QA/QC Plan for Sampling from Final Discharge Point of Bermed Fuel Storage Facilities at CAM-M, CAM-3, FOX-M, FOX-3, DYE-M, and BAF-3

Licensee: Department of National Defence,
Government of Canada

Licenses, Locations, & Monitoring Station #s:

Licence	Location	Monitoring Station # (Final Discharge Point of Bermed Fuel Storage Facility)
3BC-CAM0919 Type "B"	CAM-M North Warning System Site, Cambridge Bay, Victoria Island, Kitikmeot Region, Nunavut	CDL-3
3BC-SHE0919 Type "B"	CAM-3 North Warning System Site, Shepherd Bay, Kitikmeot Region, Nunavut	SHE-3
3BC-FOH0919 Type "B"	FOX-M North Warning System Site, Hall Beach, Melville Peninsula, Qikiqtani Region, Nunavut	FOH-3
3BC-FOD0919 Type "B"	FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut	FOD-3
3BC-DYE0919 Type "B"	DYE-M North Warning System Site, Cape Dyer, Qikiqtani Region, Nunavut	DYE-3
3BC-BAF0919 Type "B"	BAF-3 North Warning System Site, Brevoort Island, Qikiqtani Region, Nunavut	BAF-4

Plan submitted by: Nasittuq Corporation

Date: 27 January 2010

Objective

This QA/QC plan applies to the six sites listed above at the monitoring stations for the final discharge point of each bermed fuel storage facility. It has been prepared to ensure that sampling, sample preservation, and analyses are done in accordance with methods in the current edition of the Standard Methods for the Examination of Water and Wastewater as required by the Nunavut Water Board Water Licences listed above.

Review

This plan shall be reviewed annually by Nasittuq's Environmental Services and will be updated as required. Updated plans will be submitted to the NWB with an approval letter from a laboratory accredited to ISO/IEC Standard 17025.

Feedback

Feedback such as comments, complaints, and suggestions for improvements are to be submitted to: Nasittuq Corp., 100-170 Laurier Ave. W., Ottawa, ON, K1P 5V5, Attention: Supervisor, Environmental Services.

Approval

This plan has been reviewed and accepted.

Original signed by Barb Thomson	27 Jan 2010
_____	_____
Supervisor, Environmental Services Nasittuq Corp.	Date (dd/mm/yy)

Background

Some fuel storage tanks at the six sites are surrounded by berms. Water from precipitation accumulates in the berms and must be pumped out to prevent damage to the fuel tanks.

The water licenses require that prior to release of the effluent, samples must be taken and analyzed for the stated parameters. If the results don't exceed the effluent quality limits, then the water can be pumped out. However, if the results do exceed the effluent quality limits, then the effluent is considered hazardous waste and must be disposed of off-site at an approved, licensed facility.

Samples are taken from each berm. This sampling point is the final discharge point of the bermed fuel storage facility. The liquid is adequately represented by single grab samples.

Equipment

The Berm Water Testing Kit is a cooler which contains:
- a Chain of Custody form which includes an area for the sample analysis request;
- cold packs; and
- sample bottles (including bubble pack for glass bottles)

provided by Exova Accutest Laboratories. The sample bottles are listed in **Table 1** below. The sample bottles are clean and free of contaminants.

Personal Protective Equipment (PPE)

Eye protection (safety glasses or goggles) and acid-resistant gloves are to be worn. A filled portable eye wash or source of water to flush eyes must be on-hand at the sampling point.

Table 1. Sample bottle requirements

Bottle	Parameters	Sampling	Storage Instructions
250 ml plastic chem. bottle (no preservative)	pH	Grab	Keep cool. Return to the laboratory within 7 days of sampling.
1 liter amber glass (no preservative)	Oil & Grease (total)	Grab	Keep cool. Return to the laboratory within 7 days of sampling.
125 ml plastic with HNO3 preservative	Metals (total)	Unfiltered. No rinsing. **Be careful of concentrated acid preservative.**	Keep cool. **Be sure "total" is written on the bottle label.**
125 ml plastic with HNO3 preservative	Metals (dissolved)	Field-filtered to 0.45 um. No rinsing. **Be careful of concentrated acid preservative.**	Keep cool. **Be sure "dissolved" is written on the bottle label.**
125 ml plastic with HNO3 + K2CR2O7 preservative	Mercury (total)	Unfiltered. **Be careful of acid preservative.**	Keep cool.
125 ml amber glass with H2SO4 preservative	Phenols	No rinsing. **Be careful of concentrated acid preservative.**	Keep cool.
1 liter amber glass (no preservative)	PCBs	Grab	Keep cool. Return to the laboratory within 7 days of sampling.
2 x 40 ml VOC vials	BTE	Fill slowly and completely – no air bubbles present.	Keep cool. Holding time is 14 days.

Sample Collection

1. Co-ordinate taking the samples with the air cargo flight schedule to minimize sample storage time.
2. The day before sampling, get the cold packs from the berm water testing kit and place in freezer overnight.
3. The day of sampling, gather these items at the sampling point:
   a. eye protection (safety glasses or goggles);
   b. acid- resistant gloves;
   c. filled portable eye wash or source of water to flush eyes;
   d. Berm Water Testing Kit from Logistics;
   e. 0.45 um filter units;
   f. plastic bag (garbage bag is OK); and
   g. permanent marker.
4. With permanent marker, mark each bottle with its parameter. For the metals bottles, be sure to mark "Metals, total" or "Metals, dissolved". Mark each bottle with site, unique sample # (include tank ID), time, and date.
5. Put on PPE. Have eye wash/water source within reach in case acid preservative splashes.
6. Fill and cap all bottles in kit as described in Table 1.
   Note: Don't rinse the bottles before collecting the sample.
7. Wrap glass bottles with bubble pack from kit.
8. Pack bottles carefully in garbage bag and place in cooler. Add cold packs. Add cushioning material if required.
9. Complete Chain of Custody form. See attached example. Keep the pink sampler copy. Place the remaining copies in the cooler.
10. Seal cooler with packing tape and air freight as soon as possible to: Exova Accutest Laboratories, 146 Colonnade Rd, Unit 8, Nepean, ON, Tel 613-727-5692.
    If any delay, keep samples cool (4 degrees C.).

Analyses

Exova Accutest Laboratories is accredited to ISO/IEC Standard 17025. Exova has an established QA/QC program for the analyses required under this water licence.

Results

Results are sent to Nasittuq's Supervisor, Environmental Services.

Exova Accutest

CHAIN OF CUSTODY

☑ 146 Colonnade Rd., Unit 8, Ottawa, ON K2E 7Y1, Ph: (613) 727-5692 Fax: (613) 727-5222

☐ 608 Norris Court, Kingston, ON K7P 2R9, Ph: (613) 634-9307 Fax: (613) 634-9308

☐ 380 Vansickle Rd., Unit 630, St. Catharines, ON L2R 6P7, Ph: (905) 680-8887 Fax: (905) 680-4256

LABORATORY USE ONLY
Report #: ______

Company Name: Nasittuq Corp.	Address: 100-170 Laurier Ave. W.		☐ Fax Results to: ______
Report Attention: Barb Thomson (Spr, Envtl Services)	City/Prov: Ottawa, ON	Postal Code: K1P 5V5	☑ E-mail Results to: barb.thomson@nasittuq.com
Phone: 613-787-3867 Ext: —	Project #: CAM-M (ML)	* Quotation #: 100053	☐ Copy of Results to: ______
* Waterworks Name: N/A	* Waterworks Number: N/A		*Note that for drinking water samples, all exceedances will be reported where (and how) the applicable legislation requires.*

Invoice to:
(If different from above)

______

______

SAMPLE ANALYSIS REQUIRED

⇦ Indicate: F=Filtered or P=Preserved

Sample ID	* Date/Time Collected	Sample Matrix (i.e. Water, Soil, Paint)	* Sample Type (see Codes below)	* MOE Reportable? Y = Yes N = No	# of Containers	** Service Required R=Rush S=Standard	pH	Oil & Grease (total)	Metals (total)	Metals (dissolved)	Mercury (total)	Phenols	PCBs	BTE	Criteria Required (i.e. Reg. 170, Reg. 153, CCME, PWQO etc.) Include sub-categories if appropriate	Laboratory Identification
									– P	F P	– P	– P				
ML-W20BC-1	31 Apr 2010, 09:00h				1	S	✓									
	″ ″				1	S		✓								
	″ ″				1	S			✓							
	″ ″				1	S				✓						
	″ ″				1	S					✓					
	″ ″				1	S						✓				
	″ ″				1	S							✓			
	″ ″				2	S								✓		
	″ ″													✓		

Sample Type Codes for Drinking Water Systems: **RW** = Raw Water, **RWFC** = Raw Water For Consumption, **TW** = Treated Water at point of entry to distribution, **DW** = Distribution/Plumbing Water
"MOE Reportable" refers to the requirements under the SDWA for immediate reporting of results, which are indicators of adverse water quality, to the Owner/Operator, MOE, and MOH Medical Officer.

Sampled By: Name of FMT/POL Tech.	Date/Time: 31 Apr 2010, 09:00h	Relinquished By:	Date/Time:	Comments	Cooler Temp. (°C) on Receipt
Work Authorized By (signature):	Date/Time:	Received By Lab:	Date/Time:		

*** Indicates a required field.** If not complete, analysis will proceed only on verification of missing information. A quotation number is required, if one was provided.
**** There may be surcharges applied to "Rush" service.** Please check with lab prior to submission of samples for rush analysis to confirm availability and pricing.

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AFCOCR.2

Copies: White - Laboratory, Yellow - With Report, Pink - Sampler

NASITTUQ

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Exova Accutest

January 28, 2010

Ms. Barb Thomson
Nasittuq Corporation
100-170 Laurier Ave. W.
Ottawa, ON K1P 5V5

Re: QA/QC Plan for Sampling from Final Discharge Point of Bermed Fuel Storage Facilities at CAM-M, CAM-3, FOX-M, FOX-3, DYE-M, and BAF-3

Dear Ms. Thomson,

Please note that we have reviewed Nasittuq's QA/QC Plan, dated 27-Jan-2010, for the program noted above and accept it as written.

Through the Canadian Association for Laboratory Accreditation (CALA), Exova Accutest is accredited to ISO 17025 specific parameters. From a laboratory standpoint, we are committed to fulfill the QA/QC requirements as outlined in your plan.

Let me know if you require any additional input or need copies of our accreditation certificates.

Sincerely,

Tim McCooeye, B.Sc., C.Chem.
General Manager
Exova Accutest