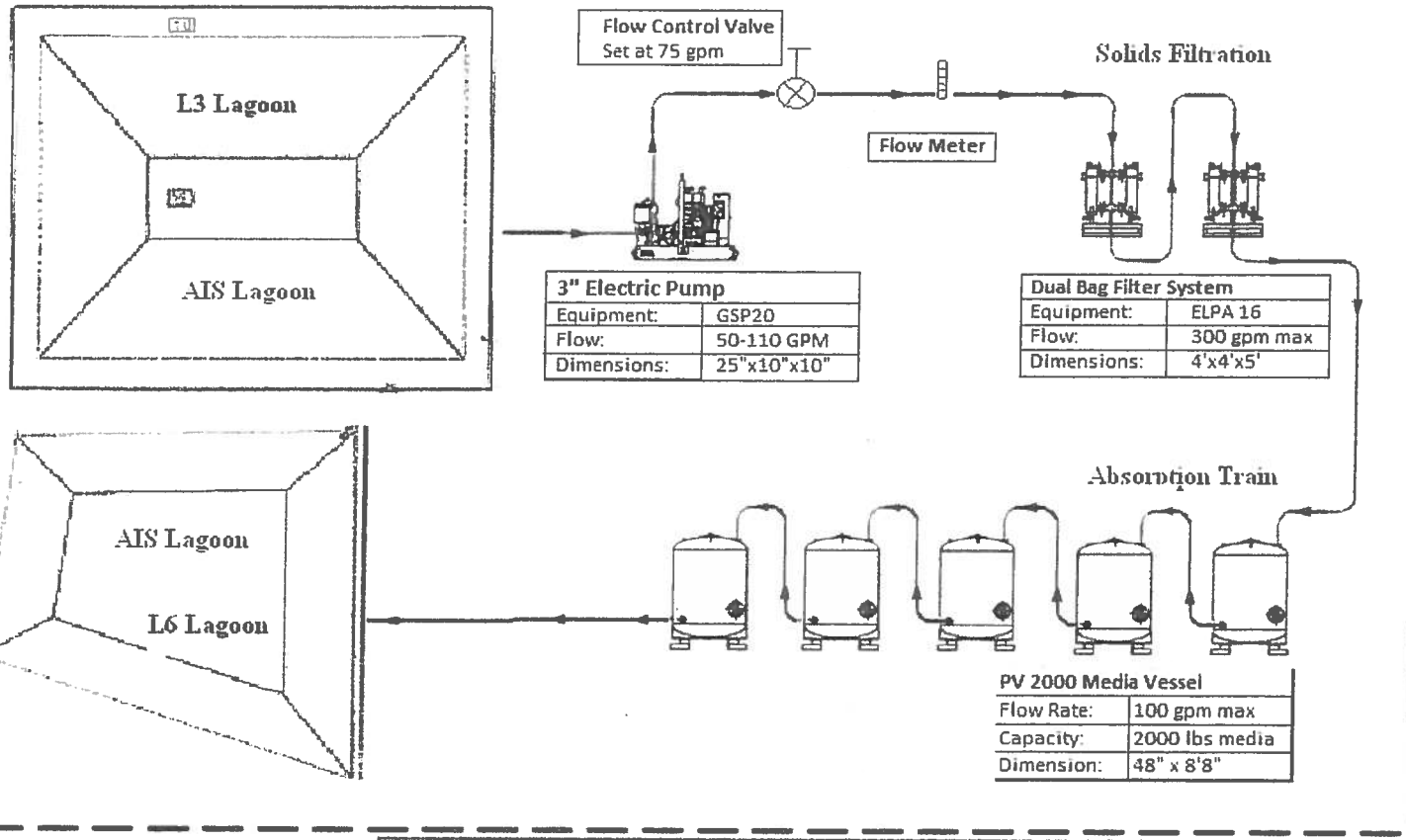
MAXXAM ANALYTICS
Client Project #: [redacted]

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6321133	Hex. Chromium (Cr 6+)	2012/11/06	97	80 - 120	94	80 - 120	<0.0010	mg/L	NC	20

N/A = Not Applicable
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Appendix D - Treatment Schematic



Entire System is Isolated from the regular waste water processing

Atlantic Industrial Services	Title: AIS Pre treatment	Project: No AIS-30044
	Project: NORM Water Processing	
Date: October 15, 2012	Customer: Triangle Petroleum	Drawing No: 4