

VOLUME I

DEMPSTER HIGHWAY LATERAL
COMPRESSOR STATION COST ESTIMATE
CHILLED AND NON-CHILLED

PREPARED FOR
FOOTHILLS PIPE LINES (YUKON) LTD.

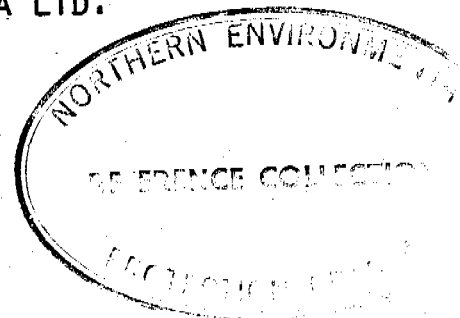
BY

CANUCK ENGINEERING LTD.

AND

DILLINGHAM CORPORATION CANADA LTD.

JANUARY 31, 1979



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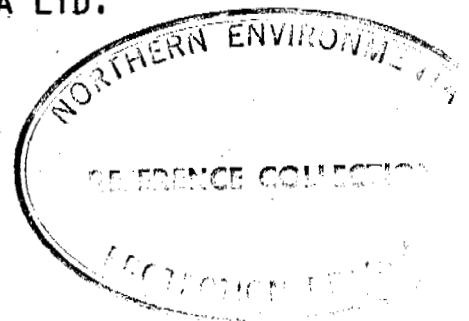


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DEMPSTER HIGHWAY COMPRESSOR STATION

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DEMPSTER HIGHWAY COMPRESSOR STATION

I. SCOPE OF WORK AND CONCLUSIONS

On December 12, 1978, Foothills Pipe Lines (Yukon) Ltd. authorized Canuck Engineering Ltd. to proceed with the preparation of cost estimates for a typical chilled compressor station (No. 3) in the permafrost zone and a typical non-chilled compressor station (No. 7) for the Dempster Highway Pipe Line. Both stations were to utilize a single 16,000 ISO horsepower gas turbine compressor package for the main high pressure gas unit.

A discussion of the methodology used in the preparation of the estimate is presented in Section II of this report, and the detailed approach and assumptions are outlined in Section III. The station designs are in accordance with CSA Standard Z184-1975 and the NEB PC 1974-807 Gas Pipeline Regulations. The installation portion of the cost estimate has been prepared by the Dillingham Corporation Canada Ltd. who have had extensive experience in the installation of compressor stations and natural gas process plants in Western Canada. The estimate was prepared with the consideration that the contractor would move in and construct a minimum of four stations over a two-year period.

First quarter 1979 material costs were used in the preparation of this estimate and no allowance was made for escalation.

The following summarizes the installed costs for each compressor station:

<u>Station</u>	<u>Subtotal</u>	<u>Contingency</u>	<u>Freight</u>	<u>Total</u>
	\$	\$	\$	\$
Chilled (Stn. No. 3)	26,142,500	916,000	575,000	27,633,500
Non-Chilled (Stn. No. 7)	14,109,500	425,000	325,000	14,859,500

The contingency figure is on materials only and a figure of 10 percent was generally used. Freight costs as shown cover freight of permanent station materials to the jobsite from Edmonton but do not include freight costs of contractor's equipment which is included in the mobilization section of Contractor's Overhead.

It should be noted that the above figures exclude some direct costs as directed by Foothills Pipe Lines (Yukon) Ltd. in their correspondence dated December 21, 1978 to Canuck Engineering Ltd. Foothills Pipe Lines (Yukon) Ltd. must add their own appraisals for those elements that are excluded. The direct costs that are outstanding are discussed in Section II.

In addition, Owner's indirect costs have not been included in this estimate but must be considered by Foothills Pipe Lines (Yukon) Ltd. in order to have a complete assessment of compressor station costs.

Detailed cost estimate summaries for each compressor station are presented in Tables 1 and 2.

TABLE 1
 CAPITAL COST ESTIMATE SUMMARY
 DEMPSTER HIGHWAY COMPRESSOR STATION NO. 3
 CHILLED

<u>Cost Category</u>	<u>Materials</u>	<u>Installation</u>	<u>Total</u>
	\$	\$	\$
1. Foundations	452,000	902,000	1,354,000
2. Buildings	1,125,000	268,000	1,393,000
3. Gas Compressor Package	3,900,000	67,000	3,967,000
4. Propane Compressor Packages	3,600,000	99,000	3,699,000
5. High Pressure Gas Piping	1,587,000	199,000	1,786,000
6. Other Major Systems	2,367,000	343,000	2,710,000
7. Utilities	255,000	89,000	344,000
8. Instrumentation	383,000	52,000	435,000
9. Electrical	867,000	255,000	1,122,000
10. Insulation & Painting	124,000	184,000	308,000
11. Testing, Winterizing & Startup	114,000	83,000	197,000
12. Miscellaneous	187,000	41,000	228,000
13. Federal Sales Tax	1,357,500	-	1,357,500
14. Contractors Overhead	-	8,158,000	8,158,000
15. Freight (Materials Only)	575,000	-	575,000
TOTAL	<u>16,893,500</u>	<u>10,740,000</u>	<u>27,633,500</u>
(Includes Contingency of \$916,000 on Materials)			
16. Tools & Major Spares (Includes FST)	640,000 (optional)		

TABLE 2
 CAPITAL COST ESTIMATE SUMMARY
 DEMPSTER HIGHWAY COMPRESSOR STATION NO. 7
 NON-CHILLED

<u>Cost Category</u>	<u>Materials</u>	<u>Installation</u>	<u>Total</u>
	\$	\$	\$
1. Foundations	252,000	506,000	758,000
2. Buildings	741,000	190,000	931,000
3. Gas Compressor Package	3,900,000	67,000	3,967,000
4. Propane Compressor Packages	-	-	-
5. High Pressure Gas Piping	946,000	126,000	1,072,000
6. Other Major Systems	536,000	70,000	606,000
7. Utilities	228,000	89,000	317,000
8. Instrumentation	114,000	28,000	142,000
9. Electrical	464,000	179,000	643,000
10. Insulation & Painting	35,000	93,000	128,000
11. Testing, Winterizing & Startup	89,000	44,000	133,000
12. Miscellaneous	187,000	41,000	228,000
13. Federal Sales Tax	698,500	-	698,500
14. Contractors Overhead	-	4,884,000	4,884,000
15. Freight (Materials Only)	<u>352,000</u>	<u>-</u>	<u>352,000</u>
TOTAL (Includes Contingency of \$425,000 on Materials)	<u>8,542,500</u>	<u>6,317,000</u>	<u>14,859,500</u>
16. Tools & Major Spares (Includes FST)	360,500 (optional)		