



## Compressor Stations

**Natural gas is moved through a pipeline under pressure. As natural gas flows through a pipeline, it loses pressure due to friction against the inside of the pipe. To keep the natural gas moving at the desired rate, the pressure must be increased. This is accomplished with compressor stations located along a pipeline.**

In the proposed Mackenzie Gas Project, after natural gas leaves the Inuvik area facility, it enters the natural gas pipeline. The temperature of the natural gas will slowly decrease in the pipeline, along with the pressure, as it flows south. The temperature decreases due to the pressure reduction. As a result, the natural gas cools.

The pressure of the natural gas must be increased along the pipeline through the use of compressor stations. When compressor stations increase the pressure of the natural gas, the temperature of the natural gas rises. The natural gas must be cooled to minimize impacts on the pipeline and permafrost.

Two main processes take place at a typical compressor station:

- gas compression; and
- gas chilling and cooling.

### GAS COMPRESSION

Compressor stations increase or raise the pressure of the natural gas using gas compression machinery that is widely used throughout the oil and gas industry.

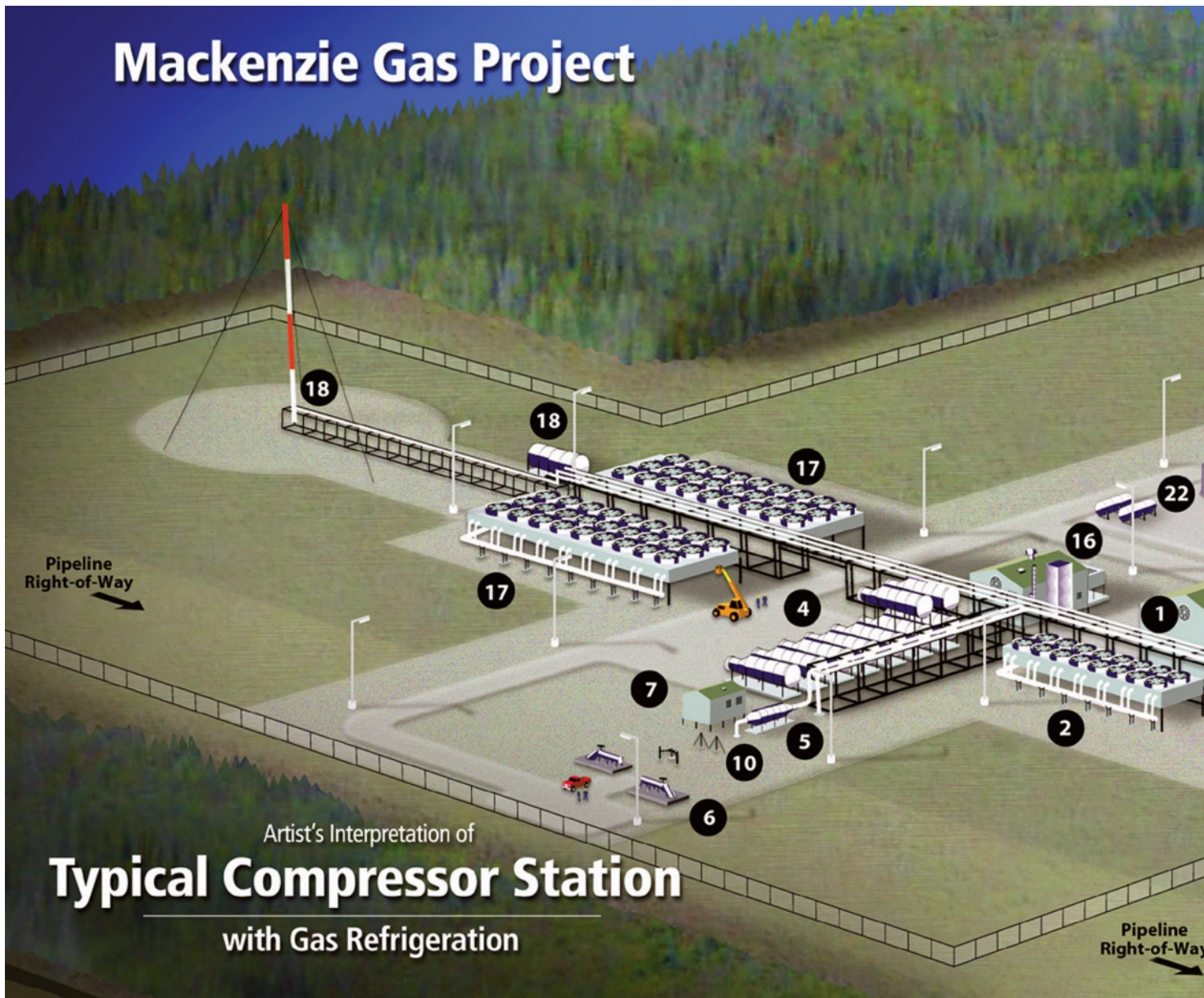
### GAS CHILLING AND GAS COOLING

The cooling or chilling method used at each compressor station and the station spacing along the pipeline both help to control the temperature. Soil conditions such as ground temperature and water content surrounding the pipe are major factors in determining the required natural gas temperature.

If permafrost exists continuously along the pipeline corridor, then the natural gas must be chilled below freezing year-round. Continuous permafrost exists north of Fort Good Hope. Refrigeration is required to achieve this temperature. Where the permafrost is primarily not continuous, the natural gas is cooled to below freezing during the winter. It is also cooled in the warmer months, but remains above freezing. Air coolers and heat exchangers are used to maintain temperatures.

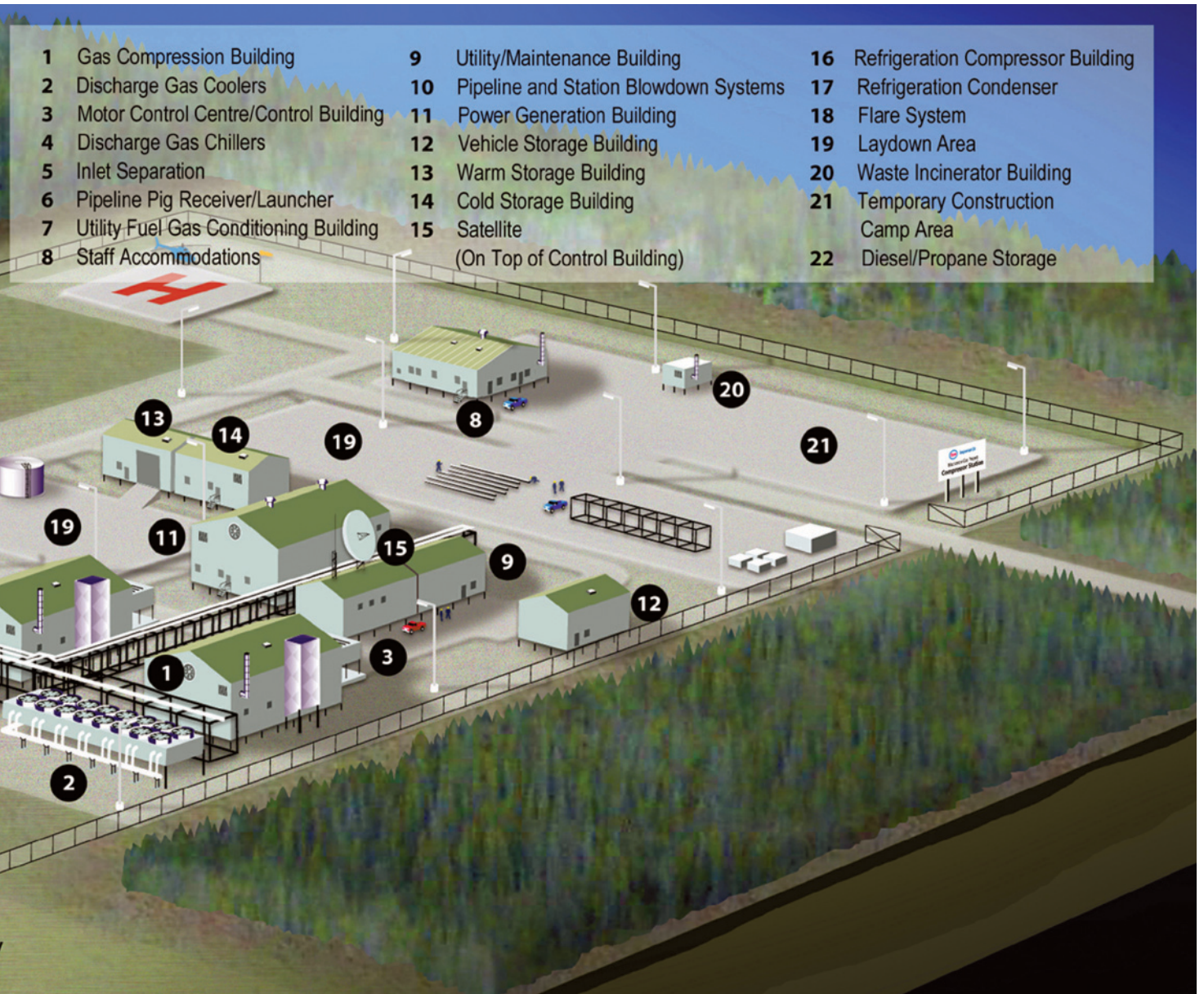
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# Mackenzie Gas Project





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|--|---|--------------------------------------|
| 1 Gas Compression Building               | 9 Utility/Maintenance Building            | 16 Refrigeration Compressor Building |
| 2 Discharge Gas Coolers                  | 10 Pipeline and Station Blowdown Systems  | 17 Refrigeration Condenser           |
| 3 Motor Control Centre/Control Building  | 11 Power Generation Building              | 18 Flare System                      |
| 4 Discharge Gas Chillers                 | 12 Vehicle Storage Building               | 19 Laydown Area                      |
| 5 Inlet Separation                       | 13 Warm Storage Building                  | 20 Waste Incinerator Building        |
| 6 Pipeline Pig Receiver/Launcher         | 14 Cold Storage Building                  | 21 Temporary Construction Camp Area  |
| 7 Utility Fuel Gas Conditioning Building | 15 Satellite (On Top of Control Building) | 22 Diesel/Propane Storage            |
| 8 Staff Accommodations                   |   |                                      |



## LOCATIONS AND DESIGN

The Mackenzie Gas Project team seeks to improve the design, construction and operation of the compressor stations through public consultation. Information will also be gained from environmental and Traditional Knowledge studies. The combined input will aid in defining the proposed facility locations. Initially four compressor stations will be built as part of the Mackenzie Gas Project. They are located near Little Chicago, Norman Wells, Blackwater River and Trail River. As new natural gas discoveries become developed, more compressor stations may be added.

Compressor stations that require refrigeration chill the natural gas using propane. These stations will be a little bigger than the stations that don't need refrigeration. The cleared area will be about 20 to 30 acres (eight to 12 hectares) with a fenced area of about 15 to 20 acres (six to eight hectares).

These stations will have a flare stack to ensure the safe release of propane. Flare stacks may be anywhere from 15 to 25 metres tall (approximately three to five stories high).

Buildings at each station will shelter people and equipment from the weather. Main buildings include the control room, gas compression, refrigeration and electrical.

Sites will be fenced for security and safety reasons. Lights will be on all the time to allow for safe operations. All compressor stations will meet applicable Canadian environmental standards, including those for noise. Typically, the standard means that people can easily hold a conversation at the fence line around the facility.

## CONSTRUCTION PLANS

Preparation for construction could start as early as the summer of 2006, assuming the Project proceeds. Equipment, materials and supplies would be moved by rail, truck, barge and air transportation to staging sites near locations where the stations will be built.

## OPERATIONS

During the start-up phase, it is expected the compressor stations will be operated and maintained by staff located onsite on a full-time basis. Activities will include general operations surveillance, troubleshooting, starting and stopping equipment, equipment maintenance, and warehouse inventory re-supply. The stations will be continuously monitored (24 hours a day, seven days a week) from a central operations control centre. Activities at the operations control centre will include adjusting flow rates, temperatures and pressures, reading process and equipment alarms, and shut downs.

Following this phase, staff will visit the site on a periodic basis for surveillance, maintenance, and other operations activities, as required.



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