

CONSTRUCTION AND INSTALLATION**APPLICATION FOR APPROVAL OF
THE DEVELOPMENT PLAN FOR
TAGLU FIELD
PROJECT DESCRIPTION****INTRODUCTION****8.1.1 SCOPE**

This section outlines the current conceptual strategies and plans for constructing and installing the Taglu production facilities. The construction execution plan takes into consideration the infrastructure, support services, logistics and transportation requirements to support the construction and operations phases of the development. Construction plans will continue to be integrated with the overall Mackenzie Gas Project requirements, to manage infrastructure needs and coordinate material and personnel movements throughout the project.

8.1.2 CONTRACTING PRINCIPLES

Qualified Aboriginal and other northern contractors will be invited to participate in a competitive bidding process. The project will use Aboriginal and other northern businesses that are:

- able to meet or exceed specified safety, quality and technical standards, as well as the project's timing requirements
- internationally cost competitive at the point where the goods and services are required

Sufficient facility construction resources are available within Canada to meet the project's construction requirements.

Employment opportunities will be available to qualified Aboriginal and other northern residents.

8.1.3 CONSTRUCTION SCHEDULE

Construction activities are expected to start with the transportation of materials to the site in the summer of 2006. Initial construction activities will include:

- hauling, placing and compacting granular material
- constructing the barge landing site
- providing a fuel supply
- installing the camp

8.1.3 CONSTRUCTION SCHEDULE (cont'd)

Construction will continue for about three years, and will include preparing the well pad for drilling, and installing site infrastructure and the gas conditioning facility. Drilling will start during the first quarter of 2008 and continue year-round. Wells will be completed and tested in preparation for start-up in 2009.

The first natural gas production could be shipped through the gathering and transmission pipelines in 2009.

8.1.4 MAJOR MATERIALS AND SERVICES**8.1.4.1 Materials and Equipment**

The major materials and equipment required for constructing the Taglu development facilities include:

- about 400,000 m³ of granular material, pending completion of engineering design of the Taglu facilities
- about 50 to 60 prefabricated modules
- piling material
- mobile construction and drilling camps and associated camp facilities
- office trailers, heaters, tool cribs, air compressors and generators
- bulldozers, graders, gravel trucks, loaders, compactors, a piling rig and Bobcats
- mobile cranes, Scheuerle trailers, fuel trucks, welding machines and forklift trucks

8.1.4.2 Services

The following services will be required during project construction:

- excavating, hauling and placing granular material
- fuel supply and storage
- camp supply, transportation, installation and maintenance
- waste management
- transportation of personnel
- transportation of materials
- communication equipment and services
- drilling support services
- environmental monitoring
- equipment servicing
- camp catering
- emergency services, including ambulance and medical evacuation services

8.1.5 QUALITY ASSURANCE

Quality assurance is an integral part of performing work and is a line management responsibility. It is achieved by completing tasks using trained and qualified personnel, and using documented processes to meet project requirements.

8.1.5.1 Quality Plans

Quality plans are required before anyone starts work, including the project management team, engineering, procurement and construction (EPC) suppliers and vendors. Inspection and Test Plans (ITPs) and quality control procedures will support quality plans. This applies to all project-related activities that affect quality objectives, including:

- contract management
- detailed engineering and design
- procurement
- fabrication
- construction
- transportation
- installation and hook-up
- commissioning and start-up

8.1.5.2 Requirements

Project-specific quality requirements will be established to ensure that the goods and services supplied will meet corporate and project requirements and design specifications.

All organizations and individuals providing products or services will be responsible for the quality of their work.

Quality requirements for EPC suppliers and vendors will be in accordance with fundamental quality assurance and control. EPC supplier and vendor quality systems, plans and procedures will follow recognized industry quality standards, such as ISO 9000 and API Specification Q1.

EPC suppliers and vendors will use existing, proven quality plans and procedures, adjusted to meet project-specific requirements. Where adequate plans and procedures do not exist, they will be developed.

Verification activities will be used to confirm compliance with requirements. Criticality of work processes and work products will be used to determine the degree and type of verification.

Quality related action items will be assigned to individuals with a sufficient level of responsibility and authority to direct activities and allocate the resources needed for implementation.

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PROJECT DESCRIPTION****CONSTRUCTION EXECUTION PLAN**

8.2.1 SITE PREPARATION

Site preparation will include:

- defining the site boundaries
- clearing and stockpiling surface materials, where warranted
- grading and placing granular material to provide a supporting surface for construction equipment, fuel storage, aircraft access and camp facilities

8.2.2 FOUNDATIONS

Foundations to be constructed include:

- shallow compacted gravel pads
- pile-supported elevated structures

Where piles are required, they will be installed by:

- drilling a hole in permafrost soil conditions, using an auger drill
- placing and levelling a steel pile
- freezing the pile in place using a sand–slurry mixture

Foundations for storage tanks, if not double-walled, will include an arctic liner installed under the tank and dyke area.

8.2.3 MODULE FABRICATION AND ASSEMBLY

Facility components will be fabricated in off-site fabrication shops into modules suitable for transportation by truck. To the extent possible, modules will be pre-tested at the fabrication shops.

The modules will be transported by rail or truck to a staging site in Hay River, where some additional assembly and testing might be performed. Modules will then be shipped by barge from Hay River to the Taglu site for installation.

8.2.4 SITE INSTALLATION

Upon delivery to the site, the modules will be set onto previously installed pile foundations. Site installation work will consist of:

- interconnecting the modules
- installing shipped loose items
- completing electrical, instrumentation, mechanical, structural and civil work
- installing insulation
- pre-commissioning the modules

Because of limited daylight hours during the winter, temporary lighting for construction will be required 24 hours daily.

8.2.5 TESTING AND PRE-COMMISSIONING

Pre-commissioning activities will verify readiness to turn the facility over to the operating phase of development. These activities will include a variety of inspections, quality verifications and tests, including pressure testing. If hydrostatic testing is performed, water source and disposal locations will be identified.

8.2.6 INFRASTRUCTURE

Preliminary planning for infrastructure components required to support construction and drilling activities includes:

- a barge landing site
- fuel storage
- material staging
- camps
- potable water
- site access, including a winter road, airstrip and helicopter pad
- communications
- waste management
- water treatment

8.2.6.1 Barge Landing Site

The preliminary construction plan includes a permanent barge landing site for unloading equipment, material and fuel. A number of large facility modules will be transported to the site by barge.

8.2.6.2 Fuel Storage

Fuel storage is required at the Taglu development site to support construction, drilling and operations activities. Up to 2.2 million litres of fuel will be stored on site. All fuel will be stored in double-walled tanks, or tanks with secondary

containment systems, such as berms. The fuel will be transported to site by barge or trucks, via the winter road, from the Mackenzie Gas Project bulk fuel storage sites located at Inuvik, Norman Wells, Fort Simpson and Hay River. It will then be transferred to the fuel storage facility at Taglu.

8.2.6.3 Material Staging

The preliminary construction plan for staging Taglu materials, including drilling tubulars, is based on using existing sites at Hay River and Tununuk Point (Bar C) and establishing a new staging area at Taglu. The Hay River staging site will be used to assemble construction equipment and facility modules and will also be used extensively by other components of the Mackenzie Gas Project. The existing Tununuk Point staging area will be used mainly by drilling for stockpiling materials.

8.2.6.4 Camps

Both mobile and stationary camps will be required to support the construction and drilling activities at the Taglu development site. Mobile camps are small, self-contained camps that might be barge or land based. Mobile camps accommodating between 30 and 40 people are most likely to be used during site preparation and pile installation.

A stationary construction camp will be required for the peak workforce of about 150, including:

- construction managers and supervisors
- tradespeople and general labourers
- inspectors
- camp support staff
- third party and owner representatives

The peak workforce will occur during the site installation phase of construction. This phase will start in Q3, 2008, and will extend to Q1, 2009.

A separate 130-person camp located adjacent to the well pad will be required to support the drilling operation.

8.2.6.5 Potable Water

Domestic water will be piped to the facilities at the Taglu field. The primary source will be the Kuluarpak Channel or Big Lake. Potable water might be transported to the site rather than being withdrawn and treated on site.

8.2.6.6 Site Access

Infrastructure will be required to provide access to the Taglu site all year to support the construction and operations phases of the development. This will include:

- a river barge dock

8.2.6.6 Site Access (cont'd)

- an all-weather road within the plot area to provide access between the barge landing site, airstrip, well pad and gas conditioning facility pad
- a winter road from Tununuk Point (Bar C) to transport gravel, drilling equipment and other site supplies
- a permanent airstrip to transport equipment and personnel by aircraft
- a permanent helicopter pad for use in the shoulder seasons when the airstrip might be inaccessible because of flooding

8.2.6.7 Communications

The primary communications system will be a self-contained, stand-alone, satellite-based system, with backup redundancy for emergency purposes. The system will consist of:

- telephone and fax service, including long distance
- e-mail and internet service
- multiple channel very high frequency (VHF) radios, both hand held and in-vehicle
- satellite telephones
- satellite-based television and radio
- air-to-ground communication at airstrips and helipads
- communication links with truck, barge and air transport providers
- SCADA systems

8.2.6.8 Waste Management

The project's Waste Management Plan will outline the various sources of waste that will be generated throughout the project. The plan will also establish procedures for reducing and handling waste according to all corporate standards and applicable regulations. For more information, see EIS Volume 7, Environmental Management.

8.2.6.9 Water Treatment

Water disposal techniques will depend on the quality of the water after it has been used. Special treatments will be required where additives have been used, such as for hydrotest water, or where the water has become grey water or produced water, and is considered to be waste. For more information, see EIS, Volume 7, Environmental Management.

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8.3.1 SCOPE

Logistics and transportation needs will increase during the pre-construction phase of the project, with peak demand occurring throughout construction and drilling as the following items are moved into the project area:

- a drilling rig and support equipment
- facility modules
- granular material
- camps
- fuel
- miscellaneous materials

As the project moves into the Operations Phase, transportation activity will decrease. Throughout all phases, transportation methods will include:

- river barges on the Mackenzie River system
- rail service to Hay River
- aircraft, including helicopters
- trucks

8.3.2 RIVER BARGES

The location of the Taglu development on the Kuluarpak Channel provides an opportunity for much of the major equipment and materials to be transported by barge from southern supply points. The barge transportation season on the Mackenzie River system typically extends from June to October for Taglu. Transporting modules and other construction equipment will require 40 to 50 barge loads from Hay River.

8.3.3 RAIL TRANSPORTATION

The Mackenzie Northern Railway (MNR) serves Hay River, with regular service from Alberta. This railway connects with the Canadian National Railway at Smith, Alberta. The railway system could be used to transport modules, pipe, fuel, drilling casing, drilling supplies and other construction equipment and supplies. Goods arriving to Hay River by rail will be transferred onto barges for shipment to Taglu. There are no seasonal restrictions for rail transportation.

8.3.4 AIR TRANSPORTATION

The primary mode for transporting drilling, construction and operations personnel will be by:

- fixed-wing aircraft
- helicopters

Air transport to and from the Taglu site during initial drilling and construction could result in up to 200 flights per year.

8.3.4.1 Fixed-Wing Aircraft

Commercial jet aircraft operate between Inuvik and Calgary and Edmonton, and will be used to transport personnel and air cargo. Smaller, commercial aircraft will be used to access the Taglu site. Daily flights for each camp might be required to ship perishable food items and air cargo, and to transport personnel.

8.3.4.2 Helicopters

Helicopters will be used when fixed-wing aircraft are not suitable. This will be mainly in shoulder seasons when flying fixed-wing aircraft is constrained because of limited visibility, or if the airstrip at Taglu is inaccessible because of rising water levels. Helicopters might also be used in emergencies.

8.3.5 TRUCK TRANSPORTATION

A significant volume of project-related materials will be moved by truck. The all-weather road system will be used to deliver modules, equipment and materials to Hay River or Inuvik via the Dempster Highway.

North of Inuvik, winter roads will be used to transport equipment and supplies to the Taglu site. About 40 km of winter roads will be constructed to haul granular material from the Yaya Lakes borrow site to Taglu.