CHAPTER 2 DESIGN FLOW REQUIREMENT AND PROPOSED MAINLINE FACILITIES

2.1 Introduction

This chapter presents an overview of the design flow requirement, as described in Section 3.5 – Mainline Facilities Flow Determination of the Facilities Design Methodology Document, which can be accessed online at:

http://www.transcanada.com/customerexpress/5070.html

This chapter also presents the proposed natural gas transportation mainline facilities to be applied-for on the Alberta System in the 2011 calendar year to transport the design flow requirements for the 2011/12 to 2013/14 Gas Years. Included is information regarding size, routes, locations and cost estimates for the proposed facilities.

The design flow requirements are represented by peak expected flows and are presented for those design areas where new mainline facilities are required. Peak expected flows are based on the June 2010 design forecast presented in Chapter 1.

An overview of the design peak expected flows and proposed facilities resulting from the June 2010 design forecast was presented at the TTFP meeting on November 23, 2010.

The figures in Sections 2.2.1, 2.2.2, 2.2.3 and 2.3.1 show a comparison between winter and summer historical actual flow for the 2005/06 Gas Year through to the 2009/10 Gas Year. The figures also show the projected winter and summer peak expected flow and Firm Transportation (FT) contract level to the 2014/15 Gas Year. Additionally, the current design capability is shown for the Gas Year when facilities

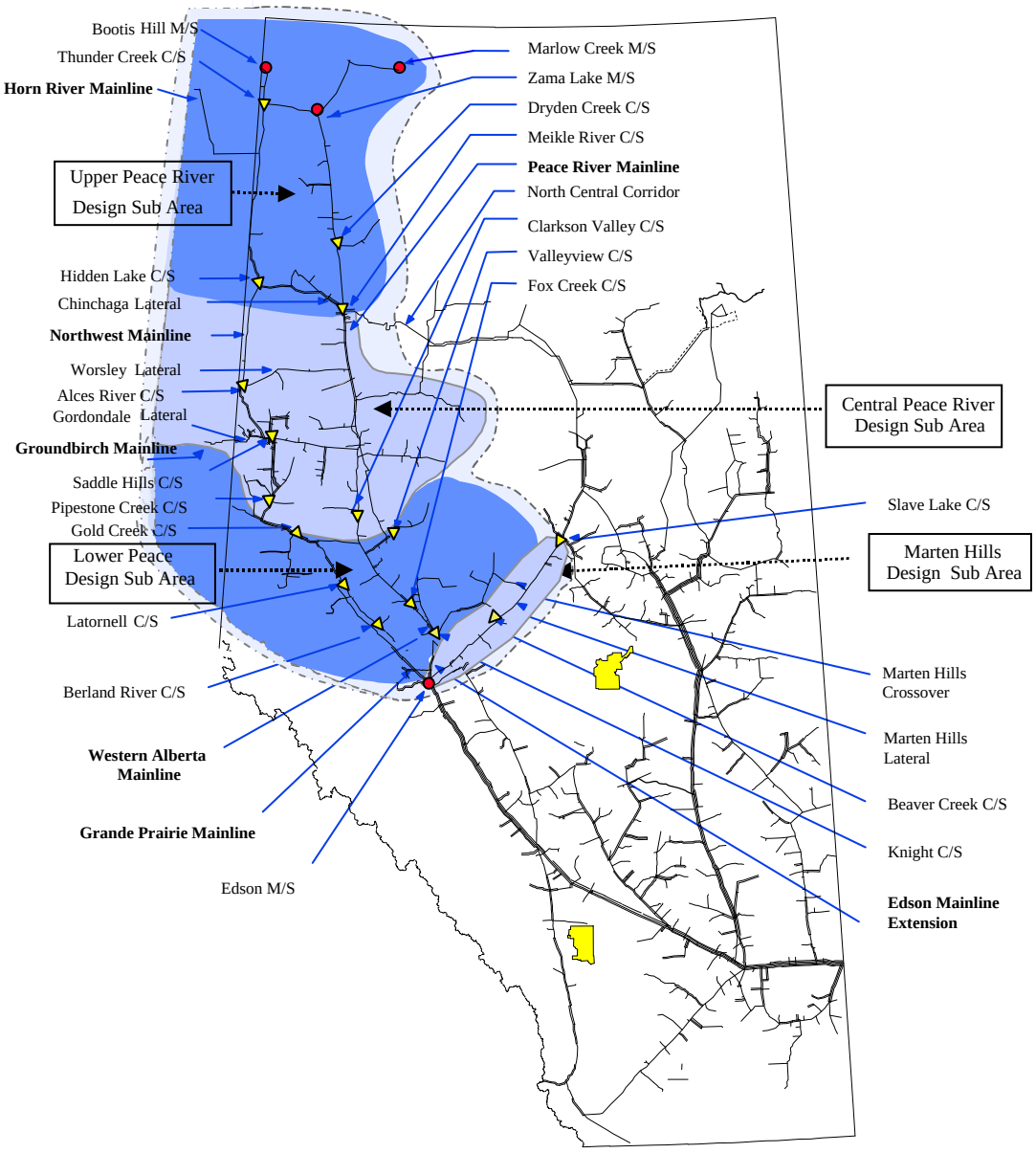
are required within each particular design area. Where there is a shortfall between peak expected flow and the existing design capability, a facility solution has been proposed. A facility application to the regulator for construction and operation is triggered by FT contracts such that the facility is in place in time to meet the FT requirements.

A summary of the status of mainline facilities that have been applied-for or placed in-service since the December 2009 Annual Plan was issued is included under Appendix 2 – Facility Status Update.

2.2 Peace River Project Area

The Peace River Project Area comprises the Peace River and Marten Hills Design Areas (Figure 2.2).

Figure 2.2
Peace River Project Area



In the Peace River Project Area, the proposed facilities are required to transport growing receipts in the Peace River Project Area to deliveries throughout the Alberta System. Additional information on design flow conditions can be found in Section

3.5 – Mainline Facilities Flow determination of the Facility Design Methodology Document.

2.2.1 Peace River Design Area

2.2.1.1 Design Flows -Upper Peace River Design Sub Area

The peak expected flow for the Upper Peace River Design Sub Area is the flow out of the area at the Hidden Lake and Meikle River Compressor Stations.

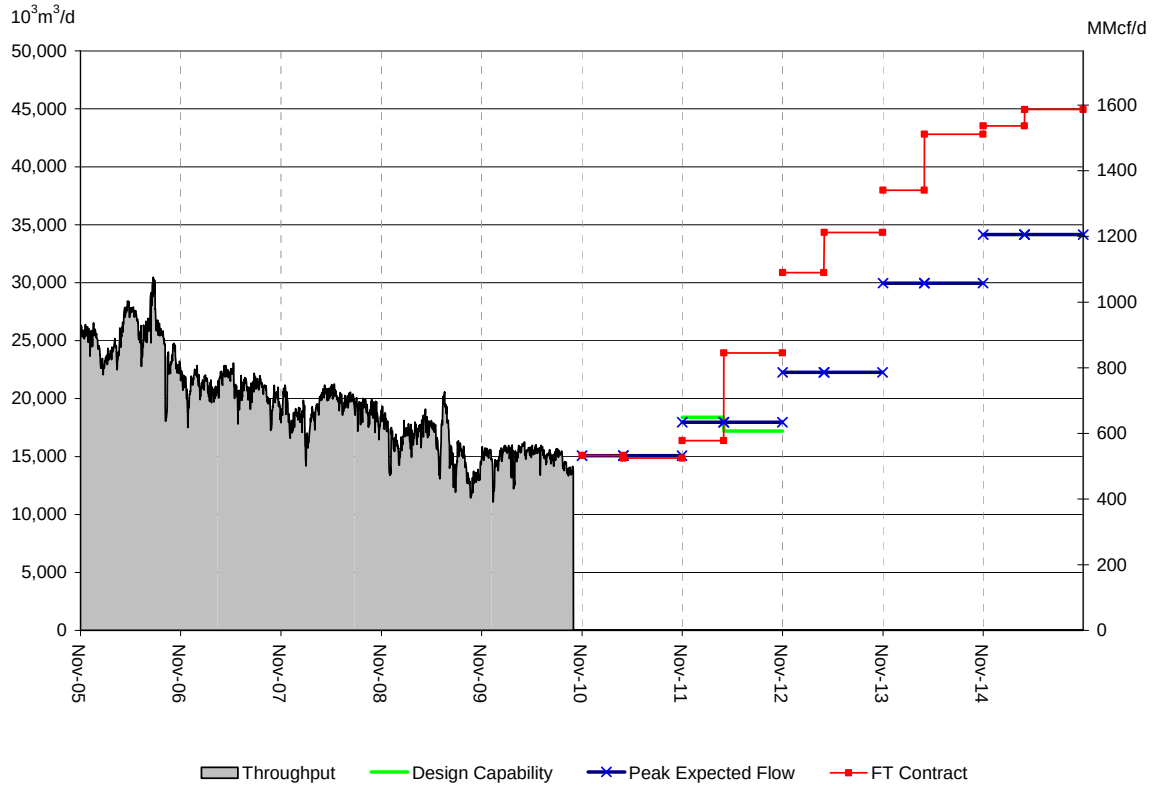
Figure 2.2.1 provides historical actual flow, the design capability for the area, projected peak expected flow and expected FT contract level consisting of confirmed and requested contracts as of November 2010. While peak expected flow is anticipated to rise throughout this forecast period, the near term producer interest in firm transportation service appears to be even greater as evidenced by the FT confirmed and requested contract level for both the 2011/12 and 2012/13 Gas Years.

These FT contract level within this design sub-area during the period covered by this Annual Plan have resulted in the identified new mainline facilities.

Figure 2.2.1

Throughput / Design Capability / Contracted Flow /Peak Expected Flow

Upper Peace River Design Area



2.2.1.2 Proposed Facilities -Upper Peace River Design Sub Area

Figure 2.2.1.2
Upper Peace River Design Area
Proposed Facilities

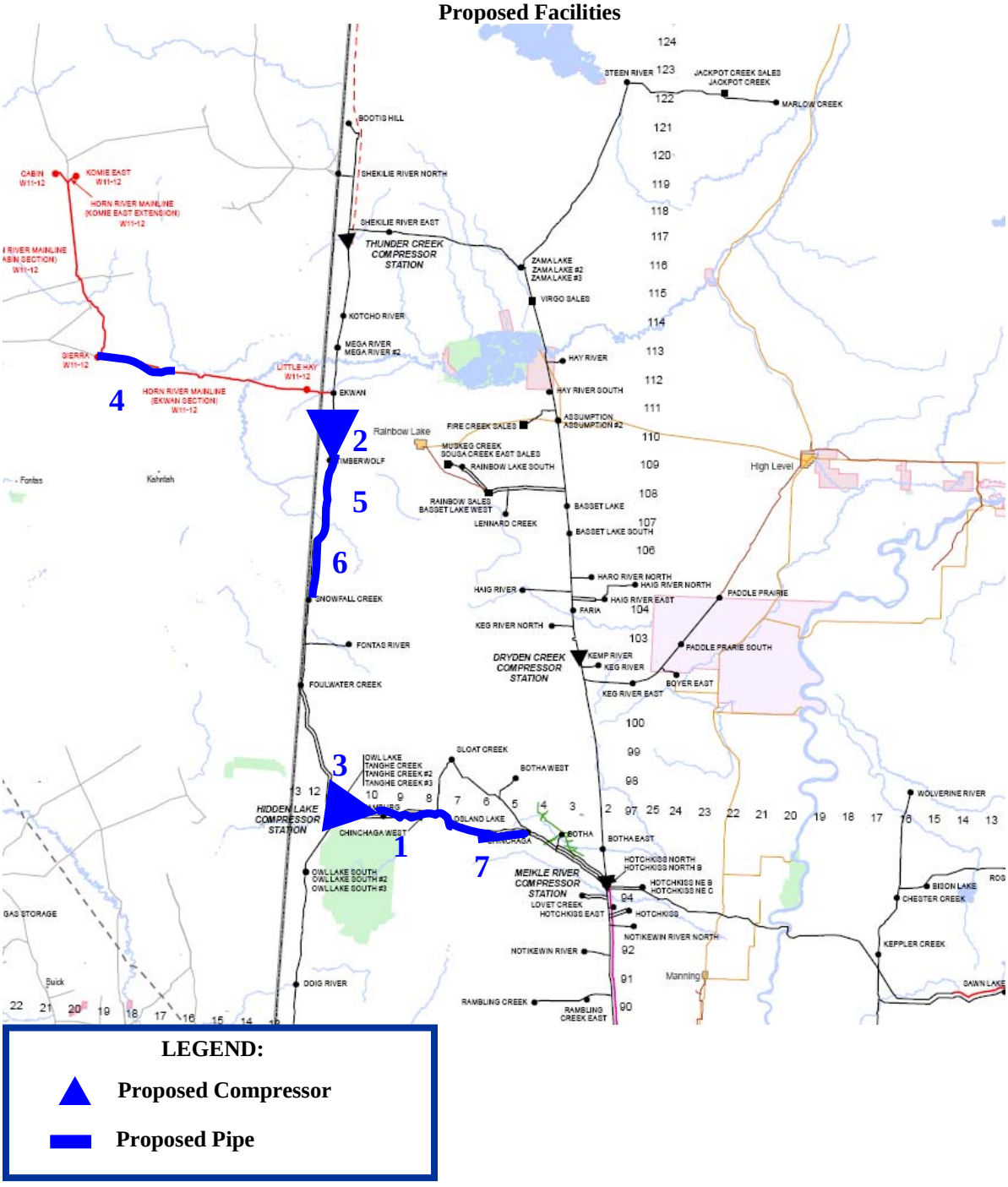


Table 2.2.1
Upper Peace River Design Sub Area
Proposed Facilities

Map Location	Proposed Facility	Description	Required In-Service Date	Capital Cost ($Millions)
1	Tanghe Creek Lateral Loop #2 (Sloat Creek Section)	38 km NPS 48	Apr 12	115.0
2	Moody Creek C/S	15 MW	Nov 12	62.1
3	Hidden Lake North C/S	15 MW	Nov 12	62.1
4	Horn River Mainline Loop (Ekwan Section)	30 km NPS 42	Apr 13	86.0
5	NWML Loop (Timberwolf Section)	25 km NPS 48	Apr 13	82.4
6	NWML Loop (Sabbath Section)	24 km NPS 48	Apr 13	71.2
7	Tanghe Creek Lateral Loop #2 (Cranberry Section)	32 km NPS 48	Apr 13	89.2
Capital Costs are in 2010 dollars and include AFUDC			**TOTAL**	**568.0**

The proposed facilities in this design sub-area serve multiple purposes:

- The two Tanghe Creek Lateral loops (Map Location 1 & 7) enable incremental flow to be transported to the North Central Corridor and help defer and/or offset additional facilities on the Grand Prairie Mainline (GPML).
- Horn River Mainline Loop (Ekwan Section) (Map Location 4) enables additional flow from the Horn River shale area, and
- The remaining proposed facilities serve the aggregate upstream flow requirements both within Alberta and N.E. B.C.

2.2.2.1 Design Flows - Upper and Central Peace River Design Sub Areas

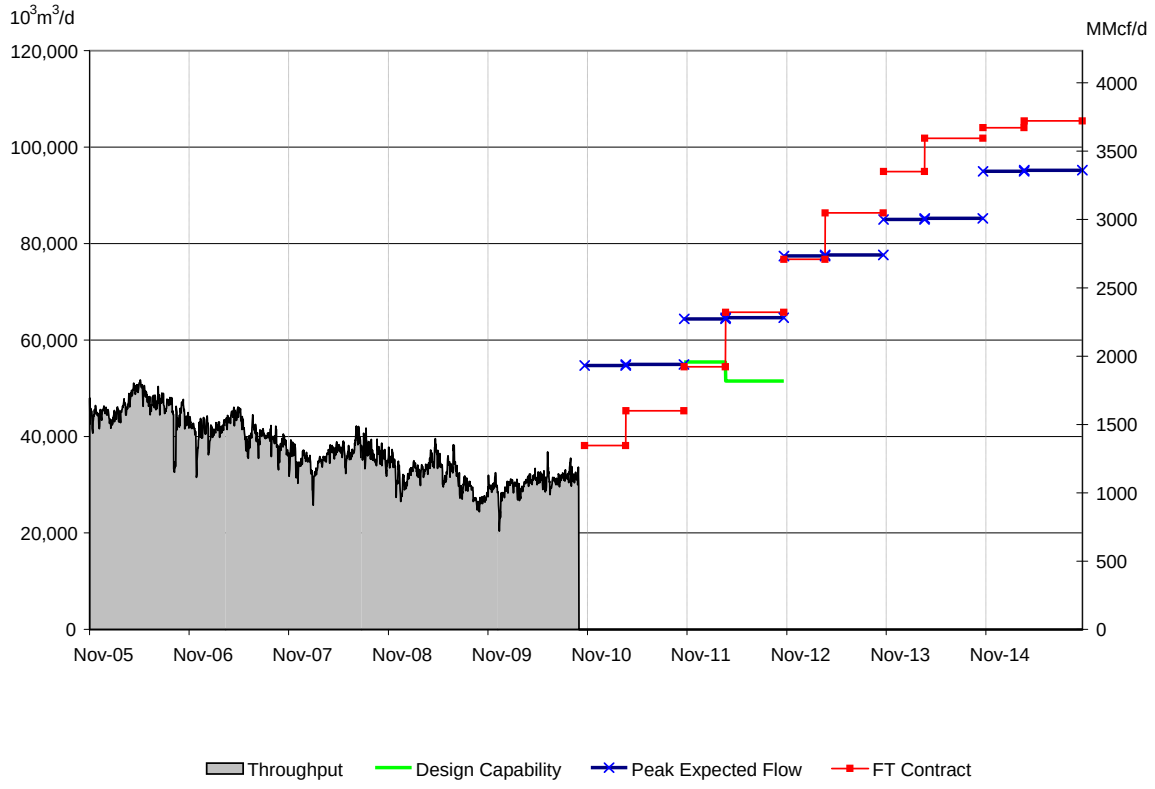
The peak expected flow for the Upper and Central Peace River Design Sub Areas is the flow out of the area at the Meikle Compressor Station toward the North Central Corridor and at the Saddle Hills, Clarkson Valley and Valleyview Compressor Stations toward the Lower Peace River Design Area.

Figure 2.2.2 provides historical actual flow, the design capability for the area, projected peak expected flow and FT contract level. As shown in the Figure both peak expected flow and FT contract level is expected to exceed the design capability for this area during the 2011/12 Gas Year.

Figure 2.2.2

Throughput / Design Capability / Peak Expected Flow

Upper and Central Peace River Design Area



2.2.2.2 Proposed Facilities - Central Peace River Design Sub Area

Figure 2.2.2.2
Central Peace River Design Sub Area
Proposed Facilities

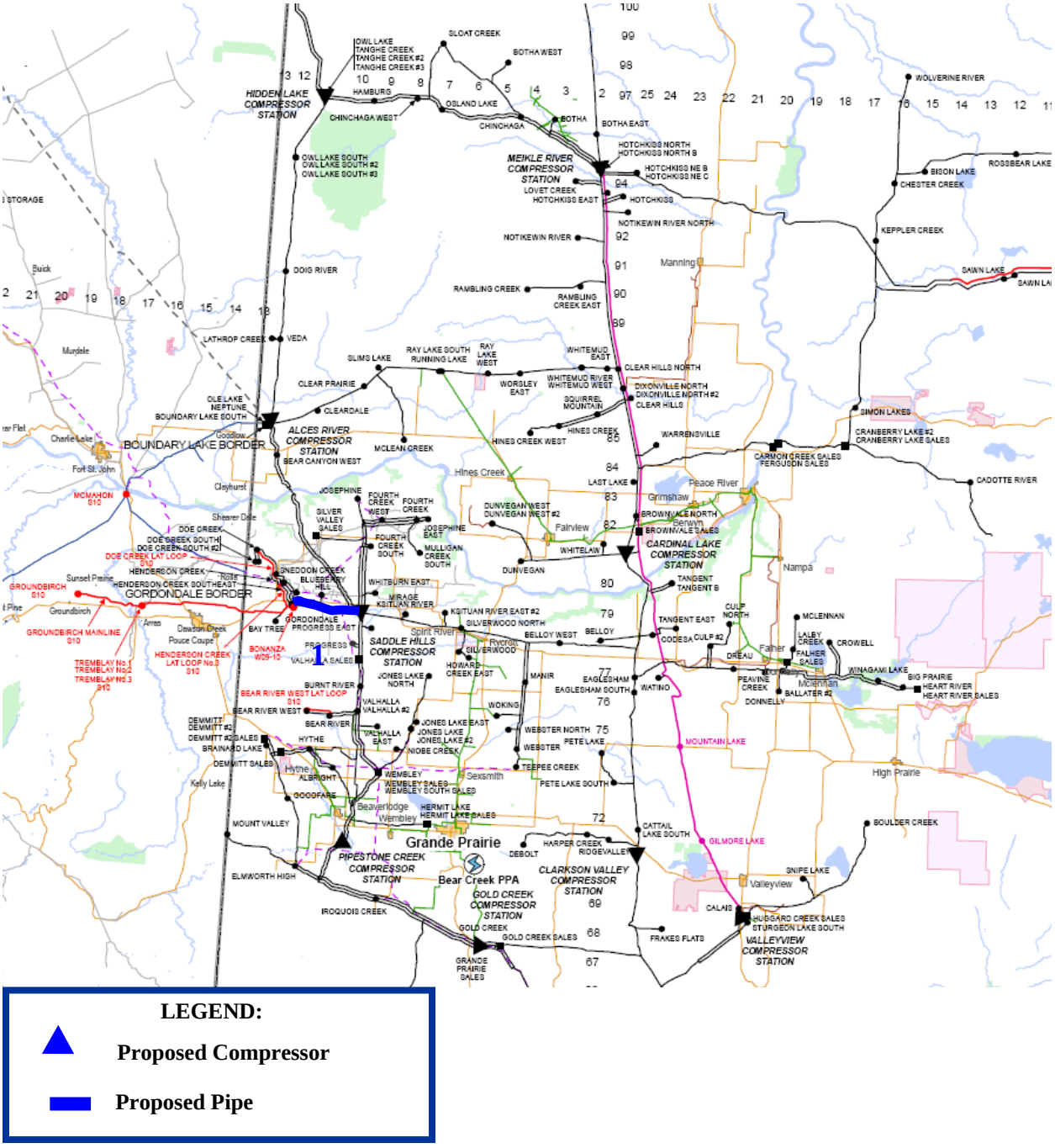


Table 2.2.2
Central Peace River Design Sub Area
Proposed Facilities

Map Location	Proposed Facility	Description	Required In-Service Date	Capital Cost ($Millions)
1	Gordondale Lateral Loop No.2	24 km NPS 42	Nov 11	65.3
Capital Costs are in 2010 dollars and include AFUDC			**TOTAL**	**65.3**

The Gordondale Lateral Loop No. 2 increases the capacity to transport incremental supply from a number of areas including the Doe Creek area, Spectra Pipeline through the Gordondale Border Receipt Station and from the new Groundbirch Mainline.

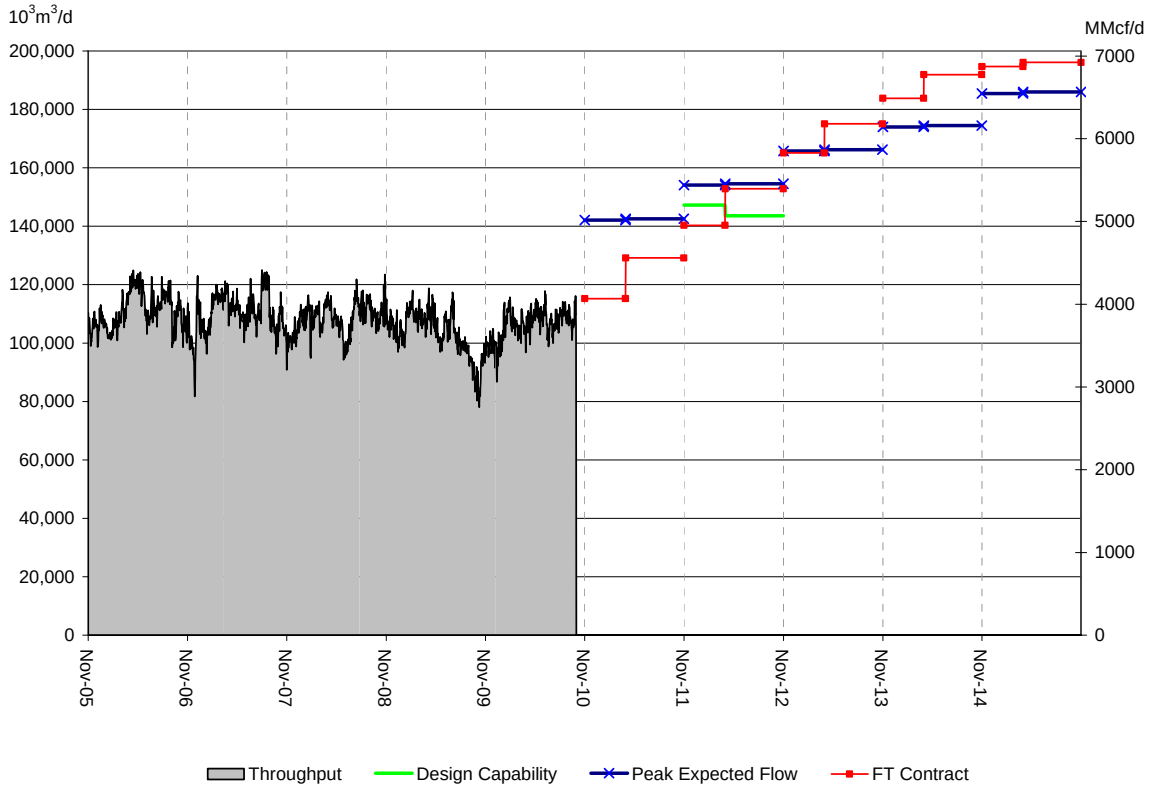
2.2.3.1 Design Flows - Upper, Central and Lower Peace River Design Sub Areas

The peak expected flow for the Upper, Central and Lower Peace River Design Sub Areas is the flow out of the area at the Meikle Compressor Station as well as the flow from the Grande Prairie Mainline and the Edson Mainline Extension at the Edson Meter Station, excluding the Marten Hills Lateral flow.

Figure 2.2.3 provides historical actual flow, the design capability for the area, projected peak expected flow and FT contract level. The FT contract level is expected to exceed the design capability within a portion of this area in the 2011/12 Gas Year.

Figure 2.2.3

Throughput / Design Capability / Peak Expected Flow
Upper, Central and Lower Peace River Design Area



2.2.3.2 Proposed Facilities - Lower Peace River Design Sub Area

Figure 2.2.3.1
Lower Peace River Design Sub Area
Proposed Facilities

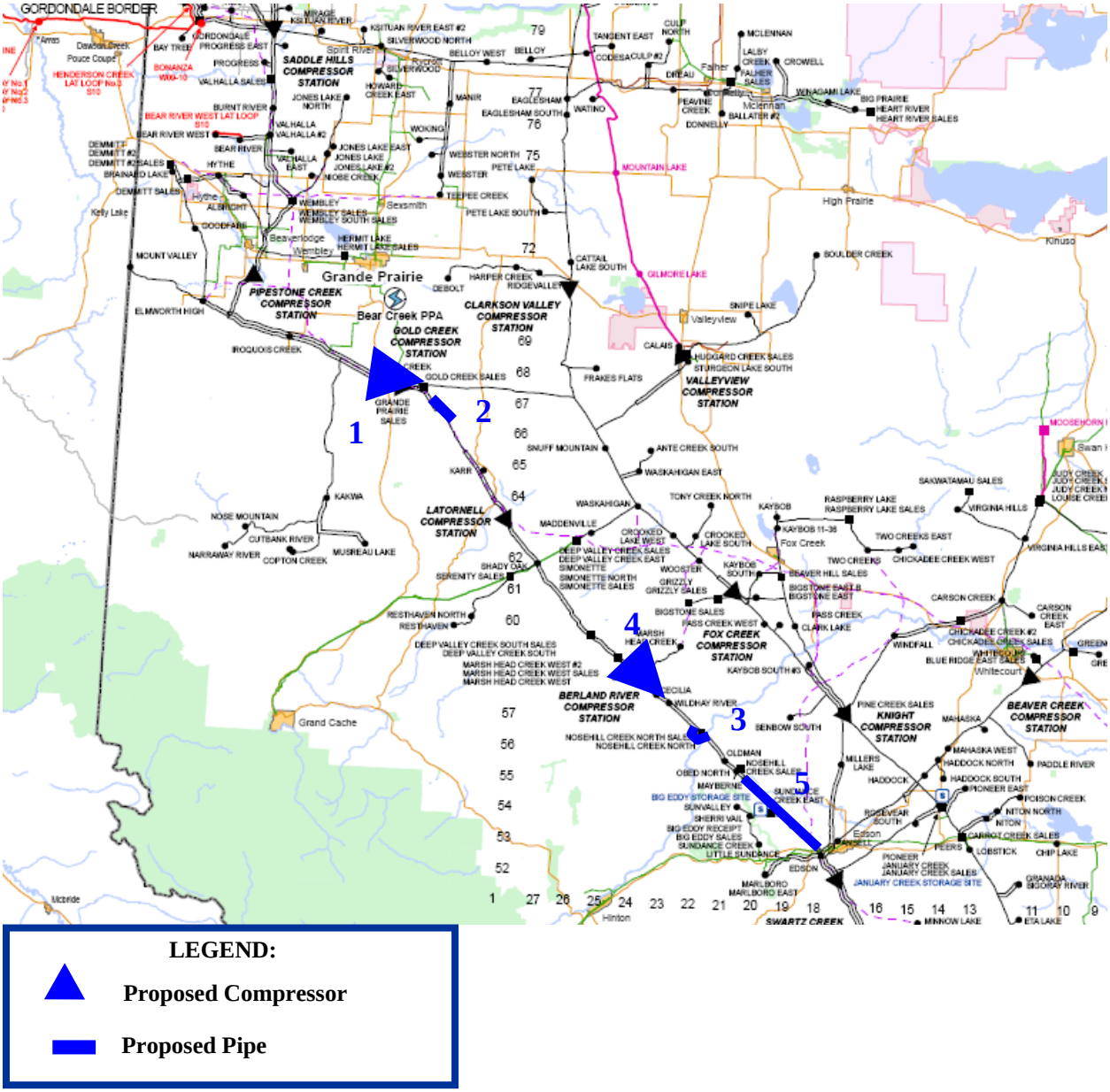


Table 2.2.3
Lower Peace River Design Sub Area
Proposed Facilities

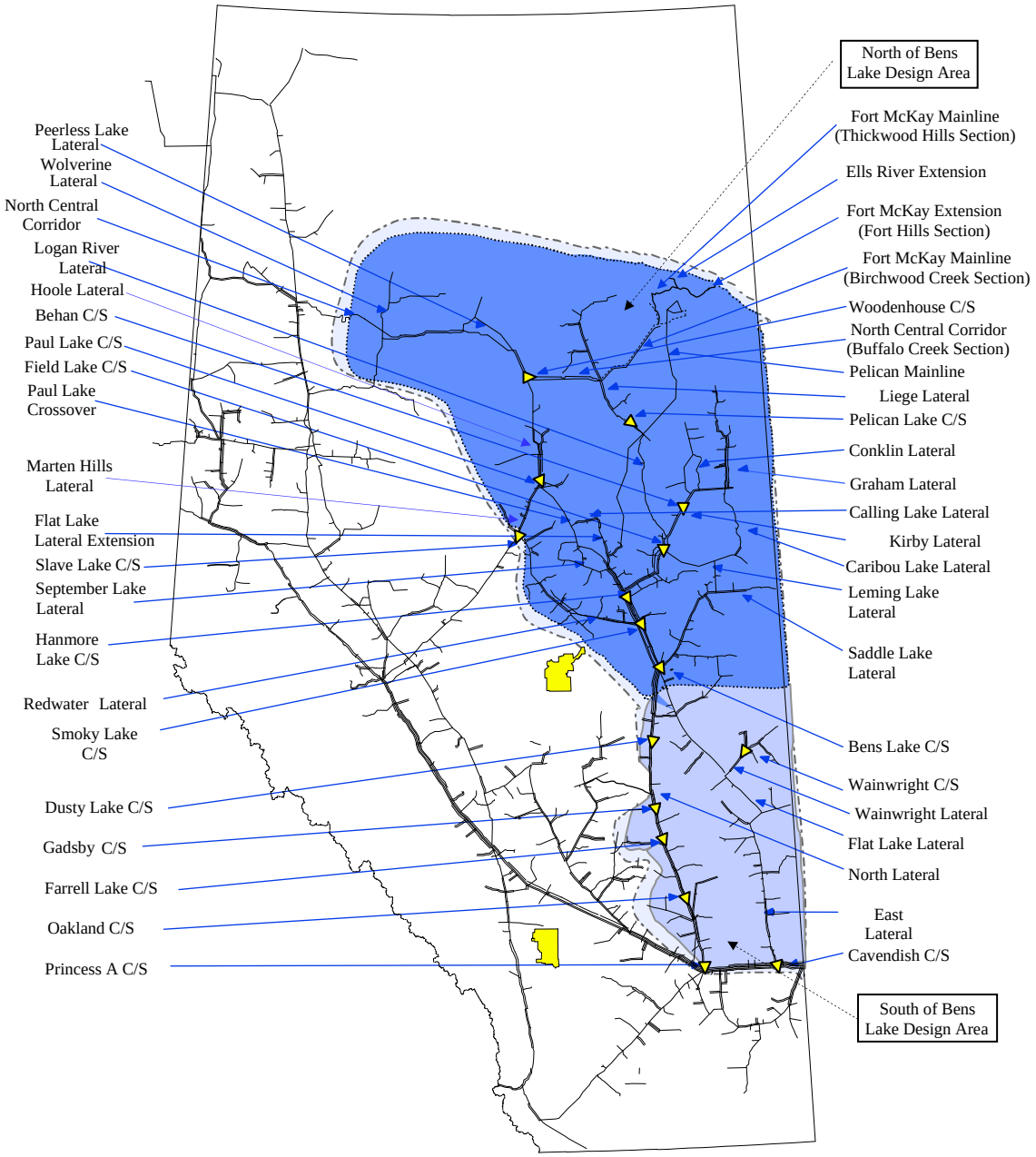
Map Location	Proposed Facility	Description	Required In-Service Date	Capital Cost ($Millions)
1	Gold Creek C/S Unit Addition	28 MW	Nov 11	60.3
2	GPML Loop (Karr North Section)	16 km NPS 42	Apr 12	39.2
3	GPML Loop (Nosehill Creek Section)	3 km NPS 42	Apr 12	21.4
4	Berland Rvr C/S Unit Addition	28 MW	Nov 12	66.4
5	GPML Loop No. 2 (Macleod River Section)	35 km NPS 48	Apr 13	81.6
Capital Costs are in 2010 dollars and include AFUDC			**TOTAL**	**268.9**

These proposed facilities are required to service the aggregate needs of all upstream supply including gas from the Montney area through the Groundbirch Mainline, the Spectra Pipeline through Gordondale Border Receipt Station and upstream supply from the Northwest Mainline. These facilities provide incremental capability to transport natural gas southbound through the Grande Prairie Mainline and towards the major export points.

2.3 North and East Project Area

The North and East Project Area (Figure 2.3) is comprised of the North of Bens Lake and South of Bens Lake Design Areas.

Figure 2.3
North and East Project Area



Two distinct flow conditions are examined in assessing facilities requirements in the North and East Project Area. First, there is the "flow through" condition that is governed by the North and East Project Area design flow requirements methodology. Second, there is the "flow within" condition that is governed by the maximum day delivery to the North of Bens Lake Design Area. Currently, the "flow within" condition governs facilities requirements in the North and East Project Area. Additional information on design flow conditions can be found in Section 3.5 – Mainline Facilities Flow Determination of the Facilities Design Methodology Document.

2.3.1 North of Bens Lake Design Area

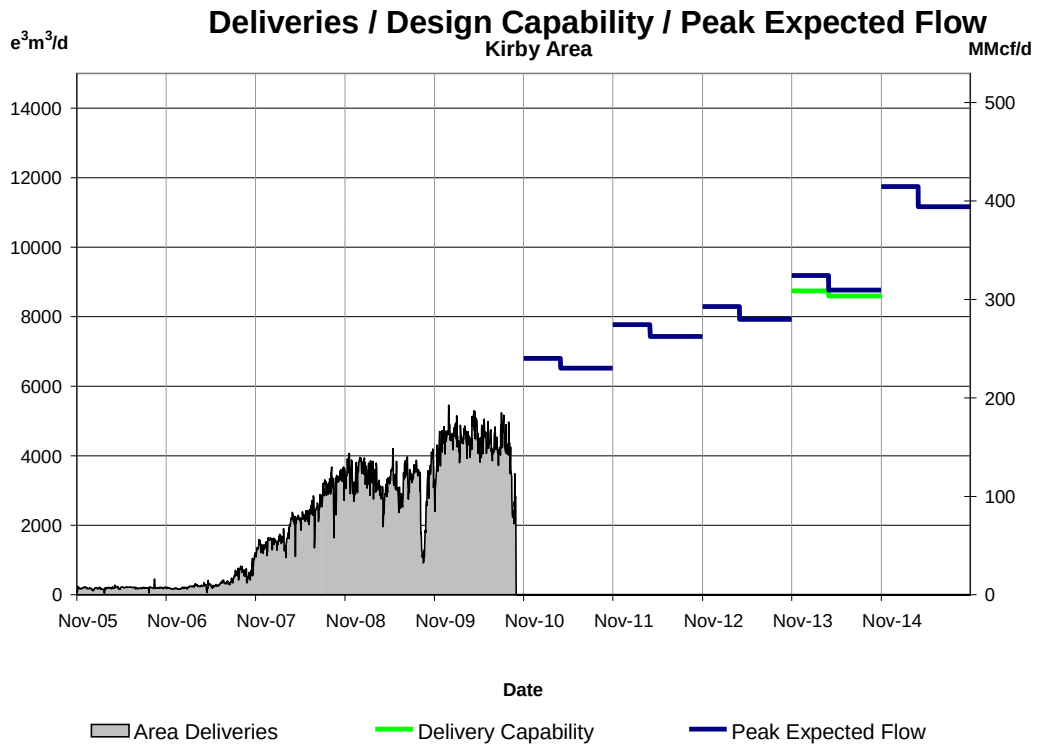
2.3.1.1 Design Flows – North of Bens Lake Design Areas

The peak expected flow, for the flow within condition, in the North of Bens Lake Design Area is the net effect of localized minimum available supply less the maximum deliveries expected within the area. As outlined in Chapter 1, Alberta deliveries to the North of Bens Lake Design Area are forecast to increase in the future. The productive capability required to meet the maximum day delivery draws from available receipts on the Liege, Logan, Conklin and Kirby Laterals plus the supply that is brought into the area from the Peerless Lake Lateral, via the North Central Corridor (Buffalo Creek Section) and the Marten Hills design area through the Slave Lake compressor.

Figure 2.3.1 provides historical actual flow, the design capability for the area, projected peak expected flow and FT contract levels. Peak expected flow is expected to rise in the North of Bens Lake Design Area throughout this forecast period and specifically, there is an increase in peak expected deliveries within the Kirby region of this area that will require additional mainline facilities to be in service by November 2013. This proposed facility is located in an area which requires facilities

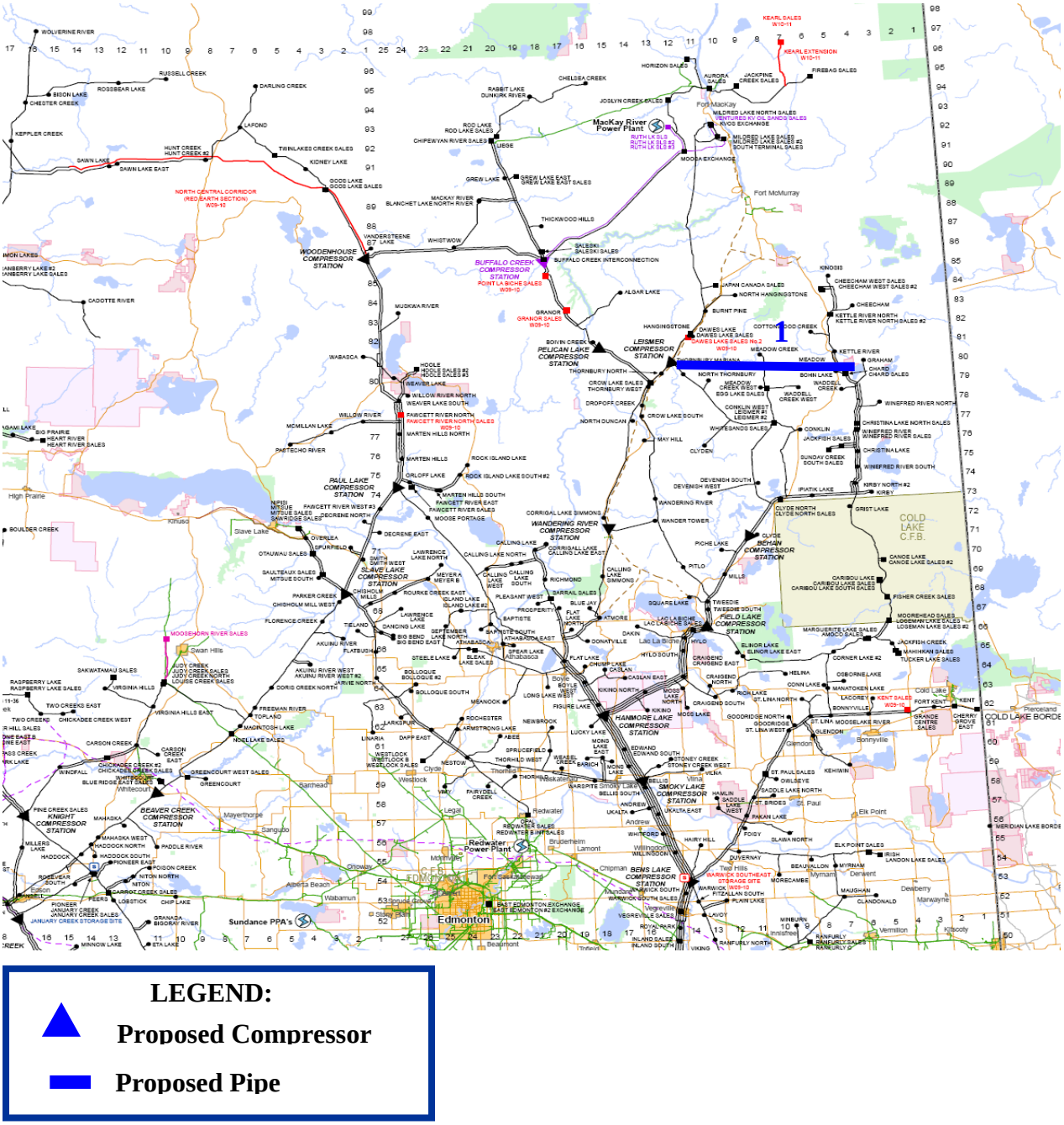
to be constructed during the winter season. Therefore, the in-service date will be April, 2013.

Figure 2.3.1
Deliveries / Design Capability / Peak Expected Flow
Kirby Area



2.3.1.2 Proposed Facilities – North of Bens Lake Design Areas

Figure 2.3.1.2
North of Bens Lake Design Area
Proposed Facilities



2.3.1.3 Proposed Facilities - North of Bens Lake Design Areas

Table 2.3.1
North & East Project Area
Proposed Facilities

Map Location	Proposed Facility	Description	Required In-Service Date	Capital Cost ($Millions)
1	Leismer to Kettle River Crossover	86 km NPS 24	April 13	137.2
Capital Costs are in 2010 dollars and include AFUDC			**TOTAL**	**137.2**

The Leismer to Kettle River Crossover will transport additional gas supply to meet increasing delivery requirements in the Kirby Area due to increasing development of in-situ oil sands production.