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Project Scope

E337697-PM407-50-128-0002

ANE Bulk Temporary Plant

Baffinland Iron Mines: Mary River Project

Bid No.: H337697-PM407

General Scope

Project Number	General – WBS TBC
Revision Number	01
Date	9/06/11

1 PROJECT DEFINITION

1.1 Project Requirement

1.1.1 Project Statement

The intent of this project is to design, construct and commission two modular/temporary bulk explosive manufacturing facilities for Baffinland Iron Mines (BIM). Each plant will be required to produce 10 K Te per year of Ammonium Nitrate Emulsion (ANE) on a single shift basis. The two temporary plants will be used to supply bulk or packaged explosives over a two year period for BIM to prepare the infrastructure and access roads for the mine.

The terrain in the area may not be suitable to transport bulk explosives by MMU's. Hence, consideration will be made to install the appropriate packaging equipment in each plant to supply packaged explosives.

It is expected each plant will be operational for a two period year period during the time BIM constructs the mine site's infrastructure.

Both plants are to be commissioned and fully operational by July 31st, 2012.

Orica's Modular plant installed in Alaska

1.1.2 Project Objectives

The deliverables at the end of this project will be two ANE plant capable of manufacturing 10 K Te/yr (each) ANE on a one shift per day basis. The plant will be capable of producing either a straight emulsion formulation or a 70/30 Blended product (an ANFO blend of 0 to 30%). It is to be determined if the plant is to produce packaged explosives.

It is to be assumed that each manufacturing facility will be self sufficient for utilities and also capable of loading MMU's for local operation.

According to the details available as of September 6th, 2011, the following main plant items will be installed and operational at the end of this project:

- AN Melt Tanks (size to be calculated based on desired volumes).
- Diesel Fuel Receiving Tank (40,000 liter capacity).
- DN20/DN14 Run Tanks (20 Te capacity) using heated IMO2 containers.
- AN Solution pH will be adjusted using Sulfamic acid (to be manually loaded)
- Stir Pot Staitc Mixer - 300 kg/min.
- Based on remote site location will have to store 1 year of AN Prill in bulk storage. (Required storage area for up to 15 M kg of AN Prill).
- Utilities containers to operate the site e.g. steam, compressed air, electricity and water.
- Boiler/steam capacity to operate plant (no boiling engineer needed) – packaged unit.
- Diesel Generator to supply power to the plant.
- All the required safety equipment including fire extinguishers, safety showers, eye wash stations and first aid kits, working at height apparatus, etc.
- Auger & conveyor system to transfer AN Prill.
- Modular Process building (+/- 50' X 80') with office space.
- Maintenance Garage & Truck Parking (+/- 20' x 50') – to determine if a wash bay is required.

Drawing References:	40-D-11-725 sheet 1 of 1	Site General Arrangement
	30-D-11-726 sheet 1 of 1	Process Flow – Process Plant
	30-D-11-725 sheet 1 of 1	Process Flow – Water Treatment

1.1.3 Project Constraints

The lead time to economically deliver the process equipment and buildings to Baffin Island by sea is extremely tight. Although the proposed "modular" plants will be a copy of a proven design, modifications are required to meet the requested production volumes and to operate effectively in the severe weather. Secondly, the lead time for the critical equipment (Stir Pot Static Mixer) is currently 7 months. In addition, transportation of the modular plant by sea is restricted to a short time frame during the summer months.

Approvals to finalize the design of the temporary plants must be obtained no later than October 2011 to meet the July 31st, 2012 start-up date. It is estimated the equipment must be ready to ship from the Bécancourt port by late May to ensure sufficient time for transportation, assembly and commissioning of the modular plants.

This short time frame also applies to ship raw materials to the site. A significant amount of raw material storage is needed to hold a total 365 days' supply plus 25%. Any deviations in the production forecast or abnormally high scrap rate will cause stock outs and delivery issues. A large amount of magazine space will be required to store the raw materials.

It is assumed the environmental assessments (Phase 1 & Phase 2) are not required for these temporary plants. Otherwise, approvals from NRCAN for environmental assessments currently take 9 to 12 months. A request will be made to NRCAN immediately after the project approval to

determine these plants meet the guidelines of a temporary site and to ensure further environmental reviews are not necessary.

1.2 Site Data

The proposed site locations are to be located near the community of Pond Inlet (Mittimatalik) – approximately 1000 km northwest of Iqaluit, the capital of Nunavut.

One temporary plant will be located at the Steensby Port and a second will be located along the Mary River. Blasting will take place on a day shift, seven days a week.

BIM will provide transportation to and from Iqaluit and the Orica plant. BIM will also provide all accommodations and meals for Orica`s employees (including subcontractors during the construction and commissioning periods as well as during plant operation).

Site conditions will play a significant role in the planning and execution of the project. The area experiences bitter cold in winter and 24-hour darkness from November to January. Summers bring 24-hour daylight from May to August but continued cool to cold conditions.

Expected climatic conditions include temperate extremes ranging from 25 C in the summer months to -54 C in the winter months (average monthly high of 10 C and average monthly low of -37 C).

Mean annual precipitation is 191 mm with the majority falling in the July to September months.

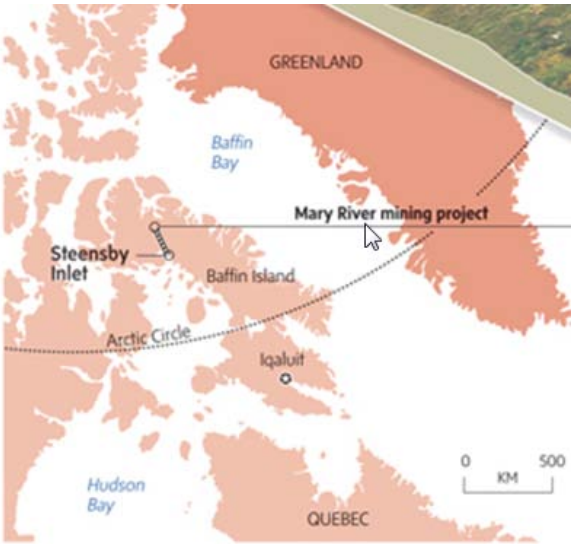
Snow fall peaks in October.

Wind should be considered as a potentil issue at this site.

The majority of snow clearing will be the responsibility of the mine.

Minor snow removal equipment is in scope.Buildings will be designed to meet all civil requirements and be approved by appropriate regulatory agencies.

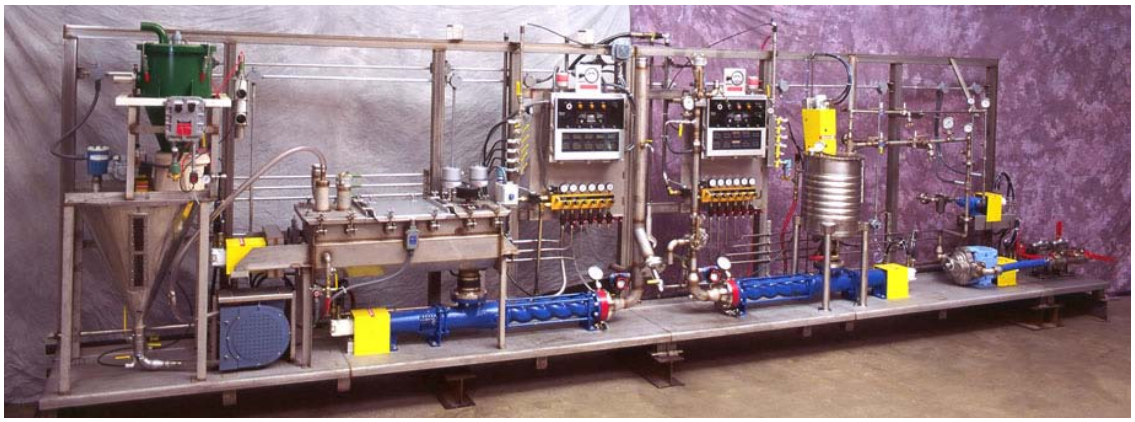
Accomodations will be required during the installation and commissioning of both temperary plants as well as during the operation of the plants.



1.3 Control Philosophy

The operating method for the plant will be largely manual, with many batching operations and valve path selections. A few batching meters will be available for quality control purposes.

The Stir Pot Static Mixer (SPSM) plant operation will be controlled using a Human Machine Interface (HMI) and PLC based on Orica's current global designs. Mass flow meters will monitor and control ANS and fuel phase flow to the emulsification module.



Stir Pot Static Mixer with Micro Balloon System Blender

1.4 Technology Selection

Due to the remote location of the plant and the severe/cold climate, it is anticipated to use a Stir Pot Static Mixer (SPSM) to manufacture the emulsion. This technology is proven and is capable to manufacture a various types of emulsion for cold weather applications (including a sensitized product). However, the manufacturing module will be re-evaluated following a detailed review of BIM's requirements.

An alternative to the SPSM modular plant is the Noise Plant. Several "containerised" Noise Plants (over 5) have been successfully installed on several Orica sites in the southern regions of Africa and in Mongolia.

Stir Pot

1.5 Financial Criteria

A financial criterion is being developed and will be available by request.

1.6 Time to Beneficial Operation

The start date of the two temporary plants is July 31st, 2012. Project approval from BIM must be given as soon as possible to meet this deadline (as noted in Section 1.1.3).

A detailed project schedule (in MicroSoft Project) will be developed and agreed prior shortly following project acceptance.

1.7 Plant Capacity/Capability/Availability

The plant must be capable of producing up to 10 K tons per year of ANE. The operations are bases on 12 hours per day of production, seven days per week, 335 days per year.

Critical spare parts will be available and a comprehensive preventive maintenance plan will be implemented to avoid equipment downtime for both the production equipment and the MMU's.

1.8 Product Requirements

This project is based on a 43° C low fudge point system (75% AN in oxidiser), with heating based on a 60° C manufacturing temperature. Other operational configurations will be possible, including 60°C fudge point systems (80% AN in oxidiser) with a manufacturing temperature of 75°C. The equipment design must take into account the operating conditions and types of MMU in use within Orica.

Additional details will be required from BIM to determine the product best suited for the applications.

1.9 Raw Materials Sourcing

The plant is intended to be used in a number of locations throughout various regions as required. The design should, therefore, be flexible enough to cater for the most sources of raw materials. The following assumptions should be included;

- AN sources include solid prilled AN, either IGAN or AGAN in bulk
- Fuel blend could be either pre-blend or as individual raw materials;
- Some forms of AN may require flocculation (TOPAN based products) prior to use in Oxidiser solution;
- Diesel will be stored using Transtank configurations;
- Acetic Acid will be supplied in 1000L IBC's;
- Emulsifier will be supplied in 20,000Te UN Portable Tanks.
- MMU loading will be designed for Tread and Bulkmaster vehicles.

1.10 Statutory Requirements

Specific local statutory requirements have to be addressed. The plants will be designed to meet applicable Orica and Canadian Standards. Local regulations will need to be confirmed prior to plant deployment. Local and provincial regulatory permits will be prepared as needed. The types of permit required will be determined by the local construction contracting company.

- A site permit will need to be obtained from Natural Resources Canada's Explosives Regulatory Division. Approval in principal will be obtained as part of the FEL3 phase of the project.
- The proposed sites must be classified as "temporary plants" under NRCAN's Guidelines for Bulk Explosive Plants to avoid the need for Environmental Assessment approvals from NRCAN.
- At this moment, it is not known if an Environment Assessment must pass through the Nunavut government.

The building layouts and process equipment will be reviewed as part of Orica's internal risk assessment process (i.e.: Hazard Study #1, #2, #3, #4, #5). The risk assessments will review and ensure the following items are addressed:

- Occupational Health Plan and Safeguards
- Environmental Plan and Mitigation
- Quantity of Explosive and Distance Standard
- Economic viability of the new plant
- Bases of Safety Guidelines are built into the process
- Industrial Safety Aspects (CSA, OSHA) are respected and built as designed.

2 PROJECT SCOPE

2.1 Scope of Works

The overarching design objective is to design a modular emulsion manufacturing facility that:

- falls within the definition of a temporary plant under NRCAN's Guidelines for Bulk Explosives,
- is self sufficient for utilities,
- is capable of loading MMU's for local operation.

The design effort will be focused on minimising site civil costs and assembly time. Pre-engineering the plant modules will minimize the amount of process piping and electrical requirements that are to be completed on Baffin Island. The buildings will be self supporting to avoid the necessity to excavate and erect foundations. The silos and exterior tanks will also be designed to minimize excavation and eliminate the need to pour concrete. The concrete will be limited to pre-cast slabs and blocks to facilitate removal when the plants are to be decommissioned within 2 years.

Modules that require bunding will be self-bunded and will not require concrete at site.

It is part of the design scope that this asset could then be used in multiple locations throughout the assets life to provide emulsion manufacturing capability in new areas whilst more permanent facilities or customer`s demand are further developed

BIM will provide the following services for the temporary plants:

- diesel fuel,
- process and potable water,
- power to both temporary plants (not excluding the possibillty to use diesel generators).

Site Preparation

It is expected BIM will perform the following activities for each of the two temporary plants and the explosive storage magazines (boosters, detonators, packaged product):

- Site clearing for the temporary buildings and associated car park,
- All roadwork leading to and around the site (including parking areas),
- Berms for the magazines,
- Process and potable water to the site,
- Means of sewage,
- Telecommunication,
- Data communication.

All concrete will be pre-cast.

Orica will provide the necessary details to BIM for site preparation.

All site preparation activities will be confirmed and fully delineated in the finalized contract.

Site Services

Services will need to be brought to the site. This includes:

- Water – The site will require approximately 11,000 litres/day of process water and approximately 350 litres/truck for one normal truck wash. If insufficient water cannot be drawn from the site's well, the mine site would be required to provide and install appropriately sized and engineered holding tanks. The well will be provided by BIM. Water to process quality, specification available upon request. No storage or surge tank will be required.
- Potable water – Will be supplied by the mine either because the well is of sufficient quality or bottles.
- Electricity – The electrical requirements (KVA) will be confirmed during the detailed engineering phase of the project. It is possible to supply electricity to each plant using a diesel generator pack. The details will be determined during further discussion with BIM.
- Telephone and data services will be brought to a pole 15 meters.
- Sewerage – An appropriately sized septic system will be installed by BIM. The sizing of sewarage will be confirmed during the detailed engineering phase of the project.

Rail works

No rail works are planned to service this site.

Drainage / Storm water

Care not to upset the normal course of water by the changes will be taken into account. This will be confirmed against Provincial and Municipal requirements.

Warehouse Storage

There is no plan for a warehouse for the plants. Critical spare parts will be kept in a sea container.

Effluent System

All liquid wastes at the plant/process building will be collected in a sump and transferred into an appropriate container.

The Garage will act as the plant's wash bay. An "insta-berm" will be used to capture the waste water and an evaporator system will be used to separate the solids from the water (refer to Process Flow Diagram #30-D-11-725).

No solution containing nitrates will be discharged into the environment.

The remaining solids from the evaporation process will be disposed of in shot bags for "down-the-blast hole" disposal, as per the agreement with the mine site.

The proposed Evaporation System is a proven design and will be copied for other Orica sites.

A septic system will be installed for handling human effluent (the details to be determined with BIM as part of the detailed design for the facilities).

Solid wastes will be disposed of using existing mine site practices. The solid waste generated from the process is negligible (limited to Sulfamic Acid paper bags) and most of the plastic tote containers will be recyclable.

Non-conforming product from the process will be reworked or placed into shot bags. Minimal product waste is expected to be generated by the process following "wet" commissioning.

Security and Fencing

The site will be located on mine site property and as such will be secured as part of the mine plan. Access to the mine will be controlled by the mine. The plant area will be secured by a chain-link fenced and gated, as per regulatory and SSAN requirements. Plant fencing to be installed by the mine

Process Equipment

Orica will deliver the complete process equipment package as outlined in section 1.1.2 to deliver two 10 K tons of ANE product per year.

The work performed by Orica includes:

- Engineering & design,
- Fabrication of components,
- On-site installation and assembly of components,
- Construction Management and Supervision,
- Commissioning,
- Plant Start-up.

All engineering drawings will be reviewed and approved by an accredited professional engineer for the region.

The materials of construction for the plant and equipment will meet or exceed CSA requirements and will be adapted to the northern location of the site.

The process equipment's electrical systems will meet NRCAN's Guidelines for Bulk Explosives Facilities (with respect to electrical area classifications).

Process Building

The Process Building (25' -8" x 50' x 8") will be pre-fabricated and delivered to Baffin Island in modular sections (as represented in the photograph). The process equipment will be assembled inside each section. The design of the temporary plant will ensure minimal time on site for final assembly and start-up. The base of the building will be structurally engineered to allow it to be placed on compacted gravek to avoid the need for concrete foundations.

Orica `s Modular Plant

Garage Building

The Garage (20' x 50') will be a "fold away" type building placed on gravel. This building will also serve as a wash bay. An "Insta-berm" system (or equivalent product) will be used to capture the waste water during vehicle decontamination.

Office and Amenities Buildings

One office will be available in the process building. Mobile trailers (ATCO type) could be acquired as needed for locker rooms, cafeteria and additional office space.

The number of employees to operate each plant will be evaluated during detailed engineering.

Storage Buildings

See Warehousing

Workshop Buildings

No workshop building will be installed. A work area including a small work bench will be part of the Garage. An Open Flame permit will be secured for the area where hot work will take place.

The necessary tools to maintain the site's process and mobile equipment will be included in this project.

QC Facilities

QC testing will be done on lab bench in the manufacturing building. The QC equipment required includes the pH measurement, two thermometers, two bench scales and a viscometer. A small Hobart machine will be included for technical support troubleshooting. This equipment will be standardized with what is used at other sites.

Ammonium Nitrate Solution System

ANS will be made on site through a melting process. Two SS tanks (size to be evaluated during detailed engineering) will be required to support this operation. The tanks will have steam heating coils to keep the solution at the desired temperature. The tanks will be insulated with closed cell "Rockwool" insulation (hydrocarbon free) and clad with aluminium. Mineral wool will be used in nozzle and instrument areas.

All ANS tanks will be equipped with agitation systems, will be properly vented and will have a sampling valve. Water addition to the tanks will be provided to allow for formulation adjustment.

The piping arrangement will allow the recirculation of ANS as protection against agitator failure. It will also enable the transfer of ANS between the run tanks.

All pipe lines connecting the tanks and the process will be steam traced and insulated with "Rockwool" insulation and clad with aluminium. Mineral wool will be used in nozzle and instrument areas.

Process Water System

The site will require approximately 11,000 litres/day of process water (largely due to the "prill melt" process (refer to the spreadsheet entitled "water rate.xls" for the detailed calculations). In addition, the truck wash requirements will be 350 litres/truck. The process water is to be supplied via a well to be drilled on site and piped throughout the site. A mechanical water meter will be installed to control water addition to any of the ANS tanks.

Sulfamic acid addition / storage

Sulfamic acid (SAc) will be received in pallets of 25 kg bags and stored in a suitable container. The SAc will be manually added to only one of the ANS Batch tanks.

Oil phase System

Details will be evaluated upon receipt of more information from BIM.

A fuel phase tank will be installed to allow for mixing fuel oil and surfactant for those fuel phases including more than one component. The fuel phase will be heated using steam condensate and an in-line heat exchanger to warm the oil phase to the correct temperature specification.

Emulsion Production System

It is anticipated that the bulk ANE will be produced by mixing the fuel phase with the solution phase using a proven Stir Pot technology.

Gassing and Water Lube Systems

There will be a gassing system and a water lube system provided. It is planned for this equipment to be located in the MMU Storage building.

ANE Storage System

ANE Storage in SS tanks will be required for each plant. The quantity of storage will be evaluated during the detailed engineering phase of the project.

MMUs

The type and quantity of MMU's will determined during detailed engineering following the receipt of more information from BIM.

Site Vehicles

The be determined during detailed engineering following the receipt of more information from BIM.

Plant Lighting

Lighting will be installed as per good practices. The type of lighting will be determined by area classification and location of installation.

Emergency Lighting / Alarms

An audible alarm and visual alarm will sound at the emulsification module. The audible and visual alarm will notify all personnel on site if an emergency situation has occurred. It will also serve as a warning to others approaching the site of the building in which the emergency has occurred. As well, in order to meet ERD's requirement for process vehicles parked/stored with ANE, there may be the requirement for CCTV linked directly to the mine's gatehouse for security.

Communication Systems

To be determined.

Snow Clearing

Snow Clearing during construction will be the responsibility of the Mine.

Thereafter, the majority of snow clearing will be the responsibility of the Mine. Included in Orica's scope will be a snow plow for the on-site pickup truck and a snow blower.

2.2 SHE Requirements

Emergency Shower / Eyewash stations

The number of emergency showers and eyewash stations will be evaluated during detailed engineering following the receipt of more information from BIM.

Fire Suppression

Several 20lb ABC fire extinguishers will be located strategically inside the process building, offices, wash bay and at all truck loading / un-loading stations. There will be no other form of fire suppression.

CO_2 Detector

To be determined.

Spill Clean-up

Spill clean-up kits will be provided for the acetic acid and oil phases.

Spills will be reported to the appropriate authorities.

All spills will be reported to the site supervision/management and will be investigated accordingly.

Environmental Assessments

Orica's Phase 1 and Phase 2 environmental assessments will be conducted prior to final project approval.

Hazard Studies

Hazard Studies I, II, III will be completed prior to project sanction. Hazard Studies IV and V will be completed as the project progresses. (Refer to section 1.10 for additional details)

On-Site Construction Safety

Orica will follow and adhere to the Mine's Site SHE Policy and Procedures (including "On-Site Construction Safety").

An Orica representative will be on-site to manage, monitor and audit the construction activities to enforce both the Mine's and Orica's SHE procedures. Such as,

- Deliver site SHE inductions to all trades,
- Develop/implement the construction site emergency plan,
- Ensure site safety meetings/tool box talks are being done,
- Create the necessary Permit to Work (including, but not limited to, Hot Work and Work at Height),
- Lead Job Safety and Environment Risk Assessments (JSERA's),
- Ensure proper use of equipment and tools,
- Report and investigate all incidents,
- Report all hours of work.

2.3 Timescale/Limitations

Approval must be obtained by October 2011 to meet the July 31st deadline for plant start-up.

2.4 Design Life

The modular plant's building and tanks will have a useable life of 7 – 10 years.

2.5 Plant flexibility / Expandability

The layout of the plant uses a standard "modular" design. As this plant is capable of manufacturing all expected market requirements no further expansion of capability is planned. Additional production could be accommodated by extending from a single shift per day to multiple shifts.

2.6 Resources and Timing

Resources to be available upon project approval.

2.7 Known Risks and Threats

- Time line is very tight (less than 10 months).
- The type of product to be used is unknown related to product type (packaged versus bulk).

2.8 Documentation

- Engineering documentation will include all drawings, plans, and operating and maintenance manuals.

2.9 Project Critical Success Factors

- Information from BIM to be available in a timely fashion to perform the detailed engineering.
- Plant is commissioned on time and to the agreed scope.
- The plant is operating to the agreed resource model within 2 months of the RFBO date.
- The business plan is delivering its objectives within 2 months of the RFBO date.
- The project is delivered on budget.
- Customer's expectations have been met within 3 months of start-up.