In reference to Schedule "B", page 15 of 82, the purchase of portable diesel generation at a project cost of $1,500,000:

Q. Please provide a copy of the Rose Blanche study presented to the Public Utilities Board as justification for the Rose Blanche project.

A. Attachment A is a copy of the *Rose Blanche Brook Development Feasibility Review Update* submitted to the Public Utilities Board on December 19, 1997.

ROSE BLANCHE BROOK DEVELOPMENT

FEASIBILITY REVIEW UPDATE

Newfoundland Light & Power Co. Limited
December 19, 1997

NEWFOUNDLAND POWER
A FORTIS COMPANY

ROSE BLANCHE BROOK DEVELOPMENT

FEASIBILITY REVIEW UPDATE

Newfoundland Light & Power Co. Limited
December 19, 1997

EXECUTIVE SUMMARY

The Rose Blanche project adds a relatively small increment of both energy production and generation capacity to the Newfoundland electrical system. Net present value analysis of the project reveals that, when the costs of the project are compared to the benefits of either (1) delay of the need for capital expenditures on large-scale generation, or (2) displacement of fuel requirements at Holyrood, plus the reduction of line losses on the electrical system and avoidance of the need to replace obsolete diesel generation capacity in Port aux Basques, the benefits of the project exceed its costs. From the ratepayer's perspective, the project is one of the most economical small-scale hydroelectric generation options currently available for development on the island.

The Company chose the Rose Blanche project not only for economic reasons, but because it provides significant qualitative benefits to the province in general (environment), and to customers in the Port aux Basques area in particular (reliability).

The project will displace 38,000 barrels of oil annually. This provides a tangible environmental benefit in the form of reduced "greenhouse gas" emissions of carbon dioxide, sulphur dioxide and nitrous oxide in Newfoundland's most populous region, the northeast Avalon. The design of the plant also incorporates features which will enhance the ability of the Rose Blanche Brook ecosystem to support fish populations.

The Port aux Basques area is served by a long (185 kilometers) series of radial transmission lines that traverse an area which is subject to some of the harshest weather conditions in the province. For this reason, an additional source of generation in the area will provide enhanced security and reliability of supply. While upgrading of the lines has resulted in improved reliability in recent years, a weather-induced interruption in the transmission supply would leave the Port aux Basques area with only enough power to meet 45% of its peak requirements.

Local generation in the Port aux Basques area is currently limited to 4.16 MW of diesel generating capacity at Port aux Basques, and a 7.3 MW mobile gas turbine unit and 1.0 MW of portable diesel generation at the Grand Bay substation. The Company, with the assistance of an outside consultant, recently conducted a review of all of its diesel generation units. The review resulted in a decision to retire 1.66 MW of the diesel generation in Port aux Basques, among others, because the units are obsolete, difficult to operate safely, and no longer reliable. The construction of the Rose Blanche plant will more than offset this reduction in local generation, thereby avoiding the approximately $1.2 million cost of replacing the retired diesel capacity.

Maintenance is critical on any electrical system, but particularly so for an area such as Port aux Basques with only one transmission infeed and limited local generation. Transmission line maintenance often requires that the line be de-energized. The addition of the planned generation at Rose Blanche will provide the added benefit of lengthening the time during which it is practical to perform major transmission line maintenance, thereby providing scheduling flexibility for maintenance crews and reducing disruptions to the power supply.

The present value financial analysis set out in Section 4 of the report shows the present value of the cost of the Rose Blanche project, in 1998 dollars, to be $13,483,000. The comparison to avoided generation capacity costs assumes no capacity benefit until 2002. The only case analyzed against which the cost of Rose Blanche does not compare favourably is a comparison considering avoided energy production only, and utilizing the fuel forecast provided by Newfoundland & Labrador Hydro prior to the hearing. However, since a need for system capacity is projected for 2002, comparing the cost of Rose Blanche to only the avoided cost of energy production at Holyrood beyond that year does not reflect reality.

The more valid avoided generation comparison reveals that the present value of the cost of Rose Blanche is $5.6 million less than the $19.0 million present value of the avoided cost of generation. Substituting Hydro's fuel forecast in the analysis still leaves the Rose Blanche project with a cost advantage of more than $3.8 million.

Sensitivity analyses were conducted on the cost effect of delaying the project to either 1999 or 2002. These analyses reveal that any benefit in delaying the project is more than offset by the cost of financing the approved 1997 capital expenditures in the interim. Consequently, the least-cost timing scenario is completion of the project in 1998.

This report recommends that the project be completed in 1998 to meet a planned in-service date of November 1998. The recommendation is based on the favourable economics of the project, as well as the significant qualitative benefits, including the positive environmental impact of the project, and the resulting enhancement of the security and reliability of the power supply in the southwest corner of the province.

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Appendix A: Details of Results of Financial Analysis

1.0 INTRODUCTION

Newfoundland Power ("the Company") presently operates 22 small hydroelectric developments, the oldest of which was commissioned in 1900 and the newest in 1983. Consistent with its belief that small hydroelectric installations can provide clean, efficient energy generation to its customers, the Company studied various potential hydro plant sites during the 1980s. In 1991, the Company reviewed this previous work and other studies to determine if the economics of any of these developments had improved.

The Rose Blanche Brook Development, a 5.5 MW (megawatt) hydroelectric generating plant on Rose Blanche Brook, near Port aux Basques, showed excellent potential. So, in 1991, the water rights release was obtained from Newfoundland and Labrador Hydro ("Hydro") and the project was registered with the Environmental Assessment Branch of the Department of Environment and Lands. Following further site evaluation, a detailed financial feasibility study was completed in April 1992. The study was updated in 1996.

In December 1996, the Company's application to the Board of Commissioners of Public Utilities ("the Board") for approval of its 1997 capital expenditure budget included an application for approval of the first phase of the project.

The 1997 capital expenditures for the first phase, which included engineering costs, construction of a 6.5-kilometer access road and a portion of the 5-kilometer transmission line, and certain expenditures in relation to the supply of mechanical/electrical equipment, were approved by the Board. Construction of the first phase is now nearly complete and the mechanical/electrical equipment is on order. Since the filing of the initial application, design improvements have resulted in the upgrading of the plant's capacity to 6.1 MW, and the projected average annual energy production of the plant has increased from 22 GWh (gigawatt-hours) to 23 GWh.

In December 1997, the Company included the completion of the Rose Blanche project in its 1998 capital budget application. The remainder of the project consists of completion of the transmission line, and the construction of the dam, generating plant, penstock, substation, telecommunications and associated equipment for an expenditure in 1998 of $11.9 million. The estimated cost of the entire project as presented in the December 1996 application was $13.2 million. For the 1998 capital budget application, this cost estimate was updated to $13.8 million, reflecting actual experience and the results of negotiations with the Department of Fisheries and Oceans with respect to fish habitat enhancement measures. The details of the construction cost estimate are shown in Schedule 1.

Information requests at the hearing, which was held on December 2, 1997, resulted in a requirement to file additional and updated information in relation to the project. This report is an update of the report entitled "Rose Blanche Brook Development - Feasibility Review", initially filed with the Board in 1996.

2.0 PROJECT DESCRIPTION

The proposed Rose Blanche Brook Hydroelectric Development will provide 6.1 MW of capacity that will be interconnected to the provincial grid. The average annual output of the plant will be 23 GWh, with a firm yield of 18 GWh.

The plant will be located on Rose Blanche Brook on the south-west coast of Newfoundland approximately 45 kilometers east of Port aux Basques (see Figure 2.1). The development site is approximately 5 kilometers upstream of the community of Rose Blanche-Harbour Le Cou. The project will utilize runoff from 52.0 kilometers^2 of the 83.65 kilometers^2 Rose Blanche Brook watershed.

The project requires construction of 5 kilometers of permanent and 1.5 kilometers of temporary access road. The road generally follows Rose Blanche Brook, but lies above the existing flood plain. It crosses the brook by means of new timber and steel bridges.

A 5-kilometer, 25 kV single wood pole transmission line is to be constructed from an existing distribution feeder near Rose Blanche-Harbour Le Cou to a substation adjacent to the powerhouse. The substation will step up the generation voltage to 25 kV from a 6.9 kV generator powered by the single horizontal Francis dual turbine located in the concrete and steel powerhouse.

A concrete gravity dam (35 meters long and 8-10 meters high) and overflow spillway will be constructed in the river channel to elevation 160 m. The reservoir created by the dam will cover approximately 100 hectares and will provide two million cubic meters of storage. An intake structure will be incorporated into the main dam, and will feed water into a 1,300 meter long penstock for delivery to the powerhouse.

Construction activities for the access road and bridges commenced in September of 1997, and are expected to be substantially complete by the end of 1997. The remaining structures will be constructed between May and November 1998. The plant is to be commissioned in November 1998. During construction, the project is expected to employ about 70 workers. The project schedule is summarized in Figure 2.2.

The facility will be operated primarily by remote control from the Company's System Control Centre in St. John's. Operations and maintenance support will be supplied by existing personnel from the Company's Port aux Basques and Stephenville offices.

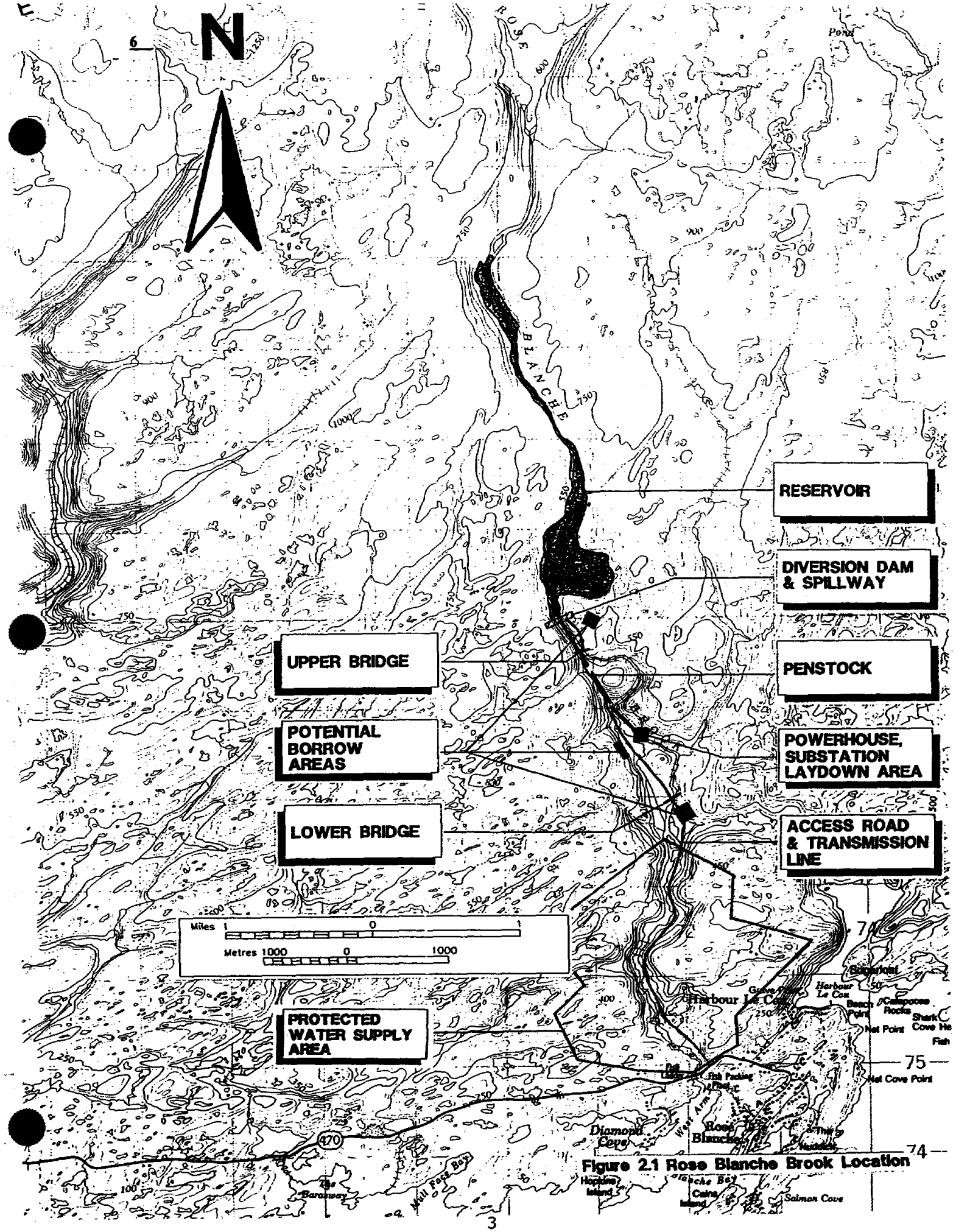


Figure 2.1 Rose Blanche Brook Location

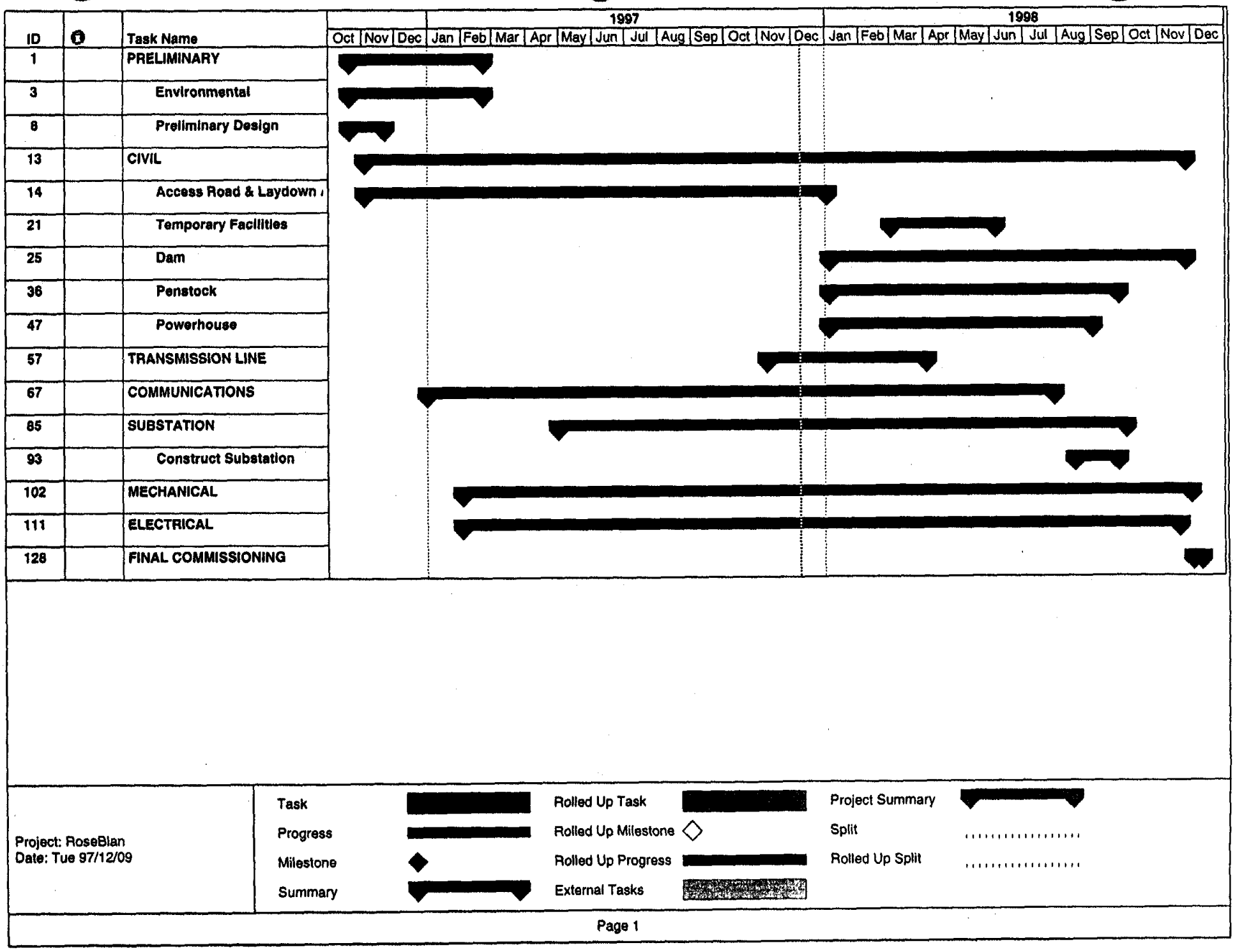

ID
Task Name
1997
1998
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1 PRELIMINARY
3 Environmental
8 Preliminary Design
13 CIVIL
14 Access Road & Laydown
21 Temporary Facilities
25 Dam
36 Penstock
47 Powerhouse
57 TRANSMISSION LINE
67 COMMUNICATIONS
85 SUBSTATION
93 Construct Substation
102 MECHANICAL
111 ELECTRICAL
128 FINAL COMMISSIONING
Project: RoseBlan
Date: Tue 97/12/09
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
Split
Rolled Up Split
Page 1

Figure 2.2

3.0 SUMMARY OF WORK TO DATE

3.1 Environmental

The water rights release for Rose Blanche Brook was obtained from Hydro, and the project was registered with the Environmental Assessment Branch of the Department of Environment and Lands in September 1991.

The environmental process commenced with the registration of the project in September 1991. In November 1991, the Company was informed that an Environmental Preview Report (EPR) was required. This work required field surveys over a number of seasons as requested in guidelines issued in April 1992. The report was submitted in February 1994.

After review and comment by the assessment committee, the revised EPR was resubmitted in May 1995. The document was accepted, and the project was cleared from further assessment on June 29, 1995. However, as of that date, the Department of Fisheries and Oceans (DFO) had not yet commented.

DFO responded in May 1996. Their concerns were addressed, and the Company's response was submitted to DFO in August 1996.

DFO's response in January 1997 revealed a necessity for further field work to rationalize a level of instream flow that was less than the rate DFO had requested. The field work was necessary because the level of instream flow impacts on the annual energy production of the plant. A compensation plan for lost habitat was also discussed at this time and data obtained for the design of the plan.

Following some delays due to weather, the field work was completed in the summer of 1997. Further discussions with DFO indicated more information was required to allow for a reasonable estimate of the actual alteration to fish habitat. It was agreed that the consultant would conduct a more comprehensive base line study for the compensation plan. This baseline study was carried out in September 1997. The compensation plan was submitted in October 1997. DFO staff have indicated that the Company's proposal is reasonable.

3.2 Engineering

As work progressed on the environmental assessment process, the Company continued to work on preliminary designs and cost estimates. Over the next several years, as changes were made to conceptual designs to accommodate environmental concerns, the financial analysis was updated to ensure the project remained feasible.

In the fall of 1996, the project was again reviewed, including a field visit with a geotechnical consultant and two contractors, and a visit to the local town council. The financial analysis was also reviewed, and the present value of costs compared to Holyrood marginal costs and system avoided costs.

Design of the access road and bridges began in January 1997, and a tender for the construction of the road was issued in June 1997. Construction of the road commenced in September 1997, and will be substantially complete by the end of the year.

Preparation of the tender package for the turbine and generator and associated equipment also commenced in early 1997. The contract for the supply of the turbine and generator has been negotiated, and supply and installation is scheduled for September and October of 1998.

The transmission line has also been surveyed and designed and pole installation is proceeding. Stringing of conductor is scheduled for the first quarter of 1998.

Engineering for the powerhouse, penstock and forebay dam is also on schedule, and will be completed in the first quarter of 1998.

4.0 ECONOMIC ANALYSIS

The financial analysis in this report is based primarily on comparing the cost of production at Rose Blanche Brook against:

- The marginal costs of energy production (fuel and variable operating and maintenance expenses) at Hydro's Holyrood Generating Plant;
- Avoided generation capacity (beyond 2002) and energy;
- A combination of the marginal cost of energy production at Holyrood, avoided losses in transmitting electrical energy to the Port aux Basques area, and the avoided cost of replacing 1.66 MW of diesel generation at Port aux Basques.

Sensitivity analyses were completed using Hydro's fuel forecast, construction cost estimates, in-service dates, and discount rates. Each of these comparisons is discussed in Section 4.2. Schedule 2 outlines the assumptions which govern the analysis.

Additional analysis compares the project costs to Hydro's 1992 price offers to non-utility generators (NUGs) and addresses the project's potential impact on rates. This analysis is discussed in Sections 4.3 and 4.4.

The results of the economic feasibility assessment are shown in Table 4.1. All present value costs are stated in 1998 dollars. Annual revenue requirements and cumulative present worth series for the base case and sensitivities are contained in Appendix A.

Table 4.1 - Financial Analysis Results

	Present Value of Costs [1998$]			
	Rose Blanche Brook (RBB)	Avoided Holyrood Production	Avoided Generation	Avoided Holyrood Production + Losses & PAB Diesel Replacement
BASE CASE:				
RBB in-service November, 1998	$13,483,000	$13,681,000	$19,084,000	$16,257,000
SENSITIVITY ANALYSIS:				
Hydro Fuel Forecast		11,901,000	17,303,000	14,390,000
Delay RBB in-service to November, 1999	13,538,000			
Delay RBB in-service to November, 2002	13,801,000			
Increase RBB Construction Costs by 10%	14,723,000			
Decrease RBB Construction Costs by 10%	12,244,000			
Excluding Sunk Costs	11,694,000			
Discount Rate Changed from 9.3% to 14%	9,249,000	7,784,000	10,640,000	9,387,000
Discount Rate Changed from 9.3% to 6%	19,297,000	23,813,000	33,540,000	28,013,000

4.1 Base Case Comparisons

The present value of cost for the Rose Blanche Brook Development has been calculated at $13,483,000 (see Table 4.1), assuming an in-service date of November 1998. This cost has been compared to the three scenarios which are described below:

(i) ***Holyrood production*** will be reduced as a result of energy production at Rose Blanche Brook. The cost savings to the system of reducing the overall consumption of oil at Holyrood is estimated to have a present value of $13,681,000 (see Table 4.1).

(ii) The analysis of ***avoided future generation costs*** considers the value of avoiding the need to add 6.1 MW of capacity on the system in 2002, in combination with the reduced energy production at Holyrood. The present value of these benefits is $19,084,000 (see Table 4.1), which exceeds the cost of Rose Blanche Brook by $5,601,000. The cost of capacity is based on gas turbines which are regarded as the lowest cost source for peaking capacity.

(iii) The analysis of ***avoided system losses and avoided diesel capital costs*** reflects the benefits derived from (1) avoiding losses associated with transmitting electrical

energy over long distances, and (2) avoiding the capital costs involved in the replacement of 1.66 MW of diesel generation at Port aux Basques. The losses that will be avoided on the Port aux Basques transmission line are estimated at 1.1 GWh annually. The avoided cost of replacing the diesel generation to be retired at Port aux Basques is estimated to be $1.2 million in 1998 dollars. When combined with the benefit of reduced production at Holyrood, the present value of these benefits is $16,257,000 (see Table 4.1), which exceeds the cost of Rose Blanche Brook by $2,774,000.

4.2 Sensitivity Analysis

To further test the economics of the Rose Blanche Brook project, several variables were adjusted to determine whether they change the base case results. These sensitivities are discussed below:

(i) *Variation of Fuel Forecast*

Although fuel forecasts can change significantly over a short period of time, the Base Case scenarios were re-analyzed using the new fuel cost projections recently provided by Hydro. The analysis shows that the project may not be justified on fuel savings alone when using this particular fuel cost forecast. However, even with Hydro's fuel forecast, Rose Blanche Brook is the least-cost option when either the cost of avoided capacity, or the value of savings in system losses along with the cost of replacement diesel generation, is included.

(ii) *Delaying the in-service date*

The sensitivity analysis reveals that delaying the project to 1999 or 2002 will actually increase the cost of the project. This sensitivity includes the impact of:

- The cost of the carrying charges associated with the project's approved 1997 capital expenditures
- The cost of replacement energy from the Holyrood generating station
- The cost of system losses during the delay period

Delaying the project to an in-service date of November 1999 increases the present value of the cost of the project by $55,000 to $13,538,000. Delaying the project to an in-service date of November 2002 increases the present value by $318,000 to $13,801,000.

(iii) *Project Cost Sensitivities*

Sensitivity analyses were also carried out on variations in the project cost. The resulting scenarios for increases and decreases in construction costs are shown in Table 4.1. Since the environmental costs and road construction costs are now firmly established, the Company is confident that the current cost estimate is sound. However, delaying the project past the in-service date of 1998 may result in further environmental work being required.

(iv) *Impact of Sunk Costs*

By the end of 1997, thirteen percent ($1,887,000) of the total project cost will have been incurred. Using Newfoundland and Labrador Hydro's own fuel cost projections (see Table 4.1), the analysis demonstrates that the present value of the remaining expenditures is less than the value of avoided Holyrood fuel costs. Viewed on this basis, the Rose Blanche Brook Development is the most cost-effective of all scenarios analyzed in this review.

(v) *Variation in Discount Rate*

A discount rate is used to account for the time-value of money. The Company currently uses its incremental return on rate base as the discount rate for revenue requirement analysis. A sensitivity analysis was conducted to determine whether the base case results vary significantly with different discount rates. The results in Table 4.1 show that the benefits exceed the costs of the Rose Blanche Brook Development in every scenario examined, other than the comparison to avoided Holyrood production at a discount rate of 14%.

4.3 Comparison to NUG Prices

The levelized production cost of the Rose Blanche Brook hydro plant is 5.94¢/kWh in 1998 dollars. In 1992 dollars, it is approximately 5.5 ¢/kWh, which is significantly less than the 1992 price offer to non-utility generators (NUGs) of 6.67 ¢/kWh (1992 dollars). The price offer to NUGs includes both an energy and a demand component. Since the demand component of the price escalates to the NUG in-service date (1998) and the energy component escalates in perpetuity, the price of NUG-supplied power will increase over time, making power produced at Rose Blanche Brook considerably less expensive by comparison.

4.4 Impact on Rates

The highest annual cost associated with Rose Blanche Brook occurs in 1999. This is an effect of the use of straight-line depreciation. The 1999 revenue requirement will be approximately $1,946,000. The short run impact, assuming Hydro's current wholesale mill rate of 45.31 mills/kWh applies, is a decrease in purchased power expense of $1,042,000, leaving a net revenue requirement of approximately $904,000 in 1999. This equates to an increase of about one-quarter of one percent based on current overall revenue requirements. This impact is not sufficient to compel the Company to seek rate relief.

Beyond 1999, the rate impact of Rose Blanche Brook will decrease, as the revenue requirement for the project decreases in each successive year. Based on the present value analysis, the benefits from Rose Blanche Brook will exceed its cost. Rates will therefore tend to be lower with this generating plant on the system than they would otherwise be.

5.0 RELIABILITY & SECURITY OF SUPPLY

Available Local Generation

A diagram of the transmission system in the Port aux Basques area is shown in Figure 5.2. Emergency backup generation in the area is currently limited to a 7.3 MW mobile gas turbine unit and 1.0 MW of portable diesel generation at the Grand Bay Substation, and 4.16 MW of diesel generation at the Port aux Basques diesel plant. However, a recent Company decision to retire a portion of the diesel generation at the Port aux Basques plant will reduce total diesel generation at the plant to 2.5 MW.

Based on its own review and a study by engineering consultants, the Company believes that, due to safety concerns associated with the age of the equipment, and instrumentation and control problems that are being experienced, 1.66 MW of the diesel generation at the Port aux Basques plant should be retired from service. The Company will be applying to the PUB for approval to retire this generation when the Rose Blanche hydroelectric plant is placed in service. The construction of the Rose Blanche Brook plant will eliminate the need for the capital expenditure of approximately $1.2 million that would be required to replace this 1.66 MW of diesel generation.

The concern that the Company has with the reliability and security of the power supply to the southwest corner of the Island is reflected in the fact that the Company has chosen to station the mobile gas turbine in Port aux Basques for the past 15 years. In winter, the only time the unit is moved is in the case of an outage emergency. For example, the unit was moved to the Connaigre Peninsula at Hydro's request during the major outage experienced in that area in 1996. In summer, it is sometimes moved to other locations to provide local generation while maintenance is performed on Company transmission lines, but it is always returned to Port aux Basques. Completion of the Rose Blanche plant will increase opportunities to avail of the unit's mobility.

Local Peak Loads

Table 5.1 shows the 1998 projected substation peaks for the Port aux Basques area. Existing generation can provide backup for approximately 42% of the projected peak for 1998. The net result of the addition of 6.1 MW of generation from the Rose Blanche Brook plant and the removal of the 1.66 MW from the diesel plant is a backup capacity of 16.9 MW of generation. This would provide backup capacity for approximately 62% of the projected 1998 peak.

Table 5.1 - Peak Loads

Substation	Projected 1998 Peak (MVA)
Grand Bay	7.7
Port aux Basques	13.4
Long Lake	6.1
Total	**27.2**

Scheduled Outages

As previously mentioned, the Port aux Basques area is at the end of a long transmission line. From time to time, it is necessary to take the line out of service for maintenance or upgrading purposes. If an interruption in service to customers is to be avoided, it is necessary to schedule the outage when the load is not expected to exceed the available local generation (a "predictable maintenance window"). During the summer, there are very few days when the maximum daily load for the Port aux Basques area is less than the available local generation. Currently, the predictable maintenance window for the transmission feed into Port aux Basques is limited to off-peak hours (6 p.m. to 11 a.m.). This greatly limits the efficiency with which line maintenance and upgrades can be performed. It also creates a risk of power interruptions to some customers if the time required to perform maintenance exceeds initial estimates. Because winter peaks are higher, scheduling maintenance at that time of year is practically impossible under current circumstances.

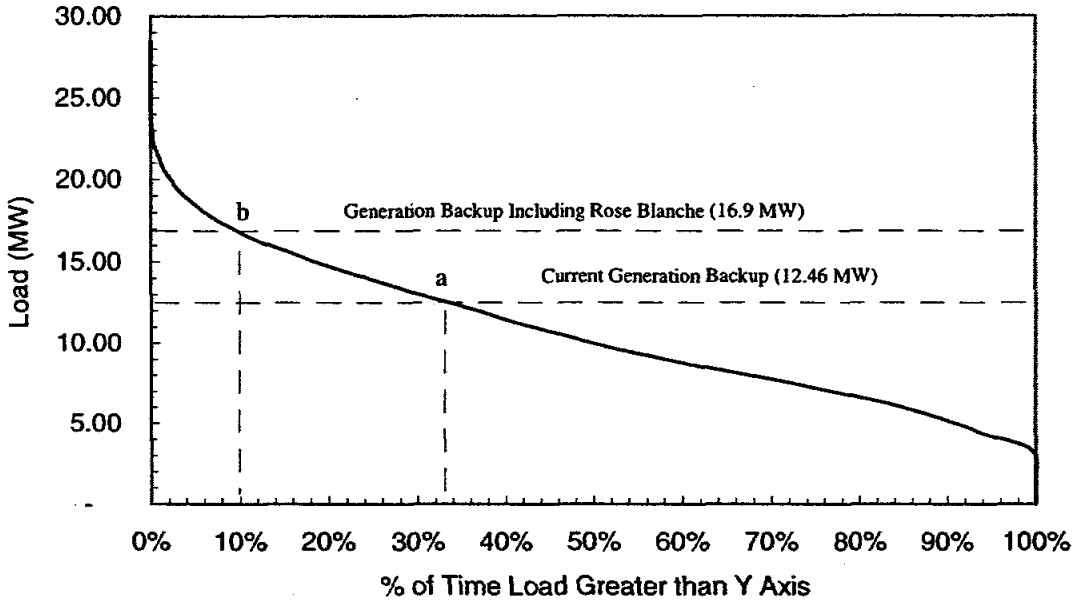
With the addition of Rose Blanche Brook, the amount of local generation will exceed the load for most of the summer. As a result there will be a long periods of time when the line can be left out of service. This will provide greater flexibility in how maintenance is carried out, reduce the cost of maintenance, and minimize the risk of power interruptions during scheduled maintenance.

Unscheduled Outages

Currently, the Port aux Basques system is limited in its capacity to maintain service to customers in the event of a long unscheduled interruption in the transmission feed. An average load duration curve for the Port aux Basques area is shown in Figure 5.1. Point "a" in the figure shows that the projected Port aux Basques load for 1998 will exceed the existing backup generation levels of 12.46 MW thirty five percent of the time. In other

words, in the event of an outage on the transmission feed to the area, the system will only be able to support the load 65 percent of the time. As the graph also shows (point "b"), the addition of generation at Rose Blanche Brook (for a total backup of 16.9MW) would reduce the time that load will exceed generation to 10% of the time. [These figures do not include consideration of the Doyles Substation load (See Figure 5.1) which would rely on Port aux Basques area generation if the cause of an interruption was located on TL214.]

Figure 5.1: Average Load Duration Curve
for Port aux Basques Area Infeed
(Data from 1993 - 1995)



An examination of unscheduled transmission outages for the last eight years shows that the Port aux Basques area experienced an average of approximately 11 hours of interruptions per year. To demonstrate the extent to which local generation provided support for the area, the log sheets for the mobile gas turbine at Grand Bay Substation for the period from 1992 to 1997 were reviewed. As Table 5.2 shows, this unit has been used an average of approximately 6 hours annually during unscheduled outages and approximately 36 hours annually to facilitate planned maintenance. During all of these outages, a 6.1 MW plant at Rose Blanche Brook could have been used either to offset expensive fossil fuel production or to allow a greater portion of the load to be met.

Table 5.2 - Mobile Gas Turbine Usage

Year	Usage at GBS [Hours]	
	Planned	Unplanned
1992	52	7
1993	33	5
1994	24	8
1995	29	0
1996	37	5
1997	41	10
Average	**36**	**6**

A 6.1 MW plant at Rose Blanche Brook would improve the overall reliability and security of the power system in the Port aux Basques area. If one considers only recent outage data, the magnitude of improvement would not be large. However, a more relevant analysis involves consideration of the circumstances of customers in the event that a severe winter storm causes an interruption of the transmission feed.

Although, as outage statistics indicate, the Port aux Basques area has escaped severe storm damage in recent years, this does not preclude future occurrences. The transmission line passes through the Wreckhouse area, a region known for its extreme winds. If a weather-induced interruption in the transmission feed occurs during the winter season, the limited amount of local backup generation will be able to meet only a portion of the Port aux Basques area load. A local source of generation would enhance the security of supply by increasing the capacity to supply either complete or partial power to the area while the line is being repaired.

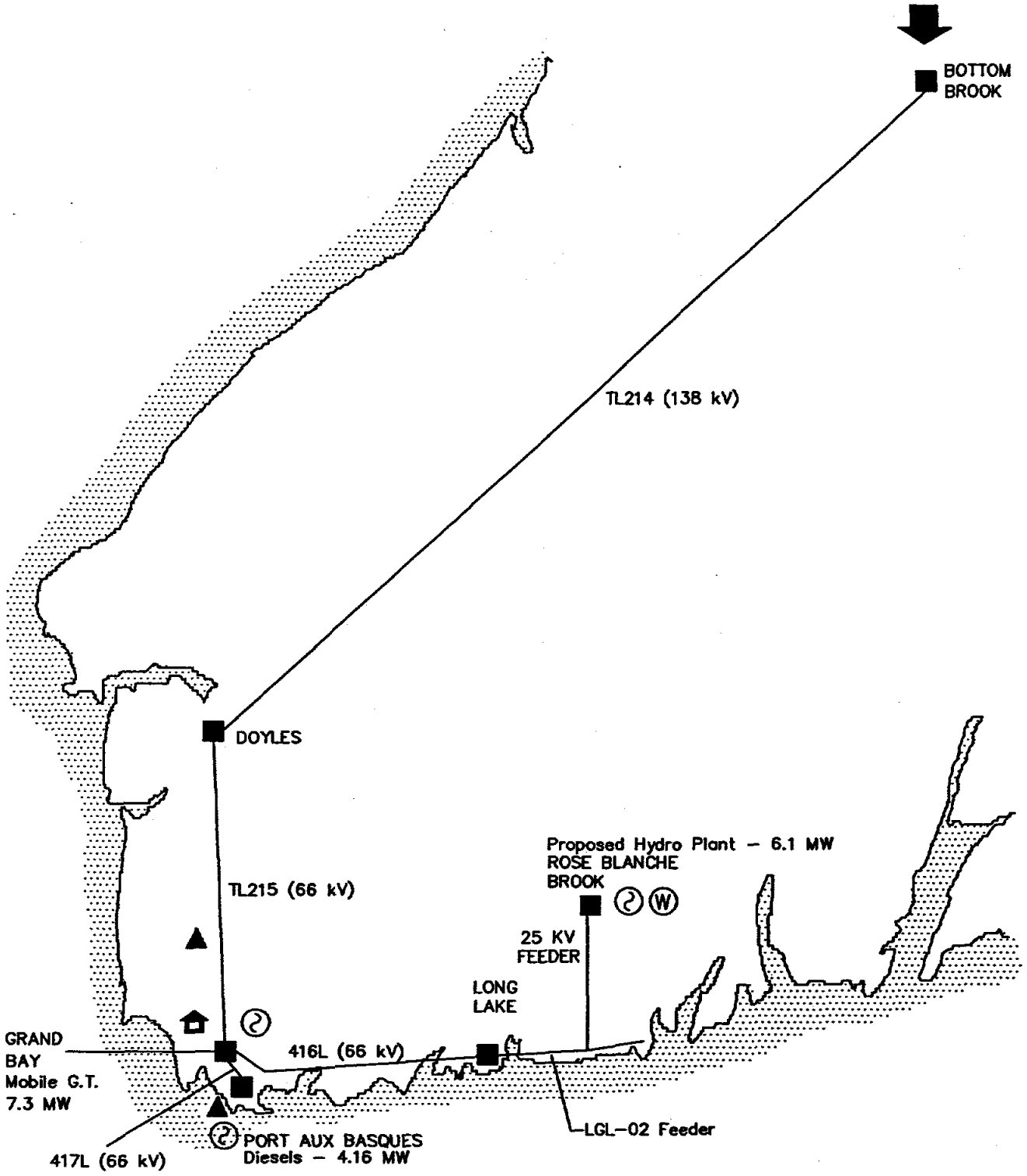


Figure 5.2

NEWFOUNDLAND POWER

POWER SYSTEM
STEPHENVILLE AREA

6.0 TRANSMISSION SYSTEM CAPACITY

The Port aux Basques system is supplied by Hydro via a radial transmission system from Bottom Brook (see figure 5.2). Peak loads in the area are currently about 26 MW but are forecasted to increase. For 1998, the Company is forecasting an increase in load of 2 MW at a metal fabrication yard in Port aux Basques. There are also a number of potential loads that could develop quite rapidly. The following is a list of those which are known to the Company:

- A further increase of 3 MW at the metal fabrication yard in Port aux Basques for additional work currently under discussion
- A load increase of 0.5 MW associated with the possible relocation of the Marine Atlantic Head Office to Port aux Basques
- A 1.7 MW increase in winter peak load at the local fish plant if production should return to pre-moratorium levels

In total, there is potential for a rapid increase of 7.2 MW in load in the Port aux Basques area, raising the total peak load to 33.2 MW from the current 26 MW.

Newfoundland Power's load flow analysis indicates that load levels of approximately 34 MW will result in voltage problems in the Port aux Basques area. The options for addressing these voltage problems are:

- Making additions to the transmission system,
- Adding voltage compensation equipment, or
- Adding local generation.

Construction of Rose Blanche Brook Development addresses this issue and will delay the need for further capital expenditures to address transmission capacity requirements.

7.0 ENVIRONMENTAL FACTORS

When small hydroelectric developments are constructed with proper environmental mitigation, they provide one of the cleanest sources of renewable energy. Because production at Rose Blanche will displace approximately 38,000 barrels of annual oil consumption at Holyrood, it will not only reduce dependency on foreign-supplied fossil fuel, but will also reduce emissions of sulphur dioxide (SO_2), carbon dioxide (CO_2) and nitrous oxide (NO_X) emissions, a consideration that has received global attention as a result of the recent international "greenhouse gas" conference in Kyoto, Japan.

The design of the plant incorporates features such as fishways, spawning areas, and a regulated streamflow. These features were developed in consultation with the federal Department of Fisheries & Oceans, and are designed to enhance the ability of the Rose Blanche Brook ecosystem to support fish populations.

The Environmental Preview Report addressed the concerns of the environmental assessment committee and the project was released from further environmental assessment on June 29, 1995. However, the Environmental Assessment Act provides that if a project has not commenced within three years of the release date the approval expires. The Company is concerned that, if the project is deferred, it may result in further environmental assessment costs.

8.0 CONCLUSION

This report provides information, analysis and comparisons supporting the development of the Rose Blanche Brook project. The present value calculations show the project to be cost-effective. The qualitative benefits of enhanced reliability and security of the power supply in the Port aux Basques area and the positive environmental impact also recommend the project.

Since, the cost of financing the $1.88 million already spent outweighs any benefits of deferral, the project should be completed in 1998, as scheduled, in order to meet the November 1998 in-service target date.

SCHEDULE 1

ROSE BLANCHE BROOK

PROJECT COST

AS PER 1998 CAPITAL BUDGET

	Up to Dec. 1996	1997	1998	Total
Energy Supply	$332,000	$1,425,000	$11,141,000	$12,898,000
Transmission		$ 120,000	$ 142,000	$ 262,000
Substation		-	$ 524,000	$ 524,000
Communications		$ 10,000	$ 95,000	$ 105,000
Total	$332,000	$1,555,000	$11,902,000	$13,789,000

SCHEDULE 2

FINANCIAL ANALYSIS ASSUMPTIONS

1. The fuel forecast, shown in Schedule 3, was updated to current projections obtained from the Conference Board of Canada in March 1997. To avoid unrealistic projections of oil prices beyond the year 2016, the fuel series is capped at $30.00 per barrel in 1997 dollars. This cap is reached in the year 2016, and the GDP deflator is used to escalate fuel beyond that point.

2. The escalation factors identified in Table 6.1 are the 20 year forecast of the GDP deflator supplied by the Conference Board of Canada on December 10, 1996. The average escalation over the period 2011-2015 is used to escalate beyond 2015.

3. The incremental return on rate base reflects Board Order No. P.U. 7 (1996-1997) as follows:

	Capital Structure	Return	Weighted Cost
Debt	52.0 %	8.00 %	4.16 %
Preferred	3.0 %	6.33 %	0.19 %
Common	45.0 %	11.00%	4.95 %
TOTAL	100.0%		9.30 %

4. The analysis used an income tax rate of 42%. In addition, a large corporation tax of 0.225% was applied to the amount of capital at year end.

5. Project capital cost (including GEC) were updated to current estimates.

6. Operating and maintenance costs were estimated at $150,000 in 1998 and $75,000 in 1999. In subsequent years, the $75,000 is inflated using Conference Board of Canada GDP deflators.

7. Revenue requirement and energy production were adjusted for an in-service date of October 31 in the year the project is planned to be placed in service.

8. The depreciation of the assets reflects the average life for new assets as determined in the Company's 1995 Depreciation Study.

9. The discount rate used was 9.3%. A sensitivity analysis was conducted using rates of 6% and 14%.

SCHEDULE 3

GDP Deflators and System Avoided Costs

Year	GDP Deflators (1)	Demand $/kw-yr (2)	Fuel cost $/bbl (3)	Holyrood Energy (Cents/kwh) (4)
1998	1.0000	0.0	22.1	4.0
1999	1.0188	0.0	22.5	4.1
2000	1.0430	0.0	23.3	4.3
2001	1.0665	0.0	24.1	4.4
2002	1.0933	92.5	21.6	4.0
2003	1.1203	94.8	22.6	4.2
2004	1.1491	97.2	23.9	4.4
2005	1.1795	99.8	25.1	4.6
2006	1.2102	102.4	26.5	4.8
2007	1.2418	105.1	28.1	5.1
2008	1.2741	107.8	29.9	5.4
2009	1.3064	110.5	31.7	5.7
2010	1.3361	113.0	33.7	6.1
2011	1.3657	115.5	36.0	6.5
2012	1.3956	118.1	38.2	6.8
2013	1.4253	120.6	40.6	7.3
2014	1.4552	123.1	42.7	7.6
2015	1.4855	125.7	44.6	7.9
2016	1.5170	128.4	46.3	8.2
2017	1.5492	131.1	47.3	8.4
2018	1.5821	133.9	48.4	8.6
2019	1.6157	136.8	49.4	8.8
2020	1.6500	139.7	50.5	9.0
2021	1.6850	142.7	51.5	9.2
2022	1.7208	145.8	52.6	9.4
2023	1.7573	148.9	53.8	9.6
2024	1.7946	152.1	54.9	9.8
2025	1.8327	155.3	56.1	10.0
2026	1.8717	158.7	57.3	10.2
2027	1.9114	162.1	58.5	10.4
2028	1.9520	165.5	59.8	10.6
2029	1.9934	169.1	61.1	10.9
2030	2.0357	172.7	62.4	11.1
2031	2.0790	176.4	63.7	11.3
2032	2.1231	180.2	65.1	11.6
2033	2.1682	184.0	66.5	11.8
2034	2.2142	188.0	67.9	12.1
2035	2.2612	192.0	69.3	12.3
2036	2.3092	196.1	70.8	12.6
2037	2.3582	200.3	72.3	12.9
2038	2.4083	204.6	73.9	13.1
2039	2.4594	209.0	75.5	13.4
2040	2.5117	213.5	77.1	13.7
2041	2.5650	218.1	78.7	14.0
2042	2.6194	222.7	80.4	14.3
2043	2.6750	227.5	82.2	14.6
2044	2.7318	232.4	83.9	14.9
2045	2.7898	237.4	85.7	15.2
2046	2.8491	242.4	87.5	15.6
2047	2.9096	247.6	89.4	15.9
2048	2.9713	252.9	91.3	16.2
2049	3.0344	258.4	93.3	16.6
2050	3.0988	263.9	95.3	16.9
2051	3.1646	269.6	97.3	17.3

1) GDP Deflators from Conference Board of Canada were rebased so that 1998 = 1.000. The average escalation over the period 2011-2015 used to escalate beyond 2015.
2) Based on a projection of the marginal generation cost presented in the report "A Study of Innovative Approaches to Rate Design Based on Marginal Cost and Time of Use Design Principals" This report was presented to the Public Utilities Board on June 30, 1997.
3) From Conference Board of Canada March 1997. Fuel capped at $30.00 per barrel in 1997 dollars.
4) Based on the projections of fuel and variable Holyrood O & M costs.

APPENDIX A

Details of Results of Financial Analysis

Revised December 1997 Estimates - System Capacity Additions in 2002

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Energy Comparison (Base Case)

Capacity: 6.1 MW
Production: 23 GWh

Year	Rose Blanche Brook		Equivalent Holyrood Energy		Equivalent System Avoided Cost	
	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement	Annual Energy Cost	Cumulative Present Worth Annual Energy Cost	Annual System Avoided Cost*	Cumulative Present Worth Annual System Avoided Cost
1998	($6,675)	($6,107)	$154,704	$141,541	$154,704	$141,541
1999	1,946,450	1,623,203	945,089	932,644	945,089	932,644
2000	1,779,436	2,985,974	977,631	1,681,357	977,631	1,681,357
2001	1,656,639	4,146,751	1,010,112	2,389,124	1,010,112	2,389,124
2002	1,565,121	5,150,093	917,428	2,977,254	1,481,592	3,338,919
2003	1,495,394	6,027,169	957,822	3,539,034	1,535,917	4,239,763
2004	1,441,086	6,800,475	1,009,782	4,080,896	1,602,752	5,099,821
2005	1,397,634	7,486,650	1,058,081	4,600,367	1,666,753	5,918,123
2006	1,361,757	8,098,327	1,114,010	5,100,760	1,738,542	6,699,044
2007	1,331,264	8,645,427	1,177,617	5,584,716	1,818,441	7,446,355
2008	1,304,576	9,135,941	1,248,887	6,054,292	1,906,357	8,163,137
2009	1,280,550	9,576,455	1,320,164	6,508,433	1,994,320	8,849,190
2010	1,258,392	9,972,513	1,398,810	6,948,686	2,088,274	9,506,440
2011	1,226,963	10,325,822	1,488,860	7,377,409	2,193,632	10,138,105
2012	1,207,798	10,644,020	1,575,129	7,792,382	2,295,328	10,742,817
2013	1,189,303	10,930,687	1,668,981	8,194,668	2,404,488	11,322,388
2014	1,171,326	11,188,997	1,751,448	8,580,911	2,502,381	11,874,233
2015	1,153,744	11,421,781	1,826,345	8,949,403	2,592,902	12,397,388
2016	1,136,528	11,631,581	1,895,661	9,299,336	2,678,642	12,891,857
2017	1,119,567	11,820,665	1,936,276	9,626,354	2,736,032	13,353,946
2018	1,102,813	11,991,072	1,977,761	9,931,958	2,794,651	13,785,776
2019	1,086,233	12,144,635	2,020,135	10,217,550	2,854,527	14,189,328
2020	1,069,803	12,283,008	2,063,416	10,484,440	2,915,685	14,566,453
2021	1,053,505	12,407,678	2,107,625	10,733,852	2,978,154	14,918,883
2022	1,037,325	12,519,988	2,152,781	10,966,933	3,041,961	15,248,235
2023	1,021,256	12,621,151	2,198,904	11,184,750	3,107,136	15,556,019
2024	1,005,289	12,712,259	2,246,016	11,388,304	3,173,706	15,843,648
2025	989,420	12,794,300	2,294,137	11,578,528	3,241,703	16,112,443
2026	973,645	12,868,163	2,343,289	11,756,296	3,311,157	16,363,635
2027	957,962	12,934,653	2,393,494	11,922,423	3,382,098	16,598,378
2028	942,368	12,994,495	2,444,775	12,077,671	3,454,560	16,817,750
2029	926,861	13,048,344	2,497,155	12,222,752	3,528,574	17,022,756
2030	911,441	13,096,792	2,550,656	12,358,334	3,604,174	17,214,337
2031	896,108	13,140,373	2,605,304	12,485,037	3,681,394	17,393,373
2032	880,860	13,179,566	2,661,123	12,603,442	3,760,268	17,560,685
2033	856,254	13,214,423	2,718,138	12,714,095	3,840,832	17,717,041
2034	841,941	13,245,781	2,776,374	12,817,501	3,923,122	17,863,158
2035	827,715	13,273,987	2,835,858	12,914,136	4,007,175	17,999,707
2036	813,575	13,299,351	2,896,616	13,004,442	4,093,029	18,127,313
2037	799,521	13,322,157	2,958,677	13,088,835	4,180,723	18,246,564
2038	769,786	13,342,246	3,022,066	13,167,702	4,270,295	18,358,006
2039	757,185	13,360,325	3,086,814	13,241,404	4,361,786	18,462,150
2040	728,844	13,376,246	3,152,950	13,310,280	4,455,238	18,559,474
2041	717,704	13,390,590	3,220,502	13,374,646	4,550,692	18,650,425
2042	706,656	13,403,512	3,289,501	13,434,797	4,648,190	18,735,420
2043	695,699	13,415,151	3,359,979	13,491,008	4,747,778	18,814,850
2044	684,836	13,425,633	3,431,967	13,543,539	4,849,500	18,889,078
2045	674,067	13,435,073	3,505,497	13,592,630	4,953,401	18,958,445
2046	663,394	13,443,572	3,580,602	13,638,506	5,059,527	19,023,270
2047	3,402,873	13,483,462	3,657,317	13,681,378	5,167,928	19,083,850

Note: Present Worths in beginning of year dollars.
Holyrood Energy and System Avoided Cost based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.
*Series reflects economic carrying charges associated with generation additions. Therefore, caution should be used when comparing this series to any revenue requirement series.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Base Case - Holyrood Energy, Losses & Diesel Replacement

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement				Cumulative Present Worth Annual Energy Cost
	Equivalent Holyrood Energy	Energy Losses	Diesel Plant Replacement (1.66 MW)	Total	
1998	$154,704	$7,457	$88,983	$251,145	$229,776
1999	945,089	45,556	211,136	1,201,781	1,235,747
2000	977,631	47,125	203,874	1,228,630	2,176,687
2001	1,010,112	48,691	196,717	1,255,519	3,056,407
2002	917,428	44,223	189,659	1,151,310	3,794,469
2003	957,822	46,170	182,696	1,186,688	4,490,483
2004	1,009,782	48,675	175,826	1,234,282	5,152,816
2005	1,058,081	51,003	169,043	1,278,127	5,780,319
2006	1,114,010	53,699	162,346	1,330,055	6,377,755
2007	1,177,617	56,765	155,729	1,390,111	6,949,039
2008	1,248,887	60,200	149,191	1,458,278	7,497,345
2009	1,320,164	63,636	142,727	1,526,527	8,022,476
2010	1,398,810	67,427	136,335	1,602,572	8,526,859
2011	1,488,860	71,768	130,013	1,690,640	9,013,686
2012	1,575,129	75,926	123,756	1,774,811	9,481,265
2013	1,668,981	80,450	117,563	1,866,994	9,931,280
2014	1,751,448	84,425	111,431	1,947,304	10,360,715
2015	1,826,345	88,036	105,358	2,019,739	10,768,226
2016	1,895,661	91,377	99,341	2,086,379	11,153,366
2017	1,936,276	93,335	93,378	2,122,989	11,511,918
2018	1,977,761	95,334	344,617	2,417,713	11,885,503
2019	2,020,135	97,377	334,040	2,451,551	12,232,085
2020	2,063,416	99,463	322,551	2,485,430	12,553,560
2021	2,107,625	101,594	311,227	2,520,446	12,851,825
2022	2,152,781	103,771	300,060	2,556,612	13,128,628
2023	2,198,904	105,994	289,045	2,593,944	13,385,577
2024	2,246,016	108,265	278,175	2,632,456	13,624,154
2025	2,294,137	110,585	267,445	2,672,167	13,845,723
2026	2,343,289	112,954	256,848	2,713,091	14,051,545
2027	2,393,494	115,374	246,380	2,755,248	14,242,780
2028	2,444,775	117,846	236,036	2,798,657	14,420,500
2029	2,497,155	120,371	225,809	2,843,335	14,585,695
2030	2,550,656	122,950	215,697	2,889,303	14,739,277
2031	2,605,304	125,584	205,694	2,936,582	14,882,091
2032	2,661,123	128,274	195,795	2,985,193	15,014,916
2033	2,718,138	131,023	185,997	3,035,158	15,138,474
2034	2,776,374	133,830	176,296	3,086,500	15,253,431
2035	2,835,858	136,697	166,688	3,139,243	15,360,404
2036	2,896,616	139,626	157,168	3,193,411	15,459,963
2037	2,958,677	142,618	147,734	3,249,028	15,552,638
2038	3,022,066	145,673	524,583	3,692,322	15,648,997
2039	3,086,814	148,794	508,481	3,744,089	15,738,392
2040	3,152,950	151,982	490,993	3,795,925	15,821,314
2041	3,220,502	155,238	473,755	3,849,495	15,898,251
2042	3,289,501	158,564	456,757	3,904,823	15,969,653
2043	3,359,979	161,962	439,990	3,961,930	16,035,935
2044	3,431,967	165,432	423,443	4,020,842	16,097,480
2045	3,505,497	168,976	407,109	4,081,582	16,154,638
2046	3,580,602	172,596	390,979	4,144,178	16,207,735
2047	3,657,317	176,294	375,044	4,208,656	16,257,070

Note: Present Worths in beginning of year dollars.
Holyrood Energy based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.

Revised December 1997 Estimates - System Capacity Additions in 2002

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Energy Comparison (NLH Fuel Forecast)

Capacity: 6.1 MW
Production: 23 GWh

Year	Rose Blanche Brook		Equivalent Holyrood Energy		Equivalent System Avoided Cost	
	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement	Annual Energy Cost	Cumulative Present Worth Annual Energy Cost	Annual System Avoided Cost*	Cumulative Present Worth Annual System Avoided Cost
1998	($6,675)	($6,107)	$150,269	$137,483	$150,269	$137,483
1999	1,946,450	1,623,203	925,562	912,241	925,562	912,241
2000	1,779,436	2,985,974	950,593	1,640,247	950,593	1,640,247
2001	1,656,639	4,146,751	976,191	2,324,246	976,191	2,324,246
2002	1,565,121	5,150,093	1,002,722	2,967,055	1,566,887	3,328,720
2003	1,495,394	6,027,169	1,029,936	3,571,131	1,608,032	4,271,860
2004	1,441,086	6,800,475	1,057,992	4,138,864	1,650,963	5,157,789
2005	1,397,634	7,486,650	1,086,888	4,672,477	1,695,560	5,990,233
2006	1,361,757	8,098,327	1,116,529	5,174,002	1,741,061	6,772,286
2007	1,331,264	8,645,427	1,146,982	5,645,369	1,787,806	7,507,007
2008	1,304,576	9,135,941	1,171,613	6,085,890	1,829,083	8,194,734
2009	1,280,550	9,576,455	1,196,708	6,497,561	1,870,864	8,838,318
2010	1,258,392	9,972,513	1,222,035	6,882,177	1,911,499	9,439,931
2011	1,226,963	10,325,822	1,247,839	7,241,497	1,952,612	10,002,194
2012	1,207,798	10,644,020	1,274,151	7,577,176	1,994,350	10,527,611
2013	1,189,303	10,930,687	1,300,939	7,890,751	2,036,447	11,018,471
2014	1,171,326	11,188,997	1,328,256	8,183,669	2,079,189	11,476,990
2015	1,153,744	11,421,781	1,356,124	8,457,286	2,122,681	11,905,271
2016	1,136,528	11,631,581	1,384,658	8,712,890	2,167,639	12,305,411
2017	1,119,567	11,820,665	1,413,793	8,951,666	2,213,549	12,679,258
2018	1,102,813	11,991,072	1,443,541	9,174,722	2,260,431	13,028,540
2019	1,086,233	12,144,635	1,473,914	9,383,093	2,308,307	13,354,871
2020	1,069,803	12,283,008	1,504,927	9,577,746	2,357,196	13,659,760
2021	1,053,505	12,407,678	1,536,592	9,759,584	2,407,122	13,944,615
2022	1,037,325	12,519,988	1,568,924	9,929,450	2,458,104	14,210,752
2023	1,021,256	12,621,151	1,601,936	10,088,133	2,510,167	14,459,402
2024	1,005,289	12,712,259	1,635,642	10,236,370	2,563,332	14,691,714
2025	989,420	12,794,300	1,670,058	10,374,847	2,617,624	14,908,761
2026	973,645	12,868,163	1,705,198	10,504,207	2,673,066	15,111,546
2027	957,962	12,934,653	1,741,077	10,625,051	2,729,682	15,301,007
2028	942,368	12,994,495	1,777,712	10,737,940	2,787,497	15,478,019
2029	926,861	13,048,344	1,815,117	10,843,396	2,846,537	15,643,399
2030	911,441	13,096,792	1,853,309	10,941,909	2,906,827	15,797,913
2031	896,108	13,140,373	1,892,305	11,033,937	2,968,395	15,942,274
2032	880,860	13,179,566	1,932,122	11,119,906	3,031,267	16,077,149
2033	856,254	13,214,423	1,972,776	11,200,216	3,095,470	16,203,162
2034	841,941	13,245,781	2,014,286	11,275,238	3,161,034	16,320,895
2035	827,715	13,273,987	2,056,669	11,345,321	3,227,986	16,430,892
2036	813,575	13,299,351	2,099,944	11,410,790	3,296,357	16,533,661
2037	799,521	13,322,157	2,144,129	11,471,949	3,366,175	16,629,678
2038	769,786	13,342,246	2,189,245	11,529,082	3,437,473	16,719,385
2039	757,185	13,360,325	2,235,309	11,582,453	3,510,281	16,803,198
2040	728,844	13,376,246	2,282,343	11,632,311	3,584,632	16,881,504
2041	717,704	13,390,590	2,330,367	11,678,886	3,660,557	16,954,665
2042	706,656	13,403,512	2,379,401	11,722,395	3,738,090	17,023,018
2043	695,699	13,415,151	2,429,467	11,763,039	3,817,266	17,086,881
2044	684,836	13,425,633	2,480,587	11,801,008	3,898,120	17,146,546
2045	674,067	13,435,073	2,532,782	11,836,477	3,980,685	17,202,292
2046	663,394	13,443,572	2,586,075	11,869,611	4,065,000	17,254,374
2047	3,402,873	13,483,462	2,640,490	11,900,563	4,151,101	17,303,035

Note: Present Worths in beginning of year dollars.
Holyrood Energy and System Avoided Cost based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.
*Series reflects economic carrying charges associated with generation additions. Therefore, caution should be used when comparing this series to any revenue requirement series.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

NLH Fuel Forecast - Holyrood Energy, Losses & Diesel Replacement

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement				Cumulative Present Worth Annual Energy Cost
	Equivalent Holyrood Energy	Energy Losses	Diesel Plant Replacement (1.66 MW)	Total	
1998	$150,269	$7,243	$88,983	$246,495	$225,522
1999	925,562	44,615	211,136	1,181,313	1,214,361
2000	950,593	45,822	203,874	1,200,289	2,133,595
2001	976,191	47,055	196,717	1,219,963	2,988,401
2002	1,002,722	48,334	189,659	1,240,715	3,783,779
2003	1,029,936	49,646	182,696	1,262,279	4,524,128
2004	1,057,992	50,999	175,826	1,284,816	5,213,578
2005	1,086,888	52,391	169,043	1,308,323	5,855,906
2006	1,116,529	53,820	162,346	1,332,695	6,454,528
2007	1,146,982	55,288	155,729	1,357,999	7,012,615
2008	1,171,613	56,475	149,191	1,377,279	7,530,465
2009	1,196,708	57,685	142,727	1,397,120	8,011,080
2010	1,222,035	58,906	136,335	1,417,276	8,457,144
2011	1,247,839	60,150	130,013	1,438,002	8,871,222
2012	1,274,151	61,418	123,756	1,459,325	9,255,686
2013	1,300,939	62,709	117,563	1,481,212	9,612,713
2014	1,328,256	64,026	111,431	1,503,713	9,944,324
2015	1,356,124	65,369	105,358	1,526,852	10,252,388
2016	1,384,658	66,745	99,341	1,550,744	10,538,651
2017	1,413,793	68,149	93,378	1,575,320	10,804,707
2018	1,443,541	69,583	344,617	1,857,741	11,091,766
2019	1,473,914	71,047	334,040	1,879,001	11,357,405
2020	1,504,927	72,542	322,551	1,900,020	11,603,161
2021	1,536,592	74,069	311,227	1,921,888	11,830,594
2022	1,568,924	75,627	300,060	1,944,611	12,041,136
2023	1,601,936	77,218	289,045	1,968,199	12,236,100
2024	1,635,642	78,843	278,175	1,992,661	12,416,693
2025	1,670,058	80,502	267,445	2,018,005	12,584,021
2026	1,705,198	82,196	256,848	2,044,242	12,739,102
2027	1,741,077	83,925	246,380	2,071,383	12,882,872
2028	1,777,712	85,691	236,036	2,099,439	13,016,190
2029	1,815,117	87,494	225,809	2,128,421	13,139,849
2030	1,853,309	89,335	215,697	2,158,342	13,254,577
2031	1,892,305	91,215	205,694	2,189,214	13,361,044
2032	1,932,122	93,134	195,795	2,221,051	13,459,869
2033	1,972,776	95,094	185,997	2,253,867	13,551,621
2034	2,014,286	97,095	176,296	2,287,677	13,636,826
2035	2,056,669	99,138	166,688	2,322,494	13,715,967
2036	2,099,944	101,224	157,168	2,358,336	13,789,492
2037	2,144,129	103,354	147,734	2,395,217	13,857,813
2038	2,189,245	105,528	524,583	2,819,356	13,931,390
2039	2,235,309	107,749	508,481	2,851,539	13,999,474
2040	2,282,343	110,016	490,993	2,883,352	14,062,461
2041	2,330,367	112,331	473,755	2,916,453	14,120,750
2042	2,379,401	114,695	456,757	2,950,853	14,174,708
2043	2,429,467	117,108	439,990	2,986,565	14,224,673
2044	2,480,587	119,572	423,443	3,023,602	14,270,953
2045	2,532,782	122,088	407,109	3,061,979	14,313,833
2046	2,586,075	124,657	390,979	3,101,711	14,353,573
2047	2,640,490	127,280	375,044	3,142,814	14,390,414

Note: Present Worths in beginning of year dollars.
Holyrood Energy based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Project Delayed to 1999

Capacity: 6.1 MW
Production: 23 GWh

Year	Rose Blanche Brook					
	Annual Revenue Requirement	System Energy Replacement	Cost of Additional Energy Losses	Carrying Charges For Previous Expenditures	Total Annual Cost	Cumulative Present Worth Annual Revenue Requirement
1998	$0	$154,704	$7,457	$29,248	$191,409	$175,123
1999	($9,626)	$787,574	$37,964	$146,241	$962,152	$980,509
2000	$1,981,701				$1,981,701	$2,498,184
2001	$1,811,507				$1,811,507	$3,767,475
2002	$1,686,365				$1,686,365	$4,848,542
2003	$1,593,086				$1,593,086	$5,782,916
2004	$1,522,008				$1,522,008	$6,599,646
2005	$1,466,637				$1,466,637	$7,319,699
2006	$1,422,324				$1,422,324	$7,958,582
2007	$1,385,730				$1,385,730	$8,528,065
2008	$1,354,618				$1,354,618	$9,037,395
2009	$1,327,382				$1,327,382	$9,494,019
2010	$1,302,860				$1,302,860	$9,904,072
2011	$1,280,243				$1,280,243	$10,272,724
2012	$1,248,181				$1,248,181	$10,601,561
2013	$1,228,613				$1,228,613	$10,897,702
2014	$1,209,729				$1,209,729	$11,164,482
2015	$1,191,372				$1,191,372	$11,404,858
2016	$1,173,417				$1,173,417	$11,621,467
2017	$1,155,833				$1,155,833	$11,816,676
2018	$1,138,507				$1,138,507	$11,992,598
2019	$1,121,392				$1,121,392	$12,151,132
2020	$1,104,454				$1,104,454	$12,293,986
2021	$1,087,666				$1,087,666	$12,422,699
2022	$1,071,012				$1,071,012	$12,538,657
2023	$1,054,479				$1,054,479	$12,643,111
2024	$1,038,056				$1,038,056	$12,737,188
2025	$1,021,737				$1,021,737	$12,821,908
2026	$1,005,516				$1,005,516	$12,898,189
2027	$989,390				$989,390	$12,966,860
2028	$973,356				$973,356	$13,028,671
2029	$957,412				$957,412	$13,084,295
2030	$941,556				$941,556	$13,134,344
2031	$925,787				$925,787	$13,179,367
2032	$910,104				$910,104	$13,219,862
2033	$894,508				$894,508	$13,256,277
2034	$869,376				$869,376	$13,288,656
2035	$854,730				$854,730	$13,317,782
2036	$840,171				$840,171	$13,343,976
2037	$825,698				$825,698	$13,367,528
2038	$811,311				$811,311	$13,388,701
2039	$780,946				$780,946	$13,407,347
2040	$768,037				$768,037	$13,424,125
2041	$739,090				$739,090	$13,438,896
2042	$727,667				$727,667	$13,452,202
2043	$716,334				$716,334	$13,464,186
2044	$705,094				$705,094	$13,474,979
2045	$693,947				$693,947	$13,484,697
2046	$682,895				$682,895	$13,493,446
2047	$671,939				$671,939	$13,501,323
2048	$3,462,936				$3,462,936	$13,538,463

Note: Present Worths in beginning of year dollars.
System Energy Replacement based on cost of producing equivalent energy at Holyrood.
Equivalent Holyrood Energy includes fuel and variable O&M.
Replacement energy, additional losses and carrying charges were all based on two months for 1998 and 10 months for 1999.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Project Delayed to 2002

Capacity: 6.1 MW
Production: 23 GWh

Year	Rose Blanche Brook					
	Annual Revenue Requirement	System Energy Replacement	Cost of Additional Energy Losses	Carrying Charges For Previous Expenditures	Total Annual Cost	Cumulative Present Worth Annual Revenue Requirement
1998	$0	$154,704	$7,457	$29,248	$191,409	$175,123
1999	$0	$945,089	$45,556	$175,489	$1,166,134	$1,151,256
2000	$0	$977,631	$47,125	$175,489	$1,200,245	$2,070,457
2001	$0	$1,010,112	$48,691	$175,489	$1,234,292	$2,935,303
2002	($21,288)	$764,523	$36,852	$146,241	$926,329	$3,529,139
2003	$2,120,993				$2,120,993	$4,773,140
2004	$1,938,236				$1,938,236	$5,813,223
2005	$1,803,825				$1,803,825	$6,698,821
2006	$1,703,588				$1,703,588	$7,464,041
2007	$1,627,172				$1,627,172	$8,132,748
2008	$1,567,601				$1,567,601	$8,722,159
2009	$1,519,887				$1,519,887	$9,245,006
2010	$1,480,454				$1,480,454	$9,710,954
2011	$1,446,900				$1,446,900	$10,127,595
2012	$1,417,501				$1,417,501	$10,501,040
2013	$1,391,013				$1,391,013	$10,836,326
2014	$1,366,585				$1,366,585	$11,137,696
2015	$1,332,021				$1,332,021	$11,406,451
2016	$1,310,863				$1,310,863	$11,648,432
2017	$1,290,440				$1,290,440	$11,866,374
2018	$1,270,580				$1,270,580	$12,062,705
2019	$1,251,151				$1,251,151	$12,239,583
2020	$1,232,113				$1,232,113	$12,398,949
2021	$1,213,348				$1,213,348	$12,542,535
2022	$1,194,806				$1,194,806	$12,671,896
2023	$1,176,450				$1,176,450	$12,788,432
2024	$1,158,251				$1,158,251	$12,893,403
2025	$1,140,192				$1,140,192	$12,987,945
2026	$1,122,258				$1,122,258	$13,073,082
2027	$1,104,439				$1,104,439	$13,149,738
2028	$1,086,727				$1,086,727	$13,218,748
2029	$1,069,117				$1,069,117	$13,280,862
2030	$1,051,604				$1,051,604	$13,336,761
2031	$1,034,185				$1,034,185	$13,387,056
2032	$1,016,857				$1,016,857	$13,432,300
2033	$999,620				$999,620	$13,472,994
2034	$982,472				$982,472	$13,509,586
2035	$965,411				$965,411	$13,542,483
2036	$948,438				$948,438	$13,572,052
2037	$921,227				$921,227	$13,598,330
2038	$905,264				$905,264	$13,621,954
2039	$889,388				$889,388	$13,643,190
2040	$873,600				$873,600	$13,662,273
2041	$857,899				$857,899	$13,679,419
2042	$825,046				$825,046	$13,694,506
2043	$810,919				$810,919	$13,708,072
2044	$779,576				$779,576	$13,720,005
2045	$767,032				$767,032	$13,730,746
2046	$754,579				$754,579	$13,740,414
2047	$742,218				$742,218	$13,749,115
2048	$729,952				$729,952	$13,756,944
2049	$717,780				$717,780	$13,763,987
2050	$705,706				$705,706	$13,770,322
2051	$3,700,270				$3,700,270	$13,800,715

Note: Present Worths in beginning of year dollars.
System Energy Replacement based on cost of producing equivalent energy at Holyrood.
Equivalent Holyrood Energy includes fuel and variable O&M.
Replacement energy, additional losses and carrying charges were all based on two months for 1998, full year for 2000 and 2001, and 10 months for 1999.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Construction Cost Increased by 10%

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement
1998	($22,343)	($20,442)
1999	2,133,595	1,765,521
2000	1,949,701	3,258,690
2001	1,814,452	4,530,043
2002	1,713,585	5,628,561
2003	1,636,687	6,588,507
2004	1,576,735	7,434,605
2005	1,528,714	8,185,135
2006	1,489,024	8,853,977
2007	1,455,248	9,452,030
2008	1,425,654	9,988,069
2009	1,398,988	10,469,326
2010	1,374,396	10,901,895
2011	1,339,606	11,287,640
2012	1,318,304	11,634,951
2013	1,297,742	11,947,755
2014	1,277,747	12,229,534
2015	1,258,184	12,483,391
2016	1,239,014	12,712,109
2017	1,220,119	12,918,175
2018	1,201,448	13,103,823
2019	1,182,963	13,271,061
2020	1,164,637	13,421,700
2021	1,146,451	13,557,369
2022	1,128,390	13,679,539
2023	1,110,445	13,789,537
2024	1,092,607	13,888,559
2025	1,074,871	13,977,684
2026	1,057,232	14,057,888
2027	1,039,688	14,130,051
2028	1,022,235	14,194,965
2029	1,004,873	14,253,347
2030	987,600	14,305,843
2031	970,415	14,353,037
2032	953,317	14,395,454
2033	925,918	14,433,147
2034	909,836	14,467,034
2035	893,841	14,497,493
2036	877,933	14,524,864
2037	862,114	14,549,455
2038	829,036	14,571,090
2039	814,799	14,590,545
2040	783,239	14,607,654
2041	770,593	14,623,056
2042	758,039	14,636,917
2043	745,577	14,649,390
2044	733,209	14,660,613
2045	720,936	14,670,709
2046	708,761	14,679,790
2047	3,721,742	14,723,417

Note: Present Worths in beginning of year dollars.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Construction Cost Decreased by 10%

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement
1998	$8,992	$8,227
1999	1,759,305	1,480,884
2000	1,609,170	2,713,259
2001	1,498,826	3,763,459
2002	1,416,657	4,671,626
2003	1,354,101	5,465,831
2004	1,305,436	6,166,345
2005	1,266,553	6,788,166
2006	1,234,491	7,342,677
2007	1,207,279	7,838,823
2008	1,183,497	8,283,813
2009	1,162,112	8,683,583
2010	1,142,388	9,043,131
2011	1,114,321	9,364,005
2012	1,097,292	9,653,090
2013	1,080,865	9,913,618
2014	1,064,906	10,148,460
2015	1,049,305	10,360,172
2016	1,034,043	10,551,053
2017	1,019,015	10,723,155
2018	1,004,178	10,878,321
2019	989,504	11,018,209
2020	974,969	11,144,315
2021	960,558	11,257,986
2022	946,260	11,360,437
2023	932,067	11,452,765
2024	917,971	11,535,960
2025	903,970	11,610,915
2026	890,059	11,678,437
2027	876,236	11,739,254
2028	862,500	11,794,025
2029	848,849	11,843,342
2030	835,283	11,887,742
2031	821,801	11,927,708
2032	808,403	11,963,678
2033	786,589	11,995,699
2034	774,047	12,024,528
2035	761,589	12,050,480
2036	749,216	12,073,838
2037	736,929	12,094,859
2038	710,536	12,113,401
2039	699,571	12,130,105
2040	674,449	12,144,838
2041	664,816	12,158,125
2042	655,273	12,170,107
2043	645,821	12,180,912
2044	636,462	12,190,653
2045	627,197	12,199,437
2046	618,028	12,207,355
2047	3,084,004	12,243,507

Note: Present Worths in beginning of year dollars.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Sunk Costs Removed

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement
1998	($4,713)	($4,312)
1999	1,687,091	1,407,896
2000	1,539,390	2,586,830
2001	1,431,280	3,589,702
2002	1,351,286	4,455,962
2003	1,290,826	5,213,055
2004	1,244,171	5,880,695
2005	1,207,208	6,473,380
2006	1,176,974	7,002,055
2007	1,151,501	7,475,279
2008	1,129,373	7,899,918
2009	1,109,561	8,281,611
2010	1,091,328	8,625,089
2011	1,064,747	8,931,687
2012	1,049,070	9,208,068
2013	1,033,932	9,457,284
2014	1,019,204	9,682,047
2015	1,004,781	9,884,776
2016	990,647	10,067,646
2017	976,702	10,232,602
2018	962,907	10,381,390
2019	949,235	10,515,586
2020	935,667	10,636,609
2021	922,190	10,745,739
2022	908,795	10,844,134
2023	895,477	10,932,837
2024	882,231	11,012,793
2025	869,056	11,084,853
2026	855,950	11,149,787
2027	842,912	11,208,292
2028	829,942	11,260,995
2029	817,040	11,308,464
2030	804,207	11,351,212
2031	791,444	11,389,702
2032	778,752	11,424,352
2033	761,072	11,455,335
2034	748,934	11,483,229
2035	736,870	11,508,338
2036	724,882	11,530,938
2037	712,970	11,551,274
2038	685,550	11,569,165
2039	675,059	11,585,283
2040	649,003	11,599,461
2041	639,943	11,612,251
2042	630,968	11,623,788
2043	622,079	11,634,196
2044	613,278	11,643,583
2045	604,567	11,652,049
2046	595,946	11,659,684
2047	2,896,660	11,693,640

Note: Present Worths in beginning of year dollars.

Revised December 1997 Estimates - System Capacity Additions in 2002

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Energy Comparison (Discount Rate of 14%)

Capacity: 6.1 MW
Production: 23 GWh

	Rose Blanche Brook		Equivalent Holyrood Energy		Equivalent System Avoided Cost	
Year	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement	Annual Energy Cost	Cumulative Present Worth Annual Energy Cost	Annual System Avoided Cost*	Cumulative Present Worth Annual System Avoided Cost
1998	($6,675)	($5,855)	$154,704	$135,705	$154,704	$135,705
1999	1,946,450	1,491,875	945,089	862,920	945,089	862,920
2000	1,779,436	2,692,943	977,631	1,522,793	977,631	1,522,793
2001	1,656,639	3,673,806	1,010,112	2,120,861	1,010,112	2,120,861
2002	1,565,121	4,486,681	917,428	2,597,344	1,481,592	2,890,353
2003	1,495,394	5,167,962	957,822	3,033,715	1,535,917	3,590,096
2004	1,441,086	5,743,874	1,009,782	3,437,261	1,602,752	4,230,616
2005	1,397,634	6,233,827	1,058,081	3,808,181	1,666,753	4,814,912
2006	1,361,757	6,652,578	1,114,010	4,150,748	1,738,542	5,349,527
2007	1,331,264	7,011,678	1,177,617	4,468,403	1,818,441	5,840,040
2008	1,304,576	7,320,364	1,248,887	4,763,911	1,906,357	6,291,118
2009	1,280,550	7,586,153	1,320,164	5,037,923	1,994,320	6,705,057
2010	1,258,392	7,815,268	1,398,810	5,292,604	2,088,274	7,085,268
2011	1,226,963	8,011,226	1,488,860	5,530,389	2,193,632	7,435,613
2012	1,207,798	8,180,435	1,575,129	5,751,059	2,295,328	7,757,180
2013	1,189,303	8,326,590	1,668,981	5,956,163	2,404,488	8,052,671
2014	1,171,326	8,452,859	1,751,448	6,144,969	2,502,381	8,322,427
2015	1,153,744	8,561,958	1,826,345	6,317,670	2,592,902	8,567,615
2016	1,136,528	8,656,231	1,895,661	6,474,912	2,678,642	8,789,804
2017	1,119,567	8,737,693	1,936,276	6,615,799	2,736,032	8,988,882
2018	1,102,813	8,808,081	1,977,761	6,742,032	2,794,651	9,167,254
2019	1,086,233	8,868,897	2,020,135	6,855,134	2,854,527	9,327,073
2020	1,069,803	8,921,437	2,063,416	6,956,473	2,915,685	9,470,268
2021	1,053,505	8,966,823	2,107,625	7,047,271	2,978,154	9,598,569
2022	1,037,325	9,006,024	2,152,781	7,128,625	3,041,961	9,713,526
2023	1,021,256	9,039,878	2,198,904	7,201,517	3,107,136	9,816,525
2024	1,005,289	9,069,110	2,246,016	7,266,828	3,173,706	9,908,811
2025	989,420	9,094,347	2,294,137	7,325,345	3,241,703	9,991,498
2026	973,645	9,116,132	2,343,289	7,377,775	3,311,157	10,065,584
2027	957,962	9,134,934	2,393,494	7,424,753	3,382,098	10,131,965
2028	942,368	9,151,159	2,444,775	7,466,843	3,454,560	10,191,441
2029	926,861	9,165,156	2,497,155	7,504,556	3,528,574	10,244,731
2030	911,441	9,177,231	2,550,656	7,538,347	3,604,174	10,292,478
2031	896,108	9,187,644	2,605,304	7,568,622	3,681,394	10,335,258
2032	880,860	9,196,623	2,661,123	7,595,749	3,760,268	10,373,589
2033	856,254	9,204,280	2,718,138	7,620,054	3,840,832	10,407,933
2034	841,941	9,210,884	2,776,374	7,641,831	3,923,122	10,438,705
2035	827,715	9,216,579	2,835,858	7,661,343	4,007,175	10,466,276
2036	813,575	9,221,489	2,896,616	7,678,825	4,093,029	10,490,979
2037	799,521	9,225,722	2,958,677	7,694,489	4,180,723	10,513,113
2038	769,786	9,229,297	3,022,066	7,708,524	4,270,295	10,532,945
2039	757,185	9,232,382	3,086,814	7,721,099	4,361,786	10,550,714
2040	728,844	9,234,986	3,152,950	7,732,366	4,455,238	10,566,634
2041	717,704	9,237,236	3,220,502	7,742,461	4,550,692	10,580,899
2042	706,656	9,239,179	3,289,501	7,751,506	4,648,190	10,593,680
2043	695,699	9,240,857	3,359,979	7,759,611	4,747,778	10,605,132
2044	684,836	9,242,306	3,431,967	7,766,872	4,849,500	10,615,392
2045	674,067	9,243,557	3,505,497	7,773,378	4,953,401	10,624,586
2046	663,394	9,244,637	3,580,602	7,779,207	5,059,527	10,632,823
2047	3,402,873	9,249,497	3,657,317	7,784,430	5,167,928	10,640,203

Note: Present Worths in beginning of year dollars.
Holyrood Energy and System Avoided Cost based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.
*Series reflects economic carrying charges associated with generation additions. Therefore, caution should be used when comparing this series to any revenue requirement series.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Discount Rate of 14% - Holyrood Energy, Losses & Diesel Replacement

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement				Cumulative Present Worth Annual Energy Cost
	Equivalent Holyrood Energy	Energy Losses	Diesel Plant Replacement (1.66 MW)	Total	
1998	$154,704	$7,457	$88,983	$251,145	$220,302
1999	945,089	45,556	211,136	1,201,781	1,145,033
2000	977,631	47,125	203,874	1,228,630	1,974,324
2001	1,010,112	48,691	196,717	1,255,519	2,717,692
2002	917,428	44,223	189,659	1,151,310	3,315,646
2003	957,822	46,170	182,696	1,186,688	3,856,285
2004	1,009,782	48,675	175,826	1,234,282	4,349,550
2005	1,058,081	51,003	169,043	1,278,127	4,797,609
2006	1,114,010	53,699	162,346	1,330,055	5,206,612
2007	1,177,617	56,765	155,729	1,390,111	5,581,586
2008	1,248,887	60,200	149,191	1,458,278	5,926,640
2009	1,320,164	63,636	142,727	1,526,527	6,243,484
2010	1,398,810	67,427	136,335	1,602,572	6,535,263
2011	1,488,860	71,768	130,013	1,690,640	6,805,276
2012	1,575,129	75,926	123,756	1,774,811	7,053,920
2013	1,668,981	80,450	117,563	1,866,994	7,283,358
2014	1,751,448	84,425	111,431	1,947,304	7,493,277
2015	1,826,345	88,036	105,358	2,019,739	7,684,266
2016	1,895,661	91,377	99,341	2,086,379	7,857,328
2017	1,936,276	93,335	93,378	2,122,989	8,011,800
2018	1,977,761	95,334	344,617	2,417,713	8,166,113
2019	2,020,135	97,377	334,040	2,451,551	8,303,370
2020	2,063,416	99,463	322,551	2,485,430	8,425,435
2021	2,107,625	101,594	311,227	2,520,446	8,534,017
2022	2,152,781	103,771	300,060	2,556,612	8,630,632
2023	2,198,904	105,994	289,045	2,593,944	8,716,619
2024	2,246,016	108,265	278,175	2,632,456	8,793,167
2025	2,294,137	110,585	267,445	2,672,167	8,861,327
2026	2,343,289	112,954	256,848	2,713,091	8,922,031
2027	2,393,494	115,374	246,380	2,755,248	8,976,109
2028	2,444,775	117,846	236,036	2,798,657	9,024,292
2029	2,497,155	120,371	225,809	2,843,335	9,067,233
2030	2,550,656	122,950	215,697	2,889,303	9,105,510
2031	2,605,304	125,584	205,694	2,936,582	9,139,635
2032	2,661,123	128,274	195,795	2,985,193	9,170,065
2033	2,718,138	131,023	185,997	3,035,158	9,197,205
2034	2,776,374	133,830	176,296	3,086,500	9,221,415
2035	2,835,858	136,697	166,688	3,139,243	9,243,014
2036	2,896,616	139,626	157,168	3,193,411	9,262,288
2037	2,958,677	142,618	147,734	3,249,028	9,279,489
2038	3,022,066	145,673	524,583	3,692,322	9,296,636
2039	3,086,814	148,794	508,481	3,744,089	9,311,889
2040	3,152,950	151,982	490,993	3,795,925	9,325,454
2041	3,220,502	155,238	473,755	3,849,495	9,337,520
2042	3,289,501	158,564	456,757	3,904,823	9,348,257
2043	3,359,979	161,962	439,990	3,961,930	9,357,814
2044	3,431,967	165,432	423,443	4,020,842	9,366,321
2045	3,505,497	168,976	407,109	4,081,582	9,373,896
2046	3,580,602	172,596	390,979	4,144,178	9,380,643
2047	3,657,317	176,294	375,044	4,208,656	9,386,653

Note: Present Worths in beginning of year dollars.
Holyrood Energy based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.

Revised December 1997 Estimates - System Capacity Additions in 2002

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Energy Comparison (Discount Rate of 6%)

Capacity: 6.1 MW
Production: 23 GWh

	Rose Blanche Brook		Equivalent Holyrood Energy		Equivalent System Avoided Cost	
Year	Annual Revenue Requirement	Cumulative Present Worth Annual Revenue Requirement	Annual Energy Cost	Cumulative Present Worth Annual Energy Cost	Annual System Avoided Cost*	Cumulative Present Worth Annual System Avoided Cost
1998	($6,675)	($6,297)	$154,704	$145,947	$154,704	$145,947
1999	1,946,450	1,726,036	945,089	987,073	945,089	987,073
2000	1,779,436	3,220,085	977,631	1,807,910	977,631	1,807,910
2001	1,656,639	4,532,298	1,010,112	2,608,014	1,010,112	2,608,014
2002	1,565,121	5,701,847	917,428	3,293,569	1,481,592	3,715,146
2003	1,495,394	6,756,041	957,822	3,968,796	1,535,917	4,797,907
2004	1,441,086	7,714,445	1,009,782	4,640,358	1,602,752	5,863,828
2005	1,397,634	8,591,338	1,058,081	5,304,211	1,666,753	6,909,570
2006	1,361,757	9,397,360	1,114,010	5,963,592	1,738,542	7,938,611
2007	1,331,264	10,140,730	1,177,617	6,621,167	1,818,441	8,954,018
2008	1,304,576	10,827,965	1,248,887	7,279,066	1,906,357	9,958,264
2009	1,280,550	11,464,359	1,320,164	7,935,147	1,994,320	10,949,380
2010	1,258,392	12,054,342	1,398,810	8,590,963	2,088,274	11,928,444
2011	1,226,963	12,597,029	1,488,860	9,249,487	2,193,632	12,898,690
2012	1,207,798	13,101,001	1,575,129	9,906,734	2,295,328	13,856,450
2013	1,189,303	13,569,166	1,668,981	10,563,722	2,404,488	14,802,968
2014	1,171,326	14,004,155	1,751,448	11,214,147	2,502,381	15,732,263
2015	1,153,744	14,408,362	1,826,345	11,853,996	2,592,902	16,640,670
2016	1,136,528	14,783,999	1,895,661	12,480,536	2,678,642	17,525,996
2017	1,119,567	15,133,085	1,936,276	13,084,276	2,736,032	18,379,104
2018	1,102,813	15,457,484	1,977,761	13,666,045	2,794,651	19,201,165
2019	1,086,233	15,758,919	2,020,135	14,226,643	2,854,527	19,993,311
2020	1,069,803	16,038,991	2,063,416	14,766,840	2,915,685	20,756,630
2021	1,053,505	16,299,184	2,107,625	15,287,378	2,978,154	21,492,170
2022	1,037,325	16,540,879	2,152,781	15,788,973	3,041,961	22,200,943
2023	1,021,256	16,765,362	2,198,904	16,272,314	3,107,136	22,883,922
2024	1,005,289	16,973,826	2,246,016	16,738,066	3,173,706	23,542,047
2025	989,420	17,167,387	2,294,137	17,186,868	3,241,703	24,176,222
2026	973,645	17,347,080	2,343,289	17,619,338	3,311,157	24,787,318
2027	957,962	17,513,870	2,393,494	18,036,070	3,382,098	25,376,176
2028	942,368	17,668,659	2,444,775	18,437,636	3,454,560	25,943,604
2029	926,861	17,812,283	2,497,155	18,824,588	3,528,574	26,490,383
2030	911,441	17,945,523	2,550,656	19,197,459	3,604,174	27,017,263
2031	896,108	18,069,107	2,605,304	19,556,761	3,681,394	27,524,970
2032	880,860	18,183,711	2,661,123	19,902,987	3,760,268	28,014,201
2033	856,254	18,288,808	2,718,138	20,236,613	3,840,832	28,485,627
2034	841,941	18,386,299	2,776,374	20,558,098	3,923,122	28,939,898
2035	827,715	18,476,718	2,835,858	20,867,884	4,007,175	29,377,637
2036	813,575	18,560,561	2,896,616	21,166,396	4,093,029	29,799,447
2037	799,521	18,638,293	2,958,677	21,454,045	4,180,723	30,205,906
2038	769,786	18,708,897	3,022,066	21,731,226	4,270,295	30,597,573
2039	757,185	18,774,414	3,086,814	21,998,320	4,361,786	30,974,987
2040	728,844	18,833,909	3,152,950	22,255,694	4,455,238	31,338,666
2041	717,704	18,889,179	3,220,502	22,503,702	4,550,692	31,689,111
2042	706,656	18,940,518	3,289,501	22,742,685	4,648,190	32,026,802
2043	695,699	18,988,199	3,359,979	22,972,970	4,747,778	32,352,205
2044	684,836	19,032,480	3,431,967	23,194,876	4,849,500	32,665,765
2045	674,067	19,073,597	3,505,497	23,408,705	4,953,401	32,967,915
2046	663,394	19,111,772	3,580,602	23,614,753	5,059,527	33,259,068
2047	3,402,873	19,296,508	3,657,317	23,813,303	5,167,928	33,539,627

Note: Present Worths in beginning of year dollars.
Holyrood Energy and System Avoided Cost based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.
*Series reflects economic carrying charges associated with generation additions. Therefore, caution should be used when comparing this series to any revenue requirement series.

Revised December 1997 Estimates

ROSE BLANCHE BROOK HYDRO DEVELOPMENT

Discount Rate of 6% - Holyrood Energy, Losses & Diesel Replacement

Capacity: 6.1 MW
Production: 23 GWh

Year	Annual Revenue Requirement				Cumulative Present Worth Annual Energy Cost
	Equivalent Holyrood Energy	Energy Losses	Diesel Plant Replacement (1.66 MW)	Total	
1998	$154,704	$7,457	$88,983	$251,145	$236,929
1999	945,089	45,556	211,136	1,201,781	1,306,509
2000	977,631	47,125	203,874	1,228,630	2,338,091
2001	1,010,112	48,691	196,717	1,255,519	3,332,580
2002	917,428	44,223	189,659	1,151,310	4,192,905
2003	957,822	46,170	182,696	1,186,688	5,029,473
2004	1,009,782	48,675	175,826	1,234,282	5,850,342
2005	1,058,081	51,003	169,043	1,278,127	6,652,254
2006	1,114,010	53,699	162,346	1,330,055	7,439,512
2007	1,177,617	56,765	155,729	1,390,111	8,215,742
2008	1,248,887	60,200	149,191	1,458,278	8,983,945
2009	1,320,164	63,636	142,727	1,526,527	9,742,582
2010	1,398,810	67,427	136,335	1,602,572	10,493,931
2011	1,488,860	71,768	130,013	1,690,640	11,241,702
2012	1,575,129	75,926	123,756	1,774,811	11,982,269
2013	1,668,981	80,450	117,563	1,866,994	12,717,204
2014	1,751,448	84,425	111,431	1,947,304	13,440,363
2015	1,826,345	88,036	105,358	2,019,739	14,147,966
2016	1,895,661	91,377	99,341	2,086,379	14,837,542
2017	1,936,276	93,335	93,378	2,122,989	15,499,500
2018	1,977,761	95,334	344,617	2,417,713	16,210,683
2019	2,020,135	97,377	334,040	2,451,551	16,891,001
2020	2,063,416	99,463	322,551	2,485,430	17,541,680
2021	2,107,625	101,594	311,227	2,520,446	18,164,176
2022	2,152,781	103,771	300,060	2,556,612	18,759,863
2023	2,198,904	105,994	289,045	2,593,944	19,330,038
2024	2,246,016	108,265	278,175	2,632,456	19,875,925
2025	2,294,137	110,585	267,445	2,672,167	20,398,681
2026	2,343,289	112,954	256,848	2,713,091	20,899,401
2027	2,393,494	115,374	246,380	2,755,248	21,379,117
2028	2,444,775	117,846	236,036	2,798,657	21,838,810
2029	2,497,155	120,371	225,809	2,843,335	22,279,406
2030	2,550,656	122,950	215,697	2,889,303	22,701,782
2031	2,605,304	125,584	205,694	2,936,582	23,106,771
2032	2,661,123	128,274	195,795	2,985,193	23,495,160
2033	2,718,138	131,023	185,997	3,035,158	23,867,697
2034	2,776,374	133,830	176,296	3,086,500	24,225,093
2035	2,835,858	136,697	166,688	3,139,243	24,568,020
2036	2,896,616	139,626	157,168	3,193,411	24,897,119
2037	2,958,677	142,618	147,734	3,249,028	25,212,997
2038	3,022,066	145,673	524,583	3,692,322	25,551,653
2039	3,086,814	148,794	508,481	3,744,089	25,875,619
2040	3,152,950	151,982	490,993	3,795,925	26,185,479
2041	3,220,502	155,238	473,755	3,849,495	26,481,925
2042	3,289,501	158,564	456,757	3,904,823	26,765,611
2043	3,359,979	161,962	439,990	3,961,930	27,037,153
2044	3,431,967	165,432	423,443	4,020,842	27,297,134
2045	3,505,497	168,976	407,109	4,081,582	27,546,104
2046	3,580,602	172,596	390,979	4,144,178	27,784,583
2047	3,657,317	176,294	375,044	4,208,656	28,013,064

Note: Present Worths in beginning of year dollars.
Holyrood Energy based on displacing two months production in 1998.
Equivalent Holyrood Energy includes fuel and variable O&M.