

CAPITAL AND OPERATING COSTS**APPLICATION FOR APPROVAL OF
THE DEVELOPMENT PLAN FOR
TAGLU FIELD
PROJECT DESCRIPTION****INTRODUCTION**

13.1.1 SCOPE

This section outlines the historical costs incurred for developing the Taglu field, including:

- seismic acquisition and processing
- exploration and delineation drilling
- pre-development engineering and geoscience

Also included is an estimate of future development costs and annual operating costs.

The scope of the cost estimates provided is limited to those costs directly associated with the development of the Taglu field. Imperial Oil Resources Ventures Limited's costs as a working interest owner in the Mackenzie gathering system or the Mackenzie Valley pipeline are not included. Costs associated with other anchor fields are separate and are the responsibility of the individual operators.

13.1.2 HISTORICAL COSTS

Historical costs include:

- seismic acquisition
- processing
- interpretation
- exploration and delineation drilling from 1969 to 1988
- pre-development engineering from 2000 to mid-2003

The expenditures (see Table 13-1) are gross costs in as-spent dollars and have not been adjusted for inflation.

Table 13-1: Historical Exploration and Pre-Development Costs for Taglu

Year	\$Million As-Spent			
	Seismic	Drilling	Engineering	Total
1969	1.9	0	0	1.9
1970	1.1	0	0	1.1
1971	0	3.2	0	3.2
1972	0.9	9.6	0	10.5
1973	0	3.8	0	3.8
1974	3.7	0	0	3.7
1975	1.3	0	0	1.3
1976	2.3	0	0	2.3
1977	0	7.2	0	7.2
1978	2.8	0	0	2.8
1988	9.2	0	0	9.2
2000	0	0	0.8	0.8
2001	0	0	1.7	1.7
2002	0	0	3.8	3.8
2003*	0	0	3.1	3.1
Total	23.2	23.8	9.4	56.4
Note: *Up to June 30.				

CAPITAL AND OPERATING COSTS**APPLICATION FOR APPROVAL OF
THE DEVELOPMENT PLAN FOR
TAGLU FIELD
PROJECT DESCRIPTION****CAPITAL COST BASIS**

13.2.1 ESTIMATE SCOPE

Capital cost estimates were developed for:

- drilling and completions
- facilities materials and equipment
- facilities construction
- owner's engineering and project management
- allowances

The estimated capital costs for developing the Taglu field are expressed in constant Q1, 2003, Canadian dollars. On the current scope, this estimate has an equal probability of overrun and underrun.

13.2.2 ESTIMATE BASIS**13.2.2.1 Drilling and Completions**

Drilling and completions costs are based on the following:

- materials and consumables are based on vendor quotes and include transportation costs from Edmonton to Taglu
- drilling time estimates are based on Canadian Arctic offsets and compared against current industry exploration wells
- drilling and completion costs include an initial program of a minimum of five gas producers and one disposal well
- future drilling program costs include a minimum of six additional gas producers in two drilling programs
- rig modification costs assume upgrades to an existing arctic class drilling rig
- mobilization and demobilization costs are included for the drilling rig and camp

13.2.2.2 Facilities Materials and Equipment

Facilities materials and equipment costs were estimated as follows:

13.2.2.2 Facilities Materials and Equipment (cont'd)

- the cost of major materials and equipment was based on estimates from North American manufacturers and subsequent discussions with those suppliers. These materials and equipment include:
 - compressors and drivers
 - aerial coolers and condensers
 - power generation packages
 - glycol heaters
 - pumps and drivers
 - process vessels
 - storage tanks
- the cost of other smaller equipment and materials was based on:
 - Imperial Oil Resources Limited's database of historical purchases
 - recent purchases
 - suppliers' price lists

13.2.2.3 Facilities Construction

The facilities construction costs were factored from the major mechanical and electrical equipment required for the gas conditioning facility. These cost estimates were based on:

- previous construction experience, to establish appropriate productivity rates
- discussions with contractors
- pre-constructed facility modules being transported to the site
- building trades rates in effect in Q1, 2003
- adequate contractor and labour resources being available to execute the project as planned
- the volume and weight of required temporary and permanent project components (to determine logistics costs)
- infrastructure requirements because of the remote location of the project

13.2.2.4 Owner's, Engineering and Project Management

Common costs allocated to both owner's cost and the engineering and project management cost categories include:

- project personnel costs, including consultants needed to plan, manage and supervise the project

- services for the environmental impact assessment, including the socio-economic impact assessment, and geotechnical and hydrological investigations and reports
- all testing and inspection requirements

Owner's Costs

Owner's costs include costs for:

- public notification and consultation
- land access and use
- applicable risk insurance
- management, administration and legal costs for head office functions

Engineering and Project Management Costs

Engineering and project management costs to develop the project include:

- engineering surveys related to site location, and legal as-built requirements
- conceptual design studies of facility options
- preliminary and detailed engineering design

13.2.2.5 Exclusions from Estimate

Goods and services tax (GST) and provincial sales taxes are not included in the estimate for any project materials, equipment or services.

13.2.3 ALLOWANCES**13.2.3.1 Contingency**

A contingency allowance, based on the level of definition for each major project component, has been included for each facility. The contingency allowance reflects current uncertainties related to:

- design changes
- manufacturers' pricing
- the availability of the required resources
- the remoteness of the facility locations

Contingency levels were established for each category of cost. Lower contingency levels were assigned to those costs for which recent experience or other supporting information provided additional certainty in estimating the costs. Higher contingency levels were assigned to costs for which less reliable information or limited applicable experience was available. The resulting weighted average contingency was included in the estimate.

13.2.3.2 Risk Allowance

Risk allowances have been included in the project cost, based on:

- major equipment classes
- equipment fabrication and site construction locations
- technology used
- magnitude of investment

As engineering progresses, these risk allowances will be further defined, based on specific probability-weighted events that might occur during project execution.

CAPITAL AND OPERATING COSTS
**APPLICATION FOR APPROVAL OF
THE DEVELOPMENT PLAN FOR
TAGLU FIELD
PROJECT DESCRIPTION**
DEVELOPMENT COST ESTIMATE
13.3.1 INITIAL DEVELOPMENT COSTS

The estimated cost for the initial drilling program required before the gas conditioning facility start-up is \$216 million (see Table 13-2).

Table 13-2: Drilling and Completions Initial Program Cost Estimate

Component	\$Million (Q1, 2003)
Drilling	150
Completions	18
Rig modifications	15
Mobilization and demobilization	5
Subtotal	188
Contingency	28
Total	216

13.3.2 GAS CONDITIONING FACILITY DESIGN AND CONSTRUCTION

The estimated cost related to designing and constructing the gas conditioning facility is \$340 million (see Table 13-3).

Table 13-3: Gas Conditioning Facility Cost Estimate Summary

Component	\$Million (Q1, 2003)
Materials	107
Installation	58
Subtotal	165
Engineering and project management	40
Owner's costs	53
Contingency	69
Risk allowance	13
Total	340

13.3.3 FUTURE DEVELOPMENT COSTS

The estimated cost for future drilling programs is \$206 million (see Table 13-4).

Table 13-4: Drilling and Completions Cost Estimate for Future Programs

Component	\$Million (Q1, 2003)
Year 3 post start-up program	94
Year 11 post start-up program	86
Subtotal	180
Contingency	26
Total	206

13.3.4 FUTURE COMPRESSION FACILITIES COSTS

The estimated cost related to designing and constructing future compression facilities is \$173 million (see Table 13-5).

Table 13-5: Future Compression Facilities Cost Estimate

Component	\$Million (Q1, 2003)
Materials	67
Installation	35
Subtotal	102
Engineering and project management	12
Owner's costs	18
Contingency	34
Risk allowance	7
Total	173

13.3.5 EXPENDITURE PROFILE

Table 13-6 provides a profile of the development cost expenditures throughout the life of the Taglu development.

Table 13-6: Development Cost Expenditure Profile

Year	\$Million (Q1, 2003)			
	Drilling	Facilities	Compression	Total
2003	0	7	0	7
2004	2	18	0	20
2005	2	35	0	37
2006	2	91	0	93
2007	16	89	0	105
2008	150	68	0	218
2009 (start-up)	44	32	0	76
2012	107	0	2	109
2014	0	0	80	80
2018	0	0	85	85
2020	99	0	6	105
2023	0	0	0	0
Total	422	340	173	935

CAPITAL AND OPERATING COSTS**APPLICATION FOR APPROVAL OF
THE DEVELOPMENT PLAN FOR
TAGLU FIELD
PROJECT DESCRIPTION****OPERATING COSTS**

13.4.1 ESTIMATE BASIS

An annual cost estimate for operating and maintaining facilities at Taglu has been prepared based on the technical description of the drilling and gas conditioning facilities described in this development plan application. These facilities include:

- about 11 production wells and one or two disposal wells
- separation equipment
- dehydration equipment
- refrigeration equipment
- compression equipment
- utility systems, including:
 - electrical power generation
 - control systems

The operating cost estimate includes costs for:

- proponent and contract personnel for operating and maintaining facilities, including accommodations and catering
- consumable goods and materials required in the operation
- logistics costs incurred in moving goods and materials from point of origin, and disposal costs
- communication, control and power generation support
- property taxes, access fees and insurance
- management, administration and legal costs
- contingency allowances

Operating costs do not include:

- pipeline transportation tolls and tariffs
- cost of fuel

13.4.1 ESTIMATE BASIS (cont'd)

Personnel and contract service estimates are based on the owner's experience in other operations, with equipment and conditions similar to those expected in the Taglu development.

Consumable goods, materials and logistics cost estimates are a combination of:

- experience in other operations with similar characteristics to Taglu
- vendor and supplier forecasts

A contingency allowance has been included to reflect current uncertainties related to:

- design changes
- manufacturers' pricing
- the availability of the required resources
- the remoteness of the facility locations

13.4.2 COST ESTIMATE

The estimated average annual cost to operate and maintain facilities at Taglu is about \$18 million (see Table 13-7). Costs are expressed in constant Q1, 2003, Canadian dollars.

Table 13-7: Average Annual Operating and Maintenance Cost Estimate

Activity	(\$Million)
Operations	1
Maintenance	4
Logistics	6
Well work	2
Taxes and access	2
Management and administration	3
Total cost	18