

October 11, 2016

Resource Management Officer Nunavut Field Operations Aboriginal Affairs and Northern Development Canada Box 100 Iqaluit, NU X0A 0H0 Justin Hack Justin.Hack@aandc-aadnc.gc.ca Manager, Major Projects Qikiqtani Inuit Association P.O. Box 219 Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #16-338, Reported on September 12, 2016 Mary River Project - Water Licence No. 2AM-MRY1325

### **Summary:**

On September 12, 2016 at 00:30 HRS, a loader operator discovered that the Sandvik Screen Plant, located within the Milne Port Ore Storage Pad, was leaking hydraulic oil. The operator immediately shut down the equipment and then called his supervisor to investigate. Approximately 200 litres of hydraulic oil was released to the adjacent ground surface on the Ore Storage Pad, an engineered contained area with ditches and a lined settling pond. Investigation determined the cause of the spill to be fitting failure, which was subsequently replaced prior to equipment start-up. The nearest natural water body is >100 m away from both the spill location and storage location and is currently frozen.

### Immediate and Follow-Up Action:

The ship loader Supervisor and the Environment Department were notified immediately by the operator upon spill discovery. The immediate clean-up response utilised spill pads to mop up visible free product; the spill pads were placed in a Quatrex Bag. Contaminated ore was removed and placed in the NW corner of Ore Storage Pad.

#### Recommendations:

Ensure pre-op inspections are completed before use of the Sandvik Screen Plant.

The ditches and settling pond for the Milne Port Ore Storage Pad will be monitored for the presence of free phase product and sheen during the open water season.

### **Current Status:**

The fitting was subsequently replaced and the screener is currently operational. The affected area was cleaned up and the contaminated material placed in a contained location.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden or Jim Millard at (647) 253-0596 x6016 or (902) 403-1337.

Prepared By:

Reviewed by:





Jim Millard

Connor Devereaux,

**Environmental Manager** 

**Environmental Coordinator** 

Attach: Photos, Map, NT-NU Spill Report

cc. Anant Minhas, Sylvain Proulx, Sylvain Desrochers, Allan Knight, Jim Millard, Todd Burlingame, Wayne McPhee (Baffinland),

Erik Allain, Scott Burgess Jonathan Mesher (INAC).

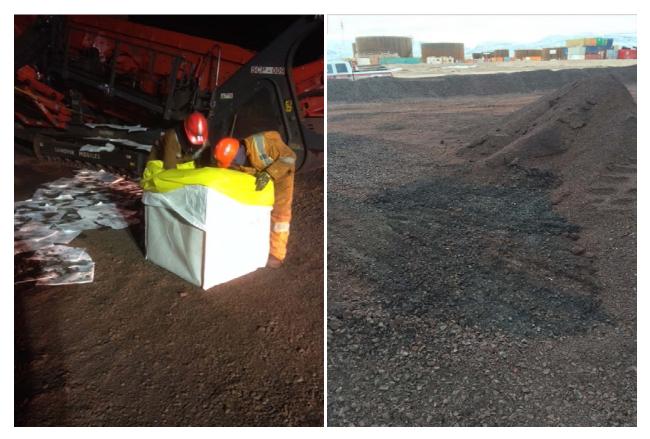


Photo 1 – Hydraulic Oil Spill – 200 L

Photo 2- Spill Location after Cleanup

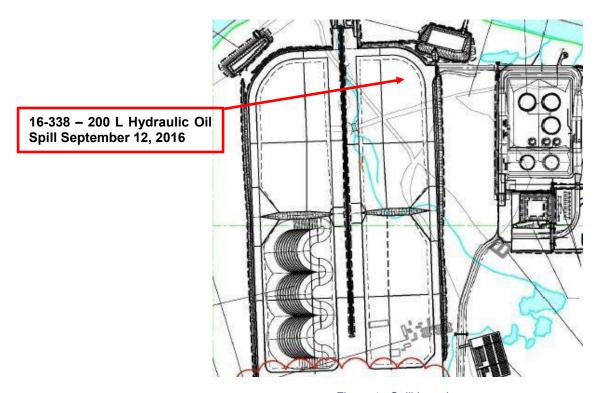


Figure 1 - Spill Location





### NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130 FAX: (867) 873-6924 EMAIL: spills@gov.nt.ca

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М	William Bowden	Env Supervis	l'	EMPLOYER Baffin	-		ernate contact ary River		Ext 6016	
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Figure 2 – NT-NU Spill Report



November 8, 2016

Resource Management Officer Nunavut Field Operations Aboriginal Affairs and Northern Development Canada Box 100 Iqaluit, NU X0A 0H0 Justin.Hack@aandc-aadnc.gc.ca Director, Major Projects Qikiqtani Inuit Association P.O. Box 219 Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #16-374, Reported on October 9, 2016
Mary River Project - Water Licence No. 2AM-MRY1325

### **Summary:**

At 08:00 HRS on October 9, 2016, Environment personnel, on a routine inspection, discovered an overflow originating from the Mine Site accommodation complex kitchen south lift station 19. This lift station only receives grey water from the kitchen. Recoverable released grey water was vacuumed and disposed of in containment. Upon the initial investigation it was determined the float from the lift station failed to actuate the pumps causing the lift station to overflow. Approximately 1 m³ of grey water was released onto the adjacent ground, affecting an area of approximately 75 m².

The volume of the spill was contained on the Mine Site camp pad, migrating underneath the office wing, this area is greater than 100 metres from the closest water body which is currently frozen.

### Immediate and Follow-Up Action:

Baffinland Fixed Plant Maintenance was immediately notified of the release. The vacuum truck was used to draw down the grey water level in the lift station, preventing further overflow and collect recoverable greywater that was released. The pumps were shut-off and the float was replaced.

#### Recommendations:

Routine inspections of the sewage lines, lift stations and pump floats will continue to be completed to ensure all components of the sewage system are functioning as designed.

### **Current Status:**

The lift station pump float was repaired shortly after the spill was reported and the lift station was placed back into service after it was determined that the float was functioning properly.

Should you require further information or clarification on the above noted spill, please feel free to contact Bill Bowden at (647) 253-0596 x6016 or Jim Millard at (902) 403-1337.

Prepared By: Reviewed by:

Jim Millard
Environmental Coordinator Environmental Manager

Attach: Map, NT-NU Spill Report

cc. Todd Burlingame, Wayne McPhee, Sylvain Proulx, Robert Gagne, Jim Millard (Baffinland), Stephen Bathory (QIA), Erik Allain, Scott Burgess, Sarah Forte (INAC).

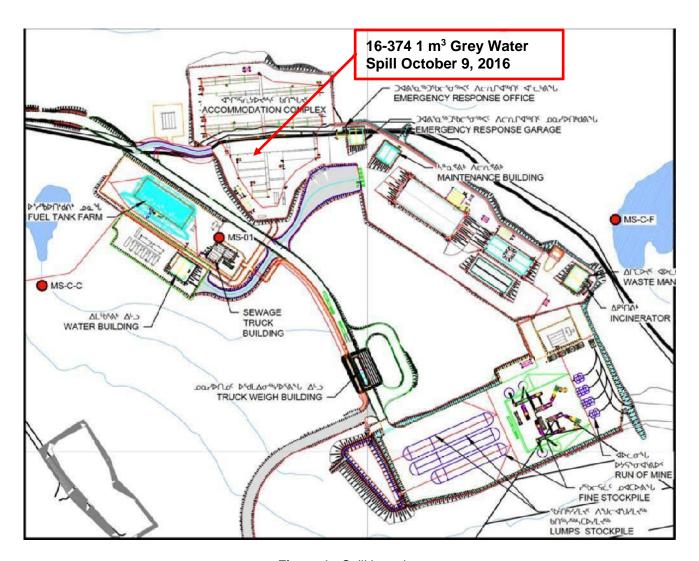


Figure 1 - Spill Location



### NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

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

REPORT LINE USE ONLY

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Figure 2 – NT-NU Spill Report



November 9, 2016

Resource Management Officer Nunavut Field Operations Aboriginal Affairs and Northern Development Canada Box 100 Iqaluit, NU X0A 0H0 Justin.Hack@aandc-aadnc.gc.ca Director, Major Projects Qikiqtani Inuit Association P.O. Box 219 Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #16-377, Reported on October 13, 2016
Mary River Project - Water Licence No. 2AM-MRY1325

### **Summary:**

At approximately 12:00 on October 12, 2016, Mine Site Services personal discovered a tank overflow originating from the AD Wing of the Mine Site accommodations complex. This lift station is a temporary station/tank that is in use while the original lift station is undergoing repairs. There is no level alarm on this temporary tank and it requires manual pumping. It appeared as though the pumping of this tank was overlooked during shift change. Approximately 300 L was released onto the adjacent ground surface covering an area of snow -covered ground of approximately 20 m<sup>2</sup>.

The released sewage was contained on the Mine Site camp pad and is greater than 100 m from the closest water body which is currently frozen.

### Immediate and Follow-Up Action:

Baffinland Fixed Plant Maintenance and Environment Department were immediately notified of the release. The vacuum truck was used to draw down the sewage level in the lift station, preventing further overflow. The contaminated snow-cover was excavated and transported for proper disposal.

### Recommendations:

Additional monitoring of this lift station, in addition to daily pumping is being completed to prevent further overflows.

### **Current Status:**

Until repairs to the permanent lift station are complete and placed back into commission, the temporary lift station will remain in use. As per the recommendation provided, monitoring of sewage levels and daily pumping will be completed.

Should you require further information or clarification on the above noted spill, please feel free to contact Bill Bowden / Jim Millard at (647) 253-0596 x6016 or Jim Millard at (902) 403-1337.

Prepared By: Reviewed by:

Lea Willemse

Environmental Coordinator

Jim Millard

Environmental Manager

Attach: Map, NT-NU Spill Report

cc. Todd Burlingame, Wayne McPhee, Sylvain Proulx, Robert Gagne, Jim Millard (Baffinland),

Stephen Bathory (QIA), Erik Allain, Scott Burgess, Sarah Forte (INAC).

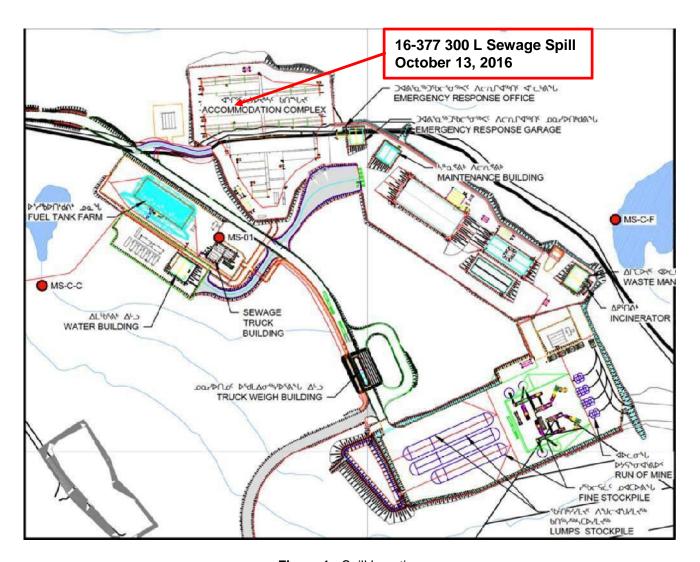


Figure 1 - Spill Location



# Canada NT-NU SPILL REPORT OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

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

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0	LAND USE PERMIT NUMBER	MDCSG ANGROUS CV. N. P.			WATER LICENCE NU			- 5		
C	Annual Control of the	I Lease: Q13C301		2AM-MRY1325 Type "A"						
D	Mary River Mine	OR DISTANCE AND DIRECTIO		OCATION	The state of the s	UNAVUT	□ ADJACENT JU	RISDICTION	OR OCEAN	
Ε	DEGREES 71	MINUTES 18	SECONDS 55		DEGREES 79		MINUTES 17	, si	CONDS 04	
F	Baffinland Iron N	Mines Corp.	2275 Middle Road East, Sutie 300, Oakville, ON L6H 0C3							
G	N/A	ED.	N/A	ADDRESS	OR OFFICE LOCATIO	ON				
	PRODUCT SPILLED		Market State Control of the Control	TRES, KIL	OGRAMS OF CUBIC	METRES	U.N. NUMBER			
Н	Sewage	Company of the State of the Sta	300 L				N/A			
п	SECOND PRODUCT SPILLED	(IF APPLICABLE)	10000000000000000000000000000000000000	TRES, KIL	OGRAMS OR CUBIC	METRES	U.N. NUMBER			
	N/A		N/A				N/A		20000000000000000000000000000000000000	
1	Lift Station		Overflow				20 m2	MINATION IN	SQUARE METRES	
ė	FACTORS AFFECTING SPILL	OO DECOUERU	100000000000000000000000000000000000000		or province			anne nan	PERTY OR EQUIPMENT	
J	Spill beside/belo		N/A				N/A			
8 4	ADDITIONAL INFORMATION.	COMMENTS, ACTIONS PROP	POSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF				PILLED PRODUCT	AND CONTA	MINATED MATERIALS	
K	and it is manuall shift change. Ap around 20 m2 disposed of whe and is greater th monitoring of the follow-up report as required by the	Il lift station is und by pumped. It apportunately 300 L. The sewage soak on resources are are an 100 m from the e sewage level in the with recommendate conditions of W.	eared as the was released into the vailable. The closest wathis tank wintions will be	ough to sed on a snow the locater bootel be compared to the co	the pumping to the adjace , and the sno ation of the s ody which is completed wi pleted within 2AM-MRY13	of this ent gro ow will spill wa curren hile the n 30 da 25, Par	s tank was ound surfact be excavarant be excavarant be sufficient by frozen. Frozen fr	e coverion e coveri ted and line Site More fr complete bill is be (b).	ked during ing an area of properly camp pad equent ed. A ing reported	
ı	REPORTED TO SPILL LINE B	Control of the Contro	otor	EMPLOY!		5533	ATION CALLING F	2000	ELEPHONE	
-	William Bowden	POSITION	iator	EMPLOY	nland	3,570	47-253-0596	NO 1	ext. 6016	
M	Jim Millard	Env. Manage	r	10000001-0000	⊪ nland	10344	ERNATE CONTACT  ff Site		902-403-1337	
	Telephonological and the control of	117	REPORT LIN	E USE ON	(LY		and the contract of	-	-	
	RECEIVED AT SPILL LINE BY	POSITION		EMPLOY		LOC	CATION CALLED	F		
Ν		STATION OPERATOR			:H		LOWKNIFE, NT	6	EPORT LINE NUMBER	
IEA	DAGENCY THE THOO	GNWT = GN = ILA = INAC	C I NEB INTO	SIGN	:H	YEL		Parameter.		
0000	NCY	GIVWY E GIVE E EA E SUA	C LINED LIV	CHOIN			- INKNOWN		967) 920-8130	
Person	2000/05/F1045	CONTACT NAME		CONT	IFICANCE IN MINOR	□ MAJOR	26.70.805.0	FILE STATE		
LEA		CONTACT NAME		CONT		□ MAJOR	DUNKNOWN REMARKS	FILE STATE	967) 920-8130	
	D AGENCY	CONTACT NAME		CONT	IFICANCE IN MINOR	□ MAJOR	26.70.805.0	FILE STATE	967) 920-8130	
FIRS	T SUPPORT AGENCY	CONTACT NAME		CONT	IFICANCE IN MINOR	□ MAJOR	26.70.805.0	FILE STATE	967) 920-8130	
3000		CONTACT NAME		CONT	IFICANCE IN MINOR	□ MAJOR	26.70.805.0	FILE STATE	967) 920-8130	

Figure 2 – NT-NU Spill Report



December 13, 2016

Resource Management Officer Nunavut Field Operations Aboriginal Affairs and Northern Development Canada Box 100 Iqaluit, NU X0A 0H0 Justin.Hack@aandc-aadnc.gc.ca Director, Major Projects Qikiqtani Inuit Association P.O. Box 219 Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #16-403, Reported on November 15, 2016
Mary River Project - Water Licence No. 2AM-MRY1325

### **Summary:**

At 08:00 HRS on November 14, 2016, a worker conducting a routine inspection discovered that the south lift station servicing the mine site complex kitchen had overflowed. This lift station only receives grey water from the kitchen. Approximately 500 L of grey water was released onto the adjacent ground, affecting an area of approximately 5 m². Upon investigation, it was determined the lift station floats failed to activate the lift station pumps, resulting in the overflow.

The location of the spill was on the Mine Site camp pad and is greater than 100 metres from the closest water body which is currently frozen.

### **Immediate and Follow-Up Action:**

Baffinland Fixed Plant Maintenance was immediately notified of the release. The lift station pumps were activated manually to draw down water levels in the lift station and prevent further overflow.

#### **Recommendations:**

Routine inspections of the sewage lines, lift stations and pump floats will continue to be completed to ensure all components of the sewage system are functioning as designed.

#### **Current Status:**

The lift station floats have been replaced with a new type of float. The lift station is back in service with all components functioning as designed.

Should you require further information or clarification on the above noted spill, please feel free to contact Andrew Vermeer at (647) 253-0596 x6039 or Jim Millard at (902) 403-1337.

Prepared By:

Reviewed by:

Andrew Vermeer Environmental Coordinator Jim Millard Environmental Manager

Attach: Map, NT-NU Spill Report

cc. Todd Burlingame, Wayne McPhee, Sylvain Proulx, Robert Gagne, Jim Millard (Baffinland), Stephen Bathory (QIA), Erik Allain, Scott Burgess, Sarah Forte (INAC).

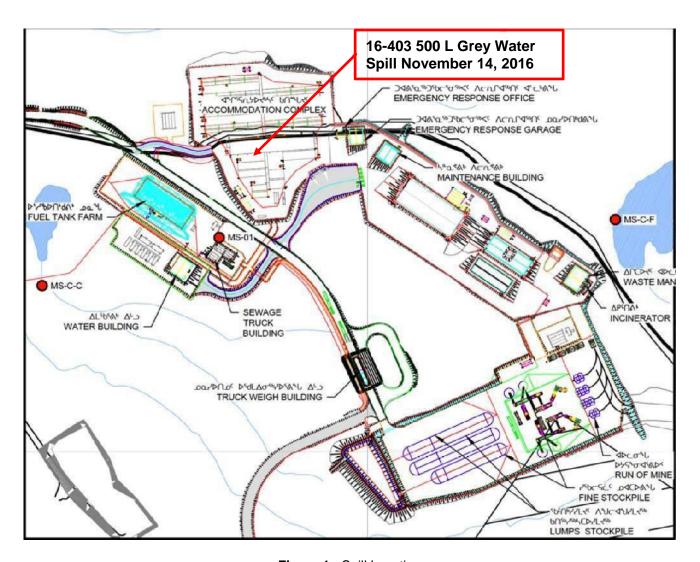


Figure 1 - Spill Location



### NT-NU SPILL REPORT

OIL GASOLINE CHEMICALS AND OTHER HAZARDOUS MATERIALS.

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

REPORT LINE USE ONLY REPORT DATE: MONTH -- DAY -- YEAR REPORT TIME XORIGINAL SPILL REPORT. REPORT NUMBER 11-14-2016 8:00 HRS OCCURRENCE DATE: MONTH - DAY - YEAR OCCURRENCE TIME UPDATE # 16 403 В TO THE ORIGINAL SPILL REPORT 11-14-2016 Unknown LAND USE PERMIT NUMBER (IF APPLICABLE) WATER LICENCE NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C301 2AM-MRY1325 Type "A" GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION REGION Mary River Mine Site, Baffin Island, NU NWT X NUNAVUT ADJACENT JURISDICTION OR OCEAN LATITUDE LONGITUDE E DEGREES 71 MINUTES 18 SECONDS 52 DEGREES 79 MINUTES 17 RESPONSIBLE PARTY OR VESSEL NAME RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION 2275 Middle Road East, Sutie 300, Oakville, ON L6H 0C3 Baffinland Iron Mines Corp. ANY CONTRACTOR INVOLVED CONTRACTOR ADDRESS OR OFFICE LOCATION G N/A PRODUCT SPILLED QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES U.N. NUMBER **Grey Water** 500 L N/A SECOND PRODUCT SPILLED (IF APPLICABLE) DUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES U.N. NUMBER N/A N/A N/A PILL CAUSE AREA OF CONTAMINATION IN SQUARE METRES **Lift Station Pump Malfunction** 5 m2 FACTORS AFFECTING SPILL OR RECOVERY DESCRIBE ANY ASSISTANCE REQUIRED HAZAROS TO PERSONS, PROPERTY OR EQUIPMENT Spill beside/below Infrastructure N/A ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS At 08:00 HRS on November 14, 2016, a worker, while conducting a routine inspection, discovered that the south lift station servicing the MSC Kitchen had overflowed. This lift station only receives grey water from the kitchen. Approximately 500 L of grey water was released onto the adjacent ground, affecting an area of approximately 5 m2. The location of the spill was on the Mine Site camp pad and is greater than 100 metres from the closest water body which is currently frozen. Accessible contaminated snow and ice will be removed and transported to Mine Site PWSP #1. The initial investigation determined the the lift station pumps did not activate causing the lift station to overflow however the root cause of the overflow is currently being investigated. Further details of the incident will be provided in the follow-up report. This spill is being reported as required by the conditions of Water Licence No. 2AM-MRY1325, Part H, item 9 (b) pursuant to subsection 12(3) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act. LOCATION CALLING FROM TELEPHONE REPORTED TO SPILL LINE BY POSITION EMPLOYER. **Env. Coordinator** Ext. 6039 **Andrew Vermeer** MR Mine Site Baffinland ANY ALTERNATE CONTACT POSITION EMPLOYER ALTERNATE CONTAI ALTERNATE TELEPHONE M Ext. 6016 MR Mine Site Jim Millard Env. Manager Baffinland REPORT LINE USE ONLY REPORT LINE NUMBER POSITION EMPLOYER LOCATION CALLED RECEIVED AT SPILL LINE BY STATION OPERATOR VELLOWKNIFE, NT (867) 920-8130 LEAD AGENCY DEC DOOR DIGNWT DIGN DILA DINAC DINEB DITC SIGNIFICANCE MINOR MAJOR DUNKNOWN FILE STATUS TOPEN CLOSED AGENCY CONTACT NAME CONTACT TIME REMARKS LEAD AGENCY FIRST SUPPORT AGENCY. SECOND SUPPORT AGENCY THIRD SUPPORT AGENCY

Figure 2 – NT-NU Spill Report

PAGE 1 OF



January 2, 2017

Resource Management Officer
Nunavut Field Operations
Aboriginal Affairs and Northern Development Canada
Box 100
Iqaluit, NU X0A 0H0
Justin.Hack@aandc-aadnc.qc.ca

Director, Major Projects Qikiqtani Inuit Association P.O. Box 219 Iqaluit, NU X0A 0H0

Re: Follow-up to Spill #16-414, Reported on December 3, 2016
Mary River Project - Water Licence No. 2AM-MRY1325

### Summary:

At 02:00 HRS on December 3, 2016 while clearing the area in preparation to remove the former seacan bridge crossing (CV217B) located at the Tote Road km 80 bridge, an excavator (EXC003) broke through the ice layer covering the water body (river outlet from Muriel Lake) submerging the EXC003 by approximately 75%. CV217B is evaluated as fish habitat, although during the fall/winter season, fish are likely not present due to shallow overwintering conditions. At the time of the incident, the freshly exposed water surrounding the submerged machine was observed for signs of a release of fuel and/or lubricating oils. No release was observed at the time of the incident. Monitoring of this area for evidence of a spill was ongoing until the safe and successful extraction of the excavator from the ice/water body. On December 6, an update to spill report 16-414 was submitted after 1 litre of lubricating oil was released to the top layer of the ice at the EXC003's location; this was promptly recovered and cleaned up. The removal of the seacan bridges are a requirement of Baffinland's Tote Road DFO authorization and at the time of the incident, the excavator was engaged in preparing the site for this reclamation activity.

The original Spill Report 16-414 (December 3) and Update No. 1 (December 6) were submitted to the NT-NU Spill Line and other applicable stakeholders. These reports including location plan are presented in Attachment A.

Photos of the incident and follow-up actions are provided in Attachment B.

### Immediate and Follow-Up Action:

The planning process for the extraction of EXC003 from the CV217B crossing was initiated immediately following the incident. To minimize the risks to worker safety and the environment, it was determined that extraction activities would be completed in the following two phases: recovery of fuel, hydraulic and glycol from EXC003 compartments, followed by the extraction of EXC003 from the ice/water body.

On December 5 and 6, 2016, accessible oil (~25L), diesel (~500L), and glycol (~25L) were recovered from EXC003 compartments. At that time it was observed that lubricating oil was released to the adjacent ice on one side of the excavator cab. Approximately one (1) litre of product was found in two pockets on the surface of the ice, covering an area of approximately 0.25 m². The released product and contaminated ice were recovered for proper disposal. Spill response supplies were proactively stockpiled at the location to mitigate any further incident.

A water sample was collected at a location downstream of the submerged EXC003 on December 9 by drilling holes through the ice with an auger. Laboratory results were below analytical detection limits for BTEX, PHC and TOG (refer to Attachment C). At that time a number of holes were augured through the ice downstream of the equipment to detect any stream flows utilizing a flow meter through the augured holes. The water column was minimal and there were no measureable flows, indicating that the incident location was in an isolated and discontinuous pocket of water.



On December 16, 2016, EXC003 was successfully extracted from the CV217B crossing without further incident to worker safety or the environment. The extraction planning process involved careful consideration to minimize potential risks to personnel, equipment and to reduce the risk of the release of any residual hydrocarbons or glycol.

The extraction process was undertaken in the following steps:

- Construction of a ramp to the bank location using clean rip rap and careful breaking of ice near and adjacent to the excavator.
- Probing around the excavator to determine the position of the tracks. Ensured the tracks were oriented in the appropriate direction to approach and pull the excavator from its submerged location.
- An underwater camera was used to locate towing points that could be utilized by heavy equipment to securely extract the excavator.
- Multiple auger holes, were drilled on the ice to measure ice thickness and water column depth in the work area where heavy equipment or personnel would be operating. No hydrocarbons were detected in the adjacent water based on visual or olfactory observations.
- Trash pumps were used to lower the surrounding water level in the non-frozen pocket of the river
  where the excavator broke through. Rigging was attached to the exposed anchor points and the
  submerged excavator was slowly removed from the water using heavy equipment.

Following the successful extraction of the excavator from the water body, a second water sample was collected on December 17, 2016, at the location of the submerged EXC003, in the standing pocket of water. Laboratory results were below analytical detection limits for BTEX, PHC, TOG, and glycols (refer to Attachment C).

### **Basic Cause and Recommendations:**

It has been recognized, that the Job Hazard Analysis formulated for the removal of the Tote Road seacan bridge crossings did not account for differences in ice thickness between the three seacan bridge locations scheduled to be removed, nor did it account for timing of removal. The seacan bridges located at km 62 (BG-50A) and km 97 (CV-223) on the Tote Road were safely removed without incident, and were both situated in shallow water (<0.5 m depth) frozen to the bottom. There was an expectation that the water depth at CV217B, would be minimal as well (<1m depth); this was not the case.

In addition, the proper procedure for working on or near ice covered water bodies was not effectively communicated to the seacan bridge removal team and operator performing the removal of CV217B. Operator assumptions may have contributed to the incident. (The operator involved had participated in the original installation of the seacan bridge crossings on the Tote Road in 2007.) An existing working on ice procedure did exist at the time of the incident however this procedure was not formally processed through document control for distribution to all departments.

Recommendations, derived from the incident investigation, developed for implementation into Baffinland's safe operating procedures include the following:

- Prior to completing all future on-ice work, a temporal and geographically site specific JHA will be completed,
- Prior to completing all future on-ice work, augured holes must be drilled to determine ice
  thickness, this instruction needs to be clearly communicated to all equipment operators working
  near or on water no matter what the estimated depth of the water column;
- Development of a formal document controlled "working on-ice" procedure to address requirement for ice-thickness measurements to determine suitability for various work activities (personnel and/or equipment), no matter what the assumed ice thickness; and
- Prior to completing all on-ice work, all personnel must be trained in the working-on ice procedure and be aware of risks of the prescribed job and their responsibilities.



#### **Current Status:**

Throughout extraction activities, the presence of hydrocarbons were not detected in the open water by visual or olfactory observations; however, confirmatory water samples were collected during two events; at a location 30 m downstream of the submerged excavator on December 9, 2016; and at the location of the submerged excavator on December 17, 2016. Laboratory results for both samples (refer to Attachment C) identify non-detect for BTEX, PHC, TOG, and glycols supporting that there was little to no hydrocarbon or glycol release to the water column from the partial submersion of EXC003.

The disturbed areas of the riverbank have been stabilized with 6" clean riprap to prevent subsequent erosion. Slope stability of the impacted area will be monitored during freshet and if required, additional sedimentation controls will be applied at that time.

After being extracted from the river, EXC 003 is parked near the Km 80 bridge, currently tarped being thawed out on a Tote Road push out greater than 31m from the closest water body. A downstream berm is erected directly below it (as a contingency measure).

The formal document controlled version of a Working On Ice Procedure and associated training is in development.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden at (647) 253-0596 x6016 or Jim Millard at (902) 403-1337.

Prepared By:

William Bowden

**Environmental Superintendent** 

Reviewed by:

Jim Millard

**Environmental Manager** 

Attach: A - NT-NU Spill Reports,

B - Photos.

C – Analytical Water Quality Results from ALS Laboratories

cc. Todd Burlingame, Wayne McPhee, Sylvain Proulx, Robert Gagne, Jim Millard Allan Knight (Baffinland), Stephen Bathory (QIA), Erik Allain, Scott Burgess, Sarah Forte, Jonathan Mesher (INAC).



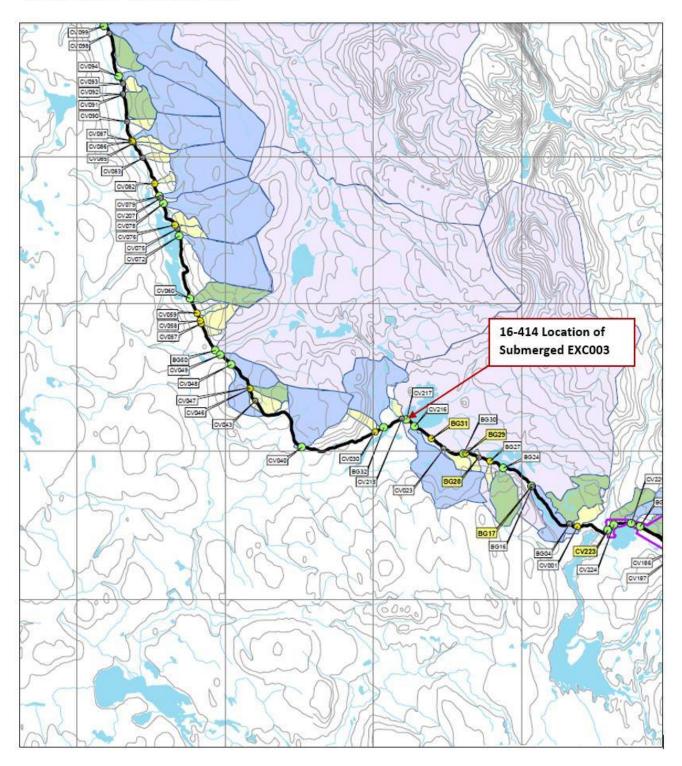


Figure 1 – Location Map

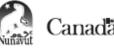


### ATTACHMENT A

**NT- NU Spill Reports** 







## Canada NT-NU SPILL REPORT

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130 FAX: (867) 873-6924 EMAIL: spills@gov.nt.ca

								REPORT LINE USE ONLY		
Α	12-03-2016	Y – YEAR		02:00		X ORIGINAL SPILL RE	PORT,	REPORT NUMBER		
	OCCURRENCE DATE: MONTH	I DAV VEAD			NCE TIME	OR □ UPDATE #				
В	12-03-2016	1- LMI - ICAN		17:00		TO THE ORIGINAL SPI	LL REPORT	16 - 414		
_	LAND USE PERMIT NUMBER				WATER LICENCE NUMBER					
С	IOL - Commercia				2AM-MRY1325	Type "A"				
D		OR DISTANCE AND DIRECTION Site, Baffin Island,		OCATION	REGION  NWT X NUNAVU	UT ADJACENT JU	IRISDICTION	OR OCEAN		
Е	DEGREES 71	MINUTES 88	SECONDS 46		LONGITUDE DEGREES 80	MINUTES 88	}	ECONDS 59		
F	RESPONSIBLE PARTY OR VE	SSEL NAME	RESPONSIBLE	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION  2275 Middle Road East, Sutie 300, Oakville, ON L6H 0C3						
Ľ	Baffinland Iron M	•			DR OFFICE LOCATION	out, Oakville,	ON LOH	UCS		
G	N/A	U	N/A							
l	PRODUCT SPILLED  Potential for fuel	oil/grease	TBD (Pot		GRAMS OR CUBIC METR	N/A				
Н	SECOND PRODUCT SPILLED	(IF APPLICABLE)		TRES, KILO	GRAMS OR CUBIC METR					
L	N/A		N/A			N/A				
lı.	Potential from fu	olloit tanklaroaco	SPILL CAUSE	ulanaara	sion in river		MINATION IN	SQUARE METRES		
Ľ	FACTORS AFFECTING SPILL	_	DESCRIBE ANY				N/A  HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT			
J	River ice cover	OH HECOVERY	N/A	ASSIS IAN	UE HEQUINED	N/A	HSUNS, PHU	PERTY OR EQUIPMENT		
$\vdash$		COMMENTS, ACTIONS PROPO		O CONTAIN	I. RECOVER OR DISPOSE		AND CONTA	AMINATED MATERIALS		
K	At 02:00 HRS on December 3, 2016 while clearing the area in preparation to remove the former seacan bridge crossing (CV217) located at Tote Road km 80 bridge, an excavator broke through the ice layer covering the water body (river outlet from Muriel Lake)submerging the excavator by approximately 75%. The river at this location is considered to be fish habitat, although during the fall/winter season, fish are not thought to be present due to shallow overwintering conditions. At the time of the incident, the freshly exposed water surrounding the submerged machine was observed for signs of a release of fuel and/or lubricating oils. No release was was observed at this time. Monitoring of this area for evidence of a spill will continue until the safe and successful extraction of the excavator from the ice/water body. If, during ongoing monitoring, there is evidence of a spill, an update to this spill report will be submitted. Additional incident details and results of investigation will be provided in the follow-up report to be submitted within 30 days.									
L	REPORTED TO SPILL LINE BY Bill Bowden	POSITION Env. Coordina	ator	Baffin		MR Mine Site		Ext. 6016		
	ANY ALTERNATE CONTACT	POSITION		EMPLOYE		ALTERNATE CONTACT		ALTERNATE TELEPHONE		
M	Jim Millard	Env. Manager		Baffin	land	Off-site		902-403-1337		
Г		·	REPORT LIN	E USE ON	LY	•				
N	RECEIVED AT SPILL LINE BY	POSITION		EMPLOYE	R	LOCATION CALLED		REPORT LINE NUMBER		
IN		STATION OPERATOR				YELLOWKNIFE, NT		(867) 920-8130		
LEA	DAGENCY = EC = CCG =	GNWT □ GN □ ILA □ INAC	□ NEB □ TC	SIGNI	FICANCE - MINOR - MA	JJOR = UNKNOWN	FILE STAT	US = OPEN = CLOSED		
AGE	NCY	CONTACT NAME		CONT	ACT TIME	REMARKS				
LEA	D AGENCY									
FIRS	ST SUPPORT AGENCY									
SEC	OND SUPPORT AGENCY									
THIE	RD SUPPORT AGENCY									

PAGE 1 OF 1

Figure 2 - NT-NU Spill Report





THIRD SUPPORT AGENCY

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130 FAX: (867) 873-6924

PAGE 1 OF 1

	in police	,	JIL, GASOLINE, GHEI	WIIOALS AND OTH	.n nazanooo	MAIENIALS		REPORT LINE USE O	
	REPORT DATE: MONTH - DAY	Y_YEAR	RE	PORT TIME				HEPORT LINE USE C	UNLY
Α	12-06-2016			2:00 HRS		□ ORIGINAL SPILL RE OR	PORT,	REPORT NUMBE	ER
В	12-03-2016	I – DAY – YEAR		7:00 HRS		X UPDATE # 1 TO THE ORIGINAL SPI	ILL REPORT	16 414	_
С	LAND USE PERMIT NUMBER IOL - Commercia	(IF APPLICABLE)  I Lease: Q13C301	•		ENCE NUMBER (				
D		OR DISTANCE AND DIRECTION				,,			$\neg$
$\vdash$	Mary River Mine	Site, Baffin Island	, NU	LONGITUDE	JRISDICTION	OR OCEAN	$\dashv$		
Е	DEGREES 71	MINUTES 88	SECONDS 46	DEGREES	80	MINUTES 88	} s	ECONDS 59	
F	RESPONSIBLE PARTY OR VE Baffinland Iron M		2275 Middl			on 00, Oakville, (	ON L6H	0C3	
G	ANY CONTRACTOR INVOLVE N/A	D	N/A	DRESS OR OFFICE	LOCATION				П
$\vdash$	PRODUCT SPILLED		QUANTITY IN LITRE	S, KILOGRAMS OF	R CUBIC METRE	S U.N. NUMBER			
LI	Lubricating oil		Approx. 1 I			N/A			
Н	SECOND PRODUCT SPILLED	(IF APPLICABLE)	QUANTITY IN LITRE	ES, KILOGRAMS OF	R CUBIC METRE				
	N/A		N/A			N/A			
1	spill source unknown		PILL CAUSE Partial submersion in river			AREA OF CONTAMINATION IN SQUARE METRES  0.25			
J	FACTORS AFFECTING SPILL RIVER ICE COVER	OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED  N/A			Working (		PERTY OR EQUIPME	:NT
$\vdash$	ADDITIONAL INFORMATION,	COMMENTS, ACTIONS PROPO	OSED OR TAKEN TO C	ONTAIN, RECOVER	OR DISPOSE C	_	SPILLED PRODUCT AND CONTAMINATED MATERIALS		
K	Upon further monitoring of the excavator that broke through the ice on December 3, 2016, located at the former km 80 seacan bridge crossing (CV217), it was identified on December 5, 2016, that lubricating oil was released to the adjacent ice on one side of the excavator cab. The released product resembles unused hydraulic and/or unused engine oil. The specific source location from the excavator is unknown at this time. Approximately one (1) litre of product was found in two pockets on the surface of the ice, covering an area of approximately 0.25 m2. The released product and contaminated ice was recovered for proper disposal. While the spill response team was on the ice, the excavator's diesel, hydraulic oil and coolant tanks were safely evacuated of accessible product, removed from the scene, and securely stored. Currently there is no other evidence of sheen or further release of product from the excavator. Further spill report updates will be provided in the event there is evidence for additional product release.								
L	REPORTED TO SPILL LINE BY Bill Bowden	POSITION Env. Coordina		Baffinland		MR Mine Site		Ext. 6016	
М	ANY ALTERNATE CONTACT Jim Millard	POSITION Env. Manager		APLOYER Baffinland		Off-site		902-403-133	
$\overline{}$			REPORT LINE U	ISE ONLY					
	RECEIVED AT SPILL LINE BY	POSITION		MPLOYER	I	LOCATION CALLED	F	REPORT LINE NUMBE	ER
N		STATION OPERATOR			1	YELLOWKNIFE, NT		(867) 920-8130	_
LEA	AGENCY DEC DOOG D	GNWT - GN - ILA - INAC	DNEB DTC	SIGNIFICANCE	MINOR - MAJ	OR 🗆 UNKNOWN	FILE STATE	US = OPEN = CLOS	SED
AGE	NCY	CONTACT NAME		CONTACT TIME		REMARKS			_
LEA	AGENCY								
FIRS	T SUPPORT AGENCY								
Ь									

Figure 3 - NT-NU Spill Report - Update No. 1



ATTACHMENT B
PHOTOS OF SPILL





Photo 1 - Submerged EXC003



Photo 2 - Diesel Fuel Recovery





Photo 3 - EXC003 Extraction



Photo 4 - After EXC003 Extraction



# ATTACHMENT C ANALYTICAL WATER QUALITY RESULTS FROM ALS LABORATORIES



Baffinland Iron Mine's Corporation

(Oakville)

ATTN: Jim Millard

2275 Upper Middle Rd. E.

Suite #300

Oakville ON L6H 0C3

Date Received: 16-DEC-16

Report Date: 22-DEC-16 14:28 (MT)

Version: FINAL

Client Phone: 416-364-8820

## Certificate of Analysis

Lab Work Order #: L1870980 Project P.O. #: 4500017476

Job Reference: 30 FEET DS OF EXCAVATOR AT KM 80

C of C Numbers: Legal Site Desc:

Wayne Smile

Wayne Smith, C.Chem., C.E.T. Client Services Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047 ALS CANADA LTD | Part of the ALS Group | A Campbell Brothers Limited Company



L1870980 CONTD.... PAGE 2 of 4 Version: FINAL

### ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1870980-1 EXKM80-30DS Sampled By: DR/AV on 09-DEC-16 @ 15:00 Matrix: WATER							
Aggregate Organics							
Oil and Grease, Total	<2.0		2.0	mg/L	19-DEC-16	19-DEC-16	R3620682
Volatile Organic Compounds				J.			
Benzene	<0.50		0.50	ug/L		19-DEC-16	R3619937
Ethylbenzene	<0.50		0.50	ug/L		19-DEC-16	R3619937
Toluene	<0.50		0.50	ug/L		19-DEC-16	R3619937
o-Xylene	<0.30		0.30	ug/L		19-DEC-16	R3619937
m+p-Xylenes	<0.40		0.40	ug/L		19-DEC-16	R3619937
Xylenes (Total)	<0.50		0.50	ug/L		19-DEC-16	
Surrogate: 4-Bromofluorobenzene	97.0		70-130	%		19-DEC-16	R3619937
Surrogate: 1,4-Difluorobenzene	101.1		70-130	%		19-DEC-16	R3619937
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		19-DEC-16	R3619937
F1-BTEX	<25		25	ug/L		22-DEC-16	
F2 (C10-C16)	<100		100	ug/L	20-DEC-16	21-DEC-16	R3621956
F3 (C16-C34)	<250		250	ug/L	20-DEC-16	21-DEC-16	R3621956
F4 (C34-C50)	<250		250	ug/L	20-DEC-16	21-DEC-16	R3621956
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-DEC-16	
Chrom. to baseline at nC50	YES				20-DEC-16	21-DEC-16	R3621956
Surrogate: 2-Bromobenzotrifluoride	101.7		60-140	%	20-DEC-16	21-DEC-16	R3621956
Surrogate: 3,4-Dichlorotoluene	94.8		60-140	%		19-DEC-16	R3619937
Refer to Referenced Information for Qualifiers (if any) and	d Methodology						

<sup>\*</sup> Refer to Referenced Information for Qualifiers (if any) and Methodology.

**Reference Information** 

L1870980 CONTD....
PAGE 3 of 4
Version: FINAL

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Benzene	MS-B	L1870980-1
Matrix Spike	F1 (C6-C10)	MS-B	L1870980-1

#### Sample Parameter Qualifier key listed:

Qualifier Description

MS-B Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

### **Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
BTX-511-HS-WT BTX is determined by an	Water alyzing by he	BTEX by Headspace eadspace-GC/MS.	SW846 8260 (511)

F1-F4-511-CALC-WT Water F1-F4 Hydrocarbon Calculated CCME CWS-PHC, Pub #1310, Dec 2001-L Parameters

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

- 1. All extraction and analysis holding times were met.
- 2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
- 3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

- 1. All extraction and analysis holding times were met.
- 2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
- 3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
- 4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT Water F1-O.Reg 153/04 (July 2011) E3398/CCME TIER 1-HS Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT Water F2-F4-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by liquid/liquid extraction with a solvent. The solvent recovered from the extracted sample is treated with silica gel to remove polar material and then analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

OGG-TOT-WT Water Oil and Grease, Total APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to

determine Oil and Grease.

XYLENES-SUM-CALC- Water Sum of Xylene Isomer CALCULATION

T Concentrations

Total xylenes represents the sum of o-xylene and m&p-xylene.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
Chain of Custody Numbers:	

30 FEET DS OF EXCAVATOR AT KM 80

**Reference Information** 

L1870980 CONTD.... PAGE 4 of 4 Version: FINAL

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1870980

Report Date: 22-DEC-16

Page 1 of 3

Client:

Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX-511-HS-WT	Water							
Batch R3	619937							
<b>WG2452788-4</b> Benzene	DUP	<b>WG2452788-3</b> 10800	10900		ug/L	1.6	30	20-DEC-16
Ethylbenzene		2.25	2.12		ug/L	5.9	30	19-DEC-16
m+p-Xylenes		8.64	8.20		ug/L	5.2	30	19-DEC-16
o-Xylene		4.87	4.74		ug/L	2.7	30	19-DEC-16
Toluene		9.17	8.75		ug/L	4.7	30	19-DEC-16
<b>WG2452788-1</b> Benzene	LCS		108.7		%		70-130	19-DEC-16
Ethylbenzene			107.2		%		70-130	19-DEC-16
m+p-Xylenes			107.2		%		70-130	19-DEC-16
o-Xylene			106.9		%		70-130	19-DEC-16
Toluene			104.9		%		70-130	19-DEC-16
WG2452788-2	МВ				, <del>-</del>		70 100	10 020 10
Benzene	mb		<0.50		ug/L		0.5	16-DEC-16
Ethylbenzene			<0.50		ug/L		0.5	16-DEC-16
m+p-Xylenes			<0.40		ug/L		0.4	16-DEC-16
o-Xylene			<0.30		ug/L		0.3	16-DEC-16
Toluene			<0.50		ug/L		0.5	16-DEC-16
Surrogate: 1,4-D	Difluorobenzene		102.3		%		70-130	16-DEC-16
Surrogate: 4-Bro	omofluorobenzene		97.3		%		70-130	16-DEC-16
WG2452788-5	MS	WG2452788-3						
Benzene			N/A	MS-B	%		-	19-DEC-16
Ethylbenzene			115.8		%		50-140	19-DEC-16
m+p-Xylenes			115.3		%		50-140	19-DEC-16
o-Xylene			113.4		%		50-140	19-DEC-16
Toluene			111.4		%		50-140	19-DEC-16
F1-HS-511-WT	Water							
	619937							
<b>WG2452788-4</b> F1 (C6-C10)	DUP	<b>WG2452788-3</b> 10500	10700		ug/L	2.2	30	20-DEC-16
<b>WG2452788-1</b> F1 (C6-C10)	LCS		85.0		%		80-120	19-DEC-16
<b>WG2452788-2</b> F1 (C6-C10)	МВ		<25		ug/L		25	16-DEC-16
Surrogate: 3,4-D	Dichlorotoluene		100.3		%		60-140	16-DEC-16
WG2452788-5	MS	WG2452788-3						



Workorder: L1870980

Report Date: 22-DEC-16

Page 2 of 3

Client:

Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard

Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT		Water							
	3619937								
WG2452788-5	MS		WG2452788-3	<b>.</b> 1/0		0/			
F1 (C6-C10)				N/A	MS-B	%		-	19-DEC-16
F2-F4-511-WT		Water							
Batch R	3621956								
WG2454630-2	LCS			116.2		0/			
F2 (C10-C16)						%		70-130	21-DEC-16
F3 (C16-C34)				115.9		%		70-130	21-DEC-16
F4 (C34-C50)				110.4		%		70-130	21-DEC-16
<b>WG2454630-3</b> F2 (C10-C16)	LCSD		<b>WG2454630-2</b> 116.2	116.0		%	0.0	50	04 850 40
, ,			-				0.2	50	21-DEC-16
F3 (C16-C34)			115.9	119.3		%	2.8	50	21-DEC-16
F4 (C34-C50)			110.4	117.8		%	6.5	50	21-DEC-16
WG2454630-1	MB			400		//		400	
F2 (C10-C16)				<100		ug/L		100	21-DEC-16
F3 (C16-C34)				<250		ug/L		250	21-DEC-16
F4 (C34-C50)				<250		ug/L		250	21-DEC-16
Surrogate: 2-B	romobenz	otrifluoride		97.9		%		60-140	21-DEC-16
OGG-TOT-WT		Water							
Batch R	3620682								
WG2454023-2									
Oil and Grease	e, Total			90.8		%		70-130	19-DEC-16
WG2454023-3			WG2454023-2			0.4			
Oil and Grease			90.8	94.1		%	3.6	40	19-DEC-16
WG2454023-1	MB			.0.0		m a/!		2	
Oil and Grease	e, rotai			<2.0		mg/L		2	19-DEC-16

Workorder: L1870980 Report Date: 22-DEC-16

Client: Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard

### Legend:

Limit ALS Control Limit (Data Quality Objectives)

DUP Duplicate

RPD Relative Percent Difference

N/A Not Available

LCS Laboratory Control Sample SRM Standard Reference Material

MS Matrix Spike

MSD Matrix Spike Duplicate

ADE Average Desorption Efficiency

MB Method Blank

IRM Internal Reference Material
 CRM Certified Reference Material
 CCV Continuing Calibration Verification
 CVS Calibration Verification Standard
 LCSD Laboratory Control Sample Duplicate

### **Sample Parameter Qualifier Definitions:**

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

#### **Hold Time Exceedances:**

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

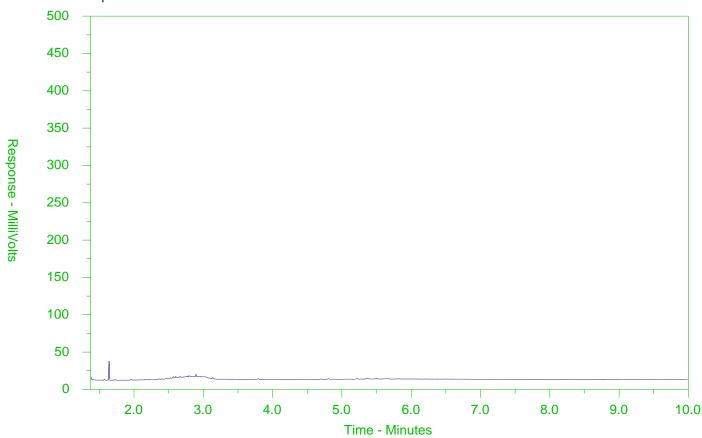
Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Page 3 of 3

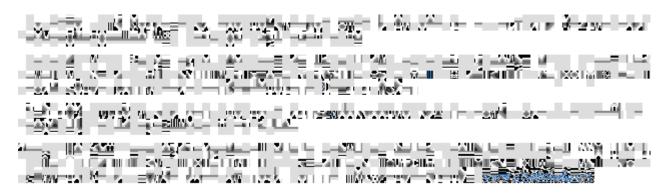
### CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L1870980-1 Client Sample ID: EXKM80-30DS



<b>←</b> -F2-	→←	_F3F4-	<b>→</b>	
nC10	nC16	nC34	nC50	
174°C	287°C	481°C	575°C	
346°F	549°F	898°F	1067°F	
Gasolin	ie →	<b>←</b> Mo	tor Oils/Lube Oils/Grease———	-
•	-Diesel/Jet	Fuels→		





### Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1870980-COFC

COC Number: 14 -

Page	1 of	1	

#### www.alsglobal.com Report To Report Format / Distribution Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests). Baffinland Iron Mines Corp. - ALS ENV Account 23642 DEXCEL DEDD (DIGITAL) R Regular (Standard TAT If received by 3 pm - business days) Company: Select Report Format: ✓PDF Contact: P Priority (2-4 bus, days if received by 3pm) 50% surcharge - contact ALS to confirm TAT Jim Millard, Allan Knight Quality Control (QC) Report with Report Yes Emergency (1-2 bus, days if received by 3pm) 100% surcharge - contact ALS to confirm TAT Address: 2275 Upper Middle Rd. E., Suite #300 Criteria on Report - provide details below if box checked Oakville, ON, L6H 0C3 Select Distribution: ☐EMAIL MAIL E2 | Same day or weekend emergency - contact ALS to confirm TAT and surcharge Phone: Email 1 or Fax bimcore@alsglobal.com 647-253-0596 EXT 6016 Specify Date Required for E2,E or P: Email 2 Analysis Request Invoice To Same as Report To Invoice Distribution Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below Select Invoice Distribution: FMAIL FAX TYes V No ☐MAIL Copy of Invoice with Report Email 1 or Fax ap@baffinland.com Company: Contact Email 2 Project Information Oil and Gas Required Fields (client use) Q42455 Cost Center: ALS Quote #: Approver ID: Job #: 30 feet DS of Excavator at Km 80 Routing Code: GL Account: ð PO / AFE: 4500017476 Activity Code: LSD: Location: 10s/0&G ALS Lab Work Order # (lab use only) ALS Contact: Wayne Smith OR/AV Sampler: **BTEX/PH** ALS Sample # Sample Identification and/or Coordinates Date Time Sample Type (lab use only) (This description will appear on the report) (dd-mmm-yy) (hh:mm) EXKM80-30DS 7 9-Dec-16 15:00 R Water SAMPLE CONDITION AS RECEIVED (lab use only) Drinking Water (DW) Samples1 (cilent use) Sample from Actual Waste Rock Pond. SIF Observations Yes Frozen Are samples taken from a Regulated DW System? Site Specific Criteria - Account Manager to update as required. No Custody seal intact Yes tce packs Yes Yes ₹ No Cooling Initiated FINAL COOLER TEMPERATURES \*C Are samples for human drinking water use? INIMAL COOLER TEMPERATURES C T Yes ₩ No SHIPMENT RELEASE (client use) FINAL SHIPMENT RECEPTION (tab use only) INITIAL SHIPMENT RECEPTION (lab use only) Released by: Andrew Vermeer Date:2016-12-14 Time: 17:30 Received by: Time: Received by:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy. 1. If any water samples are taken from a Regulated Drinking Water (DW). System, please submit using an Authorized DW COC form.



Baffinland Iron Mine's Corporation

(Oakville)

ATTN: Jim Millard, Allan Knight

2275 Upper Middle Rd. E.

Suite #300

Oakville ON L6H 0C3

Date Received: 23-DEC-16

Report Date: 30-DEC-16 11:43 (MT)

Version: FINAL

Client Phone: 416-364-8820

## Certificate of Analysis

Lab Work Order #: L1872424
Project P.O. #: 4500017476
Job Reference: EXKM80

C of C Numbers:

Legal Site Desc: EXKM80

Warene Smirt

Wayne Smith, C.Chem., C.E.T. Client Services Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047 ALS CANADA LTD | Part of the ALS Group | A Campbell Brothers Limited Company



L1872424 CONTD.... PAGE 2 of 4

Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1872424-1 EXKM80 Sampled By: CR/AV on 17-DEC-16 @ 11:00 Matrix: WATER							
Aggregate Organics							
Oil and Grease, Total	<2.0		2.0	mg/L	23-DEC-16	23-DEC-16	R3625017
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		28-DEC-16	R3624116
Ethylbenzene	<0.50		0.50	ug/L		28-DEC-16	R3624116
Toluene	<0.50		0.50	ug/L		28-DEC-16	R3624116
o-Xylene	<0.30		0.30	ug/L		28-DEC-16	R3624116
m+p-Xylenes	<0.40		0.40	ug/L		28-DEC-16	R3624116
Xylenes (Total)	<0.50		0.50	ug/L		28-DEC-16	
Surrogate: 4-Bromofluorobenzene	94.8		70-130	%		28-DEC-16	R3624116
Surrogate: 1,4-Difluorobenzene	99.9		70-130	%		28-DEC-16	R3624116
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-DEC-16	R3624116
F1-BTEX	<25		25	ug/L		30-DEC-16	
F2 (C10-C16)	<100		100	ug/L	29-DEC-16	30-DEC-16	
F3 (C16-C34)	<250		250	ug/L	29-DEC-16	30-DEC-16	R3625560
F4 (C34-C50)	<250		250	ug/L	29-DEC-16		R3625560
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-DEC-16	
Chrom. to baseline at nC50	YES				29-DEC-16	30-DEC-16	
Surrogate: 2-Bromobenzotrifluoride	93.8		60-140	%	29-DEC-16	30-DEC-16	R3625560
Surrogate: 3,4-Dichlorotoluene	104.0		60-140	%		28-DEC-16	R3624116
Glycols							
Diethylene Glycol	<5.0		5.0	mg/L		23-DEC-16	
Ethylene Glycol	<5.0		5.0	mg/L		23-DEC-16	
1,3-Propanediol	<5.0		5.0	mg/L		23-DEC-16	
1,2-Propanediol	<5.0		5.0	mg/L		23-DEC-16	
Triethylene Glycol	<5.0		5.0	mg/L		23-DEC-16	R3624355

<sup>\*</sup> Refer to Referenced Information for Qualifiers (if any) and Methodology.

L1872424 CONTD....

PAGE 3 of 4 Version: FINAL

### **Reference Information**

#### **Test Method References:**

ALS Test Code Matrix Test Description Method Reference\*\*

BTX-511-HS-WT Water BTEX by Headspace SW846 8260 (511)

BTX is determined by analyzing by headspace-GC/MS.

F1-F4-511-CALC-WT Water F1-F4 Hydrocarbon Calculated CCME CWS-PHC, Pub #1310, Dec 2001-L

Parameters

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

- 1. All extraction and analysis holding times were met.
- 2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
- 3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

- 1. All extraction and analysis holding times were met.
- 2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
- 3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
- 4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT Water F1-O.Reg 153/04 (July 2011) E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT Water F2-F4-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by liquid/liquid extraction with a solvent. The solvent recovered from the extracted sample is treated with silica gel to remove polar material and then analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

GLYCOL-1-WT Water Glycol List 1 EPA 8000A

Water samples are analyzed by direct injection using GC/FID.

OGG-TOT-WT Water Oil and Grease, Total APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to

determine Oil and Grease.

XYLENES-SUM-CALC- Water Sum of Xylene Isomer CALCULATION

VT Concentrations

Total xylenes represents the sum of o-xylene and m&p-xylene.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

 Laboratory Definition Code
 Laboratory Location

 WT
 ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

**Chain of Custody Numbers:** 

EXKM80 L1872424 CONTD....

**Reference Information** 

PAGE 4 of 4 Version: FINAL

### **GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Contact:

### **Quality Control Report**

Workorder: L1872424 Report Date: 30-DEC-16 Page 1 of 4

Baffinland Iron Mine's Corporation (Oakville) Client:

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3 Jim Millard, Allan Knight

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX-511-HS-WT	Water							
Batch R3	624116							
<b>WG2455460-4</b> Benzene	DUP	<b>WG2455460-3</b> < 0.50	<0.50	RPD-NA	ug/L	N/A	30	28-DEC-16
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-DEC-16
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	28-DEC-16
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-DEC-16
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-DEC-16
<b>WG2455460-1</b> Benzene	LCS		99.7		%		70-130	23-DEC-16
Ethylbenzene			93.5		%		70-130	23-DEC-16
m+p-Xylenes			94.2		%		70-130	23-DEC-16
o-Xylene			95.1		%		70-130	23-DEC-16
Toluene			95.9		%		70-130	23-DEC-16
WG2455460-2	МВ							20 220 .0
Benzene			<0.50		ug/L		0.5	28-DEC-16
Ethylbenzene			<0.50		ug/L		0.5	28-DEC-16
m+p-Xylenes			<0.40		ug/L		0.4	28-DEC-16
o-Xylene			<0.30		ug/L		0.3	28-DEC-16
Toluene			<0.50		ug/L		0.5	28-DEC-16
Surrogate: 1,4-	Difluorobenzene		98.9		%		70-130	28-DEC-16
Surrogate: 4-Br	omofluorobenzene		96.3		%		70-130	28-DEC-16
<b>WG2455460-5</b> Benzene	MS	WG2455460-3	99.9		%		50-140	28-DEC-16
Ethylbenzene			91.3		%		50-140	28-DEC-16
m+p-Xylenes			92.7		%		50-140	28-DEC-16
o-Xylene			93.1		%		50-140	28-DEC-16
Toluene			95.0		%		50-140	28-DEC-16
F1-HS-511-WT	Water							20 220 .0
	water 624116							
WG2455460-4	DUP	WG2455460-3						
F1 (C6-C10)	201	<25	<25	RPD-NA	ug/L	N/A	30	28-DEC-16
<b>WG2455460-1</b> F1 (C6-C10)	LCS		88.5		%		80-120	23-DEC-16
<b>WG2455460-2</b> F1 (C6-C10)	МВ		<25		ug/L		25	28-DEC-16
Surrogate: 3,4-	Dichlorotoluene		100.1		%		60-140	28-DEC-16
WG2455460-5	MS	WG2455460-3					-	20 220 10
52 100 100 0		52405400-0						



Workorder: L1872424 Report Date: 30-DEC-16 Page 2 of 4

Client: Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard, Allan Knight

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	Water							
Batch R362411 WG2455460-5 MS F1 (C6-C10)	6	WG2455460-3	82.2		%		60-140	28-DEC-16
F2-F4-511-WT	Water							
Batch R362556	0							
<b>WG2457959-2 LCS</b> F2 (C10-C16)			104.2		%		70-130	30-DEC-16
F3 (C16-C34)			109.0		%		70-130	30-DEC-16
F4 (C34-C50)			109.4		%		70-130	30-DEC-16
<b>WG2457959-3 LCS</b> F2 (C10-C16)	D	<b>WG2457959-2</b> 104.2	! 105.2		%	1.0	50	30-DEC-16
F3 (C16-C34)		109.0	108.7		%	0.3	50	30-DEC-16
F4 (C34-C50)		109.4	106.3		%	2.9	50	30-DEC-16
WG2457959-1 MB								
F2 (C10-C16)			<100		ug/L		100	30-DEC-16
F3 (C16-C34)			<250		ug/L		250	30-DEC-16
F4 (C34-C50)			<250		ug/L		250	30-DEC-16
Surrogate: 2-Bromobe	nzotrifluoride		99.8		%		60-140	30-DEC-16
GLYCOL-1-WT	Water							
Batch R362435								
WG2456974-4 DUP Ethylene Glycol		<b>L1872424-1</b> <5.0	<5.0	RPD-NA	mg/L	N/A	30	23-DEC-16
Diethylene Glycol		<5.0	<5.0	RPD-NA	mg/L	N/A	30	23-DEC-16
1,2-Propanediol		<5.0	<5.0	RPD-NA	mg/L	N/A	30	23-DEC-16
1,3-Propanediol		<5.0	<5.0	RPD-NA	mg/L	N/A	30	23-DEC-16
Triethylene Glycol		<5.0	<5.0	RPD-NA	mg/L	N/A	30	23-DEC-16
WG2456974-2 LCS			400 -		0/			
Ethylene Glycol			100.2		%		70-130	23-DEC-16
Diethylene Glycol			97.8		%		70-130	23-DEC-16
1,2-Propanedial			102.8		%		70-130	23-DEC-16
1,3-Propanediol			99.8		%		70-130	23-DEC-16
Triethylene Glycol			96.2		%		70-130	23-DEC-16
WG2456974-3 MB Ethylene Glycol			<5.0		mg/L		5	23-DEC-16
Diethylene Glycol			<5.0		mg/L		5	23-DEC-16
1,2-Propanediol			<5.0		mg/L		5	23-DEC-16



Workorder: L1872424

Report Date: 30-DEC-16

Page 3 of 4

Client:

Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard, Allan Knight

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
GLYCOL-1-WT	Water							
Batch R3624355 WG2456974-3 MB								
1,3-Propanediol			<5.0		mg/L		5	23-DEC-16
Triethylene Glycol			<5.0		mg/L		5	23-DEC-16
WG2456974-5 MS		L1872424-1						
Ethylene Glycol			101.1		%		50-150	23-DEC-16
Diethylene Glycol			97.8		%		50-150	23-DEC-16
1,2-Propanediol			104.8		%		50-150	23-DEC-16
1,3-Propanediol			102.6		%		50-150	23-DEC-16
Triethylene Glycol			96.2		%		50-150	23-DEC-16
OGG-TOT-WT	Water							
Batch R3625017 WG2456965-2 LCS			07.0		0/			
Oil and Grease, Total			97.9		%		70-130	23-DEC-16
WG2456965-3 LCSD Oil and Grease, Total		<b>WG2456965-2</b> 97.9	94.1		%	4.0	40	23-DEC-16
WG2456965-1 MB Oil and Grease, Total			<2.0		mg/L		2	23-DEC-16

Workorder: L1872424 Report Date: 30-DEC-16

Client: Baffinland Iron Mine's Corporation (Oakville)

2275 Upper Middle Rd. E. Suite #300

Oakville ON L6H 0C3

Contact: Jim Millard, Allan Knight

### Legend:

Limit ALS Control Limit (Data Quality Objectives)

DUP Duplicate

RPD Relative Percent Difference

N/A Not Available

LCS Laboratory Control Sample SRM Standard Reference Material

MS Matrix Spike

MSD Matrix Spike Duplicate

ADE Average Desorption Efficiency

MB Method Blank

IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

### **Sample Parameter Qualifier Definitions:**

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

#### **Hold Time Exceedances:**

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

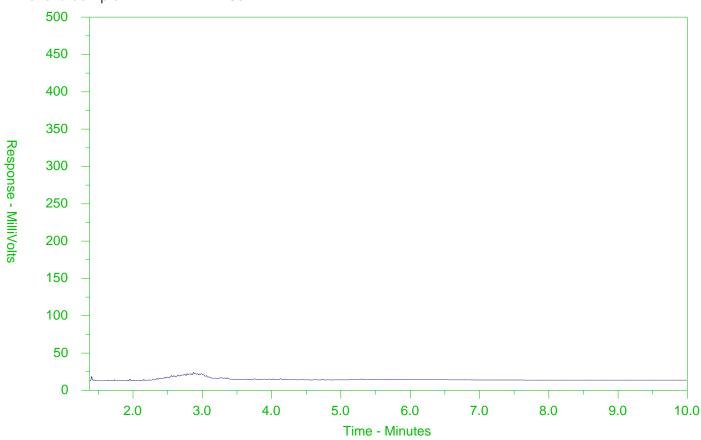
Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Page 4 of 4

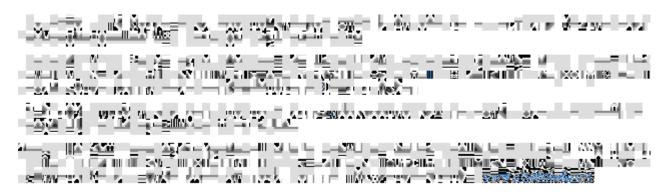
### CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L1872424-1 Client Sample ID: EXKM80



<b>←</b> -F2-	→ ←	_F3 <del></del> F4_	<b>→</b>	
nC10	nC16	nC34	nC50	
174°C	287°C	481°C	575°C	
346°F	549°F	898°F	1067°F	
Gasolin	ie →	<b>←</b> Mo	otor Oils/Lube Oils/Grease——	-
<b>←</b>	-Diesel/Jet	Fuels→		

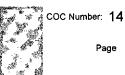


# ALS Environmental

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

### Chain of Custody (COC) / Analytical Request Form

L1872424-COFC



Page 1 of 1

Canada Toll Free; 1 800 668 9878 www.alsglobal.com Report To Report Format / Distribution Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) R Regular (Standard TAT if received by 3 pm - business days) Company: Baffinland Iron Mines Corp. - ALS ENV Account 23642 Select Report Format: TPDF . TEXCEL TEDD (DIGITAL) Priority (2-4 bus, days if received by 3pm) 50% surcharge - contact ALS to confirm TAT Contact: Jim Millard, Allan Knight ∏; No Emergency (1-2 bus, days if received by 3pm) 100% surcharge - contact ALS to confirm TAT Address: 2275 Upper Middle Rd. E., Suite #300 Driteria on Report - provide details below if box checked FAX Oakville, ON, L6H 0C3 Select Distribution: []EMAIL E2 Same day or weekend emergency - contact ALS to confirm TAT and surcharge Phone: 647-253-0596 EXT 6016 Email 1 or Fax birncore@alsglobal.com Specify Date Required for E2,E or P: Analysis Request Same as Report To M Yes 🗀 No Invoice Distribution Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below Invoice To Copy of Invoice with Report ☐ Yes 🛂 No. Select Invoice Distribution: **FEMAIL** MATE FAX Email 1 or Fax ap@baffinland.com Company: Contact: of Container Project Information Oli and Gas Required Fields (client use) ALS Quote #: Q42455 Approver ID: Cost Center: EXKM80 Job #: GL Account: Routing Code: 4500017476 PO / AFE: Activity Code: ğ SD: Location: 3TEX/PHCs/0&G というと ALS Lab Work Order # (lab use only) ALS Contact: Wayne Smith Sampler: DR/AV Sample Identification and/or Coordinates Date ALS Sample # Time Sample Type (lab use only) (This description will appear on the report) (dd-mmm-yy) (hh:mm) EXKM80 17-Dec-16 11:00 R Water 9 SAMPLE CONDITION AS RECEIVED (lab use only) E . S Drinking Water (DW) Samples (client use) Sample from Actual Waste Rock Pond. SIF Observations No Frozen Are samples taken from a Regulated DW System? Site Specific Criteria - Account Manager to update as required. No Custody seal intact Yes lce packs Yes [ Yes ₩ No Cooling Initiated INITIAL COOLER TEMPERATURES °C - FINAL COOLER TEMPERATURES °C -Are samples for human drinking water use? [ Yes ₩. No \* F INITIAL SHIPMENT RECEPTION (lab use only) FINAL SHIPMENT RECEPTION (lab use only) SHIPMENT RELEASE (client use) m (1968) 2.966 Released by: Andrew Vermeer Time: Date:2016-12-20 Time: 19:30 Received by: Received by:

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white whom copy.

1. If any water samples are taken from a Regulated Drinking Water (DW). System, please submit using an Authorized DW COC form.

Ø



January 26, 2017

Resource Management Officer **Nunavut Field Operations** Aboriginal Affairs and Northern Development Canada Box 100 Igaluit, NU X0A 0H0 Justin.Hack@aandc-aadnc.gc.ca

Director, Major Projects Qikiqtani Inuit Association P.O. Box 219 Igaluit, NU X0A 0H0

Re: Follow-up to Spill #16-434, Reported on December 27, 2016 Mary River Project - Water Licence No. 2AM-MRY1325

### **Summary:**

At 5:45 am Baffinland's vacuum truck operator was off loading raw sewage from the vacuum truck into the waste water treatment plant (WWTP). During the transfer, the operator noticed sewage coming out of the WWTP west door. The operators then turned off the vacuum truck pump. Upon investigation, the spill source was determined to be a 1/2" valve left in an improper position inside the WWTP on the influent line. Approximately 150L of raw sewage was released to the adjacent WWTP pad. An additional 150L recovered from inside the WWTP, which did not impact the receiving environment, was reintroduced back into the sewage treatment system. The closest water body is approximately 100 m to the southwest and is currently frozen.

### Immediate and Follow-Up Action:

The operator turned off the vacuum truck pump and notified the Surface Works supervisor who reported the incident. The accessible contaminated snow was shoveled into Quatrex bags and disposed of in the Mine Site Polishing Waste Stabilisation Pond 1 (PWSP 1), a lined engineered containment pond.

### Recommendations:

Supervisors need to ensure all operators receive proper training and fully understand their task. Operator must check valve settings every time before offloading sewage from the vacuum truck into the WWTP.

### **Current Status:**

The WWTP is currently fully operational and vacuum truck operators have received training on the offloading procedure.

Should you require further information or clarification on the above noted spill, please feel free to contact William Bowden at (647) 253-0596 x6016, Laura Taylor (647) 253-0596 x6016 or Allan Knight at (647) 253-0596 x6010.

Prepared By: Reviewed by:

Connor Devereaux,

William Bowden, **Environmental Coordinator Environmental Superintendent** 

Attach: Photos, Map, NT-NU Spill Report

cc. Todd Burlingame, Wayne McPhee, Sylvain Proulx, Robert Gagne, Anant Minhas, Laura Taylor (Baffinland), Stephen Bathory (QIA), Scott Burgess, Erik Allain, Sarah Forte, Jonathan Mesher (INAC).



Photo 1 – WWTP Raw Sewage Spill



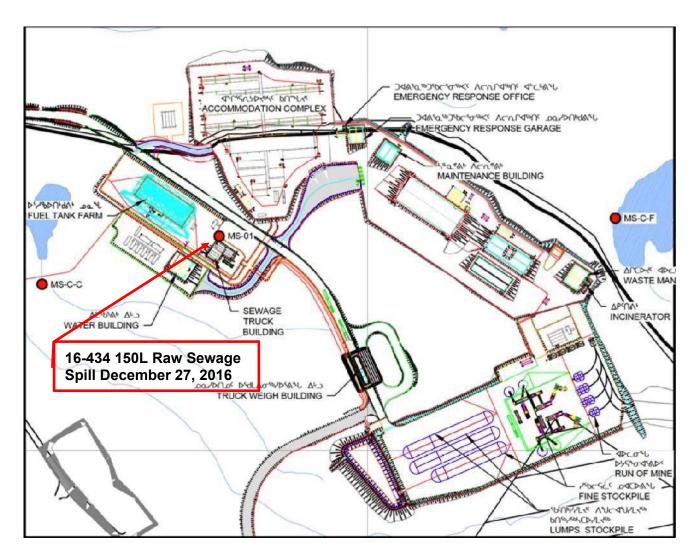


Figure 1 - Spill Location



NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

	REPORT DATE: MONTH - DAY - YEAR		REPORT TIME			\$ C
A	12-27-2016		06:00	ORIGINAL SPILL R	EPORT,	REPORT NUMBER
В	OCCURRENCE DATE: MONTH - DAY - YEAR 12-27-2016		05:45	TO THE ORIGINAL SP	ILL REPORT	16 - 434
C	LAND USE PERMIT NUMBER (IF APPLICABLE) IOL - Commercial Lease: Q13C3		2AM-MRY	NUMBER (IF APPLICABLE) 1325 Type "A"		-R 0
0	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIFFE Mary River Mine Site, Baffin Isla		CONTRACTORS CONTRACTORS	NUNAVUT 🗆 ADJACENT J	URISDICTION	OROCEAN
Ξ	DEGREES 71 MINUTES 18	OLOUHUU .	9 DEGREES 79		7 s	SECONDS 06
	RESPONSIBLE PARTY OR VESSEL NAME Baffinland Iron Mines Corp.	2275 Mi		utie 300, Oakville,	ON L6H	1 0C3
3	N/A	N/A	ADDRESS OR OFFICE LOCA	TION		
	PRODUCT SPILLED Raw Sewage	150 Litre	LITRES, KILOGRAMS OR CUB BS	N/A		
	SECOND PRODUCT SPILLED (IF APPLICABLE)  N/A	N/A	LITRES, KILOGRAMS OR CUB	N/A		
Ī	SPILL SOURCE Vacuum Truck	1/2" valv	ve inside WWTP	AREA OF CONTA	amination in	SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY  Spill inside and beside WWTP	700000000000000000000000000000000000000	Y ASSISTANCE REQUIRED	HAZARDS TO PE	RSONS, PRO	PERTY OR EQUIPMENT
285	ADDITIONAL INFORMATION, COMMENTS, ACTIONS P At 5:45 am Baffinland's vacuum into the waste water treatment coming out of the WWTP west of notified his supervisor, who rep determined to be a 1/2" valve in	truck operated truck operated the operated the income side the the income side the WW	or was off loading During the transerator immediately ident. Upon initial TP on the influent	g raw sewage from sfer, the operator r turned off the vac investigation, the line. Approximate	the vac noticed s cuum tru spill so ely 150L	cuum truck sewage uck pump and ource was of raw
285	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PA At 5:45 am Baffinland's vacuum into the waste water treatment coming out of the WWTP west of notified his supervisor, who rep determined to be a 1/2" valve in sewage was released to the adj recovered from inside the WWT back into the sewage treatment southwest and is currently froz reported as required by the cor	noposed on taken truck operated that (WWTP) door. The operated the income side the WW acent WWTP P, which did system. The en; the spill welditions of war	tor was off loading.  During the transparator immediately ident. Upon initial TP on the influent pad, impacting ar not impact the reclosest water body was confined to the ter license no. 2A	g raw sewage from sfer, the operator resturned off the vacual investigation, the line. Approximate a area of 15m2. An ociving environme by is approximately e WWTP pad. This M-MRY1325, Part I	the vac noticed s cuum tru spill so ely 150L addition nt, was i y 100 m s spill is H, item	cuum truck sewage uck pump and ource was of raw nal 150L reintroduced to the being 9 (b)
285	ADDITIONAL INFORMATION, COMMENTS, ACTIONS P At 5:45 am Baffinland's vacuum into the waste water treatment coming out of the WWTP west of notified his supervisor, who rep determined to be a 1/2" valve in sewage was released to the adj recovered from inside the WWT back into the sewage treatment southwest and is currently froz reported as required by the cor pursuant to subsection 12(3) of	truck operated the incomplete the work of the operated the incomplete the work of the incomplete the work of the work of the work of the system. The en; the spill work of the Nunavut	tor was off loading. During the transparator immediately ident. Upon initial TP on the influent pad, impacting ar not impact the recolosest water body was confined to the ter license no. 2A Waters and Nuna	g raw sewage from sfer, the operator resturned off the vacuation, the line. Approximate area of 15m2. An operator generation area of 15m2. An operation area of 15m2. An operation area of 15m2. An operation of the work of t	the vac noticed s cuum tru spill so ely 150L addition nt, was i y 100 m s spill is H, item	cuum truck sewage uck pump and ource was of raw nal 150L reintroduced to the being 9 (b) al Act.
< 	ADDITIONAL INFORMATION, COMMENTS, ACTIONS P At 5:45 am Baffinland's vacuum into the waste water treatment coming out of the WWTP west of notified his supervisor, who rep determined to be a 1/2" valve in sewage was released to the adj recovered from inside the WWT back into the sewage treatment southwest and is currently froz reported as required by the cor pursuant to subsection 12(3) of REPORTED TO SPILL LINE BY William Bowden  ANY ALTERNATE CONTACT POSITION POSITION	truck operated the incomposed of the operated the incomposed the incomposed the WW acent WWTP P, which did system. The en; the spill will be of the Nunavut trintendent	tor was off loading. During the transparator immediately ident. Upon initial TP on the influent pad, impacting ar not impact the reclosest water body was confined to the ter license no. 2A Waters and Nuna	g raw sewage from sfer, the operator resturned off the vacuum investigation, the line. Approximate area of 15m2. An operator generator area of 15m2. An operator generator area of 15m2. An operator generator	the vac noticed s cuum tru spill so ely 150L addition nt, was i y 100 m s spill is H, item s Tribuna	cuum truck sewage uck pump and ource was of raw nal 150L reintroduced to the being 9 (b) al Act.
< 	ADDITIONAL INFORMATION, COMMENTS, ACTIONS P At 5:45 am Baffinland's vacuum into the waste water treatment coming out of the WWTP west of notified his supervisor, who rep determined to be a 1/2" valve in sewage was released to the adj recovered from inside the WWT back into the sewage treatment southwest and is currently froz reported as required by the cor pursuant to subsection 12(3) of REPORTED TO SPILL LINE BY William Bowden  ANY ALTERNATE CONTACT POSITION	n truck operated at truck operated the operated the income side the WW acent WWTP P, which did system. The en; the spill verifications of wathe Nunavut	tor was off loading. During the transparator immediately ident. Upon initial TP on the influent pad, impacting ar not impact the reclosest water body was confined to that ter license no. 2A Waters and Nuna	g raw sewage from sfer, the operator recovered off the vacuum turned off the vacuum turned off the vacuum turned of 15m2. An ceiving environmedly is approximately e WWTP pad. This M-MRY1325, Part I wut Surface Rights	the vac noticed s cuum tru spill so ely 150L addition nt, was i y 100 m s spill is H, item s Tribuna	cuum truck sewage uck pump and ource was of raw nal 150L reintroduced to the being 9 (b) al Act. relephone ext. 6016
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Figure 2 - NT-NU Spill Report