CHAPTER 5 – MAINLINE FACILITY REQUIREMENTS

5.1 Introduction

This chapter details the proposed natural gas transportation mainline facilities required to be in-service on the Alberta System to transport the design flow requirements and peak expected flows shown in Chapter 4 for the 2008/09 Gas Year. Included is information regarding size, routes, locations and cost estimates for the proposed facilities together with descriptions of the next best alternative facilities.

An overview of the facilities requirements for the 2008/09 Gas Year was presented at the TTFP meeting on November 20, 2007.

For the purpose of discussing facilities requirements and next best alternative facilities, the material in this chapter is divided into the design areas described in Section 2.3.

For each project area, the design capability is shown as a percentage of design flow requirements and peak expected flows to a maximum of 100%. In project areas where facilities are required, design capability is shown for each design area within the project area. In this Annual Plan, design capability is determined using the design flow requirements and peak expected flows with facilities that are currently in-service and the facilities that are being constructed for the 2007/08 Gas Year. The design capability with proposed facilities is based on the June 2007 design forecast for the 2008/09 Gas Year.

Where new facilities are proposed, a table comparing proposed facilities and next best alternative facilities has been included. Flow schematics, based on design flow requirements for each of the design areas, with and without the proposed facilities, are provided in Appendix 5.

5.2 System Optimization Update

As described in Section 2.8.1 of this Annual Plan, system optimization continues to be an integral part of the regular facility design review and planning to meet the system design flow requirements.

There are no facilities identified for retirement for the 2008/09 Gas Year resulting from the 2007 design review.

5.3 Peace River Project Area

The Peace River Project Area comprises the Peace River Design Area and the Marten Hills Design Area as described in Section 2.3.1. There are no additional facilities required to be placed in-service based on the June 2007 design forecast to transport the 2008/09 Gas Year design flow requirements and peak expected flows shown in Sections 4.2.1.1 through 4.2.1.3 and 4.2.2 for the Peace River Project Area. Future facilities required beyond the 2008/09 Gas Year for the Northwest Mainline in the Peace River Project Area are described in Section 5.6.

Table 5.3.1 shows the design capability of existing facilities as a percentage of design flow requirements and peak expected flows.

Table 5.3.1
Peace River Project Area
June 2007 Design Forecast
Design Capability vs. Design Flow Requirements and Peak Expected Flows

Gas Year and Season	Design Capability (% of Design Flow Requirements)	Design Capability (% of Peak Expected Flows)
2008/09 Winter	100	100
2008/09 Summer	100	100

5.4 North and East Project Area

The North and East Project Area comprises the North of Bens Lake Design Area and the South of Bens Lake Design Area as described in Section 2.3.2. The proposed facilities for the North and East Project Area are identified in Figure 5.4.1.

Figure 5.4.1
North and East Project Area
Proposed Facilities

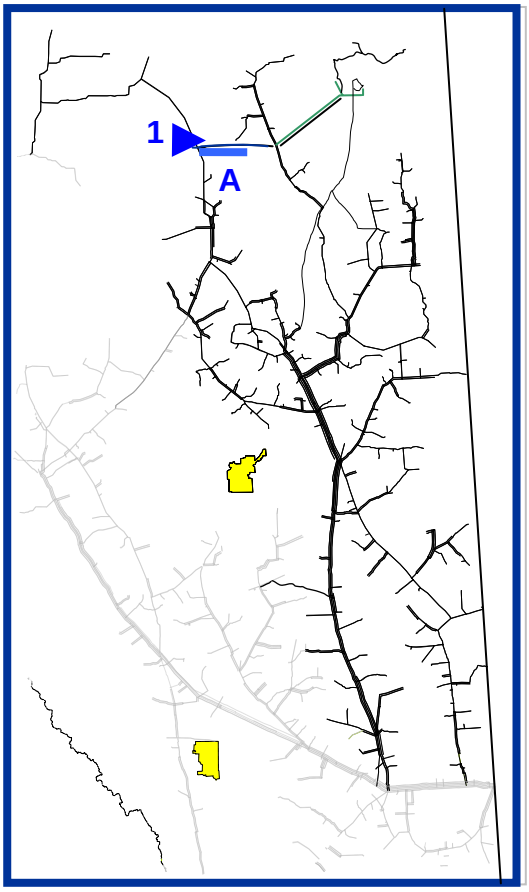

Table 5.4.1

North & East Project Area
Proposed Facilities

Map Location	Proposed Facility	Description	Required In-Service Date	Capital Cost ($Millions)	Facility Status
1	Woodenhouse Compressor Station Unit B2	13 MW	April 2009	42.0	To Be Applied-for
A	North Central Corridor Loop (Buffalo Creek West Section)	54 km NPS 36	April 2009	175.2	To Be Applied-for
	Miscellaneous[1]			12.9	N/A
Capital Costs are in 2007 dollars and include AFUDC			**TOTAL**	**230.1**	

Note:

1 Miscellaneous represents compressor station yard modifications at Oakland, Hanmore Lake, Field Lake and Behan Compressor Stations

5.4.1 North of Bens Lake Design Area

In the North of Bens Lake Design Area, there are two distinct flow conditions evaluated to determine facilities requirements. The two flow conditions used for design are the called "flow through" and "flow within" as described in Section 4.3. The flow through the area condition uses the North of Bens Lake Design Area delivery assumption as described in Section 2.6.1.2. The flow within the area condition uses the North of Bens Lake Design Area maximum day delivery flow assumption as described in Section 2.6.1.2.

Table 5.4.1.1
North of Bens Lake Design Area
June 2007 Design Forecast
Design Capability vs. Design Flow Requirements and Peak Expected Flows

Gas Year and Season	Design Capability (% of Design Flow Requirements)	Design Capability (% of Peak Expected Flows)
2008/09 Winter	100	100
2008/09 Summer	100	100

Additional facilities are required to be placed in-service based upon the June 2007 design forecast to transport the 2008/09 Gas Year design flow requirements, based on the flow within the area design flow assumption, shown in Table 4.3.1.2 for the maximum day delivery to the North of Bens Lake Design Area .

Compressor station yard modifications are proposed at each of the following compressor stations: Oakland C/S; Hanmore Lake C/S Units B & C; Field Lake C/S; and, Behan C/S for the 2008/09 Gas Year. Without the modifications at the Oakland, Hanmore, Field Lake and Behan Compressor Stations, capability to meet the maximum day deliveries within the North and East Project Area will have a shortfall of approximately 3500 $10^3m^3/d$ (125 MMcf/d). Alternative facilities to meet maximum day delivery in the North of Bens Lake Design Area would consist of compressor unit additions at each of these compression station sites at a significantly greater cost. The proposed compressor station yard modifications are the most economical way to transport additional gas to meet the North of Bens Lake Design Area requirements.

The North Central Corridor Loop (Buffalo Creek West Section) consisting of 54 km of NPS 36 pipeline, and an additional 13 MW of compression at the Woodenhouse Compressor Station are required to be placed in-service April 2009 to meet the summer 2008/09 maximum day delivery to the North of Bens Lake Design Area.

The next best alternative facilities to meet the summer 2008/09 Gas Year maximum day delivery to the North of Bens Lake Design Area are the North Central Corridor Loop (Buffalo Creek West Section) are the same as the proposed facilities with the exception of a smaller diameter pipeline. The next best alternative facilities consist of 54 km of NPS 30 pipeline, and an additional 13 MW of compression at the Woodenhouse Compressor Station. A comparison of the proposed facilities and the next best alternative facilities for the 2008/09 Gas Year is shown in Table 5.4.1.2.

No additional facilities are required to be placed in-service based upon the June 2007 design forecast to transport the 2008/09 Gas Year design flow requirements and peak expected flows, based on the flow through design area delivery assumption shown in Table 4.3.1.1 for the North of Bens Lake Design Area. Table 5.4.1.1 shows the design capability of existing facilities as a percentage of design flow requirements and peak expected flows.

Table 5.4.1.2
North and East Project Area
North of Bens Lake Design Area
Facility Comparison for the 2008/09 Gas Year

Proposed Facilities	Capital Cost ($ millions)		CPVCOS[(1)]	km	NPS	MW
	First Year	Long Term[2]				
North Central Corridor Loop (Buffalo Creek West Section)	**175.2**			**54**	**36**	
Woodenhouse Compressor Station Unit B2	**42.0**					**13**
Miscellaneous	**12.9**					
Total	**230.1**	**626.6**	**0.0**	**54**		**13**
Alternative Facilities						
North Central Corridor Loop (Buffalo Creek West Section)	**150.4**			**54**	**30**	
Woodenhouse Compressor Station Unit B2	**42.0**					**13**
Miscellaneous	**12.9**					
Total	**205.3**	**705.8**	**+53**	**54**		**13**

Note:
1 CPVCOS is used as an economic tool for comparing design alternatives and is reported as a differential amount with zero being used as the reference point for the proposed facilities.
2 Long term costs include future facilities.

The proposed facilities were chosen over the next best alternative facilities because the cumulative present value cost of service is $53 million lower than the alternative.

The installation of the proposed facilities will provide the design capability to transport 100% of forecasted North of Bens Lake Design Area design flow requirements for the 2008/09 Gas Year as shown in Table 5.4.1.3.

Table 5.4.1.3
North of Bens Lake Design Area
Maximum Day Delivery June 2007 Design Forecast
Design Capability vs. Design Flow Requirements

Gas Year and Season	Design Capability without Proposed Facilities (% of Maximum Day Delivery)	Design Capability with Proposed Facilities (% of Maximum Day Delivery)
2008/09 Winter	100	100
2008/09 Summer	92	100

5.4.2 South of Bens Lake Design Area

No additional facilities are required to be placed in-service based upon the June 2007 design forecast to transport the 2008/09 design flow requirements and peak expected flows, shown in Section 4.3.2, for the South of Bens Lake Design Area.

Table 5.4.2 shows the design capability of existing facilities as a percentage of design flow requirements and peak expected flows.

Table 5.4.2
South of Bens Lake Design Area
June 2007 Design Forecast
Design Capability vs. Design Flow Requirements and Peak Expected Flows

Gas Year and Season	Design Capability (% of Design Flow Requirements)	Design Capability (% of Peak Expected Flows)
2008/09 Winter	100	100
2008/09 Summer	100	100

5.5 Mainline Project Area

The Mainline Project Area comprises the Mainline Design Area, the Rimbey-Nevis Design Area, the South and Alderson Design Area and the Medicine Hat Design Area as described in Section 2.3.3. The Mainline Design Area comprises four design sub areas: the Edson Mainline Design Sub Area; the Eastern Alberta Mainline Design Sub

Area (James River to Princess); the Eastern Alberta Mainline Design Sub Area (Princess to Empress/McNeill); and the Western Alberta Mainline Design Sub Area.

There are no additional facilities required to be placed in-service based upon the June 2007 design forecast to transport the 2008/09 Gas Year design flow requirements and peak expected flows shown in Sections 4.4.1.1, 4.4.2 and 4.4.3 for the Edson Mainline Design Sub Area, the Rimbey-Nevis Design Area and the South and Alderson Design Area.

Table 5.5.1.1 shows the design capability of existing facilities as a percentage of design flow requirements and peak expected flows in the Edson Mainline Design Sub Area, the Rimbey-Nevis Design Area, and the South and Alderson Design Area.

Table 5.5.1.1
Edson Mainline Design Sub Area,
Rimbey-Nevis Design Area, and
South and Alderson Design Area
June 2007 Design Forecast
Design Capability vs. Design Flow Requirements and Peak Expected Flows

Gas Year and Season	Design Capability (% of Design Flow Requirements)	Design Capability (% of Peak Expected Flows)
2008/09 Winter	100	100
2008/09 Summer	100	100

There are no additional facilities required to be placed in-service based upon the June 2007 design forecast to transport the 2008/09 Gas Year design flow requirements shown in Sections 4.4.1.2, 4.4.1.3, 4.4.1.4 and 4.4.4 for the Eastern Alberta Mainline Design Sub Area (James River to Princess), the Eastern Alberta Mainline Design Sub Area (Princess to Empress/McNeill), the Western Alberta Mainline Design Sub Area and the Medicine Hat Design Area.

Table 5.5.1.2 shows the design capability of existing facilities as a percentage of design flow requirements for the Eastern Alberta Mainline Design Sub Area (James

River to Princess), the Eastern Alberta Mainline Design Sub Area (Princess to Empress/McNeill), the Western Alberta Mainline Design Sub Area and the Medicine Hat Design Area.

Table 5.5.1.2
June 2007 Design Forecast
Eastern Alberta Mainline Design Sub Area (James River to Princess),
Eastern Alberta Mainline Design Sub Area (Princess to Empress/McNeill),
Western Alberta Mainline Design Sub Area
Medicine Hat Design Area
Design Capability vs. Design Flow Requirements

Gas Year and Season	Design Capability (% of Design Flow Requirements)
2008/09 Winter	100
2008/09 Summer	100

5.6 Future Facilities

The status of the proposed future facilities on the Northwest Mainline and the North Central Corridor facilities are described in Sections 5.6.1 and 5.6.2.

5.6.1 Northwest Mainline

NGTL identified the future Northwest Mainline (Dickins Lake Section) and the Northwest Mainline Loop (Vardie River Section) facilities in the December 2004 and 2005 Annual Plans. These proposed facilities are required on the Alberta System to connect the proposed Mackenzie Valley Pipeline. NGTL submitted a facilities application to the Board in June 2006. The construction of the facilities, as filed, was proposed to begin in December 2010 with an on-stream date which aligns with the proposed completion of the Mackenzie Valley Pipeline in April 2011.

Since the filing of the facilities application with the Board, the proposed completion date of the Mackenzie Valley Pipeline has been delayed to 2014 and therefore the requirement for the Northwest Mainline (Dickins Lake Section) and the Northwest Mainline Loop (Vardie River Section) has also been delayed.

The Board is currently holding the facilities application in abeyance pending release of the Joint Review Panel report in 2008.

5.6.2 North Central Corridor

The North Central Corridor ("NCC"), consisting of approximately 300 km of 1067 mm (NPS 42) pipeline commencing at the Meikle River Compressor Station in the Peace River Project Area and terminating at the Woodenhouse Compressor Station in the North & East Project Area and the Meikle River Compressor Station Units C3 and C4, was shown in Section 5.6.2 of the December 2006 Annual Plan. On November 20, 2007, a non-routine Application for a permit to authorize the construction of the NCC was filed with the Board. As of the date of filing this Annual Plan, the Board has not yet established a process for adjudication of the Application. Due to the length and scope of the NCC, two winter construction seasons are required to complete construction and meet the required in-service date. Therefore, the NCC was divided into two sections: the North Star Section; and the Red Earth Section. The NCC (North Star Section) will be constructed in the winter season of 2008/09 and placed in-service in 2009. The NCC (Red Earth Section) will be constructed in the winter season of the 2009/10 and placed in-service in 2010. The Meikle River Compressor Station Units C3 and C4 will be placed in-service in 2009.