



## **ANNUAL REPORT 2007**

**Submitted to:**

**Nunavut Water Board**

**For**

**Licence:      NWB6BAF0409 - Type "B"**  
**BAF-3, Brevoort Island, NU**

**Submitted by: Nasittuq Corporation**

**31 March 2008**



This annual report is submitted to the Nunavut Water Board (“NWB”) as stipulated in Para. 1, Part B, General Conditions of the following licence:

Licence: NWB6BAF0409 Type “B”

## **NUNAVUT WATER LICENCE: NWB6BAF0409 Type “B”**

### **North Warning System Long Range Radar – BAF-3, Brevoort Island, Nunavut**

The annual operation and maintenance (O&M) activities at Brevoort Island during the reporting period included the quarterly preventive/corrective maintenance, in-house regulatory compliance audits and inspections, routine infrastructure maintenance in preparation for the summer Ramp-Up activities, and fuel re-supply. In addition, the discovery of a large fuel spill on 12 January 2007 drove significant site activity from that date throughout the year.

#### **Water Use**

The site reverted to manned status, earlier than originally scheduled in January as a result of a major fuel spill which was discovered on 12 January 07. The site was ramped down in late October, totaling 291 days of continuous site occupancy. The calculated total water usage for the site is 523.8 cubic meters. This is based on 150 litres per person per day, with an average daily occupancy rate of 12 persons. This gives an average daily usage of 1.8 cubic meters, below the 10 cubic meters daily allowed by the license. Note that a water meter has since been installed at the site, and for the 2009 report, we will be able to report actual usage. The DIAND inspector noted that the use of heavy equipment was evident adjacent to the intake structure. Normally, water is pumped to the summit using a pump/power unit. However, this was out of commission in 2007, necessitating the hauling of water. The pump/power unit is expected to be in service for 2008, eliminating the requirement to have heavy equipment near the water lake.

#### **Hazardous Waste Disposal**

The waste management was consistent with the Nasittuq Environmental Protection Plan (“EPP”), meeting the terms and conditions stipulated in the NWB water licence.

The following items were retrograded to Quebec for disposal in 2007.

Disposal facility: Recyclex, 8381, Place Marien, Montreal-EST Quebec. H1B 5W6

#### **Summary of Waste Retrograde in 2007**

BAF-3	Glycol	2 drums
BAF-3	Waste Fuel	1 drum
BAF-3	Waste fuel mixture	26 drums
BAF-3	Waste fuel filters	1 drum
BAF-3	Waste paint	1 drum
BAF-3	Waste batteries, wet, lead acid	1 crate x 22 batteries
BAF-3	Waste Oil	16 drums
BAF-3	Waste Oil filters	1 drum

Note that all waste generated from the spill clean-up remains on site. This waste will be disposed of in 2008 and 2009 by a combination of incineration and retrograde.

### **Non Hazardous Solid Waste Disposal**

All domestic solid waste was disposed of in the on-site incinerator with the ashes buried at a designated on-site landfill. The DIAND inspector made reference to this practice in his report dated 06 February 2008, specifically that the waste was to be incinerated, as opposed to being burned. We are requesting clarification on this issue, as we consider removing this type of waste back to Iqaluit impractical, and we believe the current practice to be an acceptable method for the disposal of this kind of waste.

Refer to Annex A for designated landfill location, with GPS coordinates at BAF-3.

### **Sewage Discharge**

Refer to Annex B for sewage outfall location, with GPS coordinates at BAF-3. The DIAND inspector made reference to concerns with regard to the current configuration of the sewage system, specifically the lack of a lagoon or sump. However, we maintain that we using the system "... as described in the water license amendment application filed on August 6, 2004", which did not include a sump or lagoon. We seek clarification on this issue.

### **Monitoring Program**

Refer to Annex C for sewage analysis for BAF-3.

### **Product Spills**

One spill occurred during this reporting period, please refer to the following table:

Date	Product	Quantity	Cause	Locality	Notification
Jan 13 2007	Aviation fuel, (Jet A-1)	148,968 litres (calculated)	Damaged pipeline	Underneath the Technical Services Module Building at summit of BAF-3	Arctic Alert & Nunavut Water Board

Clean-up/mitigation status accomplished in 2007.

- i) Delineated and intercepted further migration of fuel plumes caused by the spilled fuel.
- ii) Excavated and removed contaminated snow/ice, totaling approximately 5,000 cubic meters to minimize long term ecological damages
- iii) Effected wastewater treatment (in excess of 600,000 litres) to regulatory standards for release.
- iv) Damaged fuel line was repaired.
- v) Regular weekly spill status reports were provided to Mr. Andrew Keim of INAC during the months of March, April, May, June, July, and August 2007.

### **Revisions to the ERP**

No revisions have been effected during this reporting period.

### **Progressive reclamation work undertaken**

Significant reclamation work is planned for 2008 and 2009 as part of the on-going clean-up of the spill noted above. Key activities for 2008 are as follows:

- i) Environmental permitting and planning;
- ii) Snow clearing;
- iii) Control and mitigation (continuation from 2007);
- iv) Wastewater treatment (continuation from 2007);
- v) Construction of biopile base;
- vi) Remediation;
- vii) Trial incineration of recovered product and spent sorbent materials;
- viii) Site decommissioning.

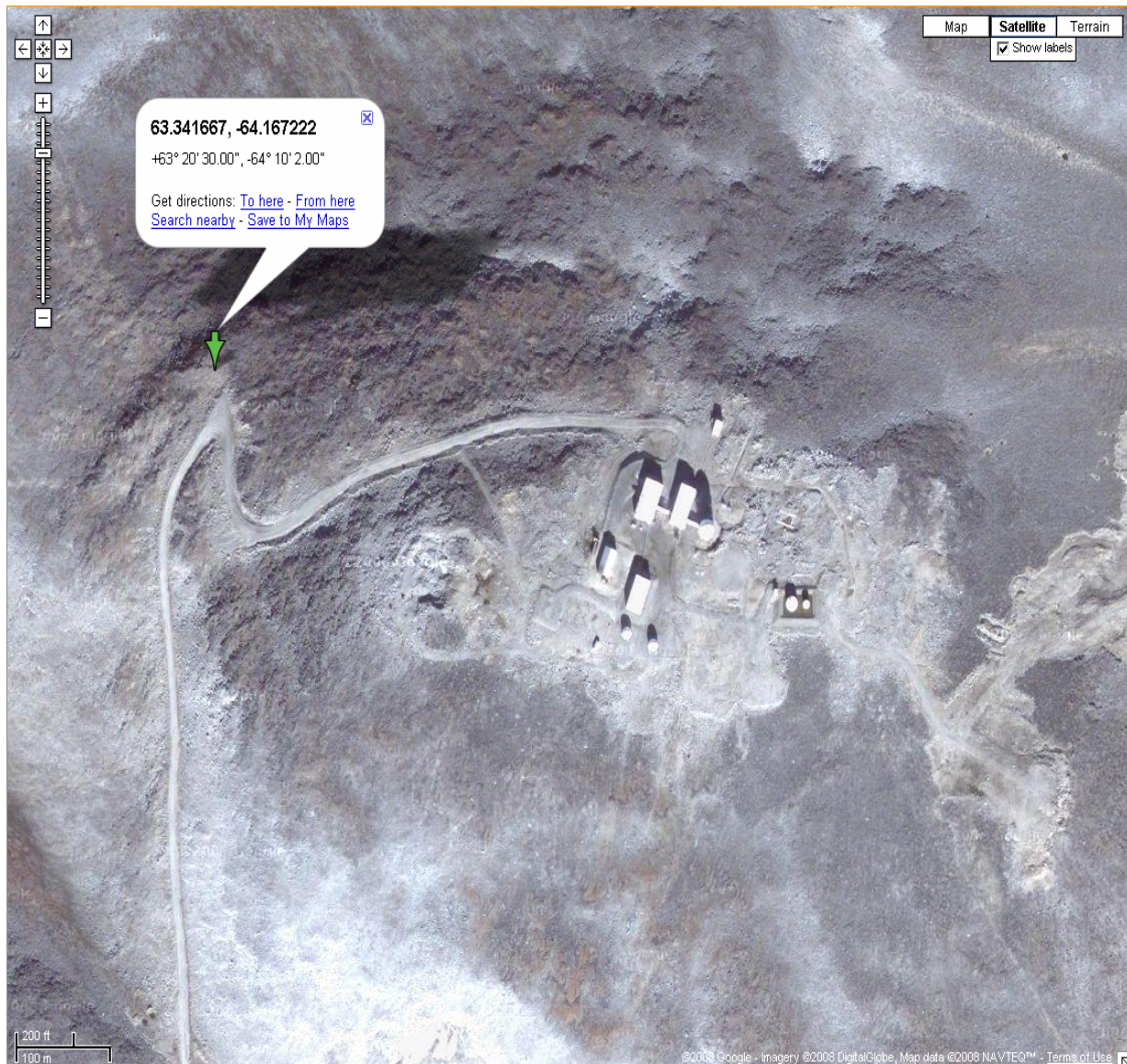
Please note that our planning for this effort is expected to be completed by mid-April. The key component we have yet to finalize is the disposal of the recovered fuel and sorbent material. To date, it appears that 2009 will be the year to complete this phase of the work. Key equipment required to incinerate this waste will only arrive by sealift later in the season, and will not likely allow enough time for this work to be completed before the end of the project season. Once our planning is completed, we will submit under separate cover our final plan. Pending this, we have attached our draft schedule as it exists today in Annex D.



## **Annex A**

Designated landfill location, with GPS coordinates at BAF-3.

## BAF-3





## **Annex B**

Sewage outfall location, with GPS coordinates at BAF-3.

## BAF-3





## **Annex C**

Sewage analysis for BAF-3.



**Client: Nasittuq Corp. (Ottawa)**  
100-170 Laurier Ave.  
West Ottawa, ON  
K1P 5V5

**Attention: Mr. Sam Chang**

**Report Number: 2803213**

**Date: 2008-02-25**

**Date Submitted: 2008-02-13**

**Project:**

**P.O. Number:**

**Chain of Custody Number: 72169**

**Matrix: Sewage**

			LAB ID:	604480	604481					GUIDELINE		
			Sample Date:	2008-01-25	2008-01-25							
			Sample ID:	DYE-M	BAF-3							
PARAMETER	UNITS	MRL								TYPE	LIMIT	UNITS
Biochemical Oxygen Demand	mg/L	1	647	3860								
Conductivity	uS/cm	5	1130	523								
N-NH <sub>3</sub> (Ammonia)	mg/L	2.0	94.4	19.8								
NO <sub>2</sub> + NO <sub>3</sub> as N	mg/L	0.10	<0.10	<0.10								
pH			6.61	5.32								
Phenols	mg/L	0.001	0.385	0.038								
Sulphate	mg/L	1	1	11								
Total Suspended Solids	mg/L	2	466	876								
Calcium	mg/L	1	32	8								
Magnesium	mg/L	1	5	2								
Potassium	mg/L	1	23	50								
Sodium	mg/L	2	64	43								
Arsenic	mg/L	0.05	0.06	<0.05								
Cadmium	mg/L	0.01	<0.01	<0.01								
Chromium	mg/L	0.02	0.06	<0.02								
Copper	mg/L	0.01	1.86	1.92								
Iron	mg/L	0.1	4.4	2.3								
Lead	mg/L	0.01	0.08	0.02								
Mercury	mg/L	0.05	<0.05	<0.05								
Nickel	mg/L	0.01	0.08	0.02								
Zinc	mg/L	0.05	0.56	0.88								

MRL = Method Reporting Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

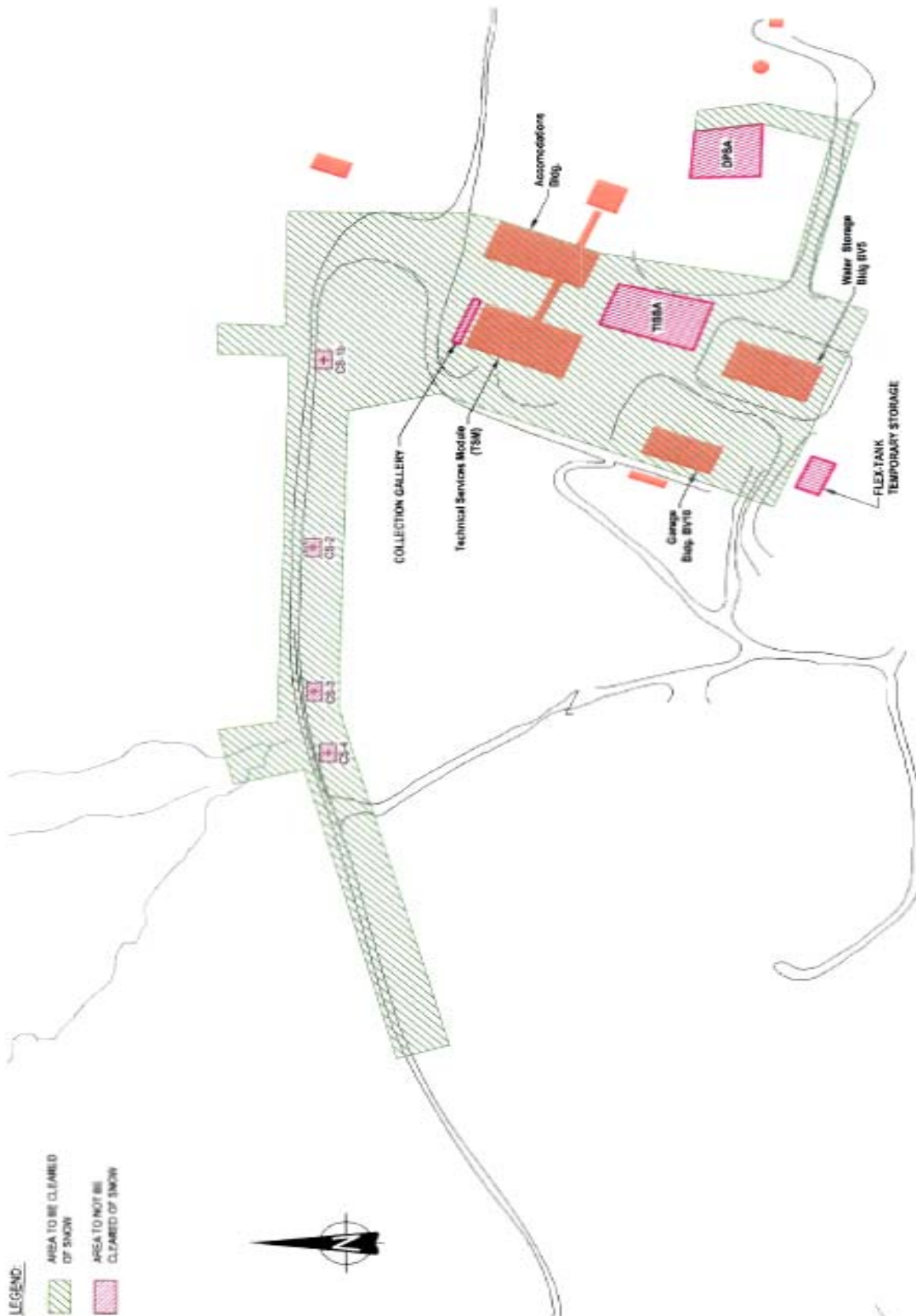
Comment: Metals analysis performed on aqua-regia digest of sample material.

APPROVAL: Lorna Wilson  
Agriculture Lab  
Supervisor



## **Annex D**

Proposed Remedial Action Plan (RAP) schedule for 2008



NOTE: THIS DRAWING IS A SUPPORTING DOCUMENT TO THE MAIN REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

<b>Reference:</b> BAF-3-ANVS-EGG 2007-001 PLAN PROVIDED BY THE ENVIRONMENTAL SCIENCES GROUP, ROYAL MILITARY COLLEGE, KINGSTON, ONTARIO		<b>Job No.:</b> 1023125 <b>Scale:</b> 1 : 1500 <b>Date:</b> 08/03/17 <b>Drawn By:</b> GSB <b>App'd By:</b>	<b>Client:</b> NASITTUQ CORPORATION <b>Site Address:</b> BAF-3, Iqrovoort Island, Nunavut	<b>PHASE II</b> ENVIRONMENTAL SITE ASSESSMENT	<b>2008 SNOW CLEARING</b>	<b>Comp. No.:</b> 9	 <b>NUNAMI</b> NUNAVUT WATER BOARD
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Task Name	Duration	Start	Finish
<b>1023128 - BAF-3, Personnel Rotation Schedule</b>	<b>149.6 days?</b>	<b>Fri 5/9/08</b>	<b>Sun 9/21/08</b>
<b>Environmental Permitting and Planning</b>	56.8 days	Fri 2/1/08	Fri 5/9/08
Update H&S Plan	3 days?	Tue 3/11/08	Fri 3/14/08
Initial Inventory, Office Set-Up, Reconnaissance	3 days	Sat 5/10/08	Tue 5/13/08
<b>Snow Clearing</b>	<b>15.4 days?</b>	<b>Wed 5/14/08</b>	<b>Sat 5/31/08</b>
Removal of snow from impacted areas, where possible.	4 days?	Wed 5/14/08	Sat 5/17/08
Removal of snow from Control Structure locations	4 days?	Mon 5/19/08	Thu 5/22/08
Removal of snow from TISSA	3 days?	Mon 5/26/08	Thu 5/29/08
Removal of snow from DPSA	1 day?	Thu 5/29/08	Fri 5/30/08
Source a location for biopiles; clear snow.	1 day?	Fri 5/30/08	Sat 5/31/08
<b>Control and Mitigation</b>	<b>102 days?</b>	<b>Fri 5/23/08</b>	<b>Thu 9/18/08</b>
Install Flex-Tanks	2 days?	Fri 5/23/08	Sat 5/24/08
Initial Control Structure Maintenance and Repair	6 days?	Mon 5/26/08	Sat 5/31/08
<b>Control Structure Maintenance</b>	<b>96.4 days</b>	<b>Mon 5/26/08</b>	<b>Mon 9/15/08</b>
Collect Impacted Water: in CS's and excavations, as required.	100 days?	Mon 5/26/08	Thu 9/18/08
<b>Water Treatment</b>	<b>106 days?</b>	<b>Mon 5/19/08</b>	<b>Thu 9/18/08</b>
System Set-Up	4 days?	Mon 5/19/08	Thu 5/22/08
Operation	100 days?	Mon 5/26/08	Thu 9/18/08
<b>Weekly Maintenance</b>	<b>91 days</b>	<b>Fri 5/30/08</b>	<b>Fri 9/12/08</b>
<b>Engineered Biopiles</b>	<b>89 days?</b>	<b>Tue 5/13/08</b>	<b>Sat 8/23/08</b>
<b>Construction of Biopile base</b>	<b>44 days?</b>	<b>Tue 5/13/08</b>	<b>Wed 7/2/08</b>
Collect Soil Sample - Send to BRI (Biotreatability Study)	1 day?	Tue 5/13/08	Tue 5/13/08
Collect Baseline Samples from Proposed Biopile Laydown Area	1.6 days?	Sat 6/7/08	Mon 6/9/08
Create Gravel Pad (Bulldozer)	4 days?	Tue 6/10/08	Fri 6/13/08
Installation of insulation, berm, liner and air induction system	4 days?	Mon 6/16/08	Thu 6/19/08
Installation of drainage control system, Phase I	2 days?	Fri 6/20/08	Sat 6/21/08
Installation of drainage control system, Phase II	3 days?	Mon 6/30/08	Wed 7/2/08
Installation of Temporary Staging Area, if required	2.4 days?	Tue 6/24/08	Thu 6/26/08
Hauling Impacted Soil	36 days?	Mon 6/30/08	Sat 8/9/08
Monitoring (Sample collection, shipping, and analysis)	6 days	Mon 8/18/08	Sat 8/23/08
<b>Remediation</b>	<b>112 days?</b>	<b>Wed 5/14/08</b>	<b>Sat 9/20/08</b>
Establish stockpiles of clean fill at strategic locations	6 days	Tue 6/24/08	Mon 6/30/08
Build Screener	5 days?	Wed 5/14/08	Mon 5/19/08
<b>APEC 1</b>	<b>12 days</b>	<b>Tue 7/15/08</b>	<b>Mon 7/28/08</b>
Excavation	6 days	Tue 7/15/08	Mon 7/21/08
Confirmatory sample collection and analysis	3.6 days	Tue 7/22/08	Fri 7/25/08
Backfill	2.4 days	Fri 7/25/08	Mon 7/28/08
<b>APEC 2</b>	<b>25 days?</b>	<b>Tue 7/1/08</b>	<b>Tue 7/29/08</b>
Excavation	12 days?	Tue 7/1/08	Mon 7/14/08
Confirmatory sample collection and analysis	5 days?	Tue 7/15/08	Sat 7/19/08
Backfill	8 days?	Mon 7/21/08	Tue 7/29/08
<b>APEC 3</b>	<b>83 days?</b>	<b>Tue 6/17/08</b>	<b>Sat 9/20/08</b>
Assess effectiveness of collection gallery	5 days?	Tue 6/17/08	Sat 6/21/08
Pilot Study: Install Drive-Points	5 days?	Thu 6/26/08	Tue 7/1/08
Install Injection Wells/Gallery	5 days?	Wed 7/30/08	Mon 8/4/08
Install Collection Wells/Gallery	6 days?	Tue 8/5/08	Mon 8/11/08
Flush APEC 3 with water/surfactant	35 days?	Tue 8/12/08	Sat 9/20/08
Collect impacted effluent and pump to north tank	36 days?	Fri 8/8/08	Thu 9/18/08
<b>Disposal of Recovered Product and Spent Booms and Pads</b>	<b>45 days?</b>	<b>Tue 7/29/08</b>	<b>Thu 9/18/08</b>
Set-up incineration equipment	2 days?	Tue 7/29/08	Wed 7/30/08
Operation and maintenance of incineration equipment	43 days?	Thu 7/31/08	Thu 9/18/08
Management of waste (sample, place in drums)	44 days?	Wed 7/30/08	Thu 9/18/08
<b>Site Decommissioning</b>	<b>76 days?</b>	<b>Wed 6/25/08</b>	<b>Sat 9/20/08</b>
Water Treatment System	4 days?	Wed 9/17/08	Sat 9/20/08
TISSA (Remove liner and berm, assess soil under footprint of TISSA, remove potentially impacted soil, as required)	74 days?	Wed 6/25/08	Thu 9/18/08
DPSA (Remove liner and berm, assess soil under footprint of TISSA, remove potentially impacted soil, as required)	43 days?	Wed 7/30/08	Wed 9/17/08
Site clean-up	10 days?	Wed 9/10/08	Sat 9/20/08