

ENVIRONMENTAL ASSESSMENT
EMULSION PLANT - CLIFFS RESSOURCES MINES



PRESENTED TO:

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

DEPT OF ENVIRONMENT AND CONSERVATION

PREPARED BY:

BENOIT CHOQUETTE, Eng., M.Sc.

ENVIRONMENTAL MANAGER CANADA

DYNO NOBEL CANADA INC.

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THE UNDERTAKING

(i) It is proposed to install a modular emulsion manufacturing plant near in Labrador near Bloom Lake Mine to supply Cliffs Mines (Wabush Mine, Bloom Lake Mine, etc.) and other customers in the area.

(ii) Cliffs Resources and Dyno Nobel have established an explosives supply agreement. In order to reliably supply Cliffs emulsion needs, a manufacturing plant has to be built locally. The best location identified that meet NRCan-ERD legal requirements and mine constraints is located in Labrador near the Bloom Lake Mine existing rails.

(iii) The project will allow rail transportation of low risk raw materials to manufacture the emulsion locally instead of shipping it already made in 20,000 kg tankers from the Montreal area. Since rail transportation is deemed safer than road transportation, the project will benefit public safety by eliminating an estimated 59,000 hours per year of presence of trucks carrying emulsion on public roads.

DESCRIPTION OF THE UNDERTAKING

(i) Geographical Location

The proposed site location is shown on the next images:

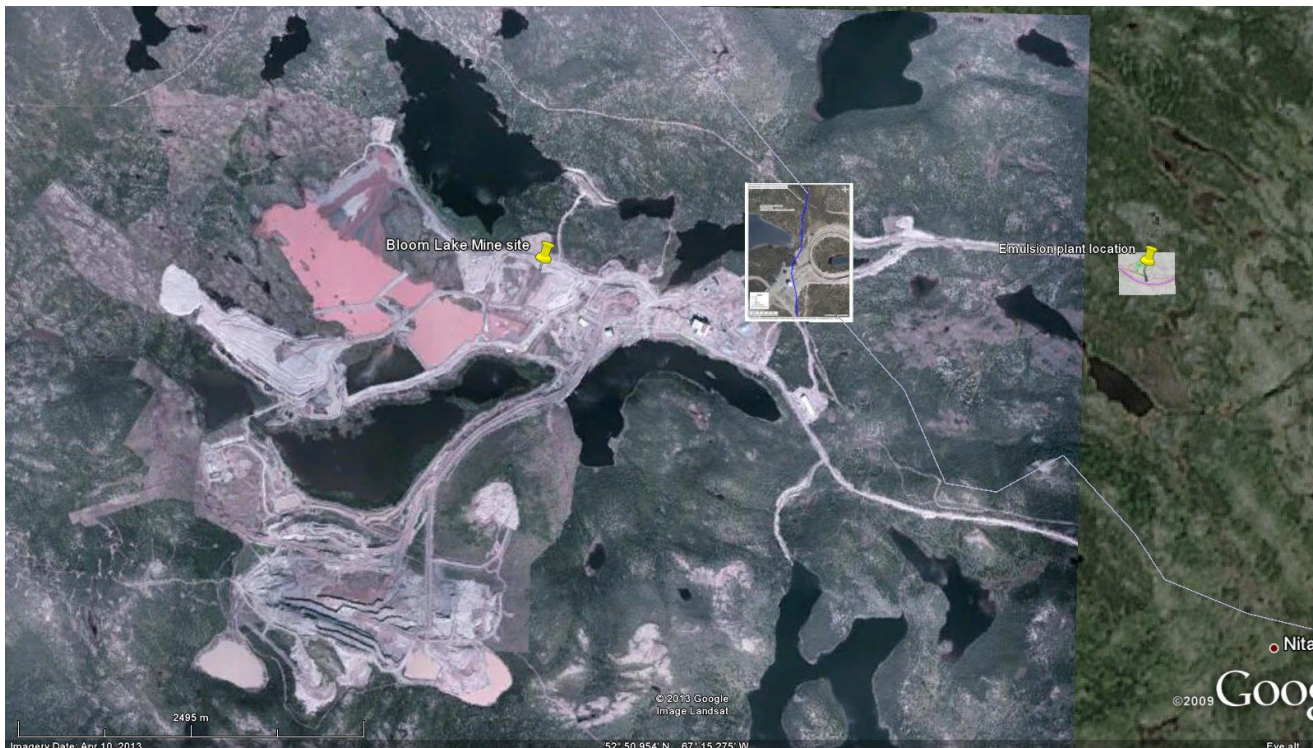


Figure 1. Location of the proposed site near Bloom Lake Mine.

Emulsion Plant GPS Coordinates: 52 ° 51.331' N, 67° 12.372' W (center of emulsion plant)

Labrador border is shown in blue near rail loop.



Figure 2: General view of the area. Labrador border is shown in blue near rail loop.



Figure 3: Closer aerial view of the proposed site in Labrador near Bloom Lake mine.

ii) Physical features

Overall Project Description

Bloom Lake site includes:

- Water Well
- Modular emulsion plant consisting of :
 - 8 sea-can containers containing emulsion manufacturing equipment
 - One (1) ammonium nitrate solution heated tank with containment
 - One (1) water heated tank
 - Two emulsion silos
 - One fuel-phase concentrate tank (double-walled)
 - One diesel tank double-walled
 - Three (3) chemical storage sea-cans
- New rail section to supply raw materials by rail cars (Ammonium Nitrate solution and fuel phase concentrate blends)
- New/modified access roads for the emulsion plant.

Plant Capacities and Processes

Bloom lake site

- Silos, overhead emulsion storage 2 x 60 MT with concrete foundation.
- One diesel tank up to 20,000 gallons (double-walled).
- Fuel phase concentrate up to 20,000 gallons (double walled).
- One 20000 litres tank of AN solution (containment).
- One 20000 litres tank of water.

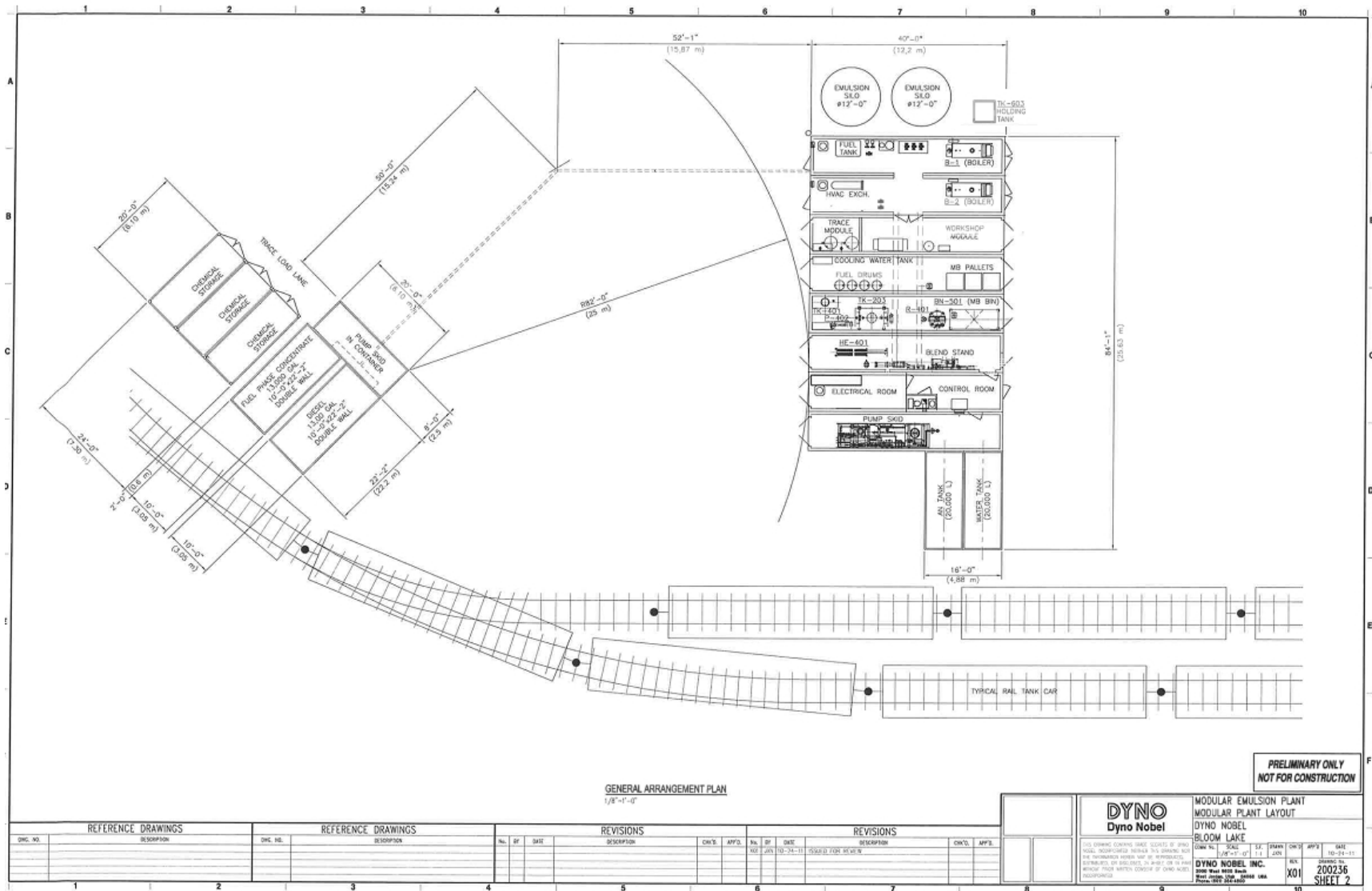


Figure 4 - Modular Emulsion Plant

Physical and biological environment within the areas potentially affected.

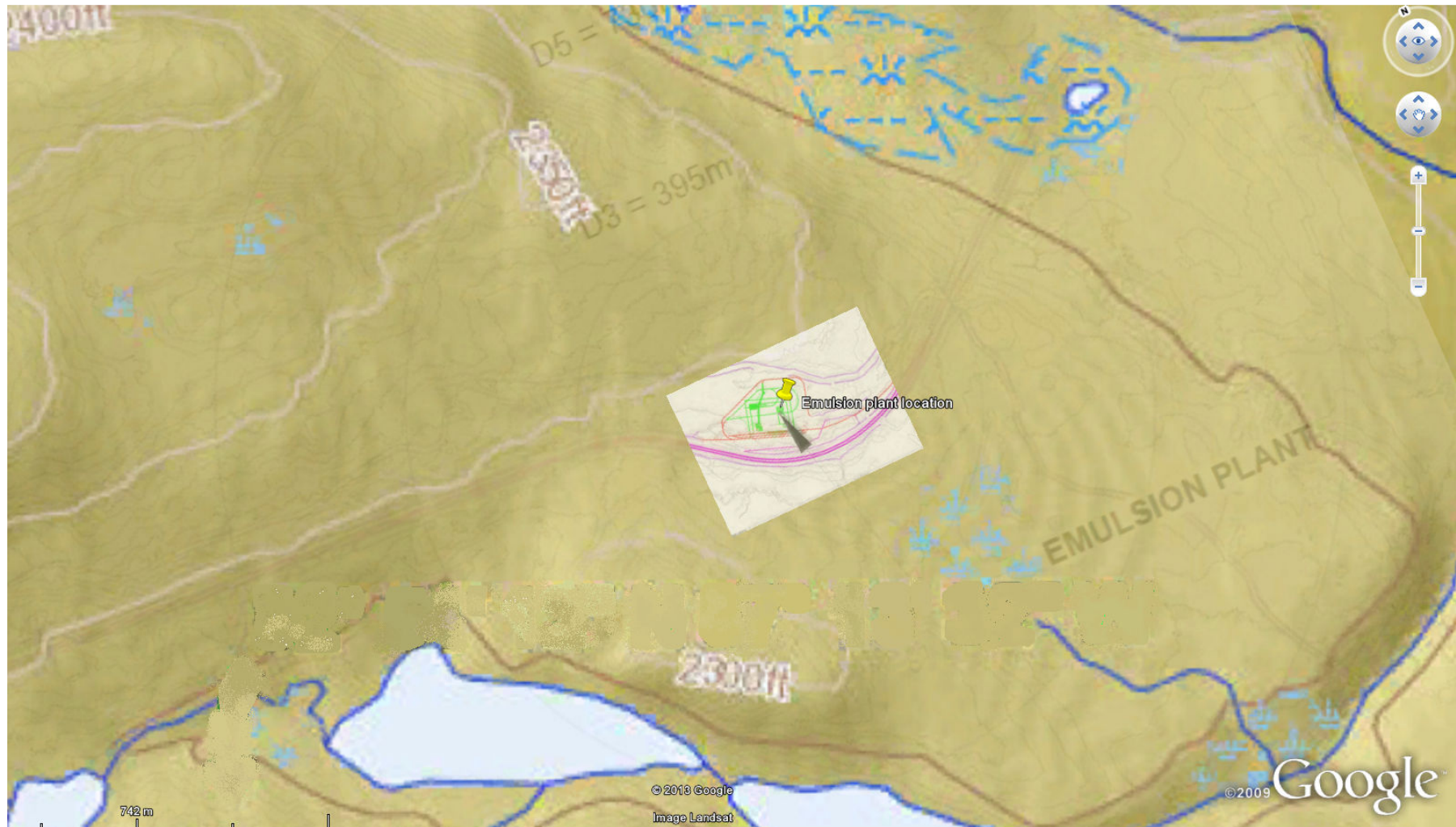


Figure 5 - Topographic map of the Bloom Lake site area.

Figure 6 - Site pictures



Looking West at the location



Looking North-West from the location



Looking North-East from the location



Looking East from the location

The emulsion plant is located at a minimum distance of 650 meters from water bodies.

The site selected is relatively flat at an elevation of about 2250 feet above sea level.

A wetland area is located at about 280 meters south separated from the site by railroad tracks.

The area drains into the Atlantic Ocean watershed.

The area is dominated by coniferous trees, especially balsam fir and black spruce, with white birch, trembling aspen and mountain ash being the commonest deciduous trees.

The characteristic animals of this area include moose, black bear, Canada lynx, red fox, pine marten, short-tailed weasel, and mink. Beaver, muskrat, and river otter abound in the numerous rivers, lakes and ponds. There are also large expanses of wetlands, especially bogs and fens .

The soils are generally acidic and lack in important nutrients such as nitrogen and phosphorus.

There is a snowmobile trail running north of the proposed location (see picture). This trail is located at about 75 meters from the proposed emulsion plant. Discussions have been initiated with the snowmobile club (Les Lagopèdes) to relocate the trail outside the required buffer zones.

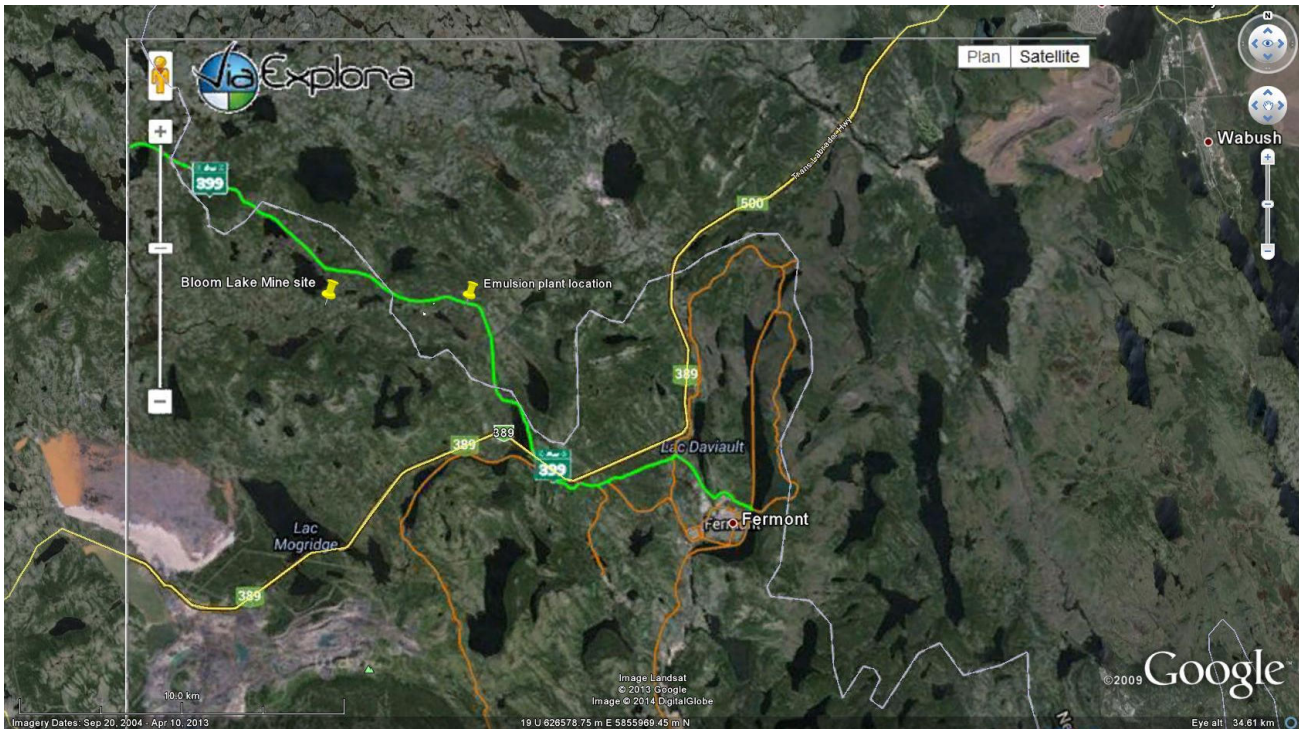


Figure 7 – Snowmobile trail 399

Population

The closest city is Fermont - QC at 10 km South-East of the site with a population of about 3000. The closest cities in Labrador are Labrador City and Wabush respectively located at about 20 and 23 km East with populations of 27000 and 2000.

Zero discharge plant

Liquid discharges from emulsion plant will be collected in a closed sump and either disposed off-site through authorized disposal companies or treated and recycled on-site. Sanitary wastewater will be collected on-site in a sealed tank and will be disposed off-site at an authorized disposal site. Emulsion waste from the emulsion module will be processed in a recycle kettle and recycled in the product or destroyed if necessary in the boreholes. Wastewater from the emulsion module will be treated and either recycled in the process, disposed off-site at an approved disposal site or re-used as wash or dilution water.

iii) Construction

The construction period is estimated at a total of 4 months including:

- Area preparation and road construction: 5 weeks.
- Ground leveling work: 3 weeks
- Concrete slabs work: 2 weeks
- Equipment erection & assembly: 8 weeks
- Bring services to equipment (water, electricity, fuel): 4 weeks
- Start-up & commissioning: 4 weeks.
- Contingency: 2 weeks.

It is proposed to start construction in May 2014

During construction activities, potential sources of pollutants are:

- Leaks of hydraulic fuel & from heavy equipment (loaders, backhoe, power-shovel, cranes, etc)
- Diesel and regular fuel from fuelling operations
- Dust from heavy machinery circulation.
- Construction waste –non hazardous
- Lubricants, greases, etc. used in small quantities.

The following control measures will be in place to contain any spills and discharges:

- Spill contingency plan
- Training/Environmental awareness

iv) Operation

Description of the operation:

Raw materials will be brought to the site by rail. AN solution at 82 -85 % AN (UN 2426) and Titan fuel phase concentrate (non-hazardous – high flash point of 107 °C) will be shipped by general purpose railcars of type DOT-11A100W1. AN solution is shipped at or about 100°C in tanker coated with liner PLASITE 9573. Titan fuel phase concentrate is shipped at ambient temperature.

The emulsion is manufactured by blending together ammonium nitrate (AN) solution at about 82 % AN with a liquid fuel phase. The formed emulsion (mayonnaise look like) is then mixed with inert microspheres or with gassing chemicals solution to make it sensitive to a detonation so it can be used as a blasting agent.

The AN solution is kept warm in an outside heated tank. The fuel phase is pumped from two tanks: a diesel fuel tank (sources locally) and a fuel phase concentrate tank. Both tanks are double-walled. The fuel phase is heated prior to entering the blend table.

The emulsion is then stored in external steel silos. Process vehicles are loaded by gravity from the bottom of the silos or by direct load from the plant. Raw materials are stored in sealed sea-cans located outside.

The estimated period of operation is the entire life of the mine and is currently estimated at 37 years.

Potential sources of pollutants from the operation are:

- Ammonium nitrate solution spills
- Fuel phase concentrate spills
- Diesel fuel spills
- Emulsion spill
- Sodium nitrite and or acetic acid spills
- Wastewater from cleaning floors and equipment in emulsion plant. This wastewater may contain small amounts of ammonium nitrate and hydrocarbons.

The following control measures will be in place to contain any spills and accidental discharges:

- Spill contingency plan
- Double-walled tanks (diesel, fuel concentrate)
- Visual inspection of aerial fuel lines
- Containment system for AN tank (membranes)
- Emulsion silo drip trays
- Training/Environmental awareness
- SOPs for proper waste and wastewater management
- Wastewater treatment and recycling system.

v) Occupation

Since most of the plant equipment will be assembled off-site in sea-can containers, manpower required will be the one associated with the following site work activities:

1. Area preparation and road access: 5 weeks. Contractor or Mine employees. 5 employees.
2. Ground leveling work: 3 weeks. Contractors or Mine personnel. 5 employees.
3. Concrete slabs work: 2 weeks. Contractors. 8-10 employees.
4. Equipment erection & assembly: 8 weeks. Contractors. 10-15 employees.
5. Bring services to equipment (water, electricity, fuel): 4 weeks. Contractors. 5-10 employees.
6. Start-up & commissioning: 4 weeks. Dyno Nobel employees. 6-10 employees.

Breakdown of occupations anticipated according to national Occupational Classification 2006:

Occupation	Direct hiring (H) or contracting out (C)
7202 Contractors and supervisors, electrical trades-	(C)
9613 Labourers in chemical products processing and utilities	(H)
7242 Industrial electricians	(C)
7203 Contractors and supervisors, pipefitting trades	(C)
7244 Electrical power line and cable workers	(C)
7251 Plumbers	(C)
7252 Steamfitters, pipefitters and sprinkler system installers	(C)
7301 Contractors and supervisors, mechanic trades	(C)
7302 Contractors and supervisors, heavy equipment operator crews	(C)
7312 Heavy-duty equipment mechanics	(C)
7511 Transport truck drivers	(C)
7521 Heavy equipment operators (except crane)	(C)
7611 Construction trades helpers and laborers	(C)

Dyno Nobel has an employment equity policy relative to age and gender.

Economic impact to the area.

- Manufacturer will immediately hire 9 new employees and expect within the next years to expand up to 17 depending on the customer base. These are all positions that will be paid similar to that of mine employees along with benefits.
- Manufacturer plans to hire locally. If need be will hire personnel and look to relocate into the Labrador/Wabush area.

- A manufacturing facility located in the area will provide a low cost production facility that will assist in making other operations more feasible of coming online.

(vi) *Project-Related Documents:*

Bibliography :

<http://www.heritage.nf.ca/environment/biosphere.html>

<http://maps.gov.nl.ca/water/mapbrowser/Default.aspx>

<http://en.wikipedia.org/wiki/Wabush>

Approval of the undertaking:

- Explosives Factory Licence – Natural Resources Canada- Explosives Regulatory Division
- Crown Lands Permit – Newfoundland & Labrador – Environment and Conservation Department
- Roads, Rails, transmission lines permits - Environment and Conservation Department
- Water taking permit - Water Resources Management Division of the department of Environment and Conservation.

Schedule:

- Earliest date of construction : May 1, 2014
- Latest date of construction : October 1, 2014

Those dates were selected based on the desire to supply Cliffs Mine before 2014 year end.

Funding:

No grant or loan from a Government Agency is needed.

The project capital investment is lower than 15 M\$

Date

Signature of General Manager