Q. **[Decommissioning] – Please all workpapers, assumptions, considerations and material reviewed and/or relied upon in developing each production plant decommissioning estimate.**

A. Attachment A contains the report *Hydro Plant Decommissioning Update, July 2010*.

Attachment B contains the report *Thermal Plant Decommissioning Update, August 2010*.

Newfoundland Power objects to the production of all workpapers, assumptions, considerations and material reviewed and/or relied upon in developing estimates as they are not necessary for the purpose of a satisfactory understanding of the matters to be considered in this Application.

Hydro Plant Decommissioning Update
July 2010

Hydro Plant Decommissioning Update

July 2010

NEWFOUNDLAND POWER
A FORTIS COMPANY

Executive Summary

The primary objective of this report is to provide an update to the previous hydro plant decommissioning reports compiled in 2000 and 2005, summarizing the estimated gross salvage, cost of retiring, and net salvage of the hydro-electrical developments currently in-service by Newfoundland Power in Canadian 2010 dollars.

The total estimated decommissioning costs in the 2000 report were determined by contacting contractors familiar with demolition work. In instances, where contractor estimates were not available, unit prices were derived using common estimating practices. To establish the cost estimates for this report the unit prices utilized in the 2010 report were adjusted to account for increased costs related to market prices, environmental regulations, inflation etc.

A summary of the gross salvage, cost of retiring, and the net salvage value of the hydro plants that Newfoundland Power currently has in-service is provided in the table below:

Estimated
Cost of Retiring
Less Salvage for Hydroelectric Plants

Plant	Fixed Capital < $ 000 >	Estimated Net Salvage < $ 000 >	Estimated Cost of Retiring < $ 000 >	Estimated Retirement Less Salvage (Col.2 - Col.3) < $ 000 >
Lookout Brook	8,606.40	8.50	1,212.43	1,220.93
Sandy Brook	4,175.90	16.22	696.31	712.52
Rattling Brook	6,182.90	10.00	1,149.96	1,159.96
Port Union	1,881.90	5.00	378.11	383.11
Lockston	3,214.40	5.00	481.91	486.91
Heart's Content	2,072.50	4.69	496.84	501.52
New Chelsea/Pittman's	6,834.50	5.90	984.05	989.95
Victoria	1,197.50	3.00	396.06	399.06
Seal Cove	7,072.90	3.60	1,381.09	1,384.69
Topsail	5,944.60	4.19	843.81	848.00
Petty Harbour	7,273.10	1.00	991.36	992.36
Pierre's Brook	5,543.50	5.00	1,114.30	1,119.30
Mobile/Morris	9,284.20	35.70	1,754.52	1,790.22
Tors Cove/Rocky Pond	9,785.72	28.76	1,887.89	1,916.65
Cape Broyle/Horse Chops	11,303.80	14.00	2,107.79	2,121.79
Fall Pond	885.20	1.00	584.19	585.19
West Brook	1,915.20	1.00	407.78	408.78
Lawn	2,110.50	2.00	274.25	276.25
Rose Blanche	15,204.80	322.50	1,943.37	2,265.87
Total	**110,489.52**	**477.04**	**14,477.58**	**14,954.62**

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1.0 Introduction

Newfoundland Power owns and operates 23 small hydroelectric plants in 19 developments. The total installed capacity is 94.7 MW and they generate an average of 450 GWH per annum. The turbine-generator units range in size from 350 kW to 12,000 kW. These developments are scattered all over the province with the greatest concentration on the Avalon Peninsula. The oldest development in the system is Petty Harbour, which is vintage 1900 while the newest development is Rose Blanche Plant. The Rose Blanche Development was constructed in 1998 and commissioned in 1999.

Since the late seventies there has been extensive work carried out on the existing hydro plants with replacements of various components due to deterioration. Replacements have included entire turbine-generator sets, dams, penstocks, switchgear and controls, and other components. There has also been various repairs and upgrading carried out including runner replacements, concrete dam repairs and controls upgrading. The intention of Newfoundland Power is to maintain and operate these developments well in to the future, as long as they continue to provide an economical source of energy.

Since the previous 2005 report there have been several upgrades and replacements to various components of the existing hydro developments. Upgrades and replacements that will directly affect the estimated retirement cost include the replacement of woodstave with steel penstocks at the Rattling Brook and Rocky Pond Hydro Plants.

2.0 Decommissioning Scenarios

To generate precise estimates associated with the demolition cost estimates, and salvage values of each component of every hydro development many appropriate assumptions and methodologies of decommissioning were developed. Comments on these assumptions are presented in Section 2.1.1-2.1.17 of the October 2000 "Decommissioning of Hydroelectric Plants Owned by Newfoundland Power" report located in Appendix A of this report.

3.0 Decommissioning Estimates

In the 2000 report, establishing the costs related to the gross salvage and cost of retiring each component of each hydro system was accomplished by using recent project costs, whenever possible. In instances where this information was not available, unit prices were derived using common raw estimating practices and/or appropriate contractor quotations. The unit prices for the 2000 report were reviewed and appeared to be reasonable for that particular time frame. To establish the cost estimates for this report the unit prices from the 2010 report were adjusted to account for increase in market price, environmental regulations, inflation etc.

The adjusted unit prices are provided in the table below:

ITEM DESCRIPTION	UNIT PRICE
Bulk Concrete	\$115 .00/ M^3
Bulk Concrete (With Attachments)	\$185 .00/ M^3
Reinforced Concrete	\$185.00/ M^3
Reinforced Concrete (With Attachments)	\$225.00/ M^3
Installed Concrete	\$1000 .00/ M^3
Steel Building Demolition	\$22.50/ M^3
Asbestos Siding Removal	\$35. 00/ M^2
Wooden Penstock	\$12.00/ M^2
Steel Penstock (.914m - 1.52m) DIA.	\$17.50/ M^2
Steel Penstock (1.83m - 2.44m) DIA.	\$21.00/ M^2
Fibreglass Penstock (.914m - 1.52m) DIA.	\$17.50/ M^2
Fibreglass Penstock (1.83m - 2.44m) DIA.	\$21.00/ M^2

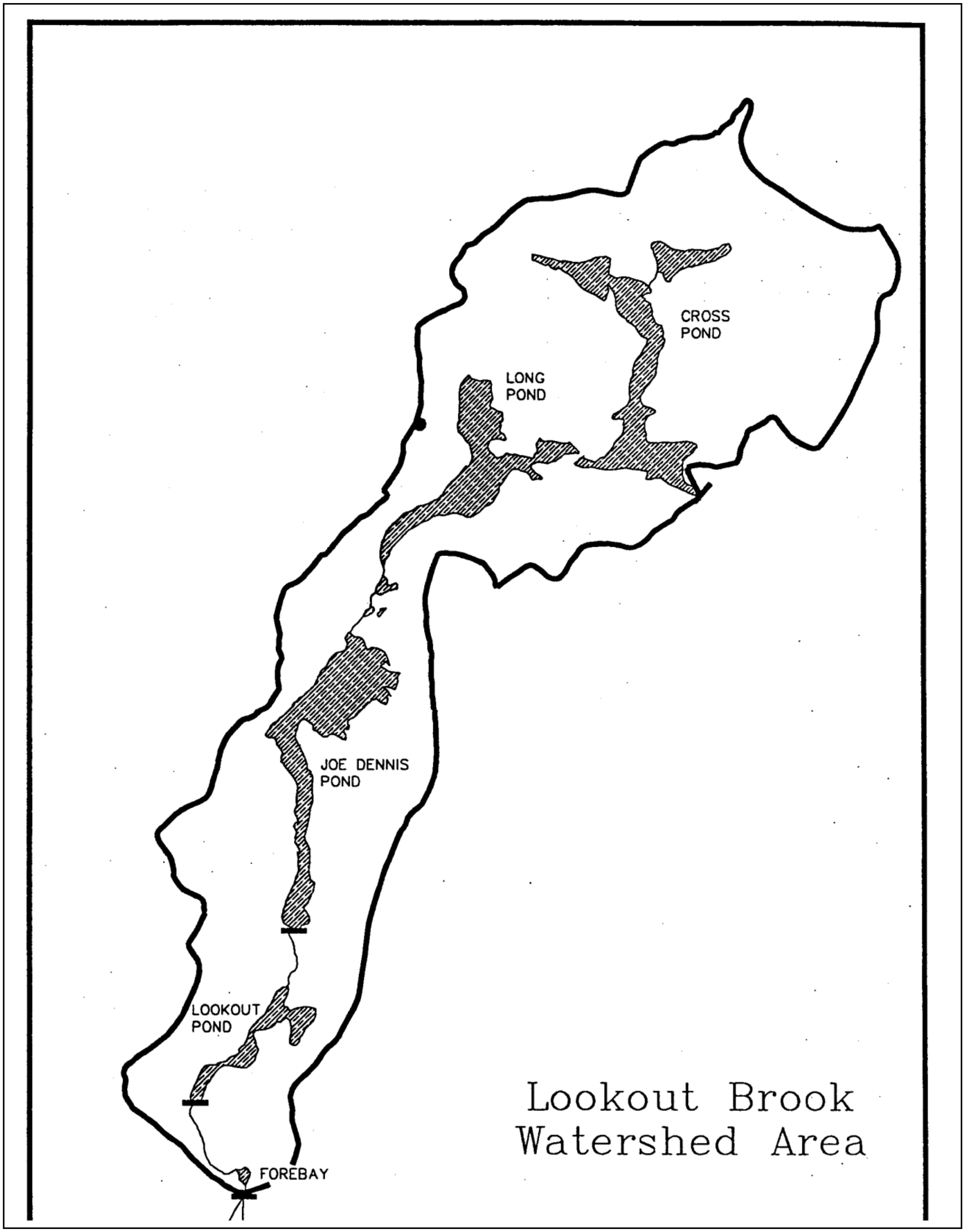
ITEM DESCRIPTION	UNIT PRICE
Transmission (Single Pole)	$18,000.00/km
Transmission (Double Pole)	$20,000.00/km
Distribution (Single Pole)	$5,000.00/km
Rockfilled Gabion Demolition	$25.00/M^3
Timber Crib Demolition	$30.00/M^3
Timber Crib Construction	$250.00/M^3
Earthfill (Removal)	$10.00/M^3
Rockfill Overflow Spillways	$11.00/M^3
Common Fill (Supply & Place)	$20.00/M^3
Culvert Removal	$20.00/ M^2
Selective Planting	$1,500.00/Ha
Hydroseeding	$3 .00/M^2

Based on the above unit prices, a cost estimate related to the gross salvage and retirement for each of Newfoundland Power's hydro electric developments in 2010 Canadian Dollars is presented below.

A description of each hydro plant, its various components, and decommissioning procedure utilized to generate the estimates is contained in Section 3.1-3.19 of the "Decommissioning of Hydroelectric Plants Owned by Newfoundland Power" report located in Appendix A of this report.

Estimates for the costs associated with an environmental assessment and with putting in place environmental controls during decommissioning are included as percentages of the total decommissioning costs. Costs associated with environmental cleanup or habatit restoration are not included. These costs are site specific and require significant study to produce an accurate cost estimate.

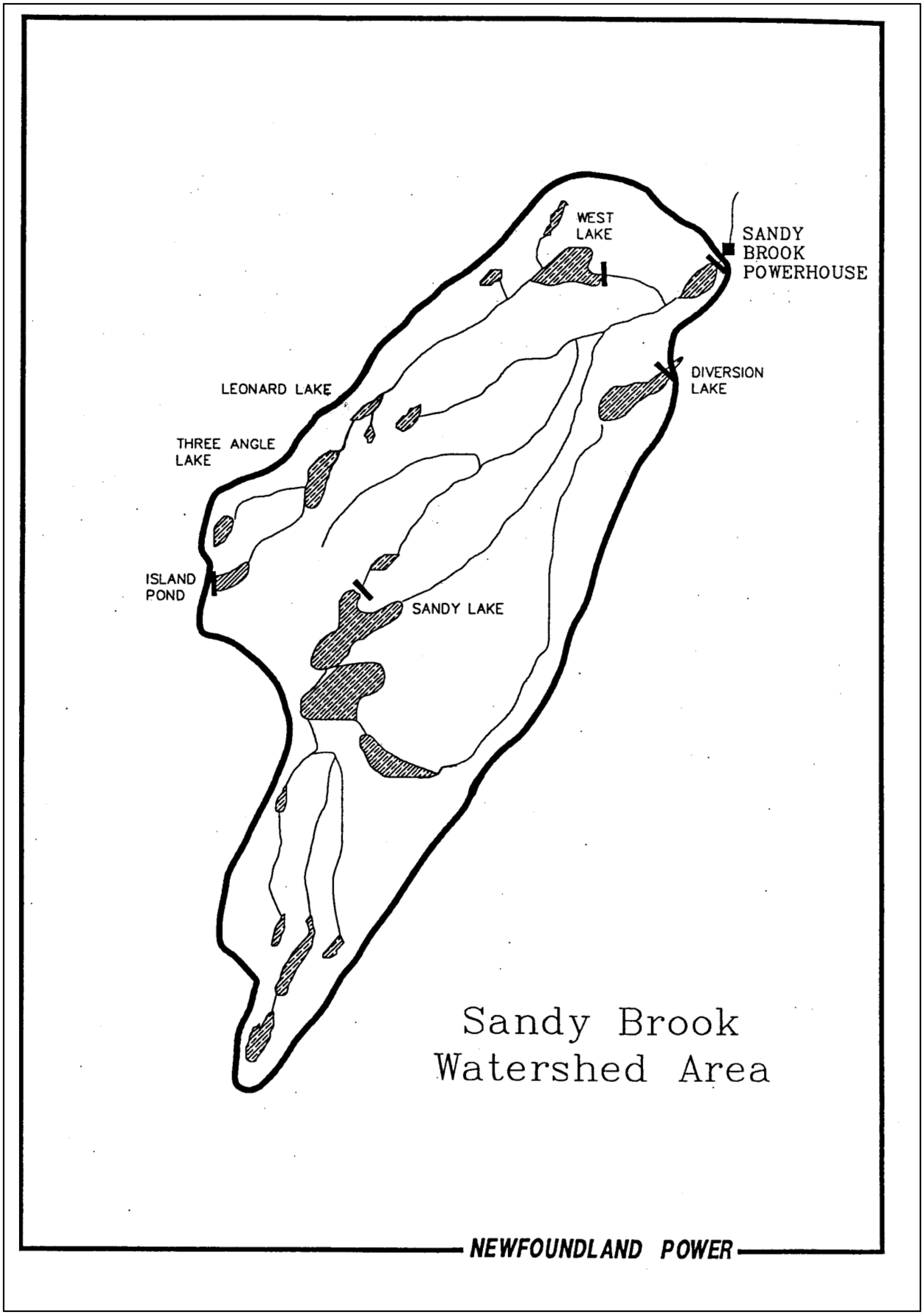
3.1 LOOKOUT BROOK


CROSS
POND
LONG
POND
JOE DENNIS
POND
LOOKOUT
POND
FOREBAY
Lookout Brook
Watershed Area

ESTIMATED COST OF RETIRING LOOKOUT BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
Substructure	Concrete	M3	$185.00	55	$10,175.00	$0.00	$10,175.00
Superstructure	Concrete	M3	$185.00	195	$36,075.00	$0.00	$36,075.00
Powerhouse crane	7.5 ton	L.S.	$1,500.00	1	$1,500.00	$2,500.00	($1,000.00)
Tailrace	Concrete	M3	$185.00	91	$16,835.00	$0.00	$16,835.00
Turbine/Generator	Horiz Francis	L.S.	$18,000.00	2	$36,000.00	$3,000.00	$33,000.00
Penstock	Steel	M2	$17.50	2473	$43,277.50	$0.00	$43,277.50
	FRP (buried)	M2	$25.00	4666	$116,650.00	$0.00	$116,650.00
Anchor Blocks							
and Saddles	Concrete	M3	$185.00	530	$98,050.00	$0.00	$98,050.00
Forebay Dam	Rockfill	M3	$11.00	1593	$17,523.00	$0.00	$17,523.00
	and Concrete	M3	$185.00	575	$106,375.00	$0.00	$106,375.00
Gatehouse Equipment		L.S.	$2,000.00	2	$4,000.00	$1,000.00	$3,000.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Joe Dennis							
Spillway Dam	Earthfill	M3	$10.00	4000	$40,000.00	$0.00	$40,000.00
Side Dam	Earthfill	M3	$10.00	304	$3,040.00	$0.00	$3,040.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Outlet	Timber culvert	M3	$25.00	250	$6,250.00	$0.00	$6,250.00
Cross Pond Dam	Earthfill	M3	$10.00	1694	$16,940.00	$0.00	$16,940.00
Cross Pond Outlet	Concrete	M3	$1,000.00	4	$4,000.00	$0.00	$4,000.00
Walkway/Platform	Timber/Steel	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Various Cabins	Woodframe	L.S.	$1,200.00	4	$4,800.00	$0.00	$4,800.00
Revegetation							
Selective Planting		Ha	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Mobilization/ Demobilization		L.S.			$40,000.00	$0.00	$40,000.00

ESTIMATED COST OF RETIRING LOOKOUT BROOK DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Transmission Line	Single Pole	KM.	$18,000.00	15	$270,000.00	$0.00	$270,000.00
Forebay Line	Single Pole	KM.	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Substation		L.S.	$6,000.00	1	$6,000.00	$2,000.00	$4,000.00
SUBTOTALS					**$891,490.50**	**$8,500.00**	**$882,990.50**
CONTINGENCIES (10%)					$89,149.05	$0.00	$89,149.05
ENGINEERING & SUPERVISION (5%)					$44,574.53	$0.00	$44,574.53
ENVIRONMENTAL ASSESSMENT (6%)					$53,489.43	$0.00	$53,489.43
SITE REMEDIATION (10%)					$89,149.05	$0.00	$89,149.05
ENVIRONMENTAL CONTROLS (5%)					$44,574.53	$0.00	$44,574.53
TOTALS					**$1,212,427.08**	**$8,500.00**	**$1,203,927.08**

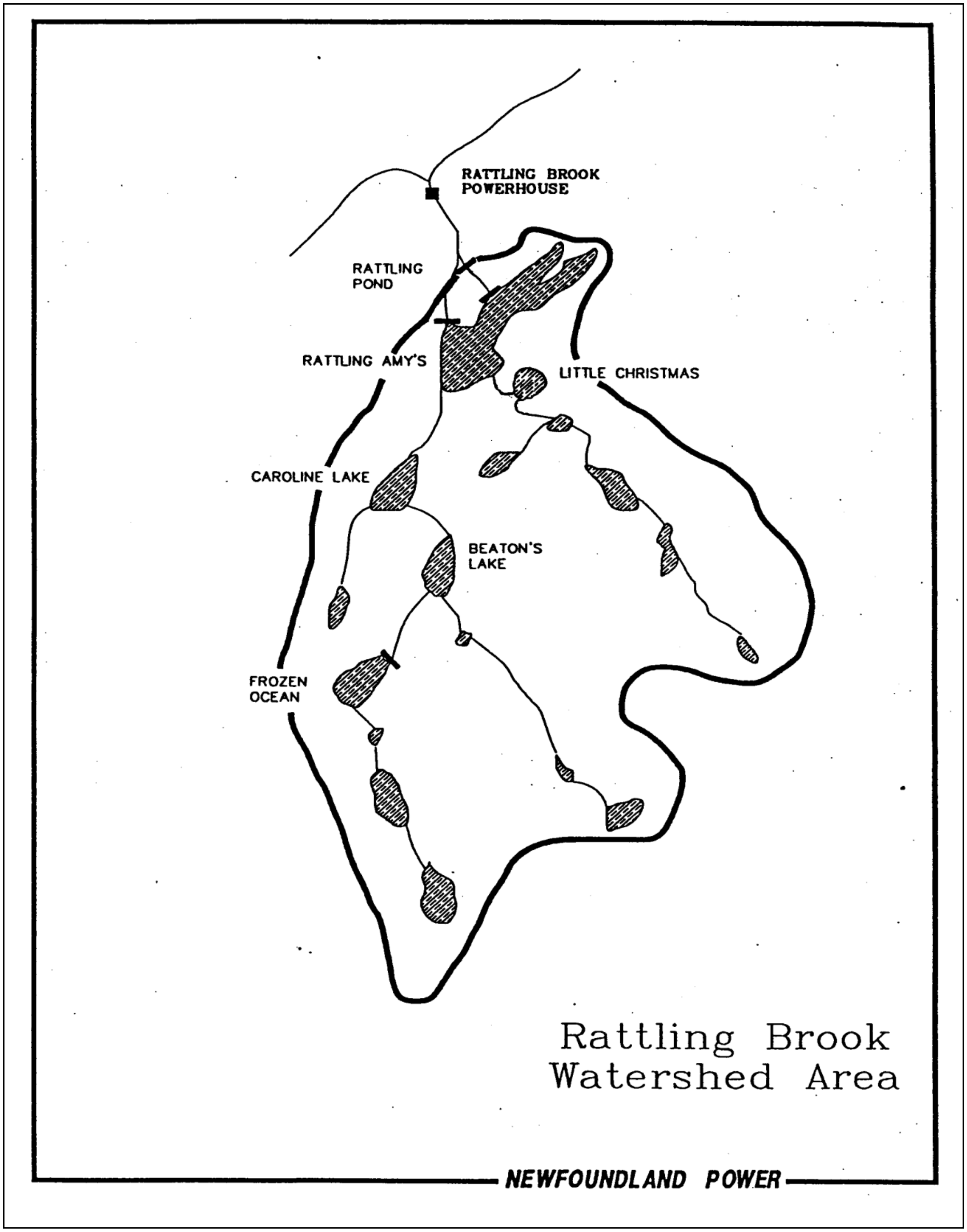
3.2 SANDY BROOK


WEST
LAKE
SANDY
BROOK
POWERHOUSE
DIVERSION
LAKE
LEONARD LAKE
THREE ANGLE
LAKE
ISLAND
POND
SANDY LAKE
Sandy Brook
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING SANDY BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
substructure	Concrete	M3	$185.00	70	$12,950.00	$0.00	$12,950.00
superstructure	Steel	M3	$22.50	1,406	$31,635.00	$3,726.00	$27,909.00
Powerhouse crane	25 ton	L.S.	$1,500.00	1	$1,500.00	$1,000.00	$500.00
Turbine/Generator	Vert. Francis	L.S.	$30,000.00	1	$30,000.00	$5,990.00	$24,010.00
Tailrace	Backfill	M3	$20.00	2,700	$54,000.00	$0.00	$54,000.00
Penstock	Woodstave	M2	$12.00	2,785	$33,420.00	$0.00	$33,420.00
	Steel	M2	$21.00	125	$2,625.00	$0.00	$2,625.00
Surge Tank	Steel	L.S.	$30,000.00	1	$30,000.00	$0.00	$30,000.00
foundations	Concrete	M3	$115.00	178	$20,470.00	$0.00	$20,470.00
Forebay Dam	Earthfill	M3	$10.00	3,240	$32,400.00	$0.00	$32,400.00
spillway	Concrete	M3	$185.00	360	$66,600.00	$0.00	$66,600.00
emergency spillway	Timber	M3	$30.00	81	$2,430.00	$0.00	$2,430.00
Intake	Concrete	M3	$185.00	160	$29,600.00	$2,000.00	$27,600.00
pipe	Steel	M3	$17.50	288	$5,040.00	$0.00	$5,040.00
walkway	Steel	L.S.	$1,200.00	1	$1,200.00	$0.00	$1,200.00
gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$2,000.00	$0.00
West Lake							
outlet	Concrete	M3	$185.00	40	$7,400.00	$0.00	$7,400.00
spillway/dam	Earthfill	M3	$10.00	1500	$15,000.00	$0.00	$15,000.00
walkway	Timber/Steel	L.S.	$600.00	1	$600.00	$0.00	$600.00
gate & lift	Timber/Steel	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Cripple Back							
Pond Dam	Timber Crib	M3	$30.00	400	$12,000.00	$0.00	$12,000.00
Sandy Lake							

ESTIMATED COST OF RETIRING SANDY BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
outlet	Concrete	M3	$185.00	20	$3,700.00	$0.00	$3,700.00
spillway/dam	Earthfill	M	$10.00	600	$6,000.00	$0.00	$6,000.00
walkway	Timber/Steel	L.S.	$600.00	1	$600.00	$0.00	$600.00
gate & lift	Timber/Steel	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gormans Steady Dam	Timber Crib	M3	$30.00	100	$3,000.00	$0.00	$3,000.00
Diversion Lake							
Dam 'C'	Timber Crib	M3	$30.00	540	$16,200.00	$0.00	$16,200.00
Dam 'D'	Timber Crib	M3	$30.00	240	$7,200.00	$0.00	$7,200.00
Revegetation (selective planting)		Ha.	$1,500.00	2	$3,000.00	$0.00	$3,000.00
Substation	L.S.	L.S.	$15,000.00	1	$15,000.00	$1,500.00	$13,500.00
Transmission	Forebay line	KM.	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Mobilization/ Demobilization		L.S.	$48,000.00	1	$48,000.00	$0.00	$48,000.00
Subtotals					**$504,570.00**	**$16,216.00**	**$488,354.00**
Contingencies (10%)					$50,457.00		$48,835.40
Environmental Assessment (8%)					$40,365.60		$39,068.32
Site Remediaiton (10%)					$50,457.00		$48,835.40
Engineering & Supervision (5%)					$25,228.50		$24,417.70
Environmental Controls (5%)					$25,228.50		$24,417.70
TOTALS					**$696,306.60**	**$16,216.00**	**$680,090.60**

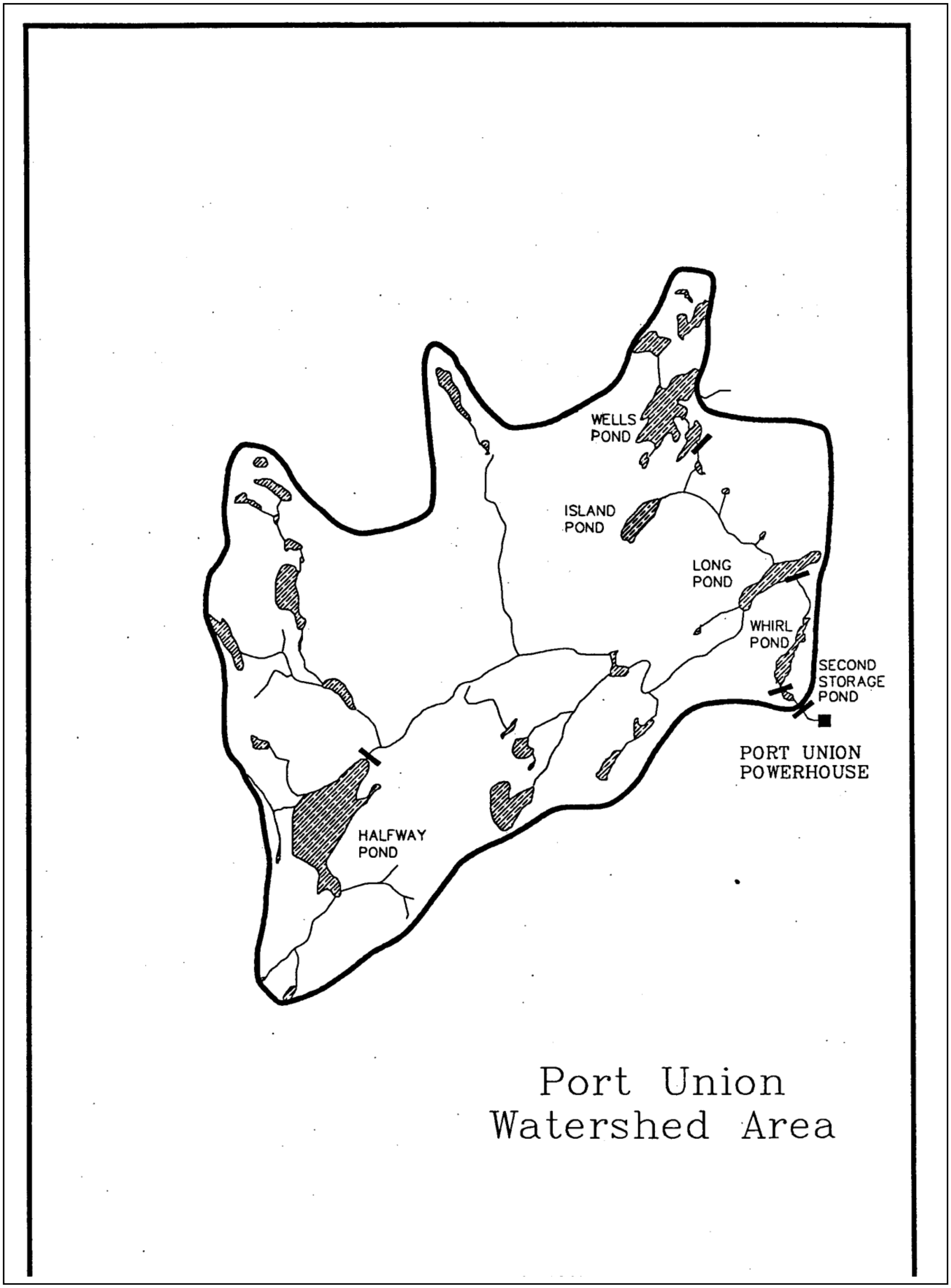
3.3 RATTLING BROOK


RATTLING BROOK
POWERHOUSE
RATTLING
POND
RATTLING AMY'S
LITTLE CHRISTMAS
CAROLINE LAKE
BEATON'S
LAKE
FROZEN
OCEAN
Rattling Brook
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING RATTLING BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
concrete	Install Concrete	M^3	$1,000.00	13	$13,000.00	$0.00	$13,000.00
powerhouse crane	25 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Tailrace	Concrete	M^3	$185.00	100	$18,500.00	$0.00	$18,500.00
	Backfill	M^3	$20.00	2600	$52,000.00	$0.00	$52,000.00
Turbine/Generator	Vert.Francis	L.S.	$27,000.00	2	$54,000.00	$5,000.00	$49,000.00
Penstock	Steel	M^2	$21.00	15,657	$328,797.00	$0.00	$328,797.00
	Steel (buried)	M2	$23.20	677	$15,706.40	$0.00	$15,706.40
Anchor blocks	Concrete	M^3	$115.00	154	$17,710.00	$0.00	$17,710.00
Surge Tank	Steel	L.S.	$72,000.00	1	$72,000.00	$0.00	$72,000.00
anchor blocks	Concrete	M^3	$115.00	50	$5,750.00	$0.00	$5,750.00
Forebay Dam	Earthfill	M^3	$10.00	2,867	$28,670.00	$0.00	$28,670.00
Forebay Spillway	Timber/Riprap	M^3	$11.00	275	$3,025.00	$0.00	$3,025.00
Intake	Concrete	M^2	$115.00	100	$11,500.00	$0.00	$11,500.00
pipe	Steel	M	$21.00	244	$5,124.00	$0.00	$5,124.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Rattling Lake Dam	Earthfill	M^3	$10.00	17,500	$175,000.00	$0.00	$175,000.00
spillway	Concrete	M^3	$185.00	108	$19,980.00	$0.00	$19,980.00
Amy's Lake Dam	Earthfill	M^3	$10.00	2,867	$28,670.00	$0.00	$28,670.00
outlet	Concrete	M^3	$185.00	185	$34,225.00	$0.00	$34,225.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Frozen Ocean Dam	Earthfill	M^3	$10.00	850	$8,500.00	$0.00	$8,500.00
spillway	Rockfill/overflow	M^3	$11.00	200	$2,200.00	$0.00	$2,200.00
outlet timber crib		M^3	$30.00	150	$4,500.00	$0.00	$4,500.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00

ESTIMATED COST OF RETIRING RATTLING BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Revegetation							
	Selected Planting	Ha.	$1,500.00	13	$19,500.00	$0.00	$19,500.00
Substation		L.S.	$24,000.00	1	$24,000.00	$5,000.00	$19,000.00
Transmission							
Forebay & Amy's	Single Pole	KM.	$5,000.00	4	$20,000.00	$0.00	$20,000.00
other lines		L.S.	$1,800.00	1	$1,800.00	$0.00	$1,800.00
Mobilization/ Demobilization		L.S.	$36,000.00	1	$36,000.00	$0.00	$36,000.00
SUBTOTALS					**$1,007,657.40**	**$10,000.00**	**$997,657.40**
CONTINGENCIES (10%)					$100,765.74		$99,765.74
ENGINEERING & SUPERVISION (5%)					$50,382.87		$49,882.87
ENVIRONMENTAL ASSESSMENT (6%)					$60,459.44		$59,859.44
SITE REMEDIATION (10%)					$100,765.74		$99,765.74
ENVIRONMENTAL CONTROLS (5%)					$50,382.87		$49,882.87
TOTALS					**$1,370,414.06**	**$10,000.00**	**$1,360,414.06**

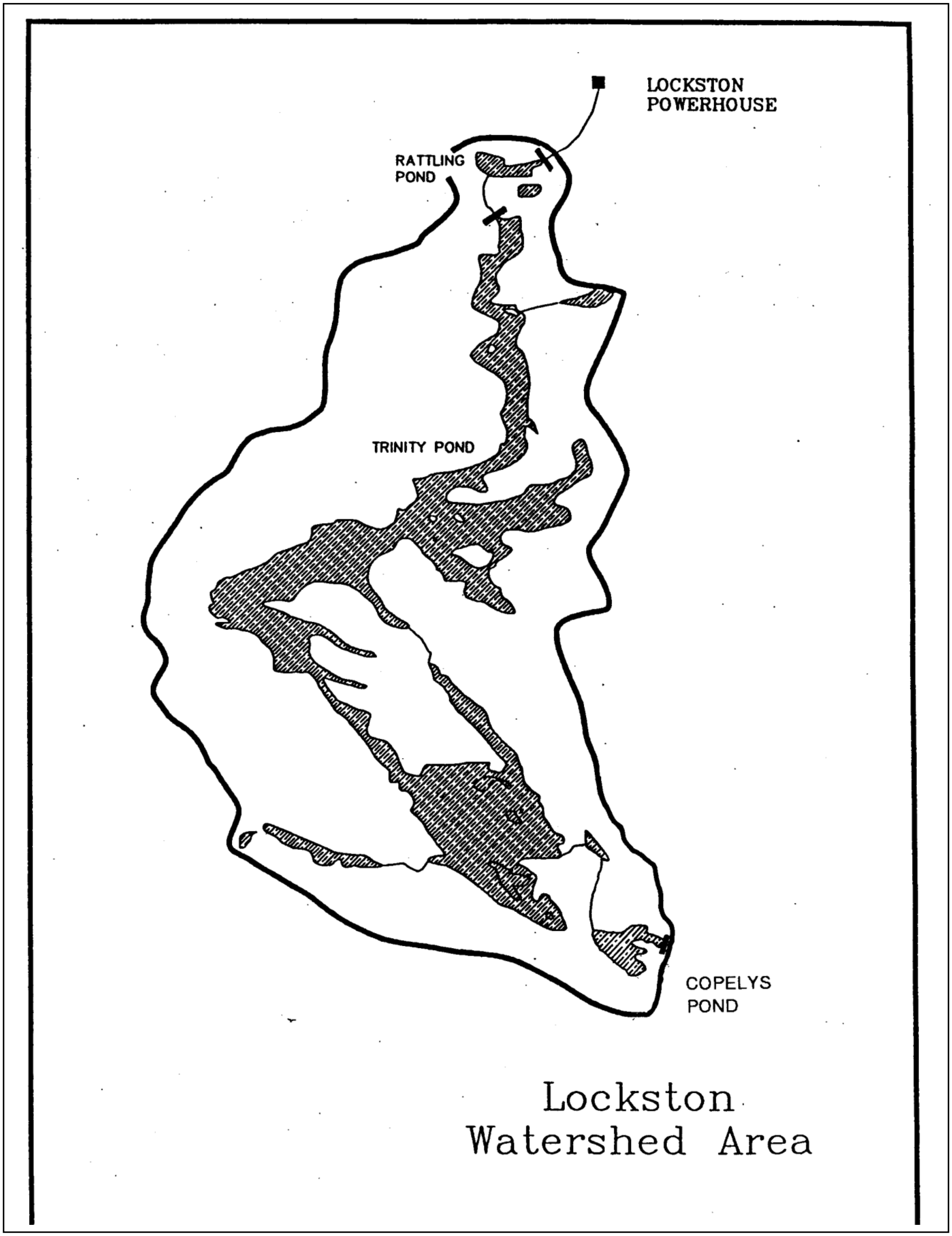
3.4 PORT UNION


WELLS POND
ISLAND POND
LONG POND
WHIRL POND
SECOND STORAGE POND
PORT UNION POWERHOUSE
HALFWAY POND
Port Union Watershed Area

ESTIMATED COST OF RETIRING PORT UNION DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse	Concrete	L.S.	$40,000.00	1	$40,000.00		$40,000.00
Turbine/Generator	Horiz. Francis	L.S.	$12,000.00	2	$24,000.00	$0.00	$24,000.00
Penstock	Woodstave	M2	$12.00	590	$7,080.00	$0.00	$7,080.00
					$0.00		$0.00
Anchor Block	Concrete	M3	$115.00	60	$6,900.00		$6,900.00
Intake	Concrete	M3	$115.00	70	$8,050.00	$0.00	$8,050.00
	Gate Lift	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Power Canal	Excavated Earth	M3	$10.00	2,100	$21,000.00	$0.00	$21,000.00
Second Storage Pond System	Rock Filled	M3	$25.00	450	$11,250.00	$0.00	$11,250.00
Whirl Pond Dam Modifications	Timber Crib	L.S.	$60,000.00	1	$60,000.00	$0.00	$60,000.00
	Gate Lift	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Spillway Modifications	Concrete	L.S.	$18,000.00	1	$18,000.00	$0.00	$18,000.00
Long Pond Dam	Timber Crib	M3	$30.00	360	$10,800.00	$0.00	$10,800.00
	Gate Lift	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Wells Pond Dam	Timber Crib	M3	$30.00	350	$10,500.00	$0.00	$10,500.00
Halfway Pond Dam	Earthfill	M3	$10.00	2000	$20,000.00	$0.00	$20,000.00
gate section	Timber Crib	M3	$30.00	228	$6,840.00	$0.00	$6,840.00
spillway	Timber Crib	M3	$30.00	200	$6,000.00	$0.00	$6,000.00
Revegetation							
Hydroseeding		M2	$3.00	750	$2,250.00	$0.00	$2,250.00

ESTIMATED COST OF RETIRING PORT UNION DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Selected Planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Substation		L.S.	$12,000.00	1	$12,000.00	$5,000.00	$7,000.00
Mobilization/ Demobilization		L.S.	$12,000.00	1	$10,000.00	$0.00	$10,000.00
Subtotals					**$282,170.00**	**$5,000.00**	**$277,170.00**
Environmental (6%)					$16,930.20		$16,630.20
Contingencies (10%)					$28,217.00		$27,717.00
Engineering & Supervision (5%)					$14,108.50		$13,858.50
Site Remediation (10%)					$28,217.00		$27,717.00
Environmental Controls (3%)					$8,465.10		$8,315.10
TOTALS					**$378,107.80**	**$5,000.00**	**$371,407.80**

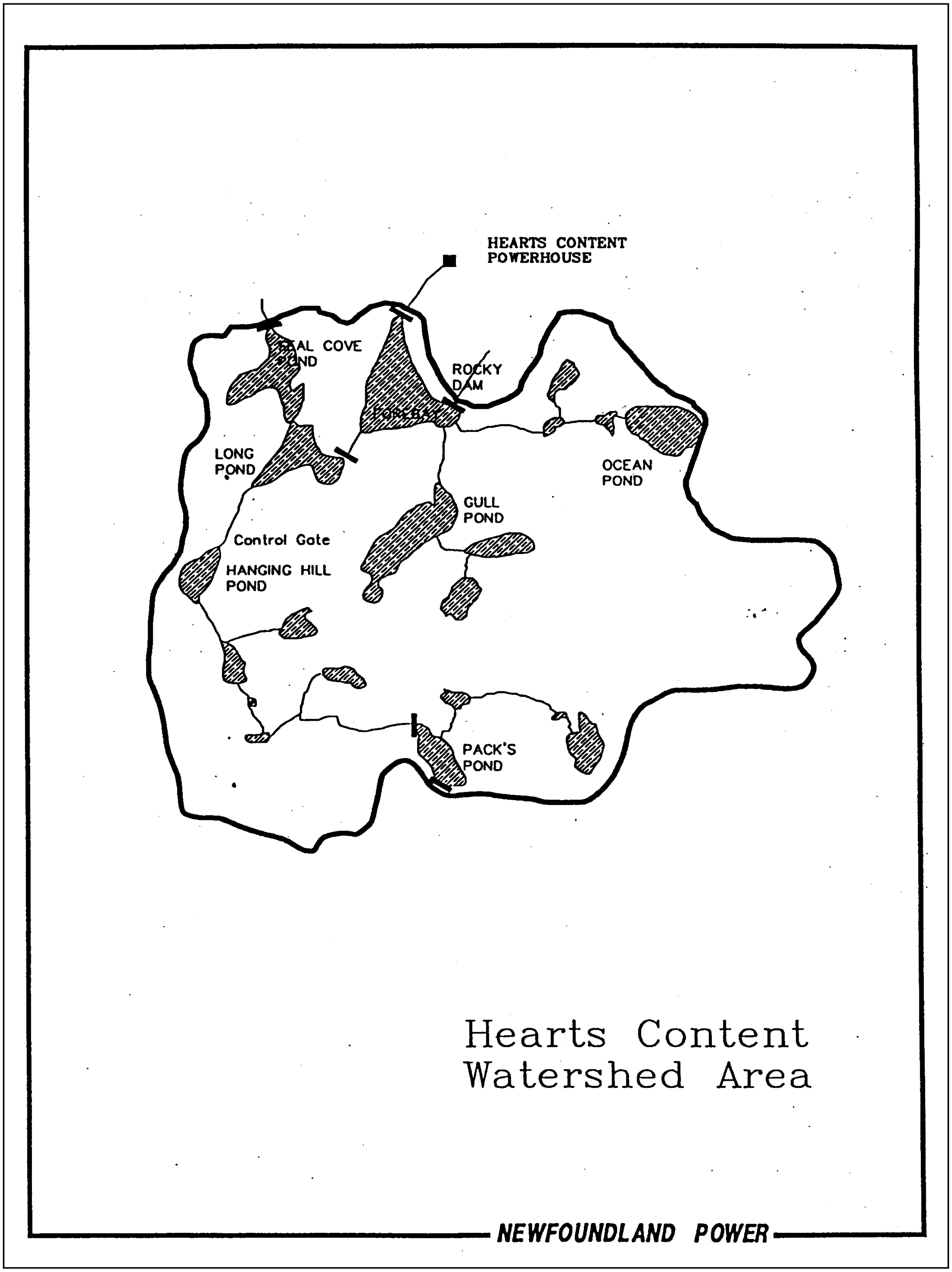
3.5 LOCKSTON


LOCKSTON
POWERHOUSE
RATTLING
POND
TRINITY POND
COPELYS
POND
Lockston
Watershed Area

ESTIMATED COST OF RETIRING LOCKSTON DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
superstructure	Concrete	M3	$185.00	150	$27,750.00	$0.00	$27,750.00
substructure	Concrete	M3	$185.00	50	$9,250.00	$0.00	$9,250.00
Turbine/Generator	Horiz. Francis	L.S	$15,000.00	2	$30,000.00	$3,000.00	$27,000.00
Powerhouse Crane	10 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Tailrace	Earth Excavation	M3	$10.00	6000	$60,000.00	$0.00	$60,000.00
Bridges	Timber	L.S.	$2,000.00	2	$4,000.00	$0.00	$4,000.00
Penstock	Steel	M2	$21.00	2,920	$61,320.00	$0.00	$61,320.00
Intake	Concrete	M3	$115.00	100	$11,500.00	$0.00	$11,500.00
Buildings	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Power Canal	Rock Excavation	M3	$25.00	3,400	$85,000.00	$0.00	$85,000.00
Rattling Pond Dam & Spillway	Concrete	M3	$115.00	75	$8,625.00	$0.00	$8,625.00
Trinity Pond Outlet	Concrete	M3	$185.00	40	$7,400.00	$0.00	$7,400.00
Trinity Pond Canal	Earth Excavation	M3	$10.00	1,850	$18,500.00	$0.00	$18,500.00
Revegetation							
Selected Planting		Ha	$1,500.00	2	$3,000.00	$0.00	$3,000.00
Substation		L.S.	$7,500.00	1	$7,500.00	$2,000.00	$5,500.00
Transmission Line	Single Pole	KM.	$5,000.00	1	$5,000.00	$0.00	$5,000.00

ESTIMATED COST OF RETIRING LOCKSTON DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Mobilization/ Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$354,345.00**	**$5,000.00**	**$349,345.00**
CONTINGENCIES (10%)					$35,434.50		$34,934.50
ENGINEERING & SUPERVISION (5%)					$17,717.25		$17,467.25
ENVIRONMENTAL ASSESSMENT (6%)					$21,260.70		$20,960.70
SITE REMEDIATION (10%)					$35,434.50		$34,934.50
ENVIRONMENTAL CONTROLS (5%)					$17,717.25		$17,467.25
TOTALS					**$481,909.20**	**$5,000.00**	**$475,109.20**

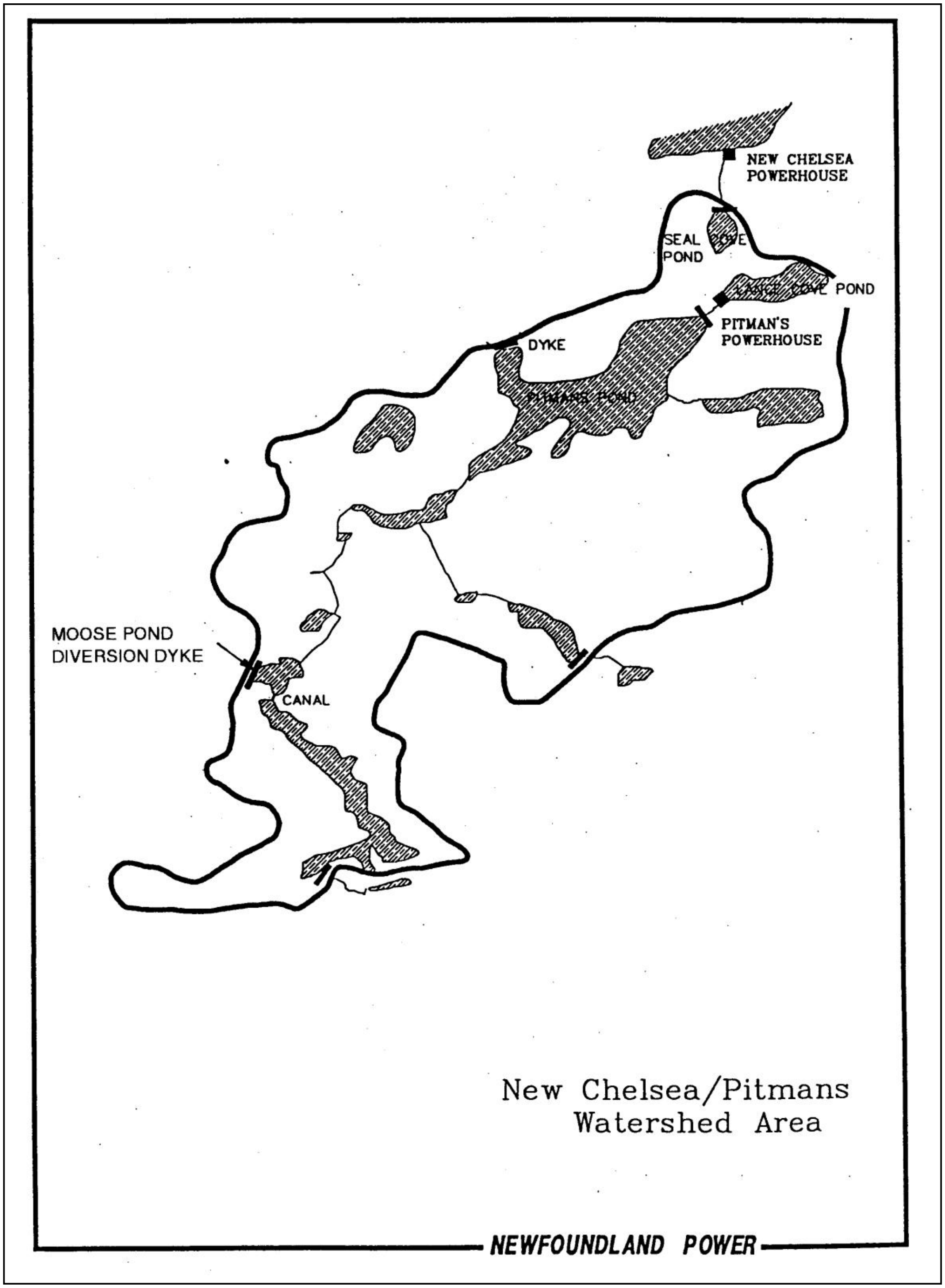
3.6 HEART'S CONTENT


HEARTS CONTENT
POWERHOUSE
SEAL COVE
POND
ROCKY
DAM
FOREBAY
LONG
POND
OCEAN
POND
GULL
POND
Control Gate
HANGING HILL
POND
PACK'S
POND
Hearts Content
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING HEART'S CONTENT DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse		L.S.	$55,000.00	1	$55,000.00	$0.00	$55,000.00
Turbine/Generator	Vert-francis	L.S.	$25,000.00	1	$25,000.00	$2,685.00	$22,315.00
Powerhouse crane	15 ton.	L.S	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Tailrace	Earth Exc.	M3	$10.00	100	$1,000.00	$0.00	$1,000.00
retaining wall	Concrete	M3	$115.00	5	$575.00	$0.00	$575.00
Penstock	Woodstave	M2	$12.00	3,208	$38,496.00	$0.00	$38,496.00
	Steel	M2	$21.00	121	$2,541.00	$0.00	$2,541.00
Anchor Blocks	Concrete	M3	$185.00	40	$7,400.00	$0.00	$7,400.00
Forebay Dam & Intake	Concrete	M3	$185.00	35	$6,475.00	$0.00	$6,475.00
gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
gate equipment		L.S.	2000	1	$2,000.00	$0.00	$2,000.00
Power Canal Dyke	Earthfill	M3	$11.00	1,820	$20,020.00	$0.00	$20,020.00
Southern Cove Pond Dam	Earthfill	M3	$11.00	400	$4,400.00	$0.00	$4,400.00
new dam	Earthfill	M3	$20.00	500	$10,000.00	$0.00	$10,000.00
Rocky Pond Dam	Earthfill	M3	$11.00	2,000	$22,000.00	$0.00	$22,000.00
outlet	Timber Crib	M3	$30.00	90	$2,700.00	$0.00	$2,700.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Long Pond Dam & Spillway	Timber Crib	M3	$30.00	900	$27,000.00	$0.00	$27,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Seal Cove Pond Diversion Dam & Spillway	Timber Crib	M3	$30.00	1313	$39,390.00	$0.00	$39,390.00
Packs Pond Dam	Earth/Rockfill	M3	$11.00	4,375	$48,125.00	$0.00	$48,125.00
Freeboard Dams	Earthfill	L.S.	$3,000.00	2	$6,000.00	$0.00	$6,000.00
Hanging Hill Pond							
Outlet	Timber Crib	M3	$30.00	100	$3,000.00	$0.00	$3,000.00
Revegetation							
hydroseeding		M2	$3.00	500	$1,500.00	$0.00	$1,500.00

ESTIMATED COST OF RETIRING HEART'S CONTENT DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
selected planting		Ha	$1,500.00	2	$3,000.00	$0.00	$3,000.00
Substation		L.S.	$6,000.00	1	$6,000.00	$2,000.00	$4,000.00
Transmission	Single Pole	L.S.	$1,200.00	1	$1,200.00	$0.00	$1,200.00
Mobilization/ Demobilization		L.S.	$25,000.00	1	$25,000.00	$0.00	$25,000.00
SUBTOTALS					**$365,322.00**	**$4,685.00**	**$360,637.00**
CONTINGENCIES (10%)					$36,532.20		$36,063.70
ENGINEERING & SUPERVISION (5%)					$18,266.10		$18,031.85
ENVIRONMENTAL ASSESSMENT (6%)					$21,919.32		$21,638.22
SITE REMEDIATION (10%)					$36,532.20		$36,063.70
ENVIRONMENTAL CONTROLS (5%)					$18,266.10		$18,031.85
TOTALS					**$496,837.92**	**$4,685.00**	**$490,466.32**

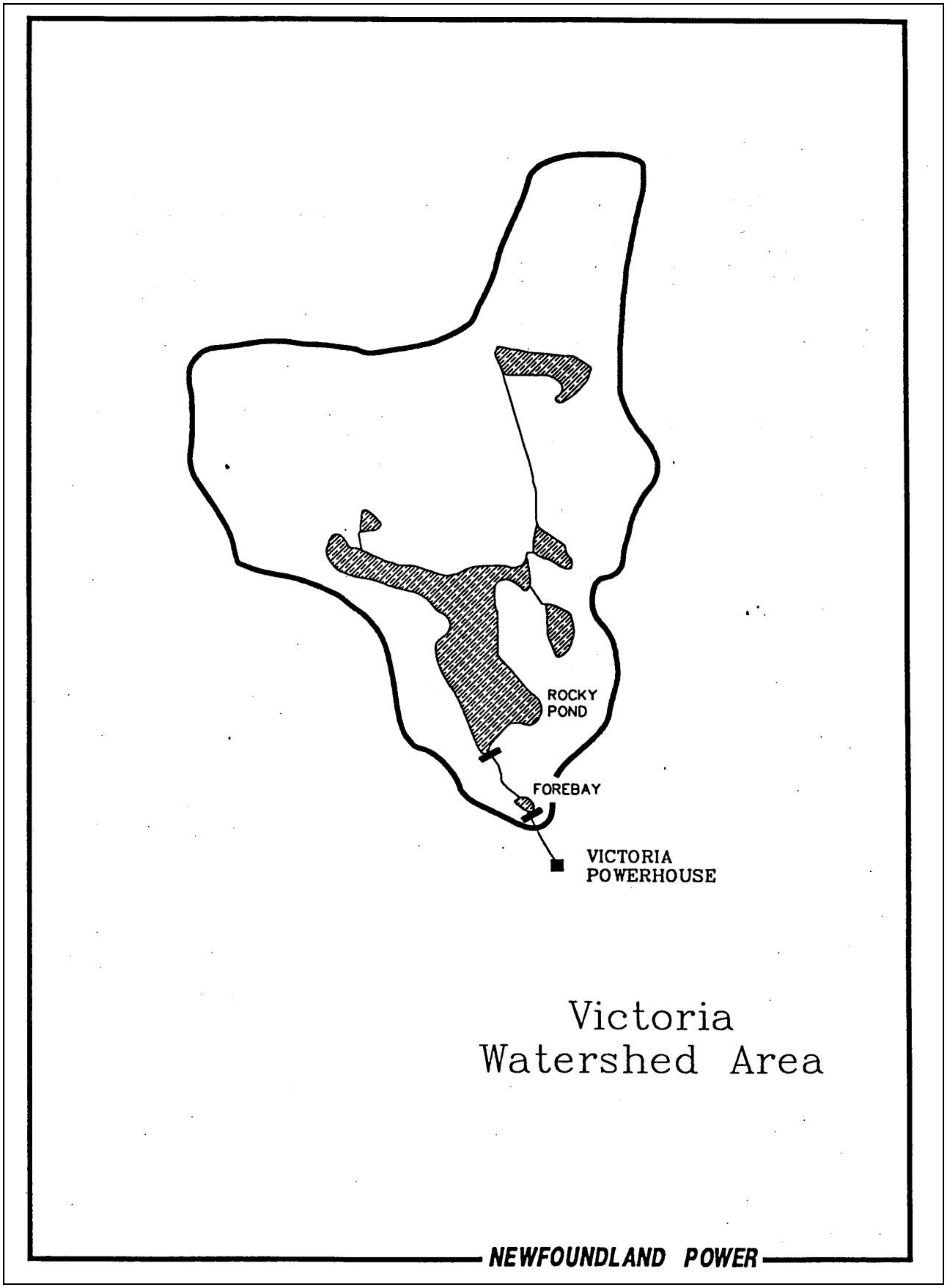
3.7 NEW CHELSEA & PITMANS POND


NEW CHELSEA
POWERHOUSE
SEAL
POND
POND
PITMAN'S
POWERHOUSE
DYKE
MOOSE POND
DIVERSION DYKE
CANAL
New Chelsea/Pitmans
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING NEW CHELSEA/PITTMAN'S DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
New Chelsea Powerhouse							
substructure	Concrete	M3	$185.00	200	$37,000.00	$0.00	$37,000.00
superstructure	Concrete	M3	$185.00	130	$24,050.00	$0.00	$24,050.00
powerhouse crane	15 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/generator	Vert. Francis		$30,000.00	1	$30,000.00	$2,000.00	$28,000.00
Penstock	Steel	M2	$17.50	4,982	$87,185.00	$0.00	$87,185.00
	Steel (buried)	M2	$25.00	1,130	$28,250.00	$0.00	$28,250.00
Anchor Blocks and Piers	Concrete	M3	$185.00	640	$118,400.00	$0.00	$118,400.00
Seal Cove Pond Dam	Earthfill	M3	$10.00	1,224	$12,240.00	$0.00	$12,240.00
Spillway	Concrete	M3	$115.00	12	$1,380.00	$0.00	$1,380.00
Intake	Concrete	M3	$185.00	60	$11,100.00	$0.00	$11,100.00
Gatehouse equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse		L.S	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Pitman's Powerhouse							
superstructure	Concrete	M3	$185.00	86	$15,910.00	$0.00	$15,910.00
substructure	Concrete	M3	$185.00	42	$7,770.00	$0.00	$7,770.00
Turbine/generator	Horiz Francis	L.S	$25,000.00	1	$25,000.00	$900.00	$24,100.00
Powerhouse Crane	5 ton		$1,000.00	2	$2,000.00	$0.00	$2,000.00
Penstock	Woodstave	M2	$12.00	1,660	$19,920.00	$0.00	$19,920.00
Pitmans Pond Dam	Earthfill	M3	$10.00	13,911	$139,110.00	$0.00	$139,110.00
Spillway	Concrete	M3	$115.00	54	$6,210.00	$0.00	$6,210.00
intake a Conduit	Concrete	M3	$185.00	374	$69,190.00	$0.00	$69,190.00
Gatehouse equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Pitmans Pond West							
Dyke	Earthfill	M3	$10.00	1,885	$18,850.00	$0.00	$18,850.00
Revegetation							

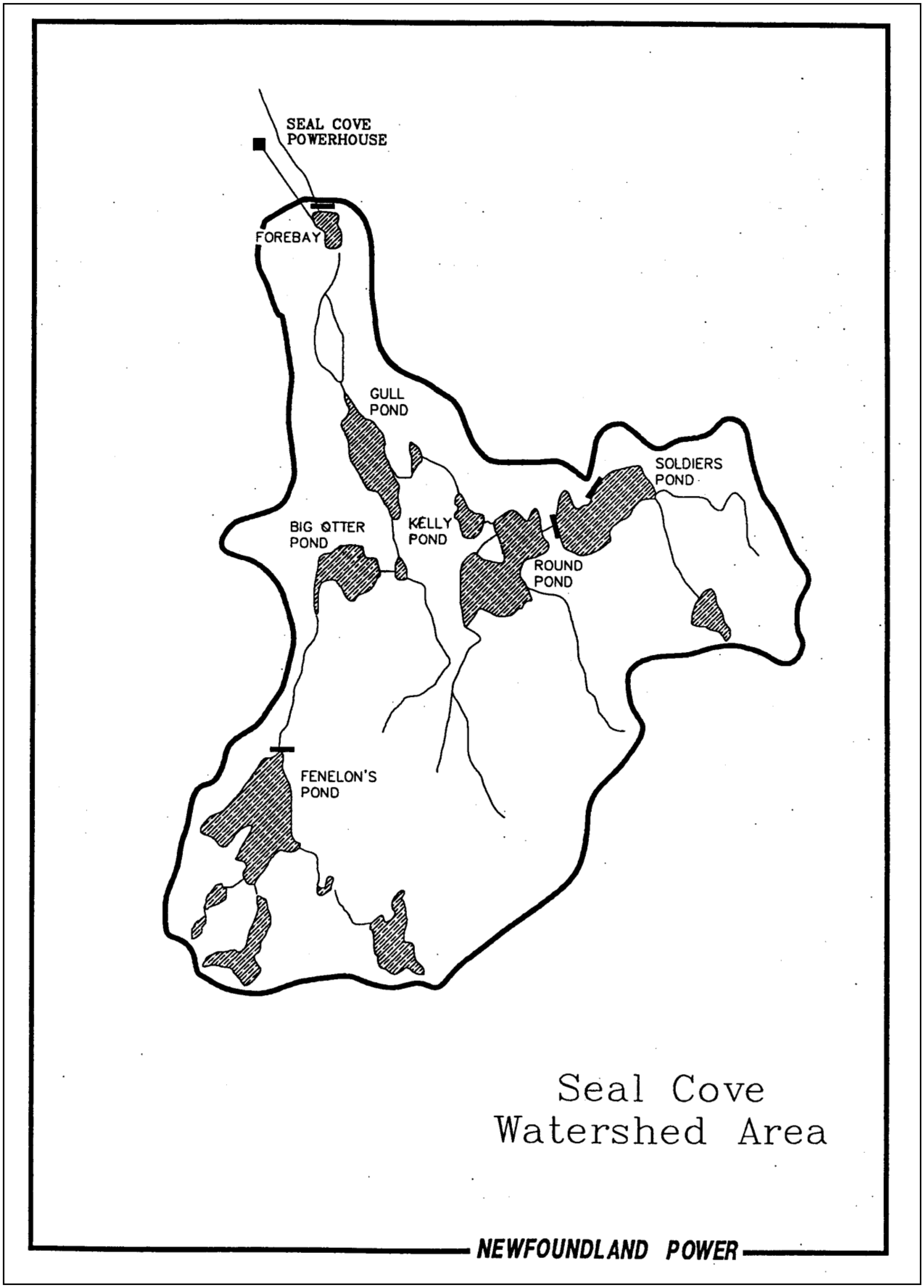
ESTIMATED COST OF RETIRING NEW CHELSEA/PITTMAN'S DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
-Selective Planting		Ha	$1,500.00	2	$3,000.00	$0.00	$3,000.00
Pitmans Substation		L.S.	$6,000.00	1	$6,000.00	$2,000.00	$4,000.00
Pitmans Transmission Lines		KM	$5,000.00	5	$25,000.00	$0.00	$25,000.00
New Chelsea Substation		L.S.	$8,500.00	1	$8,500.00	$1,000.00	$7,500.00
Mobilization/Demobilization		L.S	$18,000.00	1	$18,000.00	$0.00	$18,000.00
SUBTOTALS					**$723,565.00**	**$5,900.00**	**$717,665.00**
CONTINGENCIES (10%)					$72,356.50		$71,766.50
ENGINEERING & SUPERVISION (5%)					$36,178.25		$35,883.25
ENVIRONMENTAL ASSESSMENT (6%)					$43,413.90		$43,059.90
SITE REMEDIATION (10%)					$72,356.50		$71,766.50
ENVIRONMENTAL CONTROLS (5%)					$36,178.25		$35,883.25
TOTALS					**$984,048.40**	**$5,900.00**	**$976,024.40**

3.8 VICTORIA


ROCKY
POND
FOREBAY
VICTORIA
POWERHOUSE
Victoria
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING VICTORIA DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse					To Be Left Intact		
Turbine/Generator					To Be Left Intact		
Penstock	Woodstave	m2	$12.00	1,487	$17,844.00	$0.00	$17,844.00
	Steel	m2	$21.00	275	$5,775.00	$0.00	$5,775.00
Blue Hills Pond					$0.00		$0.00
Forebay	Concrete	m3	$115.00	127	$14,605.00	$0.00	$14,605.00
	Rockfill	m3	$11.00	268	$2,948.00	$0.00	$2,948.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$2,000.00	$0.00
Rocky Pond Dam	Concrete	m3	$185.00	1,230	$227,550.00	$0.00	$227,550.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Revegetation							
selective planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Substation		L.S.	$5,000.00	1	$5,000.00	$1,000.00	$4,000.00
Mobilization/Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$291,222.00**	**$3,000.00**	**$288,222.00**
CONTINGENCIES (10%)					$29,122.20		$28,822.20
ENVIRONMENTAL (6%)					$17,473.32		$17,293.32
ENGINEERING & SUPERVISION (5%)					$14,561.10		$14,411.10
SITE REMEDIATION (10%)					$29,122.20		$28,822.20
ENVIRONMENTAL CONTROLS (5%)					$14,561.10		$14,411.10
TOTALS					**$396,061.92**	**$3,000.00**	**$391,981.92**

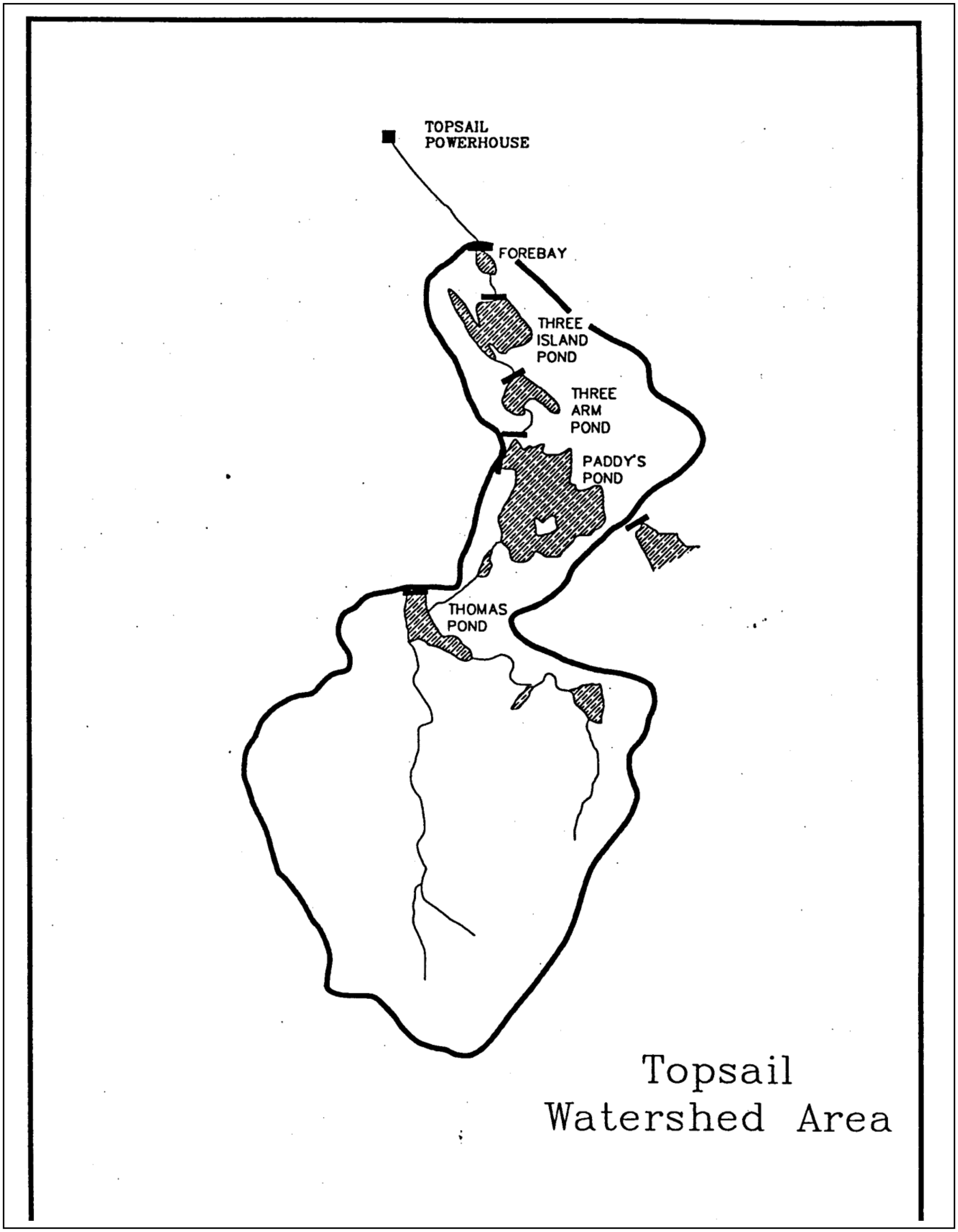
3.9 SEAL COVE


SEAL COVE
POWERHOUSE
FOREBAY
GULL
POND
SOLDIERS
POND
BIG OTTER
POND
KELLY
POND
ROUND
POND
FENELON'S
POND
Seal Cove
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING SEAL COVE DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
superstructure	Concrete	m3	$185.00	183	$33,855.00	$0.00	$33,855.00
substructure	Concrete	m3	$185.00	150	$27,750.00	$0.00	$27,750.00
powerhouse crane	10 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/Generator	Horiz.Francis	L.S.	$18,000.00	2	$36,000.00	$3,595.00	$32,405.00
Tailrace	Earthfill	m3	$10.00	500	$5,000.00	$0.00	$5,000.00
Penstock	Steel	m2	$21.00	8,179	$171,759.00	$0.00	$171,759.00
Anchor Blocks and piers	Concrete	m3	$185.00	1,620	$299,700.00		$299,700.00
Intake							
-substructure	Concrete	m3	$185.00	50	$9,250.00	$0.00	$9,250.00
-superstructure	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
-Gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Forebay dam	Concrete	m3	$185.00	580	$107,300.00	$0.00	$107,300.00
spillway	Concrete	m3	$115.00	52	$5,980.00	$0.00	$5,980.00
rockfill	Rockfill	m3	$11.00	5,800	$63,800.00	$0.00	$63,800.00
gabions	Gabions	m3	$25.00	150	$3,750.00	$0.00	$3,750.00
Soldier's Pond							
Dam & Spillway	Timber Crib	m3	$30.00	900	$27,000.00	$0.00	$27,000.00
outlet	Timber Crib	m3	$30.00	635	$19,050.00	$0.00	$19,050.00
Gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Fenelons Pond					$0.00		$0.00
Dam & Outlet	Earthfill	m3	$11.00	2,445	$26,895.00	$0.00	$26,895.00
	Timber Crib	m3	$30.00	2,544	$76,320.00	$0.00	$76,320.00
Gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Fenelons Pond							
spillway	Timber Crib	m3	$30.00	426	$12,780.00	$0.00	$12,780.00
Big Otter Pond Dam					$0.00		$0.00

ESTIMATED COST OF RETIRING SEAL COVE DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Spillway & outlet modifications		m3	$30.00	814	$24,420.00	$0.00	$24,420.00
Other					$0.00		$0.00
storage shed	Woodframe	L.S.	$1,200.00	1	$1,200.00	$0.00	$1,200.00
bridges	Misc.	L.S.	$3,000.00	2	$6,000.00	$0.00	$6,000.00
Revegetation							
Hydroseeding		m2	$3.00	6,400	$19,200.00	$0.00	$19,200.00
Selected Planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Substation		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Transmission		L.S.	$3,500.00	1	$3,500.00	$0.00	$3,500.00
Mobilization/Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$1,015,509.00**	**$3,595.00**	**$1,011,914.00**
CONTINGENCIES (10%)					$101,550.90		$101,191.40
ENVIRONMENTAL (6%)					$60,930.54		$60,714.84
ENGINEERING & SUPERVISION.(5%)					$50,775.45		$50,595.70
SITE REMEDIATION (10%)					$101,550.90		$101,191.40
ENVIRONMENTAL CONTROLS (5%)					$50,775.45		$50,595.70
TOTALS					**$1,381,092.24**	**$3,595.00**	**$1,376,203.04**

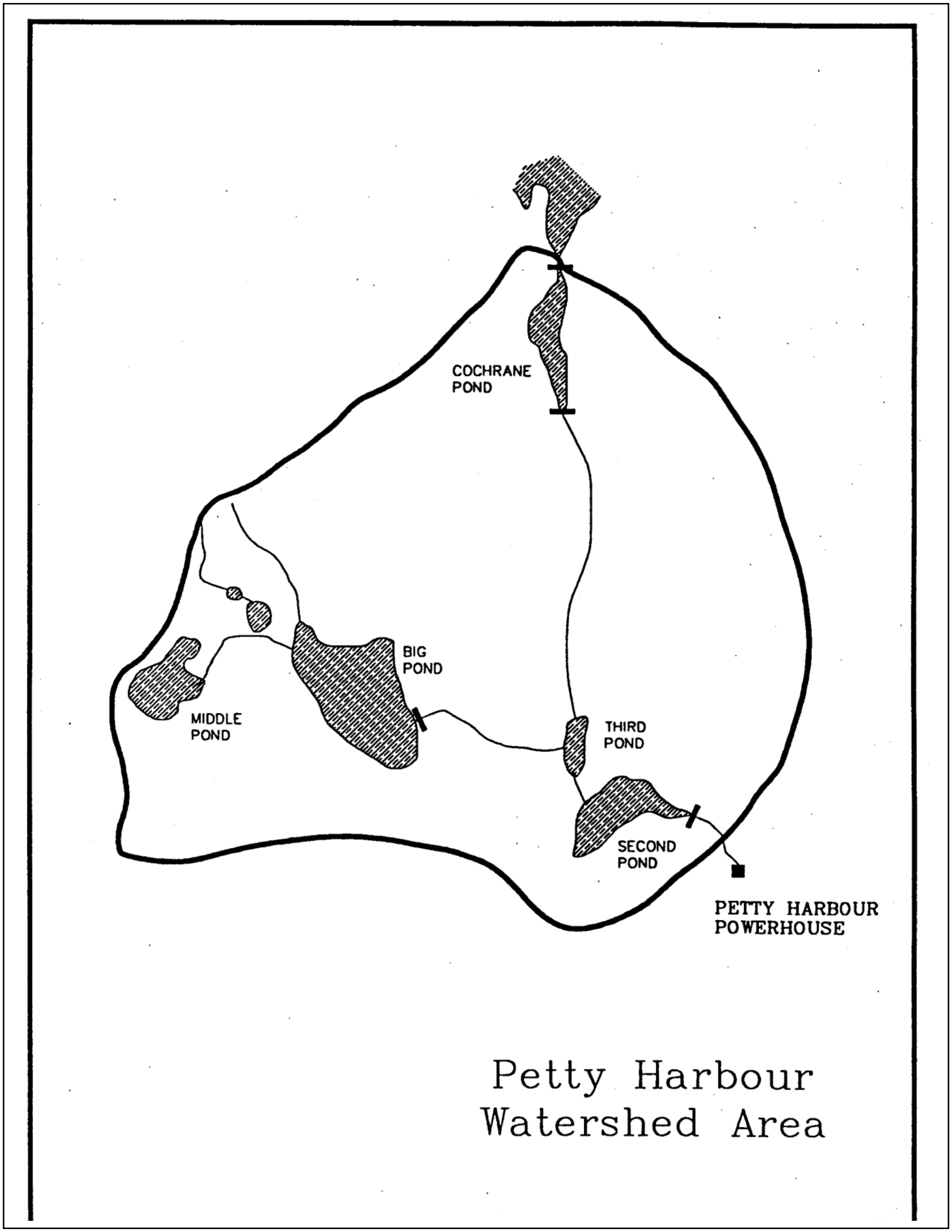
3.10 TOPSAIL


TOPSAIL
POWERHOUSE
FOREBAY
THREE
ISLAND
POND
THREE
ARM
POND
PADDY'S
POND
THOMAS
POND
Topsail
Watershed Area

ESTIMATED COST OF RETIRING TOPSAIL DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
superstructure	Concrete	m3	$185.00	89	$16,465.00	$0.00	$16,465.00
substructure	Concrete	m3	$185.00	67	$12,395.00	$0.00	$12,395.00
Powerhouse crane	10 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/Generator	Horiz.Francis	L.S.	$18,000.00	1	$18,000.00	$2,185.00	$15,815.00
Tailrace	Earth embankment	m3	$10.00	500	$5,000.00	$0.00	$5,000.00
Penstock							
above ground	Woodstave	m2	$12.00	5,420	$65,040.00	$0.00	$65,040.00
buried	Woodstave	m3	$18.00	1,000	$18,000.00	$0.00	$18,000.00
anchor block	Concrete	m3	$185.00	15	$2,775.00	$0.00	$2,775.00
Forebay							
spillway	Concrete	m3	$1,000.00	3	$3,000.00	$0.00	$3,000.00
Intake							
substructure	Concrete	m3	$185.00	15	$2,775.00	$0.00	$2,775.00
superstructure	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
supply and place fill	Earthfill	m3	$20.00	50	$1,000.00	$0.00	$1,000.00
Three Island Pond							
Dam (repairs)	Timber Crib	m3	$300.00	100	$30,000.00	$0.00	$30,000.00
Gate Equipment		L.S	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Three Arm Pond Dam							
Spillway & Outlet	Timber Crib	m 3	$30.00	150	$4,500.00	$0.00	$4,500.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Paddy's Pond							
Outlet (rebuild)	Timber Crib	m3	$300.00	40	$12,000.00	$0.00	$12,000.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Paddy's Pond Dam							

ESTIMATED COST OF RETIRING TOPSAIL DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
& Spillway repairs	Timber Crib	m3	$300.00	400	$120,000.00	$0.00	$120,000.00
Paddys Pond							
Freeboard Dams	Timber Crib	m3	$300.00	54	$16,200.00	$0.00	$16,200.00
Thomas Pond Dam	Earthfill	m3	$10.00	12,382	$123,820.00	$0.00	$123,820.00
spillway	Concrete	m3	$115.00	172	$19,780.00	$0.00	$19,780.00
outlet	Concrete	m3	$185.00	20	$3,700.00	$0.00	$3,700.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Thomas Pond Canal	Earthfill	m3	$10.00	3,000	$30,000.00	$0.00	$30,000.00
Revegetation							
selective planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
hydroseeding		m2	$3.00	27,000	$81,000.00	$0.00	$81,000.00
Mobilization/Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Substation		L.S.	$6,500.00	1	$6,500.00	$2,000.00	$4,500.00
Distribution		L.S.	$3,500.00	1	$3,500.00	$0.00	$3,500.00
SUBTOTALS					**$620,450.00**	**$4,185.00**	**$616,265.00**
CONTINGENCIES (10%)					$62,045.00		$61,626.50
ENGINEERING & SUPERVISION (5%)					$31,022.50		$30,813.25
ENVIRONMENTAL ASSESSMENT (6%)					$37,227.00		$36,975.90
SITE REMEDIATION (10%)					$62,045.00		$61,626.50
ENVIRONMENTAL CONTROLS (5%)					$31,022.50		$30,813.25
TOTALS					**$843,812.00**	**$4,185.00**	**$838,120.40**

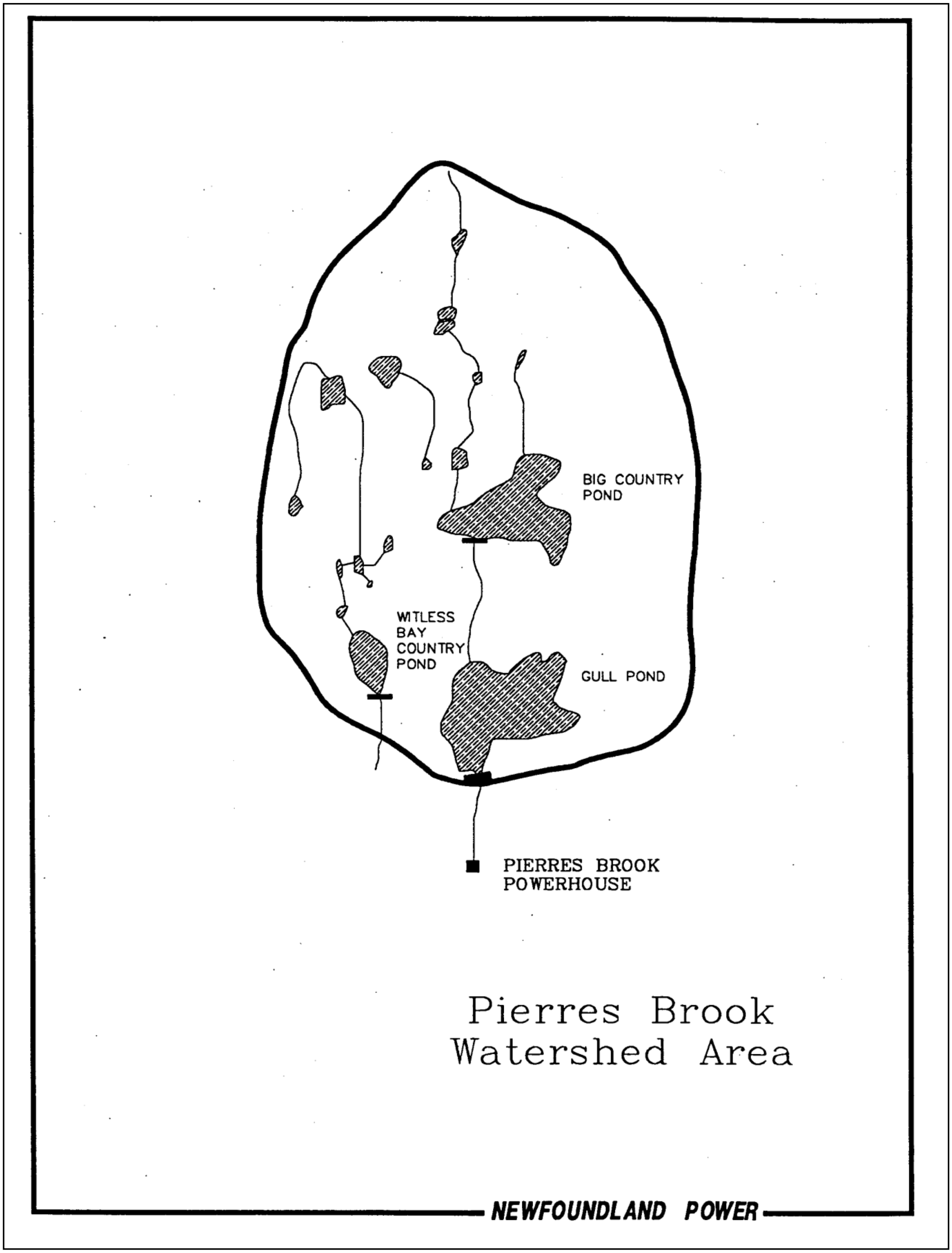
3.11 PETTY HARBOUR


COCHRANE
POND
BIG
POND
MIDDLE
POND
THIRD
POND
SECOND
POND
PETTY HARBOUR
POWERHOUSE
Petty Harbour
Watershed Area

ESTIMATED COST OF RETIRING PETTY HARBOUR DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Powerhouse					To Be Left Intact		
Turbine/Generator					To Be Left Intact		
Powerhouse Crane	15 ton				To Be Left Intact		
Tailrace	Rock Excavation	M 3	$10.00	850	$8,500.00	$0.00	$8,500.00
Penstock	Steel	M 2	$21.00	7068	$148,428.00	$0.00	$148,428.00
Anchor blocks and piers	Concrete	M3	$185.00	935	$172,975.00	$0.00	$172,975.00
Surge Tank	Steel	L.S.	$85,000.00	1	$85,000.00	$0.00	$85,000.00
Penstock Trestle	Structural Steel	L.S.	$7,500.00	1	$7,500.00	$0.00	$7,500.00
Forebay Dam	Concrete	M 3	$185.00	1,025	$189,625.00	$0.00	$189,625.00
Gatehouse Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Bay Bulls Big Pond Dam Modifications		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Gatehouse Equipment		L.S.	$2,500.00	1	$2,500.00	$0.00	$2,500.00
Gatehouse		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Cochrane Pond Spillway	Concrete	M 3	$115.00	102	$11,730.00	$0.00	$11,730.00
Earthfill Replacement		M 3	$20.00	300	$6,000.00	$0.00	$6,000.00
Cochrane Pond Outlet	Timber Crib	M 3	$30.00	54	$1,620.00	$0.00	$1,620.00
-gate lift		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Cochrane Pond Outlet Replacement	Concrete	M 3	$1,000.00	50	$50,000.00	$0.00	$50,000.00
Substation		L.S.	$8,500.00	1	$8,500.00	$1,000.00	$7,500.00
Mobilization/Demobilization		L.S.	$6,000.00	1	$6,000.00	$0.00	$6,000.00
SUBTOTALS					**$718,378.00**	**$1,000.00**	**$717,378.00**
CONTINGENCIES (10%)					$71,837.80		$71,737.80

ESTIMATED COST OF RETIRING PETTY HARBOUR DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
ENVIRONMENTAL (8%)					$57,470.24		$57,390.24
ENGINEERING & SUPERVISION (5%)					$35,918.90		$35,868.90
SITE REMEDIATION (10%)					$71,837.80		$71,737.80
ENVIRONMENTAL CONTROLS (5%)					$35,918.90		$35,868.90
TOTALS					**$991,361.64**	**$1,000.00**	**$989,981.64**

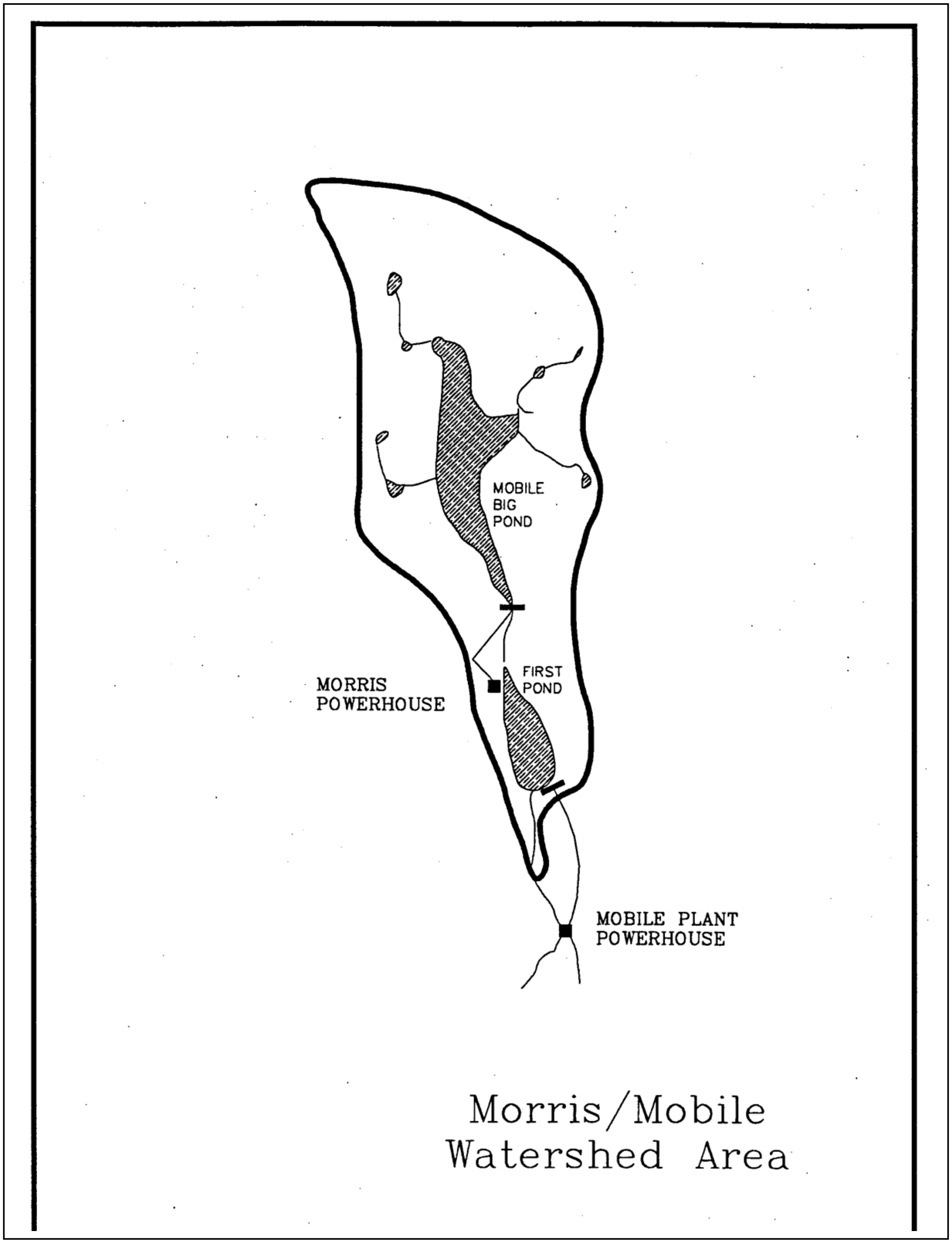
3.12 PIERRE'S BROOK


BIG COUNTRY POND
WITLESS BAY COUNTRY POND
GULL POND
PIERRES BROOK POWERHOUSE
Pierres Brook Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING PIERRE'S BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse	Concrete/masonry	L.S.	$67,000.00	1	$67,000.00	$0.00	$67,000.00
powerhouse crane	25 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Tailrace	Earthfill	M 3	$10.00	500	$5,000.00	$0.00	$5,000.00
Turbine/Generator	Vertical Francis	L.S.	$25,000.00	1	$25,000.00	$3,995.00	$21,005.00
Penstock	Woodstave	M 2	$12.00	14,203	$170,436.00	$0.00	$170,436.00
	Steel	M 2	$21.00	364	$7,644.00	$0.00	$7,644.00
anchors & cradles	Concrete	M 3	$115.00	8	$920.00	$0.00	$920.00
Surge Tank							
tank & riser	Steel	L S.	$35,000.00	1	$35,000.00	$0.00	$35,000.00
piers & anchor	Concrete	M 3	$115.00	80	$9,200.00	$0.00	$9,200.00
Gull Pond Forebay Dam	Earthfill	M 3	$11.00	2,170	$23,870.00	$0.00	$23,870.00
(earthfill with concrete core)	Concrete	M 3	$115.00	280	$32,200.00	$0.00	$32,200.00
concrete core)	Earthfill	M 3	$10.00	1,575	$15,750.00	$0.00	$15,750.00
Intake	Concrete	M 3	$185.00	120	$22,200.00	$0.00	$22,200.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gull Pond Spillway							
spillway	Concrete	M 3	$185.00	166	$30,710.00	$0.00	$30,710.00
wing walls	Concrete	M 3	$115.00	240	$27,600.00	$0.00	$27,600.00
Gull Pond Free-board dam	Earthfill	M	$10.00	1,436	$14,360.00	$0.00	$14,360.00
Witless Bay Country							
Pond Dam & Outlet	Earthfill	M 3	$10.00	960	$9,600.00	$0.00	$9,600.00
gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Witless Bay Country							
Pond Spillway	Concrete	M 3	$115.00	195	$22,425.00	$0.00	$22,425.00

ESTIMATED COST OF RETIRING PIERRE'S BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
	Earthfill	M 3	$11.00	2,650	$29,150.00	$0.00	$29,150.00
Witless Bay Country							
Diversion Canal.	Earthfill	M 3	$10.00	5,150	$51,500.00	$0.00	$51,500.00
Big Country Pond Dam	Earthfill	M 3	$11.00	900	$9,900.00	$0.00	$9,900.00
Outlet	Concrete	M 3	$185.00	300	$55,500.00	$0.00	$55,500.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
spillway	Earthfill	M 3	$11.00	104	$1,144.00	$0.00	$1,144.00
Rocky Pond Dam	Earthfill	M 3	$10.00	173	$1,730.00	$0.00	$1,730.00
	Timber Crib	M 3	$30.00	150	$4,500.00	$0.00	$4,500.00
other (sheds)	Woodframe	L.S.	$2,000.00	2	$4,000.00	$0.00	$4,000.00
bridge	Misc.	L.S.	$3,000.00	1	$3,000.00	$0.00	$3,000.00
Revegetation							
hydroseeding		M 2	$3.00	1000	$3,000.00	$0.00	$3,000.00
selected planting		Ha.	$1,500.00	3	$4,500.00	$0.00	$4,500.00
Substation		L.S.	$8,000.00	1	$8,000.00	$1,000.00	$7,000.00
Transmission	Single Pole	KM.	$18,000.00	5	$90,000.00	$0.00	$90,000.00
forebay line	Single Pole	KM.	$5,000.00	3	$15,000.00	$0.00	$15,000.00
Mobilization/Demobilization		L.S.	$10,000.00	1	$10,000.00	$0.00	$10,000.00
SUBTOTALS					**$819,339.00**	**$4,995.00**	**$814,344.00**
CONTINGENCIES (10%)					$81,933.90		$81,434.40
ENVIRONMENTAL (6%)					$49,160.34		$48,860.64
ENGINEERING & SUPERVISION (5%)					$40,966.95		$40,717.20
SITE REMEDIATION (10%)					$81,933.90		$81,434.40
ENVIRONMENTAL CONTROLS (5%)					$40,966.95		$40,717.20
TOTALS					**$1,114,301.04**	**$4,995.00**	**$1,107,507.84**

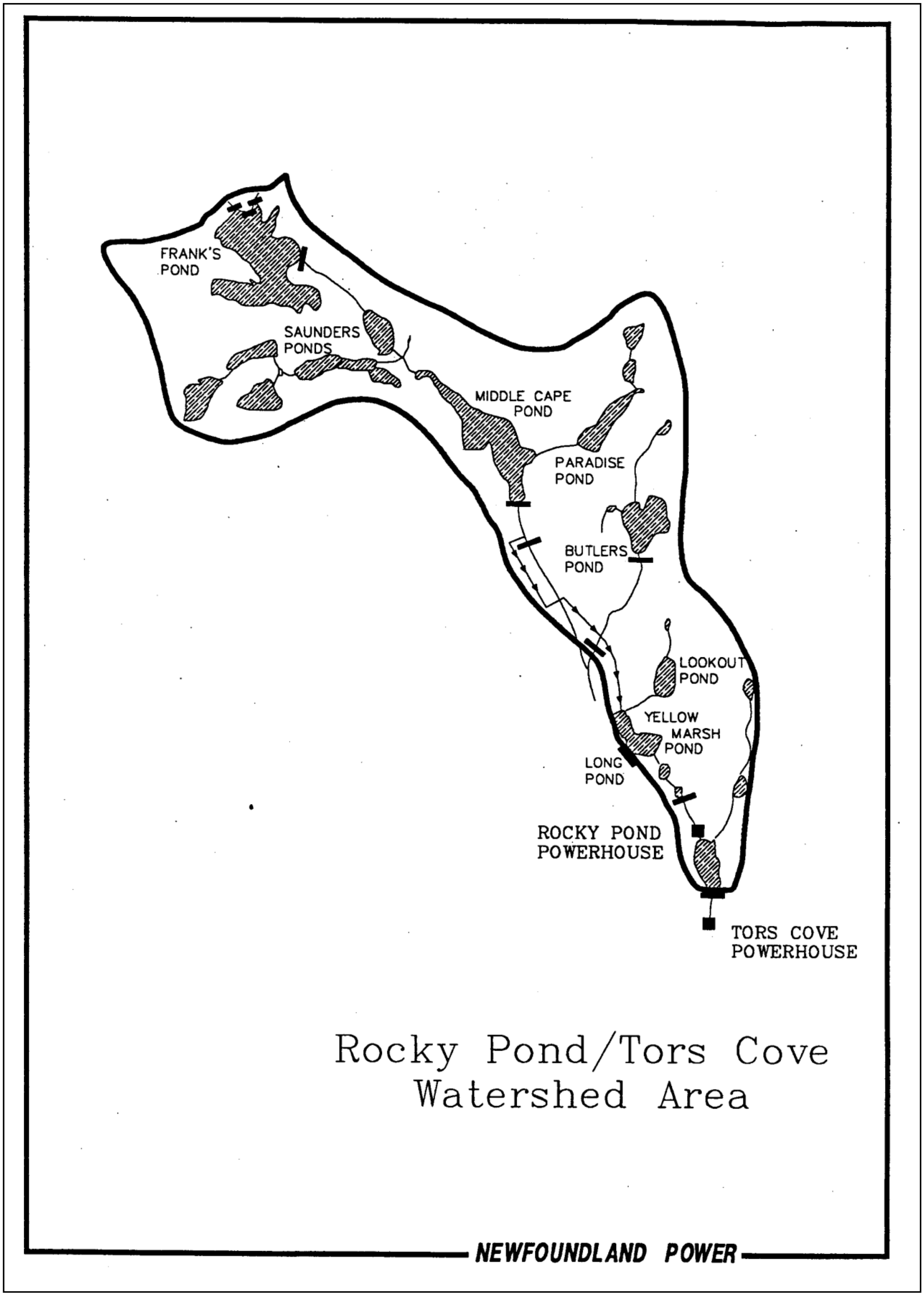
3.13 MOBILE/MORRIS


MOBILE
BIG
POND
MORRIS
POWERHOUSE
FIRST
POND
MOBILE PLANT
POWERHOUSE
Morris/Mobile
Watershed Area

ESTIMATED COST OF RETIRING MOBILE/MORRIS DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Mobile Powerhouse	Concrete (install)		$1,000.00	6	$6,000.00	$0.00	$6,000.00
Powerhouse Crane	36 tons	L.S.	$3,000.00	1	$3,000.00	$0.00	$3,000.00
Tailrace	Earth	M 3	$20.00	60	$1,200.00	$0.00	$1,200.00
(Backfill)	Washed Stone	M 3	$42.00	10	$420.00	$0.00	$420.00
Turbine/generator	Vert. Francis	L.S.	$34,000.00	1	$34,000.00	$5,000.00	$29,000.00
Penstock	Steel	M 2	$21.00	3,037	$63,777.00	$0.00	$63,777.00
	FRP (buried)	M 2	$28.00	8,008	$224,224.00	$0.00	$224,224.00
Surge Tank	Steel	L S.	$50,000.00	1	$50,000.00	$0.00	$50,000.00
Surge Tank (foundations)	Concrete	M3	$115.00	87	$10,005.00	$0.00	$10,005.00
Pipeline Thrust Blocks	Concrete	M3	$115.00	137	$15,755.00	$0.00	$15,755.00
Forebay Dam	Earth	M 3	$10.00	1,290	$12,900.00	$0.00	$12,900.00
Forebay Dam Intake	Concrete	M3	$185.00	85	$15,725.00	$0.00	$15,725.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Mobile Power Canal	Earthfill	M 3	$10.00	11,517	$115,170.00	$0.00	$115,170.00
Canal Stoplog Structure	Concrete	M 3	$185.00	9	$1,665.00	$0.00	$1,665.00
Mobile First Pond Spillway	Concrete	M 3	$185.00	237	$43,845.00	$0.00	$43,845.00
Morris Spawning Canal	Earth	M 3	$10.00	2,000	$20,000.00	$0.00	$20,000.00
Spawning Canal Control Structure	Concrete	M 3	$115.00	7	$805.00	$0.00	$805.00
Mobile Powerhouse Substructure	Concrete	M 3	$115.00	165	$18,975.00	$0.00	$18,975.00
Powerhouse bldg	Pre-eng. metal	L.S.	$10,000.00	1	$10,000.00	$7,500.00	$2,500.00
Turbine/generator	Horiz francis	L.S.	$17,000.00	1	$17,000.00	$1,200.00	$15,800.00
Penstock	FRP (buried)	M 2	$25.00	1,037	$25,925.00	$0.00	$25,925.00
Intake structure	Concrete	M 3	$185.00	60	$11,100.00	$0.00	$11,100.00
Gatehouse Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00

ESTIMATED COST OF RETIRING MOBILE/MORRIS DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Morris Canal	Earthfill	M 3	$10.00	30,000	$300,000.00	$0.00	$300,000.00
Canal stoplog structure	Concrete	M 3	$185.00	18	$3,330.00	$0.00	$3,330.00
Diversion Spillway Concrete		M 3	$185.00	13	$2,405.00	$0.00	$2,405.00
Mobile Big Pond Dam	Earthfill	M 3	$10.00	12,431	$124,310.00	$0.00	$124,310.00
Mobile Big Pond Intake	Concrete	M 3	$185.00	21	$3,885.00	$0.00	$3,885.00
Gatehouse	Woodframe	L.S.	$2,500.00	1	$2,500.00	$0.00	$2,500.00
Gatehouse Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Mobile Big Pond Spillway	Concrete	M 3	$185.00	12	$2,220.00	$0.00	$2,220.00
Selective Planting		Ha.	$1,500.00	5	$7,500.00	$0.00	$7,500.00
Mobile Substation		L.S.	$10,000.00	1	$10,000.00	$2,000.00	$8,000.00
Mobile forebay line	Single Pole	KM.	$5,000.00	2	$10,000.00	$0.00	$10,000.00
Morris Forebay line	Single Pole	KM	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Transmission line	Single Pole	KM.	$18,000.00	5	$90,000.00	$0.00	$90,000.00
Morris Substation		L.S.	$15,000.00	1	$15,000.00	$20,000.00	($5,000.00)
Mobilization/ Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$1,299,641.00**	**$35,700.00**	**$1,263,941.00**
CONTINGENCIES (10%)					$129,964.10		$126,394.10
ENVIRONMENTAL (5%)					$64,982.05		$63,197.05
ENGINEERING SUPERVISION (5%)					$64,982.05		$63,197.05
SITE REMEDIATION (10%)					$129,964.10		$126,394.10
ENVIRONMENTAL CONTROLS (5%)					$64,982.05		$63,197.05
TOTALS					**$1,754,515.35**	**$35,700.00**	**$1,706,320.35**

3.14 TORS COVE/ROCKY POND

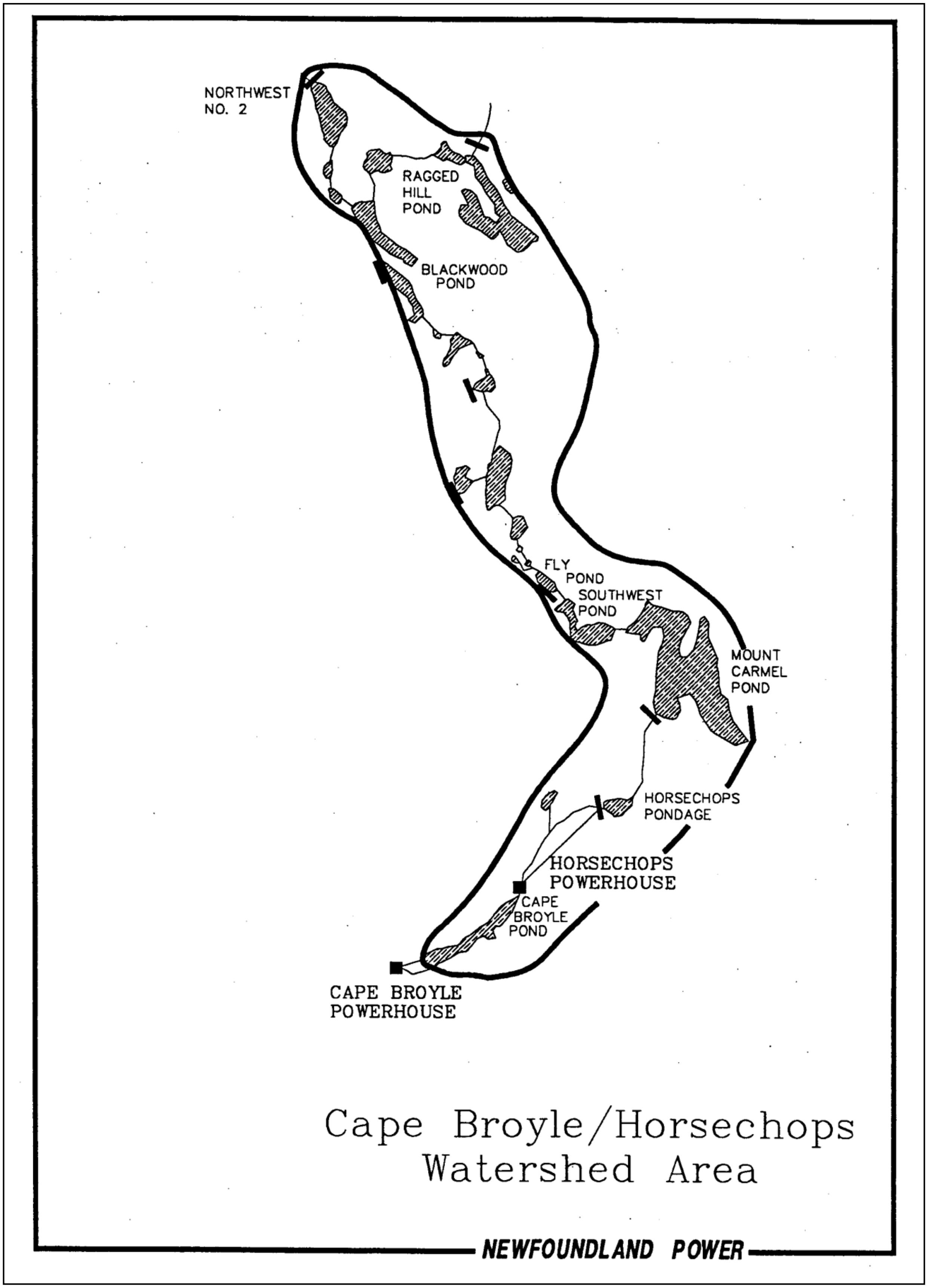

FRANK'S POND
SAUNDERS PONDS
MIDDLE CAPE POND
PARADISE POND
BUTLERS POND
LOOKOUT POND
YELLOW MARSH POND
LONG POND
ROCKY POND POWERHOUSE
TORS COVE POWERHOUSE
Rocky Pond/Tors Cove
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING TORS COVE/ROCKY POND DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Tors Cove Powerhouse	Concrete	M 3	$185.00	321	$59,385.00	$0.00	$59,385.00
powerhouse crane	15 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/Generator	Horiz Francis	L.S.	$16,000.00	3	$48,000.00	$4,000.00	$44,000.00
Tailrace	Concrete	M 3	$1,000.00	4	$4,000.00	$0.00	$4,000.00
Penstock	Woodstave	M 2	$12.00	5,958	$71,496.00	$0.00	$71,496.00
Surge Tank	Steel	L. S.	$35,000.00	1	$35,000.00	$0.00	$35,000.00
-foundations	Concrete	M 3	$115.00	80	$9,200.00	$0.00	$9,200.00
Anchor Blocks	Concrete	M 3	$115.00	100	$11,500.00	$0.00	$11,500.00
East Dam	Backfill	M 3	$11.00	285	$3,135.00	$0.00	$3,135.00
	Concrete	M 3	$1,000.00	5	$5,000.00	$0.00	$5,000.00
Tors Cove Pond Dam Reconstruction	Earthfill	L.S.	$30,000.00	1	$30,000.00	$0.00	$30,000.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Rocky Pond Powerhouse	Concrete	M 3	$185.00	133	$24,605.00	$0.00	$24,605.00
powerhouse crane	16.5 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Tailrace	Earthfill	M 3	$20.00	200	$4,000.00	$0.00	$4,000.00
Turbine/generator	Horiz-Francis	L.S	$25,000.00	1	$25,000.00	$2,000.00	$23,000.00
Penstock	Steel	M 2	$21.00	5,400	$113,400.00	$0.00	$113,400.00
Rocky Pond Dam	Earthfill	M 3	$10.00	5,575	$55,750.00	$0.00	$55,750.00
spillway	Concrete	M 3	$185.00	57	$10,545.00	$0.00	$10,545.00
intake	Concrete	M 3	$185.00	130	$24,050.00	$0.00	$24,050.00
Gatehouse		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Rocky Pond freeboard dams (3)	Earthfill	L.S.	$10.00	1,000	$10,000.00	$0.00	$10,000.00
Long Pond/Middle Pond structure	Concrete	M 3	$115.00	39	$4,485.00	$0.00	$4,485.00
Gatehouoe	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Long Pond Spillway Dam	Earthfill	M 3	$11.00	819	$9,009.00	$0.00	$9,009.00
Lamanche Canal Spillways (6)	Timber Crib	L.S.	$3,000.00	6	$18,000.00	$0.00	$18,000.00

ESTIMATED COST OF RETIRING TORS COVE/ROCKY POND DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Butlers Spillway	Timber Crib	M 3	$30.00	286	$8,580.00	$0.00	$8,580.00
Lamanche Canal	Earthfill	M 3	$10.00	12,493	$124,930.00	$0.00	$124,930.00
Butlers Pond Dam	Timber Crib	M 3	$30.00	1,000	$30,000.00	$0.00	$30,000.00
Cluneys Downstream Spillway	Timber Crib	M 3	$30.00	120	$3,600.00	$0.00	$3,600.00
Cluney's Weir	Concrete	M 3	$115.00	65	$7,475.00	$0.00	$7,475.00
Cluney's Control Structure	Concrete	M 3	$115.00	23	$2,645.00	$0.00	$2,645.00
	Gabions	M 3	$25.00	40	$1,000.00	$0.00	$1,000.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Cluney's upstream spillway	Earthfill	M 3	$11.00	890	$9,790.00	$0.00	$9,790.00
Cluney's Diversion Dam	Earthfill	M 3	$11.00	1,300	$14,300.00	$0.00	$14,300.00
Cluney's Canal	Earthfill	M 3	$10.00	8,254	$82,540.00	$0.00	$82,540.00
Cape Pond Dam	Earthfill	M 3	$10.00	14,500	$145,000.00	$0.00	$145,000.00
spillway	Concrete	M 3	$115.00	625	$71,875.00	$0.00	$71,875.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Saunders Pond Dam	Timber Crib	M 3	$30.00	170	$5,100.00	$0.00	$5,100.00
Saunders Pond							
Spillway	Timber Crib	M 3	$30.00	75	$2,250.00	$0.00	$2,250.00
Frank's Pond Storage Dam	Earthfill	M 3	$10.00	1,929	$19,290.00	$0.00	$19,290.00
Frank's Pond Intake	Concrete	M 3	$185.00	33	$6,105.00	$0.00	$6,105.00
Gatehouse	Woodframe	L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Gatehouse equipment		L.S.	$2,000.00	1	$2,000.00	$2,000.00	$0.00
Franks Pond							
No. 7 Dam	Earthfill	M 3	$10.00	455	$4,550.00	$0.00	$4,550.00
No. 6 Dam	Earthfill	M 3	$11.00	350	$3,850.00	$0.00	$3,850.00
No. 5 Dam	Earthfill	M 3	$11.00	870	$9,570.00	$0.00	$9,570.00
No. 4 Dam	Earth Encased	M 3	$11.00	835	$9,185.00	$0.00	$9,185.00
No. 3 Dam	Earth Encased	M 3	$11.00	400	$4,400.00	$0.00	$4,400.00

ESTIMATED COST OF RETIRING TORS COVE/ROCKY POND DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
No. 2 Dam	Earthfill	M	$10.00	120	$1,200.00	$0.00	$1,200.00
No. 1 Dam	Vertical Wood	L.S.	$1,200.00	1	$1,200.00	$0.00	$1,200.00
Frank's Pond Canal	Earthfill	M 3	$10.00	5,664	$56,640.00	$0.00	$56,640.00
Revegetation					$0.00		
Selective Planting		Ha.	$1,500.00	8	$12,000.00	$0.00	$12,000.00
Transmission Lines							
Tore Cove	Single Pole	KM.	$18,000.00	5	$90,000.00	$0.00	$90,000.00
Tore Cove Forebay Line	Single Pole	KM	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Rocky Pond	Single Pole	KM.	$18,000.00	1	$18,000.00	$0.00	$18,000.00
Rocky Pond Forebay Line	Single Pole	KM.	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Substation							
Tore Cove		L.S.	$7,500.00	1	$7,500.00	$18,758.00	($11,258.00)
Rocky Pond		L.S.	$7,500.00	1	$7,500.00	$2,000.00	$5,500.00
Mobilization/ Demobilization		L.S.	$50,000.00	1	$50,000.00	$0.00	$50,000.00
SUBTOTALS					**$1,416,635.00**	**$28,758.00**	**$1,387,877.00**
CONTINGENCIES (10%)					$141,663.50		$138,787.70
ENVIRONMENTAL (10%)					$141,663.50		$138,787.70
ENGINEERING & SUPERVISION (5%)					$70,831.75		$69,393.85
SITE REMEDIATION (8%)					$113,330.80		$111,030.16
ENVIRONMENTAL CONTROLS (5%)					$70,831.75		$69,393.85
TOTALS					**$1,954,956.30**	**$28,758.00**	**$1,915,270.26**

3.15 CAPE BROYLE/HORSE CHOPS

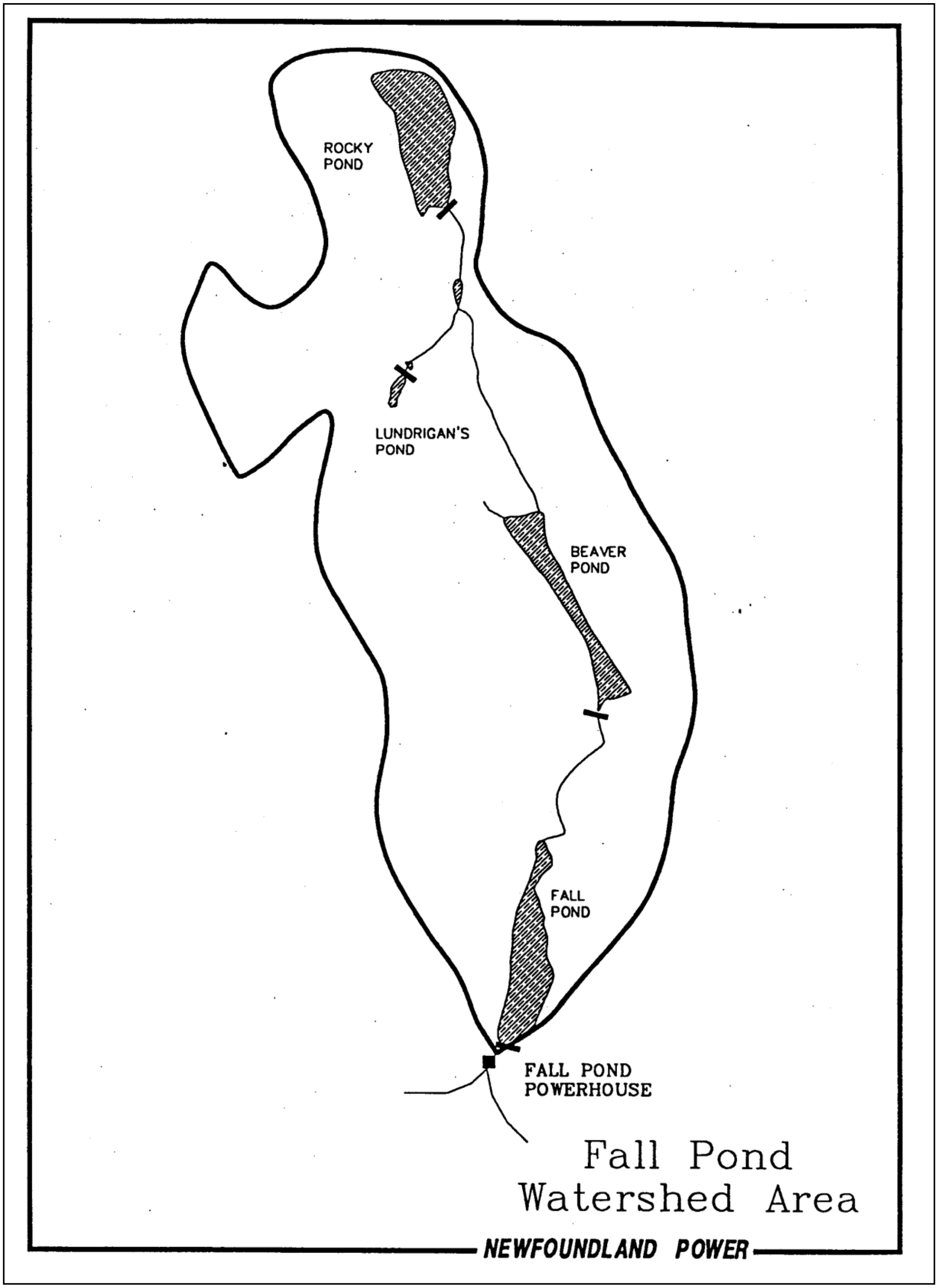

NORTHWEST
NO. 2
RAGGED
HILL
POND
BLACKWOOD
POND
FLY
POND
SOUTHWEST
POND
MOUNT
CARMEL
POND
HORSECHOPS
PONDAGE
HORSECHOPS
POWERHOUSE
CAPE
BROYLE
POND
CAPE BROYLE
POWERHOUSE
Cape Broyle/Horsechops
Watershed Area
NEWFOUNDLAND POWER

ESTIMATED COST OF RETIRING CAPE BROYLE/HORSECHOPS DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
"CAPE BROYLE"							
Powerhouse							
Superstructure	Masonry	M 3	$115.00	156	$17,940.00	$0.00	$17,940.00
Substructure	Concrete	M 3	$185.00	50	$9,250.00	$0.00	$9,250.00
Powerhouse crane	30 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/Generator	Vertical francis	L.S.	$30,000.00	1	$30,000.00	$4,000.00	$26,000.00
Tailrace							
-installed concrete	Concrete	M 3	$1,000.00	4	$4,000.00	$0.00	$4,000.00
Penstock	Steel	M 2	$21.00	3,236	$67,956.00	$0.00	$67,956.00
Anchor Blocks and piers	Concrete	M3	$185.00	600	$111,000.00	$0.00	$111,000.00
backfill	Misc.	M 3	$10.00		$0.00	$0.00	$0.00
Intake	Concrete	M 3	$185.00	35	$6,475.00	$0.00	$6,475.00
backfill	Misc	M 3	$10.00	175	$1,750.00	$0.00	$1,750.00
installed concrete	Concrete	M 3	$1,000.00	10	$10,000.00	$0.00	$10,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Cape Broyle Spillway	Timber	M 3	$50.00	70	$3,500.00	$0.00	$3,500.00
installed concrete	Concrete	M 3	$1,000.00	9	$9,000.00	$0.00	$9,000.00
"HORSE CHOPS"							
Powerhouse							
superstructure	Steel	M 3	$21.00	1,570	$32,970.00	$0.00	$32,970.00
substructure	Concrete	M 2	$185.00	112	$20,720.00	$0.00	$20,720.00
siding	Asbestos	M 2	$35.00	515	$18,025.00	$0.00	$18,025.00
powerhouse crane	36 ton	L.S.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Turbine/Generator	Vertical Francis	L.S.	$30,000.00	1	$30,000.00	$4,000.00	$26,000.00
Tailrace							
culverts	Steel	M 3	$20.00	180	$3,600.00	$0.00	$3,600.00
backfill	Misc.	M 3	$10.00	1,008	$10,080.00	$0.00	$10,080.00

ESTIMATED COST OF RETIRING CAPE BROYLE/HORSECHOPS DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Penstock	Steel	M 2	$21.00	8,018	$168,378.00	$0.00	$168,378.00
Anchor Blocks and piers	Concrete	M3	$185.00	930	$172,050.00	$0.00	$172,050.00
Surge Tank	Steel	L. S.	$50,000.00	1	$50,000.00	$0.00	$50,000.00
foundations	Concrete	M 3	$115.00	80	$9,200.00	$0.00	$9,200.00
Intake	Concrete	M 3	$185.00	35	$6,475.00		$6,475.00
gate equipment		L.S	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Embankment	Earthfill	M 3	$10.00	700	$7,000.00	$0.00	$7,000.00
Horse Chops Power Canal	Earthfill	M 3	$10.00	13,000	$130,000.00	$0.00	$130,000.00
Horse Chops East dam	Earthfill	M 3	$10.00	1,215	$12,150.00	$0.00	$12,150.00
Horse Chops spillway	Concrete	M 3	$185.00	40	$7,400.00	$0.00	$7,400.00
Horse Chops West Dam	Earthfill	M 3	$10.00	8,164	$81,640.00	$0.00	$81,640.00
Mount Carmel Pond Dam	Earthfill	M 3	$10.00	11,265	$112,650.00	$0.00	$112,650.00
outlet	Concrete	M 3	$185.00	130	$24,050.00	$0.00	$24,050.00
spillway	Concrete	M 3	$115.00	246	$28,290.00	$0.00	$28,290.00
backfill	Misc.	M 3	$10.00	1,100	$11,000.00	$0.00	$11,000.00
gate equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Fly Pond Diversion Dam & Emergency							
Plug Spillway	Earthfill	M 3	$10.00	1,380	$13,800.00	$0.00	$13,800.00
Fly Pond Canal Bridge	Steel & Timber	L.S.	$4,800.00	1	$4,800.00	$0.00	$4,800.00
Two Arm Pond Diversion Dam	Earthfill	M 3	$10.00	1,300	$13,000.00	$0.00	$13,000.00
Fourth Blackwoods Pond Canal Bridge and							
Stoplog Structure	Concrete	M 3	$185.00	10	$1,850.00	$0.00	$1,850.00
Fourth Blackwoods ond Diversion							
Dam/Spillway	Earthfill	M 3	$11.00	358	$3,938.00	$0.00	$3,938.00
Fourth Blackwood Pond Freeboard Dams (1&2)	Earthfill	M 3	$10.00	300	$3,000.00	$0.00	$3,000.00
East Blackwoods Pond Spillway	Earthfill	M 3	$11.00	306	$3,366.00	$0.00	$3,366.00
East Blackwoods					$0.00		$0.00

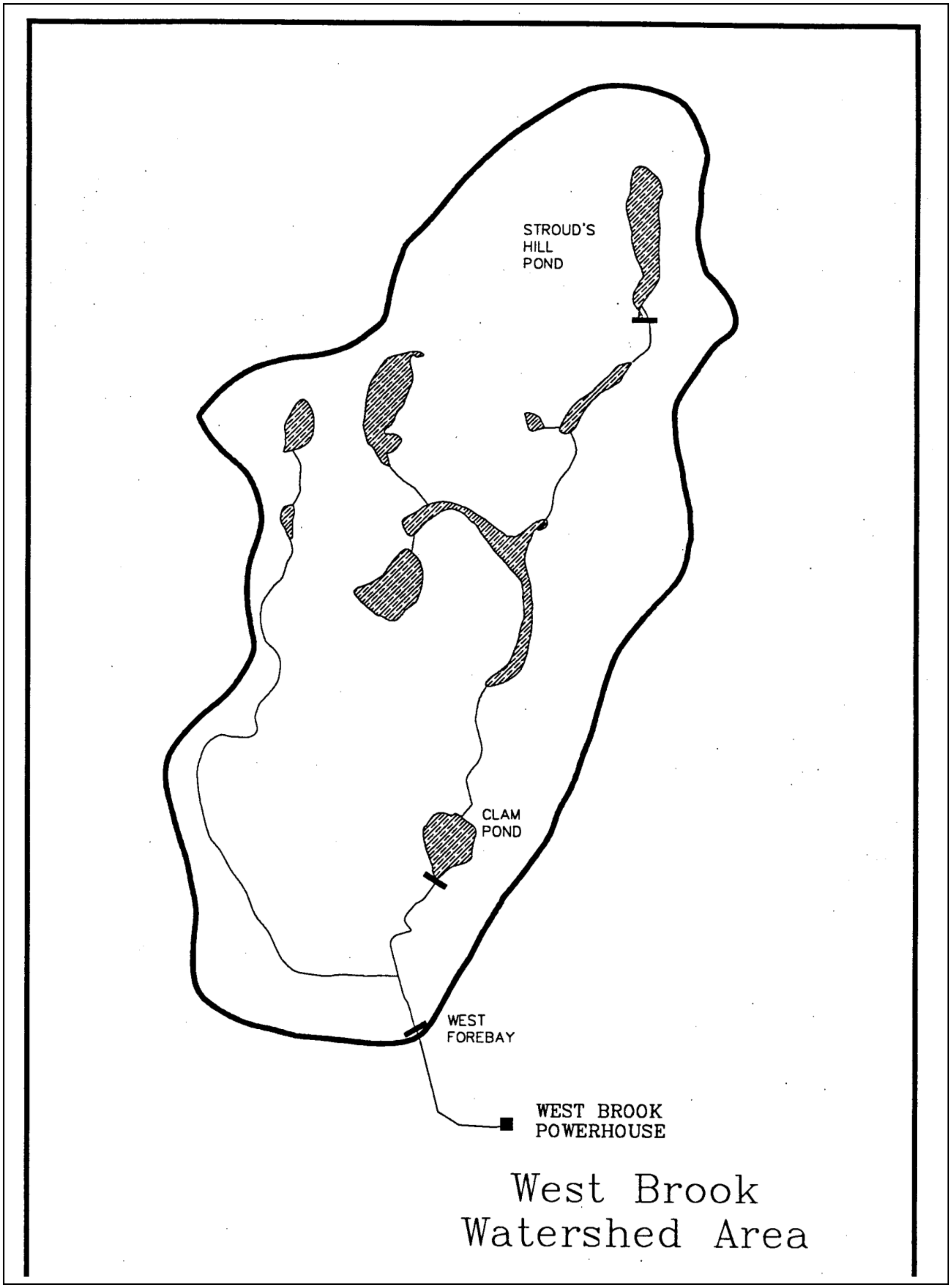
ESTIMATED COST OF RETIRING CAPE BROYLE/HORSECHOPS DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
East Blackwoods Pond Freeboard Dams (1-9)	Earthfill	M 3	$10.00	1,960	$19,600.00	$0.00	$19,600.00
Northwest Blackwoods Pond							
diversion dam	Earthfill	M 3	$10.00	2,126	$21,260.00	$0.00	$21,260.00
freeboard dam	Earthfill	M 3	$10.00	150	$1,500.00	$0.00	$1,500.00
Pond K Diversion Dam	Earthfill	M 3	$10.00	840	$8,400.00	$0.00	$8,400.00
Jordan River					$0.00		
diversion dam	Earthfill	M 3	$10.00	495	$4,950.00	$0.00	$4,950.00
freeboard dam (1&2)	Earthfill	M 3	$10.00	650	$6,500.00	$0.00	$6,500.00
West Ragged Hills Spillway Dam	Timber crib	M 3	$30.00	301	$9,030.00	$0.00	$9,030.00
Rock Pond Dam	Earthfill	M 3	$10.00	107	$1,070.00	$0.00	$1,070.00
Revegetation							
selected planting		Ha	$1,500.00	6	$9,000.00	$0.00	$9,000.00
hydroseeding		M 2	$3.00	1,400	$4,200.00	$0.00	$4,200.00
"OTHER"							
storage sheds	Woodframe	L S.	$2,500.00	1	$2,500.00	$0.00	$2,500.00
concrete		M 3	$185.00	11	$2,035.00	$0.00	$2,035.00
Substation (Horsechops)		L.S	$12,000.00	1	$12,000.00	$3,000.00	$9,000.00
Transmission (Horsechops)							
Forebay Line	Single Pole	KM	$5,000.00	1	$5,000.00	$0.00	$5,000.00
Transmission Line H-frame		KM.	$20,000.00	6	$120,000.00	$0.00	$120,000.00
Substation (Cape Broyle)		L.S.	$13,500.00	1	$13,500.00	$3,000.00	$10,500.00
Mobilization/ Demobilization		L.S.	$50,000.00	1	$50,000.00	$0.00	$50,000.00
SUBTOTALS					**$1,549,848.00**	**$14,000.00**	**$1,535,848.00**
CONTINGENCIES (10%)					$154,984.80		$153,584.80
ENVIRONMENTAL (8%)					$123,987.84		$122,867.84
ENGINEERING & SUPERVISION (5%)					$77,492.40		$76,792.40
SITE REMEDIATION (8%)					$123,987.84		$122,867.84
ENVIRONMENTAL CONTROLS (5%)					$77,492.40		$76,792.40
TOTALS					**$2,107,793.28**	**$14,000.00**	**$2,088,753.28**

3.16 FALL POND


ROCKY
POND
LUNDRIGAN'S
POND
BEAVER
POND
FALL
POND
FALL POND
POWERHOUSE
Fall Pond
Watershed Area
NEWFOUNDLAND POWER

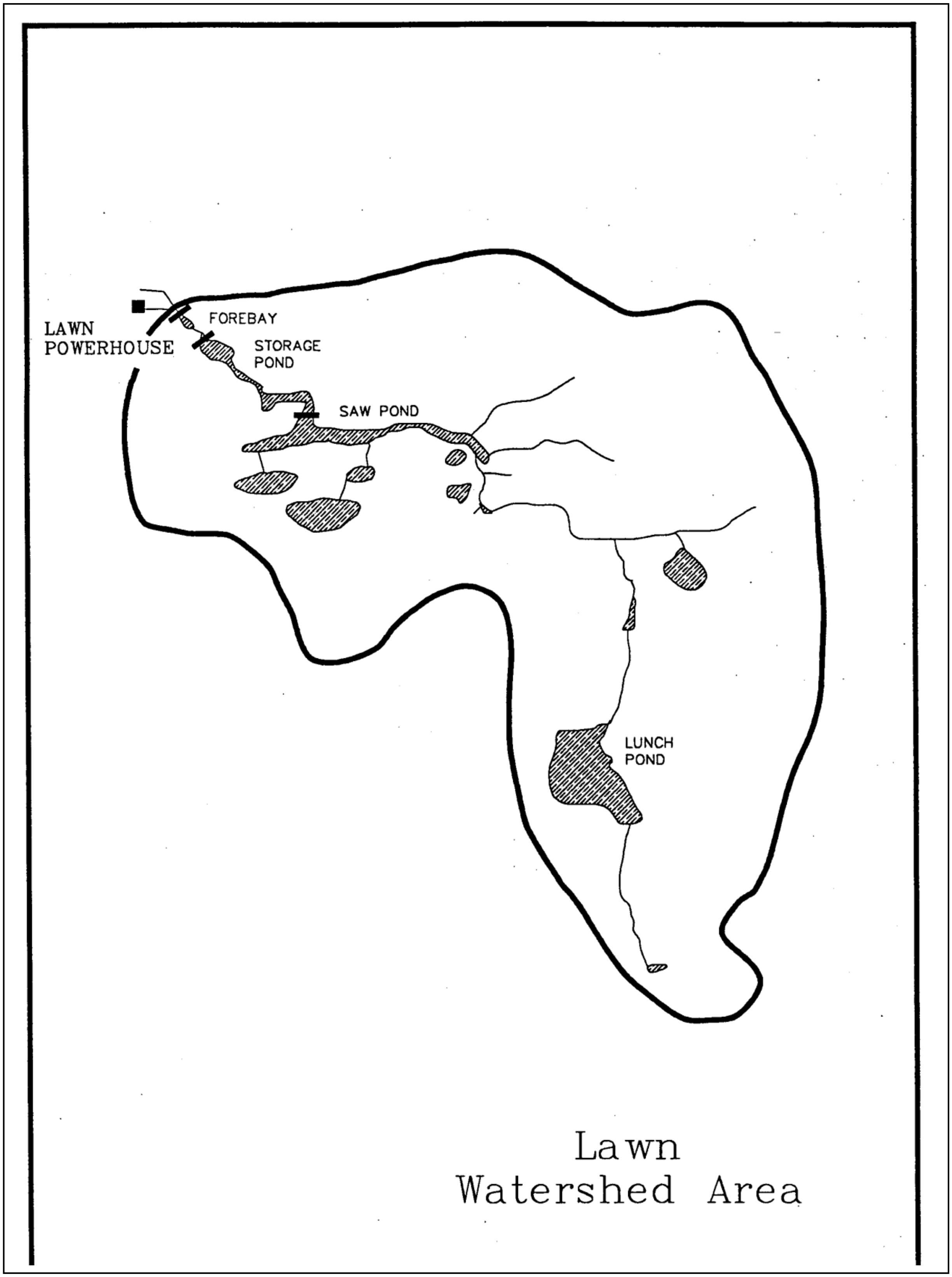
ESTIMATED COST OF RETIRING FALL POND DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
Superstructure	Concrete	M 3	$185.00	52	$9,620.00	$0.00	$9,620.00
Substructure	Concrete	M 3	$185.00	26	$4,810.00	$0.00	$4,810.00
Turbine/Generator	Horiz. Francis	L.S.	$18,500.00	1	$18,500.00	$0.00	$18,500.00
Penstock	Woodstave	M 2	$21.00	50	$1,050.00	$0.00	$1,050.00
Forebay Structures	Concrete	M	$185.00	1,450	$268,250.00	$0.00	$268,250.00
Replacement Dam	Concrete	L.S.	$90,000.00	1	$90,000.00	$0.00	$90,000.00
Beaver Pond Dam	Timber Crib	L.S.	$6,000.00	1	$6,000.00	$0.00	$6,000.00
Lundrigan's Pond	Timber Crib	L.S.	$6,000.00	1	$6,000.00	$0.00	$6,000.00
Rocky Pond Structure	Rockfill	L.S.	$6,000.00	1	$6,000.00	$0.00	$6,000.00
Revegetation							
Selected Planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Mobilization/Demonilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Substation		L.S.	$9,000.00	1	$9,000.00	$1,000.00	$8,000.00
SUBTOTALS					**$432,730.00**	**$1,000.00**	**$431,730.00**
CONTINGENCIES (10%)					$43,273.00		$43,173.00
ENVIRONMENTAL (5%)					$21,636.50		$21,586.50
ENGINEERING & SUPERVISION (5%)					$21,636.50		$21,586.50
SITE REMEDIATION (10%)					$43,273.00		$43,173.00
ENVIRONMENTAL CONTROLS (5%)					$21,636.50		$21,586.50
TOTALS					**$584,185.50**	**$1,000.00**	**$582,835.50**

3.17 WEST BROOK


STROUD'S
HILL
POND
CLAM
POND
WEST
FOREBAY
WEST BROOK
POWERHOUSE
West Brook
Watershed Area

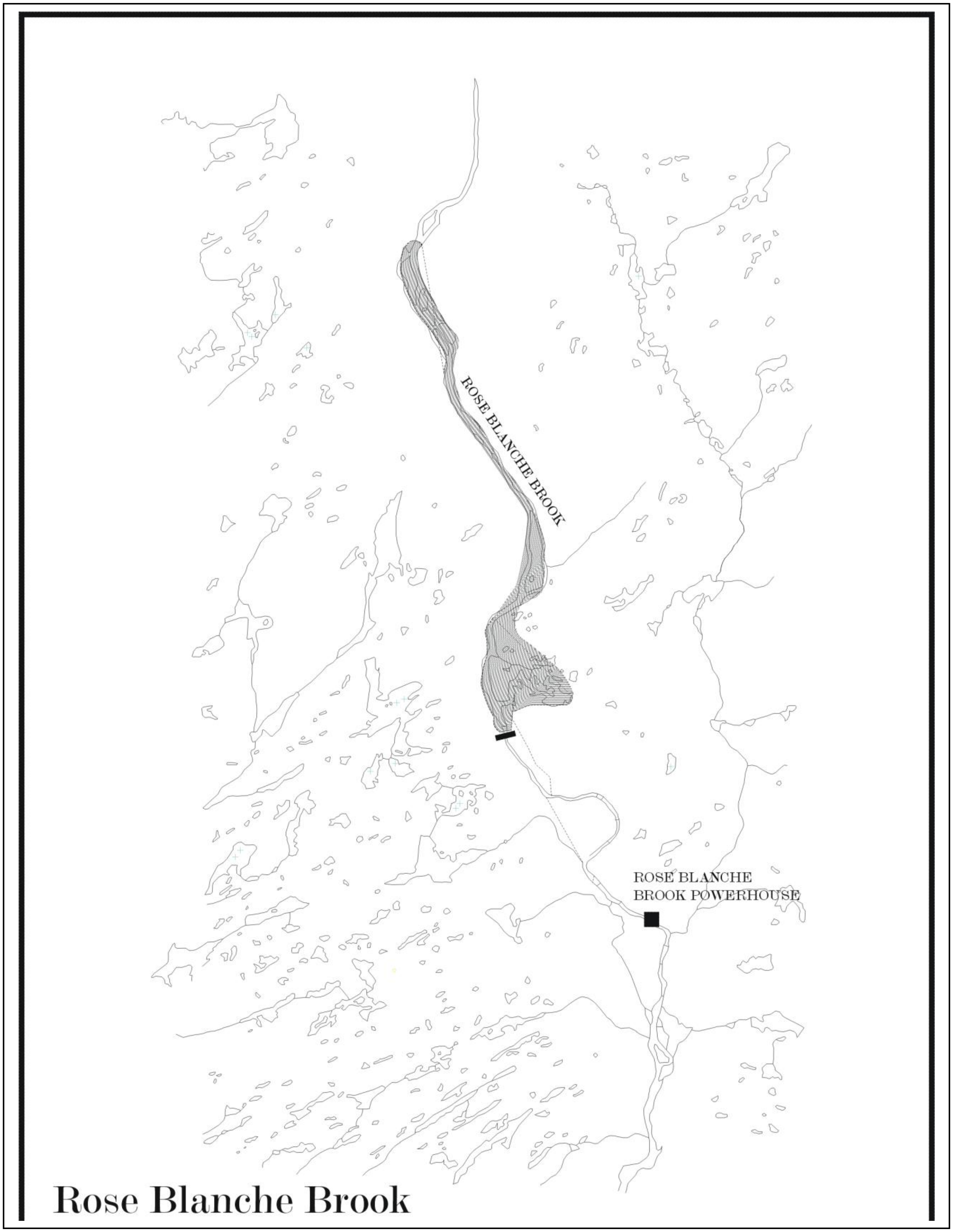
ESTIMATED COST OF RETIRING WEST BROOK DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse	Concrete	L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Turbine/Generator	Horiz-Francis	L.S.	$18,000.00	1	$18,000.00	$0.00	$18,000.00
Tailrace	Earth Excavation	M 3	$10.00	321	$3,210.00	$0.00	$3,210.00
Penstock	Fiberglass (buried)	M 2	$25.00	2,311	$57,775.00	$0.00	$57,775.00
Intake & Canal Spillway	Concrete	M 3	$185.00	15	$2,775.00	$0.00	$2,775.00
Replacement Dam	Earthfill	M 3	$20.00	675	$13,500.00	$0.00	$13,500.00
Power Canal Rehab		L.S.	$18,000.00	1	$18,000.00	$0.00	$18,000.00
Repairs to Forebay Dam	Concrete	M 3	$1,000.00	150	$150,000.00	$0.00	$150,000.00
Strouds Hill							
Strouds Hill Pond Structure	Timber crib	M 3	$30.00	200	$6,000.00	$0.00	$6,000.00
Selected Planting	Revegetation	Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
Substation		L.S.	$7,300.00	1	$7,300.00	$1,000.00	$6,300.00
Mobilization/ Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$302,060.00**	**$1,000.00**	**$301,060.00**
CONTINGENCIES (10%)					$30,206.00		$30,106.00
ENVIRONMENTAL (5%)					$15,103.00		$15,053.00
ENGINEERING & SUPERVISION (5%)					$15,103.00		$15,053.00
SITE REMEDIATION (10%)					$30,206.00		$30,106.00
ENVIRONMENTAL CONTROLS (5%)					$15,103.00		$15,053.00
TOTALS					**$407,781.00**	**$1,000.00**	**$406,431.00**

3.18 LAWN


LAWN
POWERHOUSE
FOREBAY
STORAGE
POND
SAW POND
LUNCH
POND
Lawn
Watershed Area

ESTIMATED COST OF RETIRING LAWN DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse	Concrete	L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Turbine/ Generator	Horiz.Francis	L.S.	$18,000.00	1	$18,000.00	$0.00	$18,000.00
Penstock	Woodstave	M2	$12.00	960	$11,520.00	$0.00	$11,520.00
Forebay Dam	(Conc. encased)	L.S	$58,000.00	1	$58,000.00	$0.00	$58,000.00
	Rockfill	M3	$11.00	1,200	$13,200.00	$0.00	$13,200.00
	Gatelift	L S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Replacement Dam	Concrete	L.S.	$60,000.00	1	$60,000.00	$0.00	$60,000.00
Forebay Spillway	Concrete	M3	$115.00	15	$1,725.00	$0.00	$1,725.00
Revegetation							
-Hydroseeding		H 2	$3.00	900	$2,700.00	$0.00	$2,700.00
Substation		L.S.	$12,000.00	1	$12,000.00	$2,000.00	$10,000.00
Mobilization/ Demobilization		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
SUBTOTALS					**$203,145.00**	**$2,000.00**	**$201,145.00**
CONTINGENCIES (10%)					$20,314.50		$20,114.50
ENVIRONMENTAL (5%)					$10,157.25		$10,057.25
ENGINEERING & SUPERVISION (5%)					$10,157.25		$10,057.25
SITE REMEDIATION (10%)					$20,314.50		$20,114.50
ENVVIRONMENTAL CONTROLS (5%)					$10,157.25		$10,057.25
TOTALS					**$274,245.75**	**$2,000.00**	**$271,545.75**

3.19 ROSE BLANCHE


ROSE BLANCHE BROOK
ROSE BLANCHE
BROOK POWERHOUSE
Rose Blanche Brook

ESTIMATED COST OF RETIRING ROSE BLANCHE PLANT DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							
superstructure	Steel	m3	$21.00	1085	$22,785.00	$5,000.00	$17,785.00
substructure	Concrete	m3	$185.00	1015	$187,775.00	$0.00	$187,775.00
Powerhouse crane	30 ton	L.S.	$1,500.00	1	$1,500.00	$2,500.00	($1,000.00)
Turbine/Generator	Dual Hor. Francis	L.S.	$120,000.00	1	$120,000.00	$300,000.00	($180,000.00)
Tailrace	Concrete	m3	$185.00	123	$22,755.00	$0.00	$22,755.00
	Excavation	m3	$11.00	1200	$13,200.00	$0.00	$13,200.00
Penstock							
above ground	Streel	m2	$17.50	6765	$118,387.50	$0.00	$118,387.50
anchor blocks	Concrete	m3	$185.00	1200	$222,000.00	$0.00	$222,000.00
Forebay Dam	Concrete	m3	$185.00	1010	$186,850.00	$0.00	$186,850.00
	Rockfill	m3	$10.00	26600	$266,000.00	$0.00	$266,000.00
spillway	Concrete	m3	$185.00	67	$12,395.00	$0.00	$12,395.00
Intake	Concrete	m3	$185.00	680	$125,800.00	$0.00	$125,800.00
Gate Equipment		L.S.	$2,000.00	1	$2,000.00	$0.00	$2,000.00
Revegetation							
selective planting		Ha.	$1,500.00	1	$1,500.00	$0.00	$1,500.00
hydroseeding		m2	$3.00	5000	$15,000.00	$0.00	$15,000.00
Mobilization/		L.S.	$12,000.00	1	$12,000.00	$0.00	$12,000.00
Demobilization							
Substation		L.S.	$9,000.00	1	$9,000.00	$5,000.00	$4,000.00
Transmission		KM	$18,000.00	5	$90,000.00	$10,000.00	$80,000.00
SUBTOTALS					**$1,428,947.50**	**$322,500.00**	**$1,106,447.50**
CONTINGENCIES (10%)					$142,894.75		$110,644.75
ENGINEERING & SUPERVISION (5%)					$71,447.38		$55,322.38

ESTIMATED COST OF RETIRING ROSE BLANCHE PLANT DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
ENVIRONMENTAL ASSESSMENT (6%)					$85,736.85		$66,386.85
SITE REMEDIATION (10%)					$142,894.75		$110,644.75
ENVIRONMENTAL CONTROLS (5%)					$71,447.38		$55,322.38
TOTALS					**$1,943,368.60**	**$322,500.00**	**$1,504,768.60**

Appendix A

Decommissioning for Hydro Plants Update October 2000

DECOMMISSIONING
FOR
HYDROELECTRIC PLANTS
OWNED BY
NEWFOUNDLAND POWER INC.

UPDATE
OCTOBER 2000

TABLE OF CONTENTS

PART 3 - DECOMMISSIONING SCENARIOS AND ESTIMATES (cont'd)

PART I

SUMMARY

1.1 SUMMARY OF RESULTS

This report presents the results of a study to estimate the gross salvage, cost of retiring, and net salvage of the hydro-electrical developments owned by Newfoundland Power as of December 1999. Separate estimates are provided of the gross salvage, cost of retiring and net salvage of each hydroelectric plant.

All estimates are stated in Canadian dollars of 2000 purchasing power.

Estimated Gross Salvage
Cost of Retiring
&
Net Salvage for Hydroelectric Plants

Plant	(1) Fixed Capital $000	(2) Estimated Gross Salvage $000	(3) Estimated Cost of Retiring $000	(4) Estimated Net Salvage (Col.2 - Col.3) $000
Lookout Brook	8,414.8	21.2	(668.6)	(647.4)
Sandy Brook	3,011.2	26.0	(388.8)	(362.8)
Rattling Brook	4,715.5	46.8	(592.8)	(546.0)
Port Union	1,844.8	55.2	(214.2)	(159.0)
Lockston	1,458.7	10.3	(216.3)	(206.0)
Heart's Content	1,874.8	62.6	(248.1)	(185.6)
New Chelsea/Pittman's	2,884.0	36.0	(387.9)	(351.9)
Victoria	1,148.3	6.5	(215.4)	(209.0)
Seal Cove	2,789.7	58.1	(500.6)	(442.5)
Topsail	5,295.6	34.7	(494.4)	(459.7)
Petty Harbour	7,066.8	8.5	(371.1)	(362.6)
Pierre's Brook	5,212.9	78.1	(502.6)	(424.5)
Mobile/Morris	8,989.8	72.8	(800.6)	(727.8)
Tors Cove/Rocky Pond	7,756.9	47.5	(901.7)	(854.3)
Cape Broyle/Horse Chops	7,676.2	56.7	(828.0)	(771.3)
Fall Pond	648.3	9.0	(356.4)	(347.4)
West Brook	1,767.5	8.3	(237.7)	(229.4)
Lawn	1,956.1	26.7	(187.4)	(160.6)
Rose Blanche	14,805.5	539.5	(1,078.0)	(538.5)
Total	**89,317.4**	**1,204.50**	**-9,191.60**	**-7,986.30**

NEWFOUNDLAND POWER
HYDRO GENERATION FIGURES (1999)

Plant	Est. Normal GWHS	POG Capacity KW
Petty Harbour	17	5305
Pierres Brook	27.7	4300
Tors Cove	26	6500
Rocky Pond	14.5	3250
Mobile	46.3	11968
Cape Broyle	34.5	6280
Horse Chops	50.1	8300
Topsail	13.1	2550
Seal Cove	10.1	3500
Hearts Content	8.5	2370
Victoria	3.1	550
New Chelsea	15.4	3700
Pittmans Pond	2.6	625
Morris	7.3	1135
West Brook	3.5	680
Fall Pond	1.1	350
Lawn	2.8	600
Rattling Brook	72.7	11100
Sandy Brook	27	5530
Lockston	8	3375
Port Union	2.8	600
Lookout Brook	33.3	6150
Rose Blanche	23	5964
Total	**450.4**	**94682**

PART 2

INTRODUCTION

2.1 GENERAL

Newfoundland Power owns and operates 23 small hydroelectric plants in 19 developments. The total installed capacity is 94.7 MW and they generate an average of 450 GWH per annum. The turbine-generator units range in size from 350 kW to 12,000 kW. These developments are scattered all over the province with the greatest concentration on the Avalon Peninsula. The oldest development in the system is Petty Harbour, which is vintage 1900 while the newest development is Rose Blanche Plant. The Rose Blanche Development was constructed in 1998 and commissioned in 1999.

Since the late seventies there has been extensive work carried out on the existing hydro plants with replacements of various components due to deterioration. Replacements have included entire turbine-generator sets, dams, penstocks, switchgear and controls, and other components. As well as replacement there has been various repairs and upgrading carried out including runner replacements, concrete dam repairs and controls upgrading. The intention of Newfoundland Power is to maintain and operate these developments as long as they continue to be an economical source of energy.

The first basic assumption of this report is that all developments will be maintained in good condition up until the time that they are decommissioned. This means that there should be no unexpected environmental costs during decommissioning. All equipment will be maintained in good condition and any faulty equipment will be replaced.

In the preparation of this report a number of difficulties in estimating decommissioning costs were encountered. The main items were environmental factors, demolition cost estimates, salvage values and availability of drawings and other technical information for each component. In order to carry out the estimates many appropriate assumptions and methodologies of decommissioning were developed. Comments on these assumptions are presented in point form.

2.1.1 Environmental

Most work either in new construction or decommissioning affects the environment in some way and is therefore subject to approval from a number of government agencies before execution of the work. In addition to direct approvals there will be a requirement to go through an environmental assessment process before any approvals can be obtained for the decommissioning of an entire project. In view of this, each development has a lump sum cost included for this environmental assessment. This lump sum ranges from five to eight percent of the total decommissioning cost and is dependent on the environmental sensitivity.

Recent decommissioning projects also have had the added measure of a full assessment of the site to determine the occurrence of contaminants. As stated previously all sites will be cleaned up on an ongoing basis to ensure there are no legacy issues with respect to contamination, however, it will be necessary upon the decommissioning of an entire site to verify that the site is clean. A lump sum of five percent of the total cost has been added for this work.

The methods assumed for decommissioning the various components in the developments are based mainly on past experience. As stated previously, many structures in our small hydro systems have been rebuilt and this work involved retirement of the original structures. The decommissioning procedures are based on experience from these projects. As well, prior to compiling this report, input from the Department of Environment & Labour was obtained to see if there will be more stringent measures required in future.

One of the most critical environmental concerns, of course, is salmonids. This is a major consideration in all work associated with hydroelectric developments and is considered a significant factor in decommissioning of dams. Past experience governed the various scenarios and costs reflected in the mandate of the Federal Department of Fisheries and Oceans of no net loss in fish habitat. This was the main factor for determining which direction the water would flow after removal of dams as well as the extra work that would be required on some dams to allow for passage of fish.

Other environmental concerns were water levels on reservoirs where there are a considerable number of inhabitants, both year round and seasonal, and maintenance of reservoirs that are used for municipal water supply. In both of these cases the dams would be left in place or replaced with a lower level dam in new condition. The structures would then be turned over to the appropriate authority.

2.1.2 Dams

Dams are the most environmentally sensitive component of hydroelectric projects due to their effect on water resources and fish habitat as well as their impact on flooding of land. As a basis for this study we have made the following assumptions or restrictions for the decommissioning of dams.

- The removal of dams must direct the flow of water to its original direction.
- The outlet channel after retirement of the dam must allow upstream passage of fish.
- The outlet channel must be wide enough and side slopes protected to allow passage of required flood flows.

- For earthfill dams the remainder of the dam, after the outlet is opened, will be leveled and graded to a maximum slope of 1:5.

- The timber crib dams will be demolished with all exposed timber being buried adjacent to site. The remaining rock rubble will be mounded and sloped to a maximum slope of 1:5.

- Disposal of treated timbers will required special attention. The treated timbers will be removed from site and disposed of at an approved waste disposal site. At this time disposal of this timber is permitted at local landfill sites.

- Concrete dams will be demolished to original ground level and all concrete will be buried adjacent to site.

- Areas where the dams were located will be reinstated by covering with topsoil and seeded or will receive selected planting.

- In areas where the reservoir is used as a municipal water supply the dam will be reinstated to good condition and the required structures will be turned over to the local authority.

- In areas where the reservoir is used for recreation the dam will be demolished and reinstated to maintain normal low water levels. The associated structure(s) will then be turned over to the local authority.

- There are numerous small dykes that form part of the developments and since there are minimum costs associated with any removal, these dams have been given a uniform lump sum cost for decommissioning.

Costs used in the estimates are based on actual costs that have been incurred to carry out similar work in recent years.

2.1.3 Penstocks

The various decommissioning scenarios for woodstave and steel penstocks again are based on past experience. The fiberglass penstocks are based on discussion with the manufacturer.

- For woodstave penstocks the pipe will be demolished in sections and the treated timber will be transported to the nearest waste disposal site, while the steel bands will be separated and transported to a scrap metal dealer.

- For steel penstocks the steel pipe will be cut up and transported to the nearest metal scrap yard. The present market price for scrap steel and iron is approximately $15.00/tonne in Newfoundland.

For fiberglass penstocks, it was assumed that the pipe lengths will be removed in 12 meter sections. Since there is a limited market for this material as salvage, it is assumed that the salvage value will only equal the transportation costs to a salvage location. The pipe sections will have a very limited reuse as a pipeline and will most likely have miscellaneous uses such as well liners and tanks.

Concrete anchor blocks that form part of the penstock installation will be demolished and buried on site. Costs for demolition are based on past experience with bulk concrete removal.

2.1.4 Powerhouses

Some of the powerhouses will be sold at market value when stripped of equipment. This will be limited to the buildings that are located in and around communities. Because of their age and construction they will have a limited market and will be useful for light industrial or storage uses. It is expected that they will have a low market value.

In a couple of cases it was determined that the building would have value as a museum or historical site and in these cases the building will be retained by Newfoundland Power.

The majority of the buildings, however, have no possibility of being useful and therefore it has been assumed that they will be demolished. The concrete buildings will have the superstructure totally demolished as well as the top 500 mm of the substructure. The demolished concrete will be buried adjacent to the site possibly in the manmade tailrace where there is one. Where the tailrace is part of the natural stream the rubble will be buried in an excavation.

The remainder of the buildings are of steel frame construction with siding. In these cases the structural steel and metal siding will be removed and salvaged. Buildings with asbestos siding will have the structural steel salvaged and the asbestos siding would be carefully removed meeting present standards and disposed of as required. The buildings with asbestos insulation will also have this material removed and disposed in a similar way. As in the buildings with the concrete superstructure, the steel buildings substructure will have the top 500 mm of concrete removed and this material will be buried.

The entire powerhouse area will be reinstated after demolition with a covering of fill and topsoil and then will be seeded. Cost estimates for demolition of powerhouses are based on past experience for removal of bulk concrete and earth operations.

Estimates on salvage and removal of the superstructures were obtained from various local contractors. Market values for the salvageable buildings were as supplied from Newfoundland Power property appraisers based on the current market.

2.1.5 Turbine-Generator

The turbine-generator sets are of various sizes with regard to both electrical capacity and physical size. The costs to remove were based on discussions with local contractors and the fact that the units had little residual value therefore removal would be much quicker. Our own recent experience in the removal of the sets was also considered and past costs reviewed to verify the estimates.

With regard to salvage value it has been assumed that the turbine-generator sets have no value for resale. This is again based on past experience with units that were taken out of service and attempted to sell. Therefore salvage value for these units is based on prices for scrap metal and since there is virtually no value for steel and iron, the value is based mainly on the value of copper from the generator.

2.1.6 Powerhouse Equipment

Costs for removal and salvage value for powerhouse equipment is again based on past experience where possible and where past experience is not available the estimates are based on information supplied by local contractors and suppliers.

Most of the associated powerhouse equipment (i.e. switchgear and controls) have very little value for reuse. The switchgear that has been retired recently has provided insignificant salvage value.

Minor parts have been kept for spares and there is a very little precious metal in the switchgear.

Battery Banks and other equipment have a limited salvage value and it is assumed that they will be near the end of their life at time of decommissioning.

The powerhouse cranes, however, have seen limited use and will be in excellent condition when decommissioned, therefore, these items will have a salvage value. Based on discussions with local contractors, salvage values for these items have been determined which should accurately reflect the uniqueness of this type of equipment.

2.1.7 Tailrace

The tailrace that is man made would be filled in. At the bottom of the tailrace will be concrete from powerhouse demolition and the remainder will be common fill from an adjacent site. The area will be sloped and graded to maintain the landscape in as natural a condition as possible. The area will then receive topsoil and seeding or selected planting.

For tailraces in natural streambeds the bed will be reinstated as close to its natural condition as possible.

2.1.8 Intake

The demolition of intakes is based on past experience in the removal of bulk concrete. The concrete removed will be buried either in the power canal, where available, or in an excavation adjacent to the site. The small wooden gatehouses will be removed and buried on site. Since these buildings are very small a fixed lump sum price for all of these buildings has been used.

Other equipment in the gatehouse has been given no salvage value except for screw type gate lifts. Most of the equipment is of a minor nature and will have no salvage value. The exception of course is the gate lift that can easily be reused. Since most gate lifts in service are of similar size, a uniform salvage value has been used.

2.1.9 Power Canals

The man made power canals in various hydroelectric developments will be filled in during decommissioning. The costs to carry out this work are based on past experience for common fill, rockfill and blasting. The amount of each type of fill is based on the features of the individual power canals.

The areas of the power canal will be reinstated upon completion of backfilling by selected planting.

2.1.10 Surge Tanks

Costs for removal and dismantling of surge tanks are based on past experience and information from local contractors. The steel tanks will be removed with the steel cut up and sold for scrap, when close enough to a salvage contractor, or trucked to the nearest waste disposal site. The concrete foundations and tee anchor blocks will be demolished and buried on site.

The areas will be reinstated as part of the reinstatement for the penstock.

2.1.11 Transmission Lines

Costs for removal of and salvage value for transmission lines are based on comprehensive past experience in this type of work. The costs are based on historic information of the number of structures and the amount of conductor and insulators that will be suitable for reuse. Poles will be removed and returned to stock or disposed of depending on their condition. Conductor and hardware will be returned to stock, disposed at an approved site, or sold to a scrap dealer.

2.1.12 Substations

Costs for decommissioning substations are also based on previous experience. Costs are estimated for removal of structures and equipment. Experience indicates that there is little residual value for the substation structures but there is a significant salvage value for substation equipment. All standard substation equipment will be reused and equipment that is non-standard will be sold for scrap. These costs, estimated from recent history, are included in the salvage value.

2.1.13 Miscellaneous

There are a number of miscellaneous components that form part of the hydroelectric developments. These include storage sheds, bridges, access roads and other items that are not mentioned specifically. Since it would serve no purpose to mention everything here it would suffice to say that the demolition costs for these items are based on previous experience where possible. In cases where none existed, assistance from various local contractors was used to prepare the estimate.

Some assumptions that were made were that all access roads will be left in place for use by the general public, and bridges will be removed from service. Any roads not required for public use will be left in place and allowed to grow in. There are a number of small buildings that will be of no salvage value. Therefore, a lump sum uniform demolition cost was used.

2.1.14 Reinstatement

Part of the estimate for decommissioning includes, as a lump sum for each development, a cost for reinstatement of the sites. This reinstatement cost is based on covering the area with topsail and hydroseeding in areas near public use and on using selected planting of native trees in areas not close to public use.

The cost estimates for these items are from local contractors for hydroseeding and from the Provincial Department of Forest Resources and Agrifoods for the cost of planting seedlings.

2.1.15 Engineering & Supervision

Since the estimates are based on actual contractors costs for carrying out the work, a contingency of 10% has been added to the cost. Additionally an engineering and supervision cost of 5% has been used.

2.1.16 Environmental Assessment (Regulatory Process)

Environmental regulations in effect today on both the provincial and federal level would require an assessment to be carried out. This would focus on the effect the decommissioning would have on the environment. some of the developments are located in areas that are more environmentally sensitive than others, therefore, the costs estimated for this work will range from 5% to 8% of the total decommissioning cost.

2.1.17 Environmental Site Assessment and Remediation

The present industry practices before the sale of a property or taking a property out of service is to have a site assessment carried out to determine the existence of containments at the site. Site remediation would likely be required before the site can be sold or abandoned. The cost of this assessment and site remediation would vary depending on the size of the site, therefore an assessment cost of $40,000 to $60,000 has been added to each development.

2.1.18 Decommissioning Estimates

The Unit Prices used in the Estimate Sections of this report were derived by using recent project costs, whenever possible. In instances where this information was not available, unit prices were derived using common raw estimating practices and/or appropriate contractor quotations.

ITEM DESCRIPTION	UNIT PRICE
Bulk Concrete	\$75 .00/ M^3
Bulk Concrete (With Attachments)	\$125 .00/ M^3
Reinforced Concrete	\$100.00/ M^3
Reinforced Concrete (With Attachments)	\$150.00/ M^3
Installed Concrete	\$650 .00/ M^3
Steel Building Demolition	\$15.20/ M^3
Steel Building Salvage	\$2.65/ M^3
Asbestos Siding Removal	\$23. 00/ M^2
Wooden Penstock	\$7.00/ M^2
Steel Penstock (.914m - 1.52m) DIA.	\$11.75/ M^2
Steel Penstock (1.83m - 2.44m) DIA.	\$14.50/ M^2
Fibreglass Penstock (.914m - 1.52m) DIA.	\$11.75/ M^2
Fibreglass Penstock (1.83m - 2.44m) DIA.	\$14.50/ M^2
Transmission (Single Pole)	\$10,000.00/km
Transmission (Double Pole)	\$13,000.00/km
Distribution (Single Pole)	\$3,000.00/km
Rockfilled Gabion Demolition	\$20.00/M^3
Timber Crib Demolition	\$20.00/M^3
Timber Crib Construction	\$250.00/M^3
Earthfill (Removal)	\$3.00/M^3
Rockfill Overflow Spillways	\$5.00/M^3
Common Fill (Supply & Place)	\$12.00/M^3
Culvert Removal	\$12.50/ M^2
Selective Planting	\$1,000.00/Ha
Hydroseeding	\$2 .00/M^2

* Salvage Value factored into Unit Price.

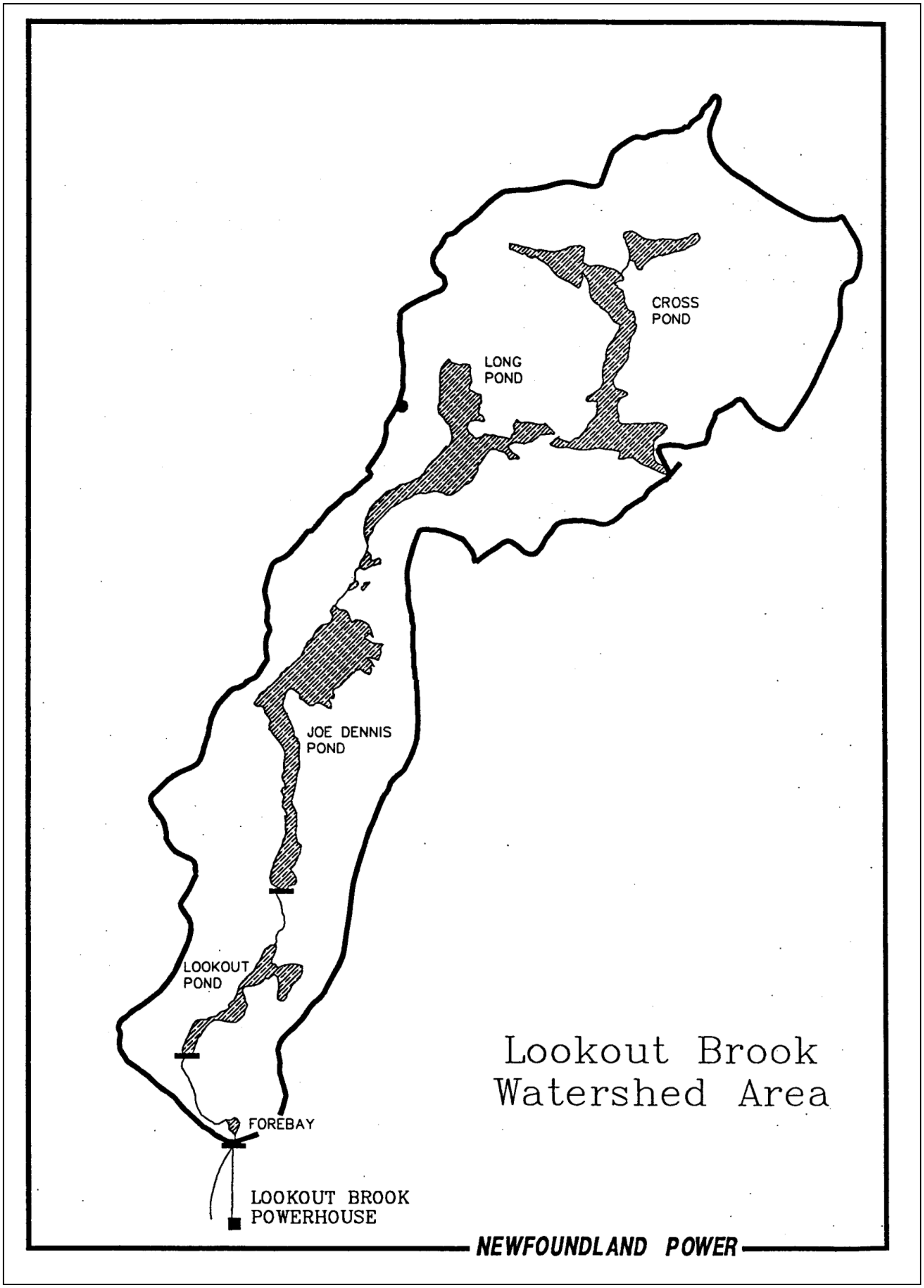
PART 3

DECOMMISSIONING SCENARIOS

AND ESTIMATES

3.1

LOOKOUT BROOK


CROSS POND
LONG POND
JOE DENNIS POND
LOOKOUT POND
FOREBAY
LOOKOUT BROOK POWERHOUSE
Lookout Brook Watershed Area
NEWFOUNDLAND POWER

LOOKOUT BROOK HYDROELECTRIC DEVELOPMENT

General

Lookout Brook Development is located on the west coast of Newfoundland near the community of St. George's. It was commissioned in 1945 and has an installed capacity of 5500 kW under a net head of 154.6 m. There are two turbine-generators supplied by a combination of fibreglass and steel penstocks and a reinforced concrete intake incorporated into the Forebay Dam. Storage reservoirs are provided by structures located at Joe Dennis Pond and Cross Pond. Storage reservoirs at Lookout Pond and Long Pond are no longer in use.

Powerhouse

The powerhouse is 37.3 m x 6.7 m x 6.7 m high and consists of a concrete substructure with concrete walls and a concrete with a built-up roof. The building also houses a 7.5 ton mechanically operated crane.

Turbine-Generator

The two Francis turbines have a combined output of 5800 kW. One Gilkes turbine with a General Electric generator was commissioned in 1958. The other Barber turbine with Ideal Electric generator was commissioned in 1983. The Barber turbine replaced the two original Leffel turbines.

Tailrace

The tailrace consists of two man made channels with concrete retaining walls about 1.8 m high and 300 mm thick from the powerhouse to the, river. One channel is about 35 m long while the other is about 20 m long.

Penstock

The penstock is of above ground steel and buried fiberglass construction. A steel Wye branch at the intake diverts water from two 914 mm steel thimbles to one 974 m long 1525 mm diameter buried fiberglass penstock which was installed in 1989 to replace two 914 mm diameter woodstave penstocks. Another wye branch then diverts the water into two 640 m long 914 mm diameter steel penstocks to the powerhouse. Fifteen reinforced concrete anchor blocks are constructed at points where the penstock changes direction and at the wye branches.

Forebay Dam, Spillway and Intake

The dam is a rockfill concrete encased structure about 75 m long with a maximum height of about 5.4 m. The intake is incorporated into the left side of the dam and consists of vertical timber stoplogs, steel trashracks, a pair of cast iron sluice gates controlled by two screw stem gate lifts, control equipment, and a wooden gatehouse. Most of the rockfill was replaced after the original rockfill was washed out due to overtopping as a result of the flood caused by Joe Dennis Gate structure failure.

A concrete gravity overflow spillway total length of about 25 m is incorporated into the right abutment. A 1.5 m wide unwatering sluice with vertical stoplogs is located between the spillway and the main section of the dam. The concrete spillway was completely rebuilt in 1992 after the original one was washed out during the flood that resulted from Joe Dennis Gate Structure failure.

Joe Dennis Pond Dam, Spillway, Outlet and Side Dyke

The structure consists of a main dam, side dam, spillway and outlet structure. The main dam is of earthfill construction with an overall length of about 135 m and a maximum height of about 6 m. Incorporated into the centre section of the main dam is a 30 m long earthfill/rockfill spillway with a galvanized steel core. The outlet is a timber culvert and a CSP liner with a concrete well which houses a 2.2 m x 1.5 m high timber gate and a screw stem gate lift. This replaces the previous timber crib structure that failed in 1992. The outlet is incorporated into the left side of the main dam. The earthfill side dam extends from the right side of the main dam. It is about 240 m long and is low with a maximum height of about 2.0 m.

The side dyke is a separate earthfill freeboard structure located to the left of the main dam. It is about 92 m long with a maximum height of about 3.0 m.

All structures at Joe Dennis Pond were completely rebuilt in 1990 to replace the rockfill timber crib structures which were originally constructed around 1945. The outlet and a section of the spillway were reconstructed in 1992 as a result of the Gate Structure failure.

Long Pond Dam, Spillway and Outlet

This dam was decommissioned in 1995, exposed timber has been removed, rockfill has been leveled and openings have been widened. The dam was about 198 m long with a maximum height of about 3.6 m and incorporated an overflow spillway and outlet structure. The entire dam was of rockfill untreated local timber crib construction. The spillway section was about 30 m long and was rebuilt in 1987 with untreated local timber cribbing enclosed by treated timber decking. The outlet was about 1.8 m wide with hand placed vertical timber stoplogs about 4.0 m long.

Cross Pond Outlet and Canal

The canal is a deep channel about 92 m long and 2.5 m wide excavated through rock to provide a channel from Cross Pond to Long Pond. The outlet is located in the canal and consists of concrete abutments with an opening about 1.8 m wide x 3.6 m high a timber gate and screw stem gate lift. This structure was rebuilt in 1995.

Cross Pond Spillway

The structure was reconstructed in 1984 of earthfill/rockfill with a galvanized steel core. The structure is about 76 m long with a maximum height of about 4.6 m. This structure replaced the original timber crib spillway. Riprap was regarded on this structure in 1999.

Lookout Pond Dam, Spillway and Outlet

The structure was of rockfill untreated local timber construction about 84 m long with a maximum height of about 4.6 m. The structure is presently abandoned, exposed timber has been removed, rockfill has been leveled and openings have been widened.

Substation

The substation serves two functions. It steps up the voltage from plant generation to 33 kV to be supplied to the grid and also steps voltage down for the distribution line to the Forebay.

Transmission Line

A 33 kV transmission line extends from Lookout Brook Plant to the transmission line from St. George's to Robinsons. A separate distribution line runs from the plant to the Forebay.

Other

A 15 km road complete with two small timber bridges, one 25 m span bridge, and numerous drainage culverts provide access to the development. Some of these were replaced as a result of the flood in 1992,

Two storage sheds at the plant and several small cabins near the dams are part of the development.

DECOMMISSIONING SCENARIO FOR LOOKOUT BROOK

General

Decommissioning will include demolition of practically all structures in this development. There are no expected direct environmental impacts with the decommissioning of this plant. It is located in an uninhabited remote area.

The nearest scrap metal yard is located 40 km from the development and material having to be disposed at an approved waste disposal site will have to be transported 35 km.

Any contaminated soil will have to be transported to Stephenville to an approved treatment facility, a distance of approximately 40 km.

Powerhouse

The powerhouse superstructure will be demolished and material will be buried in the tailrace. The foundation will be backfilled and landscaped. The powerhouse crane will be salvaged.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

The concrete retaining walls will be demolished to ground level, buried in the tailrace channel, backfilled with adjacent material and landscaped.

Penstock

The fibreglass sections will be excavated and sold for uses such as wells or road culverts. The steel sections will be cut up and sold for scrap. The concrete anchor blocks will be demolished and debris will be buried on site. Backfill from the penstock will be graded over the entire penstock route and landscaped. This area will then be selectively planted.

Forebay Dam, Spillway and Intake

The structure will be demolished to ground elevation and debris will be disposed of at an approved site. The site will be graded and landscaped. Some areas around the pond may require removal of silt and selected planting.

Joe Dennis Pond Dam, Spillway, Outlet and Side Dyke

The outlet structure will be demolished with timber, steel culvert and other debris buried on site. The opening will be widened to pass flood flows. The steel core in the spillway will be removed and buried on site. The earthfill dams and spillway will be leveled to blend with the natural terrain. The site will be landscaped. Some areas around the pond may require removal of silt and selected planting.

Long Pond Dam, Spillway and Outlet

This structure is presently decommissioned and no additional work is anticipated.

Cross Pond Outlet and Canal

The timber sections of the outlet will be removed and buried on site. The outlet will be sealed with a concrete plug.

Cross Pond Spillway

The structure will be demolished with the steel core removed and buried on site. An opening will be excavated to pass flood flows and normal flows through the original river channel. The remainder of the structure will be leveled to match the contours of the natural terrain.

Lookout Pond Dam, Spillway and Outlet

The structures are presently demolished and no additional work is anticipated.

Substation

The substation will be taken out of service and all items that can be salvaged will be reused. Items not suitable for reuse will be sold for scrap or disposed of at an approved waste disposal site.

Transmission Line

The transmission line will be removed from service and all poles, conductor and hardware salvaged. Items that are not salvageable will be disposed of at an approved waste disposal site.

Other

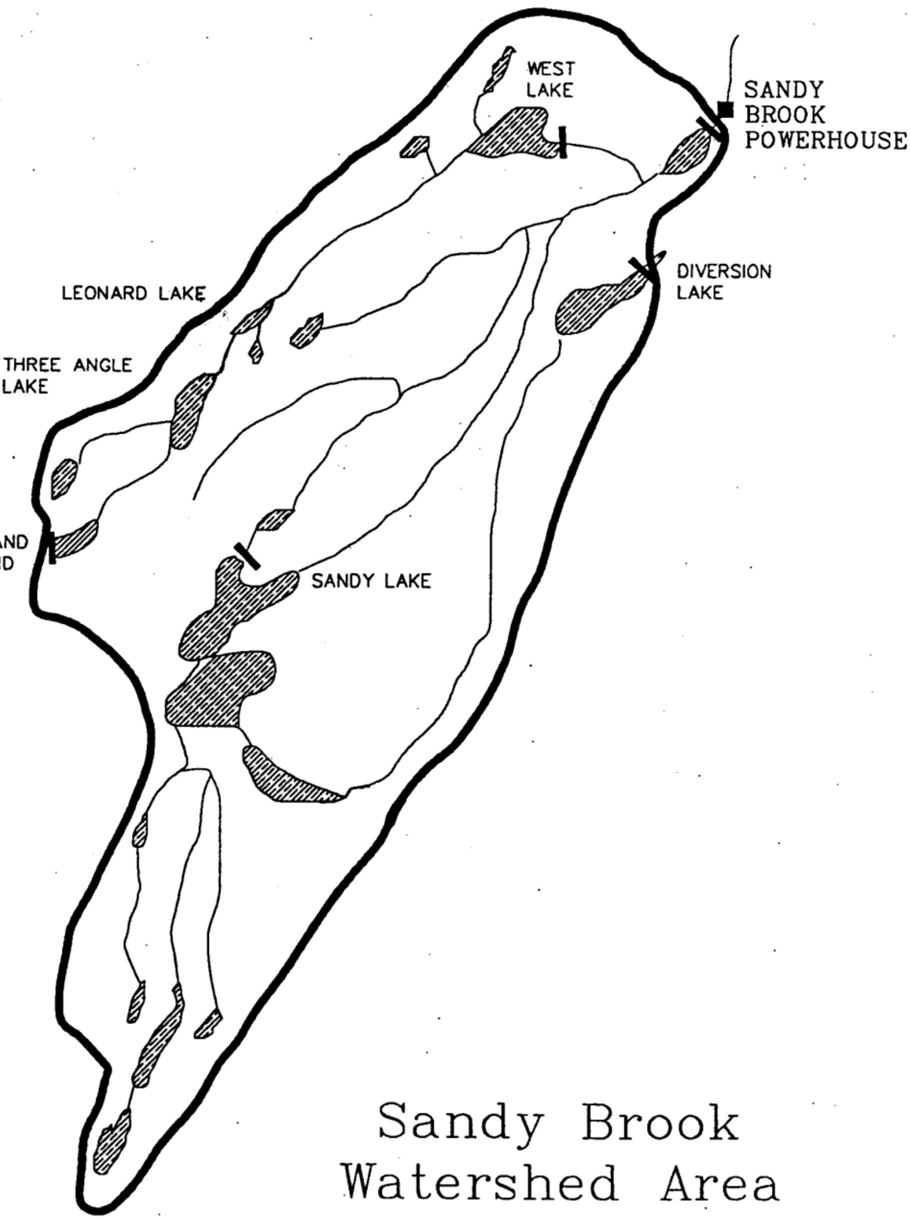
The road, bridges, and culverts will be turned over to the government to provide access to the many cabins and year round residences built along the access roads. The storage sheds and cabins will be demolished and buried on site.

ESTIMATED COST OF RETIRING LOOKOUT BROOK PLANT

DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY ($)	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
Powerhouse							($)
-Substructure	Concrete	M^3	100.00	55	5,450.00	0.00	5,450.00
-Superstructure	Concrete	M^3	100.00	195	19,500.00	0.00	19,500.00
-Powerhouse crane	7.5 ton	L.S.	1000.00	1	1,000.00	2,500.00	(1,500.00)
Tailrace	Concrete	M^3	100.00	91	9,100.00	0.00	9,100.00
Turbine/Generator	Horiz Francis	L.S.	15,000.00	2	30,000.00	4,990.00	25,010.00
Penstock	Steel	M^2	11.75	2,473	29,057.75	0.00	29,057.75
	FRP	M^2	11.75	4,666	54,825.50	0.00	54,825.50
Anchor Blocks							
and Saddles	Concrete	M^3	100.00	530	53,000.00	0.00	53,000.00
Forebay Dam	Rockfill	M^3	3.00	1,593	4,779.00	0.00	4,779.00
	and Concrete	M^3	100.00	575	57,500.00	0.00	57,500.00
Gatehouse Equipment		L.S.	1000.00	2	2,000.00	4,000.00	(2,000.00)
Gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Joe Dennis							
Spillway Dam	earthfill	M^3	5.00	4,000	20,000.00	0.00	20,000.00
Side Dam	earthfill	M^3	3.00	304	912.00	0.00	912.00
Gate Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Outlet	Timber culv	M^3	20.00	250	5,000.00	0.00	5,000.00
Cross Pond Dam	earthfill	M^3	5.00	1,694	8,470.00	0.00	8,470.00
Cross Pond Outlet	concrete	M^3	650.00	4	2,600.00	0.00	2,600.00
Walkway/Platform	timber/steel	L.S.	1200.00	1	1,200.00	0.00	1,200.00
Gate Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Various Cabins	Woodframe	L.S.	1000.00	4	4,000.00	0.00	4,000.00
Revegetation							
-Selective Planting		Ha	1,000.00	1	1,000.00	0.00	1,000.00
Mobilization/ Demobilization		L.S.			40,000.00	0.00	40,000.00
Transmission Line	Single Pole	KM.	10,000.00	15	150,000.00	0.00	150,000.00
Forebay Line	Single Pole	KM.	3,000.00	1	3,000.00	0.00	3,000.00
Substation		L.S.			5,000.00	5,750.00	(750.00)
SUBTOTALS					**510394.25**	**21,240.00**	**489,154.25**
CONTINGENCIES (10%)					51,039.43	0.00	51,039.43
ENGINEERING & SUPERVISION (5%)					25,519.71	0.00	25,519.71
ENVIRONMENTAL ASSESSMENT (6%)					30,623.65	0.00	30,623.60
SITE REMEDIATION (10%)					51,039.43	0	51,039.43
TOTALS					**668,616.47**	**21,240.00**	**647,376.43**

3.2

SANDY BROOK



Sandy Brook
Watershed Area

NEWFOUNDLAND POWER

SANDY BROOK HYDROELECTRIC DEVELOPMENT

General

Sandy Brook Development, located in central Newfoundland near the Town of Grand Falls-Windsor, was commissioned in 1963 and has an installed capacity of 6000 M under a net head of 33.5 m. The single turbine generator is supplied by a woodstave conduit and a reinforced concrete intake. Storage is provided by structures located at the- Forebay Reservoir, West Lake, Island Pond and Sandy Lake. Several structures located on West Brook and Sandy Brook are badly deteriorated and have been abandoned and where necessary decommissioned.

Powerhouse

The powerhouse is 13.6 rn x 13.6 m x 7.6 m high and consists of a steel frame building on a reinforced concrete foundation. The powerhouse also includes a 25 ton electrically operated crane.

Turbine Generator

The single unit consists of a Francis turbine with a Westinghouse generator and has a rated capacity of 6000 M.

Tailrace

The tailrace is a reinforced concrete structure that discharges into the Sandy Brook riverbed.

Penstock

The 2590 mm diameter penstock is approximately 340 m long and is constructed of above grade treated woodstave conduit supported on timber cradles. A short steel section is located at the downstream end.

Surge Tank

The structure consists of 6.7 m diameter steel tank 15.2 m high, anchored to a reinforced concrete foundation. Frost protection is provided by a 50 mm layer of styrofoam insulation and an aluminum casing. The surge tank tee is encased in the concrete foundation.

Forebay Dam, Spillway and Intake

The dam is an earthfill/rockfill embankment about 120 m in length with a maximum height of 9.0 m. The intake, located near the right abutment of the dam, is of reinforced concrete construction. It includes a steel gate, gate lift, steel trashracks, control equipment, and a wooden gatehouse.

The spillway/sluiceway is a concrete structure located near the left abutment of the dam It consists of five piers, concrete abutments, and wingwalls to complete six gate openings. Each gate consists of 2 - 0.91 m x 3.0 m long steel frame concrete gates which are hoisted by a mobile rail hoist. The gate sills consist of concrete weirs with downstream apron slabs.

Emergency Forebay Spillway

The structure is located to the left of the Forebay Dam. It is a simple overflow structure about 180 m long and is constructed of three layers of vertically placed treated timbers.

West Lake Dam, Spillway and Outlet

This structure was reconstructed in 1984 to replace the original timber crib structure. The dam/spillway is an earthfill/rockfill overflow structure with a galvanized steel core. The structure is approximately 90 m long with a maximum height of 3.6 m. A reinforced concrete outlet structure with a 1.8 m wide x 1.8 m high steel gate and a screw stem gate lift is located in the spillway section near the left abutment.

West Brook Dams

West Brook has only two structures remaining. The structures were originally built to store water for logging operations by Abitibi-Price Inc. and are located at Island Pond. Former structures on Cripple Back Pond, Three Angle Pond, Leonard's Lake, Baker's Steady and Fudge's Steady were decommissioned in 1992.

Island Pond has two earthfill dams which were constructed in 1986 to replace the original rockfill timber crib structures. Diversion Dam, located at the outlet to Noel Paul's Brook is approximately 120 m long with a maximum height of 3 m. A small earthfill dam, approximately 60 m long and 2 m high is located at the outlet to Cripple Back Pond. Water is discharged through a 2.8 m wide x 2.0 m high timber crib outlet which also serves as a bridge over the structure.

Cripple Back Pond Dam was a rockfill timber crib structure constructed of local round timbers. The outlet consisted of two gate openings approximately 2.4 m wide x 2.4 m high. This structure was decommissioned in 1992.

Three Angle Pond Dam was a rockfill timber crib structure approximately 135 m long. The outlet consisted of two gate openings 2.8 m wide x 2.4 m high. This structure was decommissioned in 1992.

Leonard's Lake Dam was a rockfill timber crib structure approximately 60 m long and 2.3 m high. The outlet consisted of two gate openings 2.6 m wide x 2.3 m high. This structure was decommissioned in 1992.

Baker's Steady Dam was a rockfill timber crib structure approximately 30 m long. The outlet consisted of two gate openings, one 3.0 m wide and the other 2.6 m wide. This structure was decommissioned in 1992.

Fudge's Steady Dam was a rockfill timber crib structure approximately 30 m long. The outlet consisted of two gate openings, each approximately 2.4 m wide x 2.4 m high. This structure was decommissioned in 1992.

Sandy Lake Dam. Spillway and Outlet

The structure was reconstructed in 1984 to replace the original rockfill timber crib dam. The dam/spillway is an earthfill/rockfill overflow type constructed with a galvanized metal core. The structure is approximately 130 m long with a maximum height of 2.7 m. A reinforced concrete outlet structure with a 2.4 m x 2.4 m timber gate and a mechanically operated gate lift is located in the spillway section near the left abutment.

Sandy Lake Dams "F" and "I"

The two dams are completely dilapidated rockfill timber crib structures that are presently abandoned. They do not impose any threat to impound water.

Sandy Brook Dams

The two abandoned timber crib structures are located in steadies downstream of Lake No. 3 on Sandy Lake. Dam S-1 (Gorman's Steady) consists of a totally deteriorated timber crib spillway apron approximately 1.0 m high and 20 m wide. Dam S-2 has all exposed timbers removed and the outlet has been cleared to form an unrestricted channel.

Diversion Lake Dams (Dams "A". "B". "C" and "D”)

All structures on Diversion Lake have deteriorated beyond repair. There are no remnants of the structure remaining at the site of Dam "A" and the outlet has been cleared to form a 12 m wide channel. At the site of Dam "B" there is no indication of a structure having been built. It may have been an earthfill structure and heavy alder growth now makes it blend in with the natural surroundings. Dam "C" is a completely deteriorated rockfill timber crib structure approximately

90 m long and 1.75 m high. The timber gates have been removed to leave a 2.6 m high x 1.7 m wide outlet. Dam "D" is a completely deteriorated rockfill timber crib structure approximately 20 m long.

Substation

The substation steps voltage up from plant generation of 6.9 kV to 66 kV for transmission to the main grid. It also has steps voltage down to 240 V for station service, surge tank heating, and a line to the Forebay. The generation voltage is also stepped up to 14.4 kV to supply Newfoundland and Labrador Hydro Microwave Site.

Transmission

A 66 kV transmission line runs from the substation to the main transmission grid. Separate 240 V lines run to the surge tank, Forebay, and a 14.4 kV line runs to Newfoundland and Labrador Hydro’s Microwave site.

Other

Several woods access roads, previously used for logging operations are used for access to the dam sites.

DECOMMISSIONING SCENARIO FOR SANDY BROOK

General

Decommissioning would include demolition of practically all structures except for the substation and transmission line which would remain to provide power to the microwave site. No direct environmental impacts are expected with the decommissioning of this plant. Provisions will be required to maintain adequate water levels on lakes where there are summer cabins.

Materials to be sold for scrap will be transported 109 km for sale and materials required to be disposed at an approved site will be hauled 18 km.

Powerhouse

The steel building will be dismantled and the material sold for scrap. The 25 ton overhead crane will be removed and either sold or re-used at another location. Concrete foundations will be demolished to ground level. The site will be backfilled and landscaped.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

Concrete in the tailrace will be demolished to ground level and material will be buried in the channel. The area will be graded and landscaped.

Penstock

The woodstave conduit will be demolished and buried at an approved waste disposal site. Steel sections will be cut up and sold for scrap. The soil under the penstock footprint will also be excavated and transported to the nearest treatment facility. The penstock route will be graded and landscaped.

Surge Tank

The steel surge tank and tee will be cut up and the material sold for scrap. The concrete foundation will be demolished and debris will be buried on site. The site will be backfilled and landscaped. The metal cladding and insulation will be hauled to an approved disposal site.

Forebay Dam, Spillway and Intake

The structure will be demolished to ground elevation and debris will be buried at the site. The site will be graded and landscaped. Normal flows will be directed towards the existing spillway/sluiceway channel.

Emergency Forebay Spillway

The structure will be demolished and leveled with all exposed timber buried at an approved location. The site will be graded and landscaped.

West Lake Dam, Spillway and Outlet

The outlet structure will be demolished with all concrete, timber, and other debris buried on site and the outlet channel will be widened to safely pass the design flood. The steel core will be removed from the spillway and buried on site and earthfill will be leveled to blend in with the contours of the surrounding terrain. The entire site will be landscaped. Removal of silt and selected planting will be carried out where required.

West Brook Dams

Earthfill dams at Island Pond will remain as these structures also form part of an existing woods access road. The timber crib outlet from Island Pond to Cripple Back Pond will also remain as this acts as a bridge over the channel.

The rockfill timber crib structures at Cripple Back Pond, Three Angle Pond, Leonard's Lake, Bakers Steady and Fudge's Steady are presently decommissioned and it is not anticipated that any further work will need to be carried out.

Sandy Lake Dam, Spillway and Outlet

The outlet structure will be demolished with all concrete, timber and other debris buried on site, and the outlet channel will be widened to safely pass the design flood. The steel core will be removed from the overflow spillway and the remaining earth and rockfill will be leveled to match the natural surroundings. The entire site will be landscaped. Removal of silt and selected planting will be carried out where required.

Sandy Brook Dams

The abandoned rockfill timber crib structures will be demolished and all timber will be buried on site. The outlets will be widened to safely pass the design flood.

Diversion Lake Dams

The structure at the site of Dam "N' has been demolished and no additional work is required in this area. Dam "B" appears to have grown over to blend with the natural surroundings, therefore no additional work is required. Old timber crib structures at Dam "C" and Dam "D" will be demolished and all exposed timber will be buried near the site. The outlet channels will be widened to pass the flows and the abutments will be leveled to blend in with the natural surroundings.

Substation

The substation will remain to provide service to the microwave site. All other equipment will be removed and salvaged for use at other sites, or sold as scrap.

Transmission

The 66 kV line and line to the microwave site will remain. Lines used for station service, surge tank heating and the Forebay will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

Other

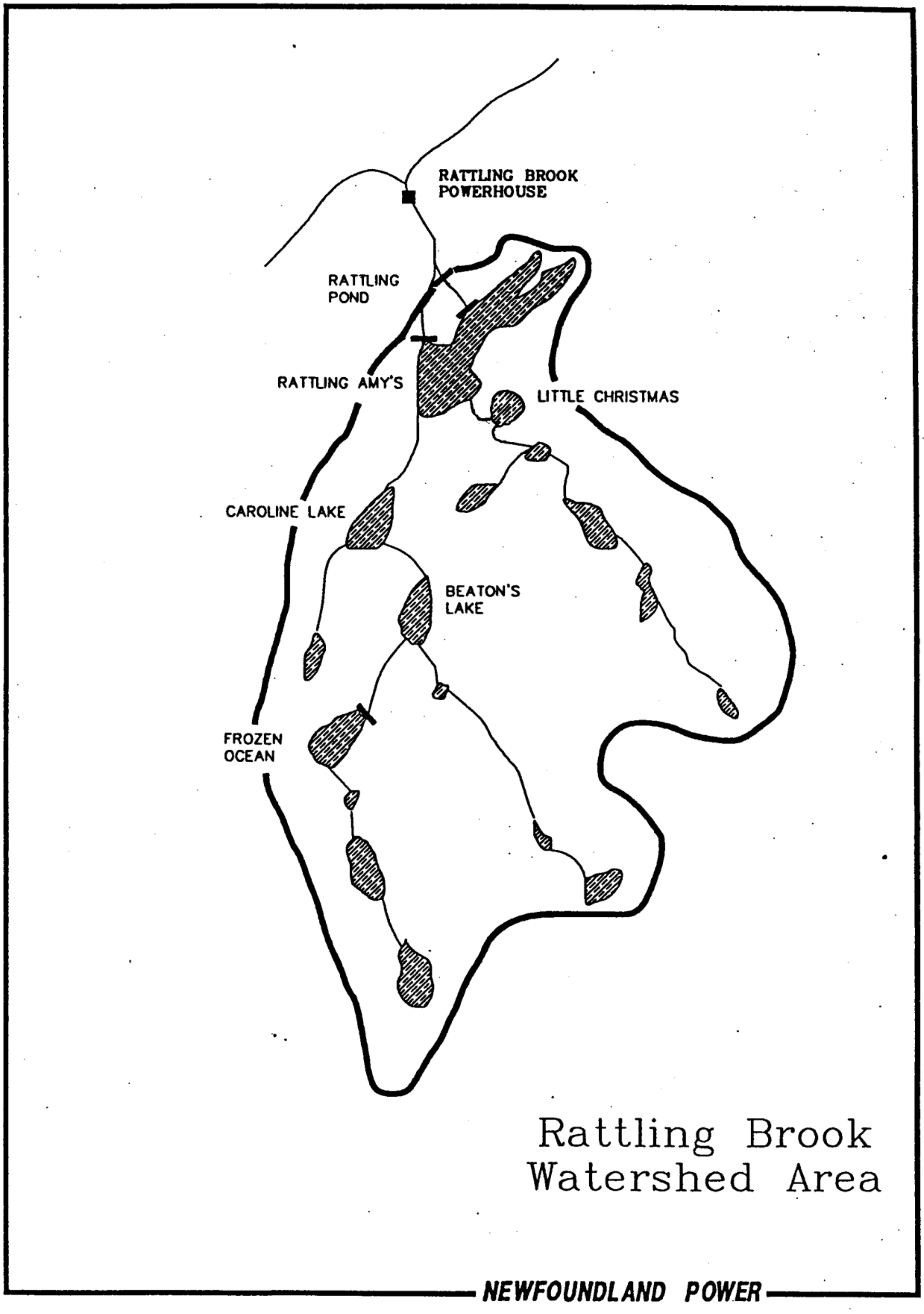
Access roads were originally built for logging operations by the predecessor of Abitibi-Consolidated. They are presently used for recreational activities and will remain in place.

ESTIMATED COST OF RETIRING SANDY BROOK PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Powerhouse							
-substructure	concrete	M^3	100.00	70	7,000.00	0.00	7,000.00
-superstructure	steel	M^3	15.20	1,406	21,371.20	3,726.00	17,645.20
Powerhouse crane	25 ton	L.S.	1000.00		1,000.00	4,000.00	(3,000.00)
Turbine/Generator	vert.francis	L.S.	25,000.00	1	25,000.00	5,990.00	19,010.00
Tailrace	Backfill	M^3	12.00	2,700	32,400.00	0.00	32,400.00
Penstock	woodstave	M^2	7.00	2,785	19,495.00	0.00	19,495.00
	steel	M^2	14.50	125	1,812.50	0.00	1,812.50
Surge Tank	steel	L.S.	20,000.00	1	20,000.00	0.00	20,000.00
-foundations	concrete	M^3	75.00	178	13,350.00	0.00	13,350.00
Forebay Dam	earthfill	M^3	3.00	3,240	9,720.00	0.00	9,720.00
-spillway	concrete	M^3	100.00	360	36,000.00	0.00	36,000.00
-emergency spillway	timber	M^3	20.00	81	1,620.00	0.00	1,620.00
Intake	concrete	M^3	100.00	160	16,000.00	2,000.00	14,000.00
-pipe	steel	M^3	11.75	288	3,384.00	0.00	3,384.00
walkway	steel	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
West Lake							
-outlet	concrete	M^3	100.00	40	4,000.00	0.00	4,000.00
-spillway/dam	earthfill	M^3	5.00	600	3,000.00	0.00	3,000.00
-walkway	timber/steel	L.S.	500.00	1	500.00	0.00	500.00
-gate & lift	timber/steel	L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Cripple Back							
Pond Dam	timber crib	M^3	20.00	400	8,000.00	0.00	8,000.00
Sandy Lake							
-outlet	concrete	M^3	100.00	20	2,000.00	0.00	2,000.00
-spillway/dam	earthfill	M	5.00	600	3,000.00	0.00	3,000.00
-walkway	timber/steel	L.S.	500.00	1	500.00	0.00	500.00
-gate & lift	timber/steel	L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Gormans Steady Dam	timber crib	M^3	20.00	100	2,000.00	0.00	2,000.00
Diversion Lake							
- Dam 'C'	timber crib	M^3	20.00	540	10,800.00	0.00	10,800.00
- Dam 'D'	timber crib	M^3	20.00	240	4,800.00	0.00	4,800.00
Revegetation-selective planting		Ha.	1,000.00	2	2,000.00	0.00	2,000.00
Substation	L.S.	L.S.	5600.00	1	5,600.00	4,340.00	1,260.00
Transmission	Forebay line	KM.	3,000.00	1	3,000.00	0.00	3,000.00
Mobilization/ Demobilization		L.S.			30,000.00	0.00	30,000.00
Subtotals					**292,352.70**	**26,056.00**	**266,296.70**
Contingencies (10%)					29,235.27		29,235.27
Environmental Assessment (8%)					23,388.22		23,388.22
Site Remediaiton (10%)					29,235.27		29,235.27

ESTIMATED COST OF RETIRING SANDY BROOK PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Engineering & Supervision (5%)					14,617.64		14,617.64
TOTALS					**388,829.11**	**26,056.00**	**362,773.11**

3.3

RATTLING BROOK


RATTLING BROOK POWERHOUSE
RATTLING POND
RATTLING AMY'S
LITTLE CHRISTMAS
CAROLINE LAKE
BEATON'S LAKE
FROZEN OCEAN
Rattling Brook Watershed Area
NEWFOUNDLAND POWER

RATTLING BROOK HYDROELECTRIC DEVELOPMENT

General

Rattling Brook Development is located in Central Newfoundland in the Bay of Exploits near the community of Norris Arm. The development was commissioned in 1958 with additional storage added in 1961. The plant has a capacity of 12,500 kW under a net head of 93.5 m. The two generating units are supplied by a single woodstave and steel penstock and a concrete intake. Storage reservoirs are provided by structures located at Rattling/Amy's Lake and Frozen Ocean Lake. A storage reservoir at Little Christmas Lake is no longer in use.

Powerhouse

The powerhouse is 14.4 m x 18.8 m with most of the building at a height of 8.3 m and the remainder at a height of 4.9 m. It is comprised of a concrete substructure with wood framing and vertical steel siding topped with a steel roof deck. The powerhouse also includes a 25 ton electrically operated crane.

Turbine-Generator

There are two 6500 kW vertical Francis turbines manufactured by Allis Chalmers and commissioned in 1958. Both generators were manufactured by General Electric. The runners in both turbines were replaced in 1987.

Tailrace

The tailrace is a combination of 150 m of rock excavation, 4.9 m wide, and 130 m of earth excavation, 9.1 m wide. It ranges in depth from 9.0 m upstream, to 0.3 m downstream. There is a low concrete gravity retaining wall at the intersection of the tailrace and Rattling Brook that is 68 m long and 1.2 m high. The tailrace is covered with a concrete arch for 46 m, to direct spill water from Rattling Brook further down the tailrace.

Penstock

The 1985 m long penstock is comprised of a short steel section at the intake, a 634 m long 2286 mm diameter woodstave section, a 1059 m long 2134 mm diameter woodstave section, a 191 m long 2134 mm diameter steel section upstream of the surge tank, a 101 m long 2134 mm diameter steel section downstream of the surge tank, and a steel bifurcation at the powerhouse entrance. Woodstave sections are supported by timber cradles and steel sections are supported by concrete piers. Concrete anchor blocks are located at the woodstave to steel transition, the surge tank tee, and the bifurcation.

Surge Tank

The surge tank about 95 m high and is of steel construction. It includes a 6.1 m diameter tank and 1.8 m diameter internal riser which is about 30 m high and supported by a 65 m high, 2.1 m diameter external riser and four support legs. Each of the support legs sit on a reinforced concrete pier, and there is a concrete anchor block around the surge tank tee.

Forebay Dam and Intake

The Forebay dam is an earthfill structure about 122 m long and 10.7 m high. The intake is incorporated into the dam and is of concrete construction. It includes steel trashracks, an electrically operated gate, and a 33.5 m long 2286 mm diameter steel pipe running from the gate to the downstream toe of the dam to the woodstave penstock.

Forebay Spillway

The structure is very low and about 49 m long. It is constructed of two layers of vertically set treated timber with heavy upstream and downstream riprap protection.

Rattling Lake Dam and Spillway

The structure is of earthfill construction about 762 m long with a maximum height of approximately 10.7 m. The spillway section is approximately 80 m long and consists of a low concrete weir topped by steel guides for horizontal treated timber stoplogs.

Amy's Lake Dam and Outlet

The structure is of earthfill construction approximately 122 m long and 10.7 m high. The outlet structure consists of a 2.1 m x 2.1 m concrete box culvert through the dam with a steel gate and shaft topped by a wooden building.

Frozen Ocean Lake Dam. Spillway and Outlet

The structure is of earthfill construction approximately 255 m long with a maximum height of 3.1 m. The outlet section is of rockfill treated timber crib construction with a 2.2 m x 2.2 m wooden gate and screw stem gate lift. The spillway section abuts the gate structure and is a rockfill overflow structure with a steel core. It is 55 m long with a maximum height of about 2.1 m. The entire structure was reconstructed in 1988 to replace the original timber crib dam.

Little Christmas Lake Dam, Spillway and Outlet

The structure was of rockfill untreated local timber crib construction with a short earthfill section. It was about 90 m long with a maximum height of about 3.0 m. The structure is presently abandoned, exposed timber has been removed, rockfill has been leveled and the opening has been widened.

Substation

The generated voltage of 6.9 kV is stepped down to 230 V for the station service. The generated voltage is also stepped up to 66 kV for transmission and the 66 kV transmission voltage is stepped down to 12.5 kV for control structures at the Forebay and Amy's Lake and for local distribution.

Transmission

Transmission lines for the plant provide a 66 kV loop feed between Gander and Grand Falls.

Other

There are various roads and maintenance buildings which form part of this development. The roads provide access to the various dams and the building houses the plant maintenance personnel and equipment in the Central Region.

DECOMMISSIONING SCENARIO FOR RATTLING BROOK

General

Decommissioning would include demolition of practically all hydraulic structures in the development and removal of substation and transmission equipment associated with generation. No direct environmental impacts are anticipated.

Scrapped materials would be transported 53 km for sale and materials requiring disposal at an approved site will be hauled 18 km. Contaminated materials would be transported and disposed at the nearest approved treatment facility.

Powerhouse

The powerhouse superstructure will be dismantled and sold for scrap and or buried at an approved waste disposal site. Equipment will be removed and salvaged and the foundation will be backfilled and landscaped. The tailrace opening will be sealed with concrete. The crane will be salvaged and sold or used at another site.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

The tailrace section near the powerhouse will be backfilled and hydroseeded. The concrete walls will be demolished wherever possible and buried in the section of the tailrace near the powerhouse.

Penstock

The woodstave sections of penstock will be demolished and disposed of at an approved waste disposal site. The concrete anchor blocks and piers will be demolished and buried on site. The steel penstock will be cut up and sold for scrap. The penstock route will be graded and hydroseeded. The soil under the penstock footprint will also be excavated and transported to the nearest treatment facility.

Surge Tank

The surge tank will be demolished and the steel will be cut into pieces and sold for scrap. The concrete surge tank tee anchor block and support footings will be demolished and buried on site. The site will be backfilled and hydroseeded.

Forebay Dam and Intake

The structure will be demolished and all waste material will be disposed of on site. Minor items such as control equipment and the gate lift will be salvaged for use at other sites. The steel pipe will be cut into sections and sold for scrap. The concrete structure will be demolished and buried on site. The earthfill section will be leveled to blend with surrounding terrain. Openings will be excavated as required to permit water to flow into original streambeds. The site will be selectively planted.

Forebay Spillway

The structure will be demolished and timber will be disposed of at an approved waste disposal site. The dam will be leveled with an opening excavated to permit water to flow unimpeded into Rattling Brook. The site will be graded and selectively planted.

Rattling Lake Dam and Spillway

The earthfill section will be leveled to blend with the surrounding terrain. Concrete from the spillway will be demolished and buried on site. Steel sections will be removed and sold for scrap. Timber will be buried at an approved waste disposal site. Water will flow freely into Rattling Brook. The site will be selectively planted.

Amy's Lake Dam and Outlet

The earthfill section will be leveled to blend with the surrounding terrain. The concrete section will be demolished and debris will be buried on site. Minor items such as control equipment and the gate lift will be salvaged for use at other sites. The wooden gatehouse will be demolished and buried. The outlet will be widened to permit unimpeded flow. The site will be selectively planted.

Frozen Ocean Lake Dam. Spillway and Outlet

The structure will be demolished and all waste material will be buried on site. The earthfill section will be leveled to blend with the surrounding terrain. The outlet will be demolished and all timber will be buried on site. The gate lift will be salvaged for use at another site. The steel core in the spillway will be removed and buried. The outlet and spillway will be widened to permit unimpeded flow. The site will be selectively planted.

Little Christmas Lake Dam, Spillway and Outlet

The structure is presently demolished and no additional work is required.

Substation

The substation will remain except for equipment used to step up generated voltage to 66 kV for transmission and to step down generated voltage for the station service and the Central Control Center. Equipment will be removed and salvaged. The control center will be fed by a 12.5 kV distribution line which is currently used as an emergency backup power supply.

Transmission

The transmission lines will remain in place to provide the loop feed between Gander and Grand Falls.

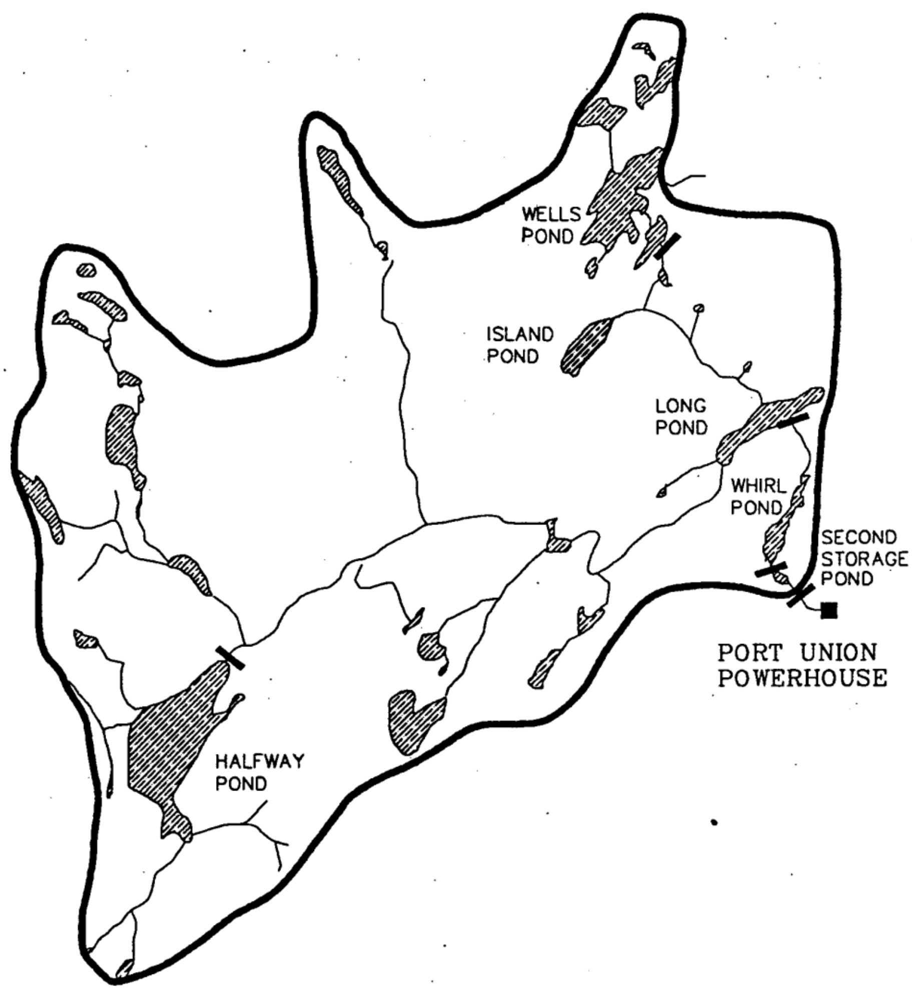
Other

All roads associated with the development will remain in place for public use. The maintenance building and Control Center building will also be left in place for Company use.

ESTIMATED COST OF RETIRING RATTLING BROOK PLANT							
DESCRIPTION	TYPE	UNIT	UNIT COST ($)	ESTIMATED QUANTITY	ESTIMATED COST ($)	SALVAGE VALUE ($)	TOTAL COST ($)
powerhouse							
	install concrete	M^3	650.00	13	8,450.00	0.00	8,450.00
powerhouse crane	25 ton	L.S.	1000.00	1	1,000.00	4,000.00	(3,000.00)
Tailrace	concrete	M^3	100.00	100	10,000.00	0.00	10,000.00
	backfill	M^3	12.00	2600	31,200.00	0.00	31,200.00
Turbine/Generator	Vert.Francis	L.S.	22,500.00	2	45,000.00	12,475.00	32,525.00
Penstock	woodstave	M^2	7.00	11,650	81,550.00	0.00	81,550.00
	steel	M^2	14.50	1,958	28,391.00	0.00	28,391.00
Anchor blocks	concrete	M^3	75.00	154	11,550.00	0.00	11,550.00
Surge Tank	steel	L.S.	40,000.00	1	40,000.00	0.00	40,000.00
-anchor blocks	concrete	M^3	75.00	50	3,750.00	0.00	3,750.00
Forebay Dam	earthfill	M^3	3.00	2,867	8,601.00	0.00	8,601.00
Forebay Spillway	timber/riprap	M^3	5.00	275	1,375.00	0.00	1,375.00
Intake	concrete	M^2	100.00	100	10,000.00	0.00	10,000.00
-pipe	steel	M	14.50	244	3,538.00	0.00	3,538.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Rattling Lake Dam	earthfill	M^3	3.00	17,500	52,500.00	0.00	52,500.00
-spillway	concrete	M^3	125.00	108	13,500.00	0.00	13,500.00
Amy's Lake Dam	earthfill	M^3	3.00	2,867	8,601.00	0.00	8,601.00
-outlet	concrete	M^3	100.00	185	18,500.00	0.00	18,500.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Frozen Ocean Dam	earthfill	M^3	3.00	850	2,550.00	0.00	2,550.00
-spillway	Rockfill/overflow	M^3	5.00	200	1000.00	0.00	1000.00
-outlet		M^3	20.00	150	3,000.00	0.00	3,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Revegetation							
	selected planting	Ha.	1,000.00	13	13,000.00	0.00	13,000.00
Substation		L.S.	9000.00	1	9,000.00	24,330.00	(15,330.00)
Transmission							
-Forebay & Amy's	single pole	KM.	3,000.00	4	12,000.00	0.00	12,000.00
-other lines		L.S.	1500.00		1,500.00	0.00	1,500.00
Mobilization/ Demobilization		L.S.	30000.00		30,000.00	0.00	30,000.00
SUBTOTALS					**452,556.00**	**46,805.00**	**405,751.00**
CONTINGENCIES (10%)					45,255.60		45,255.60
ENGINEERING & SUPERVISION (5%)					22,627.80		22,627.80
ENVIRONMENTAL ASSESSMENT (6%)					27,153.36		27,153.36
SITE REMEDIATION (10%)					45,255.60		45,255.60
TOTALS					**592,848.36**	**46,805.00**	**546,043.36**

3.4

PORT UNION



Port Union
Watershed Area

NEWFOUNDLAND POWER

PORT UNION HYDROELECTRIC DEVELOPMENT

General

The Port Union Hydroelectric Development is located on the Trinity Bay side of the Bonavista Peninsula near the community of Port Union. The plant was commissioned in 1917 and has a total capacity of 500 kW under a net head of 21.3 m. The development consists of two generating units in a concrete powerhouse supplied by a woodstave penstock, concrete intake, and earthfill embankment power canal. Storage reservoirs are provided by structures located at Second Storage Pond (Forebay), Whirl Pond, Long Pond and Halfway Pond. Storage reservoirs at Island Pond and Wells Pond are not presently in use.

Powerhouse

The powerhouse measures 7.3 m x 18.9 m x 4.0 m high. The building consists of a concrete substructure, concrete walls and a wooden roof. There is space for a diesel generator that was once used for a backup power source for the Bonavista Peninsula.

Turbine-Generator

There are two horizontal Francis turbines which were manufactured by the Pelton Waterwheel Co. and commissioned in 1917. The generators were manufactured by General Electric.

Penstock

The penstock is a 1370 mm diameter above ground treated woodstave pipe that was installed in 1984 to replace the old woodstave pipe. The penstock is approximately 137 meters in length and includes a short steel section encased in a concrete anchor block near the powerhouse.

Intake and Power Canal

The intake is a concrete structure with a wooden gatehouse, trash racks, timber gate, screw stem lift, and control equipment. The power canal is approximately 350 m long excavated through rock and earth. The built up side of the canal is constructed of rock and earthfill.

Second Storage Pond (Forebay) Dam, Spillway and Unwatering Conduit

The structure consists of a rockfill dam with an upstream timber face and timber decking. The dam is approximately 65 m long and 2.5 m high and was rehabilitated in 1999.

Whirl Pond Dam, Spillway and Outlet

The structure is about 73 m long and 2.5 m high and was rebuilt in 1985 as a rockfill dam with timber face. The gate section was also rebuilt of rockfill timber cribwork with a 1500 mm square timber gate and a screw stem lift. In 1988 a fish screen was installed upstream of the gate.

The spillway section is a low concrete gravity structure approximately 68 m in length with a height varying from 0.6 m to 1.5 m. The spillway was rebuilt in 1999 at which time a pool and weir fishway was also incorporate.

Long Pond Dam, Spillway and Outlet

The structure is about 21 m long with a maximum height of about 3.0 m. It is a rockfill treated timber crib dam that is a spillway over its entire length. The dam was rebuilt in 1985 and includes a 1500 mm square timber gate and a screw stem lift.

Wells Pond Dam, Outlet and Freeboard Dams

The dam is about 50 m long with a maximum height of about 2.9 m consisting of a rockfill dyke incorporating a small rockfill timber crib section with a timber gate which was repaired in 1985. Two small rockfill timber crib freeboard dams have been retired since reconstruction of the dyke. This dam was taken out of service in 1999 with the gate remaining open on a permanent basis. The structure will be demolished in 2001.

Island Pond Dam and Outlet

The structure was of earthfill construction with a timber crib gate structure for a total length of about 134 m and a maximum height of 5.5 m. The structure is presently abandoned.

Halfway Pond Dam. Spillway and Outlet

The dam is an earthfill structure approximately 160 meters long with a maximum height of about 3.8 m. There is a rockfill timber crib gate section and a new timber crib spillway structure which was rebuilt in 1992.

Substation

The substation steps up the voltage from the generated 2400 volts to 66 kV for the transmission grid on the Bonavista Peninsula.

Transmission Line

There is no separate transmission line for the plant. The transmission line which is connected to the plant is part of the transmission loop for the Bonavista Peninsula.

DECOMMISS10NING SCENARIO FOR PORT UNION

General

Decommissioning would involve the demolition of most of the structures except for Whirl Pond Dam and the transmission line. The only significant environmental impact of decommissioning this development is the required alterations to the Town of Port Union water supply. Due to the historical importance of this plant some items may also be restored for posterity.

The metals to be sold for scrap will have to be transported 220 km and material of a sensitive nature will be transported 10 km to the approved waste disposal site. Contaminated materials will be transported and disposed at an approved treatment facility.

Powerhouse

The powerhouse will be used as a public or private building. It will be restored for company use, sold for use by others, or converted into a historic site.

Turbine-Generator

Equipment will be removed from service and sold for scrap or restored for historical purpose.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The steel thimble at the powerhouse will be removed and sold as scrap. The concrete anchor block will be demolished and buried at an approved location. The soil under the penstock footprint will be transported to the nearest soil treatment facility. The penstock route will be graded and hydroseeded.

Intake and Power Canal

The intake will be demolished and debris will be buried in the power canal. Minor items such as the gate and lift will be salvaged.

The power canal will be filled and leveled with material from adjacent property. The area will receive selective planting.

Second Storage Pond (Forebay) Dam, Spillway and Unwatering Conduit

The dam will be demolished to a lower level to maintain a small pond upstream. Water from the pond will flow into the channel downstream of the sluice gate. A small amount of selective planting will be carried out.

Whirl Pond Dam, Spillway and Outlet

The dam will be maintained to provide the town water supply. The main dam will be left in place and the gate section will be removed and reconstructed as a rockfill timber crib structure. Water will then pass over the concrete spillway which will be modified to pass continuous flow and to allow the passage of fish. The structures will then be turned over to the appropriate authority.

Long Pond Dam, Spillway and Outlet

The dam will be completely demolished and all debris will be buried at an approved location. There will be selective planting at the site.

Wells Pond Dam, Outlet and Freeboard Dams

The earth dyke will be left in place to provide a vehicular access. The gate section will be removed and buried on site to provide unimpeded drainage. Two of the freeboard dams have been abandoned and no additional work is required. The third freeboard dam will be demolished with material buried on site. The site will receive selective planting.

Island Pond Dam and Outlet

The dam is presently abandoned however the main earthfill sections will be sloped to reduce their height and blend in with the adjacent surroundings.

Halfway Pond Dam. Spillway and Outlet

The rockfill timber crib gate structure will be removed to provide natural flow through the existing gate channel. The spillway will be demolished. The earthfill section will be leveled to match the contours of surrounding terrain. Untreated timber debris will be buried on site and treated timber will be transported to an approved waste disposal site. The site will be selectively planted.

Substation

The substation will not be required and the equipment will be salvaged or scrapped. The site will be backfilled and hydroseeded.

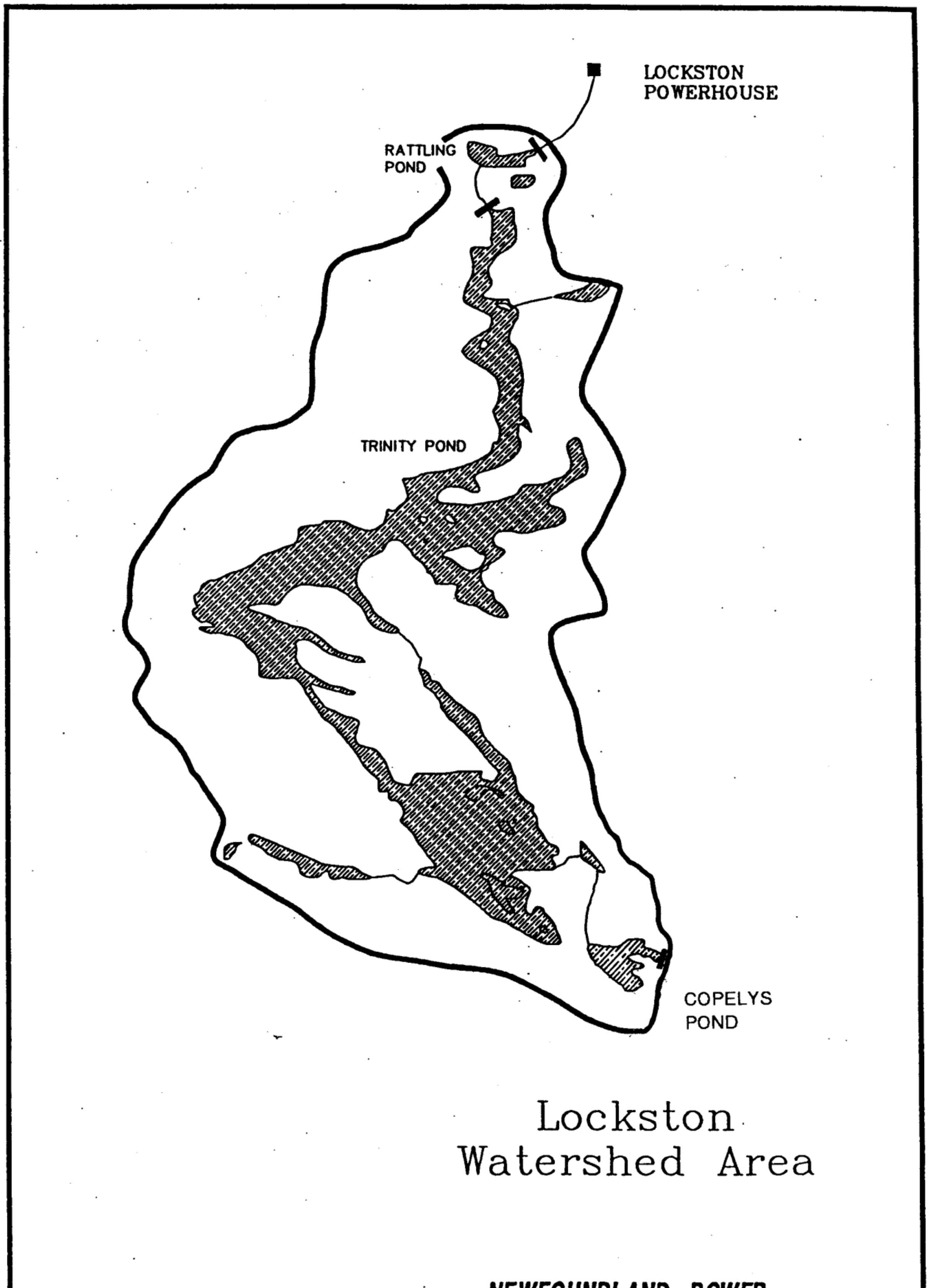
Transmission Line

There will be no retirement of transmission line.

ESTIMATED COST OF RETIRING PORT UNION PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Powerhouse	concrete				0.00	33,000.00	(33,000.00)
Turbine/Generator	Horiz. Francis	L.S.	10,000.00	2	20,000.00	500.00	19,500.00
Penstock	woodstave	M^2	7.00	590	4,130.00	0.00	4,130.00
Anchor Block	concrete	M^3	75.00	60	4,500.00		4,500.00
Intake	concrete	M^3	75.00	70	5,250.00	0.00	5,250.00
	Gate Lift	L.S.	1000.00	1	1000.00	2000.00	(1,000.00)
Power Canal	Excavated Earth	M^3	3.00	2,100	6,300.00	0.00	6,300.00
Second Storage Pond System	Rock Filled	M^3	20.00	450	9,000.00	0.00	9,000.00
Whirl Pond Dam Modifications	timber crib	L.S.	50,000.00	1	50,000.00	2,000.00	50,000.00
	Gate Lift	L.S.	1000.00	1	1000.00	0.00	(1,000.00)
Spillway Modifications	concrete	L.S.	15,000.00	1	15,000.00	0.00	15,000.00
Long Pond Dam	Timber Crib	M^3	20.00	360	7,200.00	0.00	7,200.00
	Gate Lift	L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Wells Pond Dam	Timber Crib	M^3	20.00	350	7,000.00	0.00	7,000.00
Halfway Pond Dam	Earthfill	M^3	3.00	2000	6,000.00	0.00	6,000.00
-gate section	Timber Crib	M^3	20.00	228	4,560.00	0.00	4,560.00
-spillway	Timber Crib	M^3	20.00	200	4,000.00	0.00	4,000.00
Revegetation							
-Hydroseeding		M^2	2.00	750	1,500.00	0.00	1,500.00
Selected Planting		Ha.	1,000.00	1	1,000.00	0.00	1,000.00
Substation		L.S.	5,860.00	1	5,860.00	15,750.00	(9,890.00)
Mobilization/ Demobilization		L.S.	10,000.00	1	10,000.00	0.00	10,000.00
Subtotals					**164,300.00**	**55,250.00**	**109,000.00**
Environmental (6%)					9,858.00		9,858.00
Contingencies (10%)					16,430.00		16,470.00
Engineering & Supervision (5%)					8,215.00		8,215.00
Site Remediation (10%)					16,430.00		16,430.00
TOTALS					**214,233.00**	**55,250.00**	**158,983.00**

3.5

LOCKSTON


LOCKSTON
POWERHOUSE
RATTLING
POND
TRINITY POND
COPELYS
POND
Lockston
Watershed Area
NEWFOUNDLAND POWER

LOCKSTON HYDROELECTRIC DEVELOPMENT

General

Lockston Development is located on the Trinity Bay side of the Bonavista Peninsula near the community of Port Rexton. It was commissioned in 1956 and has an installed capacity of 3000 kW under a net head of approximately 82.2 m. There are two turbine generators supplied by a woodstave penstock, a concrete intake and a power canal excavated through bedrock. A concrete dam and spillway is situated at the Rattling Pond Forebay and a concrete main dam/outlet provides the main storage reservoir at Trinity Pond.

Powerhouse

The powerhouse is 8.8 m x 23.2 m x 6.1 m high and consists of a concrete substructure with concrete walls and a steel roof.

Turbine-Generator

There are two 1500 kw turbine generators that were commissioned in 1956. The turbines are horizontal Francis and were manufactured by Gilkes. The generator was manufactured by General Electric.

Powerhouse Crane

The powerhouse has a 10 ton crane with a span of 8.5 m.

Tailrace

The tailrace was excavated from the powerhouse to a natural river channel. Two timber bridges provide access across the tailrace and spillway channel to the powerhouse.

Penstock

The penstock is of woodstave construction and is fully above ground. It is 1524 mm diameter and is approximately 610 m long. There is a steel section of penstock and a bifurcation near the plant to accommodate the two units.

Intake

The intake is a concrete structure with a wooden gatehouse. The intake forms the end of the power canal. There are three trashracks, control equipment, a gate and lift. The concrete in the intake was rehabilitated in 1996 and the gate and lift was replaced in 1999.

Power Canal

The power canal is about 565 m long and is excavated in bedrock from the Forebay pond to the intake. The bottom width varies from 2.5 m to 3.5 m over most of its length. Along much of the canal are low concrete walls which generally provide freeboard. In some sections a concrete gravity wall forms the canal.

Rattling Pond Dam, Spillway, Outlet and Unwatering Structure

The dam is a low concrete gravity structure approximately 24 m long with a maximum height of 2.5 m which forms the entrance to the power canal. A gate at the deepest section of the dam is used for dewatering the pond for dam and canal maintenance. The spillway is a separate concrete gravity structure about 16.5 m long and 1.2 m high. The outlet is a concrete structure with a timber gate about 1.5 m high x 3.7 m wide. The gate is operated by a screw stem and handwheel set in a steel superstructure. The outlet gate and lift was rehabilitated in 1999.

Trinity Pond Outlet Structure and Canal

The structure consists of a concrete bulkhead with concrete buttresses and 150 mm thick concrete deck. The structure is approximately 5.5 m high and has a pair of steel gates 1.4 m wide x 1.6 m high. The gate operator consists of a screw stem and screw stem lift. This dam was rehabilitated with new gate and lift installed in 1996.The canal is about 3.7 m wide and excavated through a low spot to connect to a natural channel draining to Rattling Pond.

Copely's Pond Diversion Dam

This dam is a very low level earthfill dam 1.5 meters in height that diverts water from Copely's Pond to Trinity Pond. This diversion also includes a diversion ditch and a section of the stream constructed as spawning habitat for fish.

Substation

The substation steps up the voltage from plant generation to 66 kv which is supplied to the grid. The substation also includes a transformer that steps voltage down for the distribution feeder out of the substation.

Transmission Line

There is no separate transmission line for Lockston Plant as it is part of the main grid. The only separate lines are the 6.9 kv line from the plant to the substation and the distribution line to the Forebay.

DECOMMISSIONING SCENARIO FOR LOCKSTON

General

Decommissioning will include demolition of most structures except for the substation. There are no expected direct environmental impacts with the decommissioning of this development. Materials to be sold for scrap will have to be transported 175 km. Materials such as treated wood that have to be dumped at a waste disposal site will have to be transported 25 km. Contaminated materials will be transported and disposed at an approved treatment facility.

Powerhouse

The powerhouse will be demolished with material buried in the tailrace. The site will be backfilled and selectively planted.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Powerhouse Crane

This equipment will be salvaged.

Tailrace

The man made section of the tailrace will be backfilled with adjacent material and selectively planted. The two bridges will be demolished with material buried in the tailrace.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The section of steel penstock near the powerhouse will be cut up and sold for scrap. The soil under the penstock footprint will be excavated and transported to a soil treatment facility. The penstock route will be graded and selectively planted.

Intake

The intake and gatehouse will be demolished and buried in the power canal.

Power Canal

All concrete walls will be demolished with debris buried in the existing power canal with local fill. The site will be graded and selectively planted.

Rattling Pond Dam, Spillway, Outlet and Unwatering Structure

The concrete structures will be demolished and buried in the power canal and the site will be selectively planted.

Trinity Pond Outlet Structure and Canal

The concrete outlet structure will be demolished and buried in the canal with local fill. Flow will be routed through the original channel.

Substation

The substation will remain in place, however, some transformers and other equipment associated with stepping up voltage from plant generation will be removed. The transformers are of non-standard voltage and will be sold as scrap.

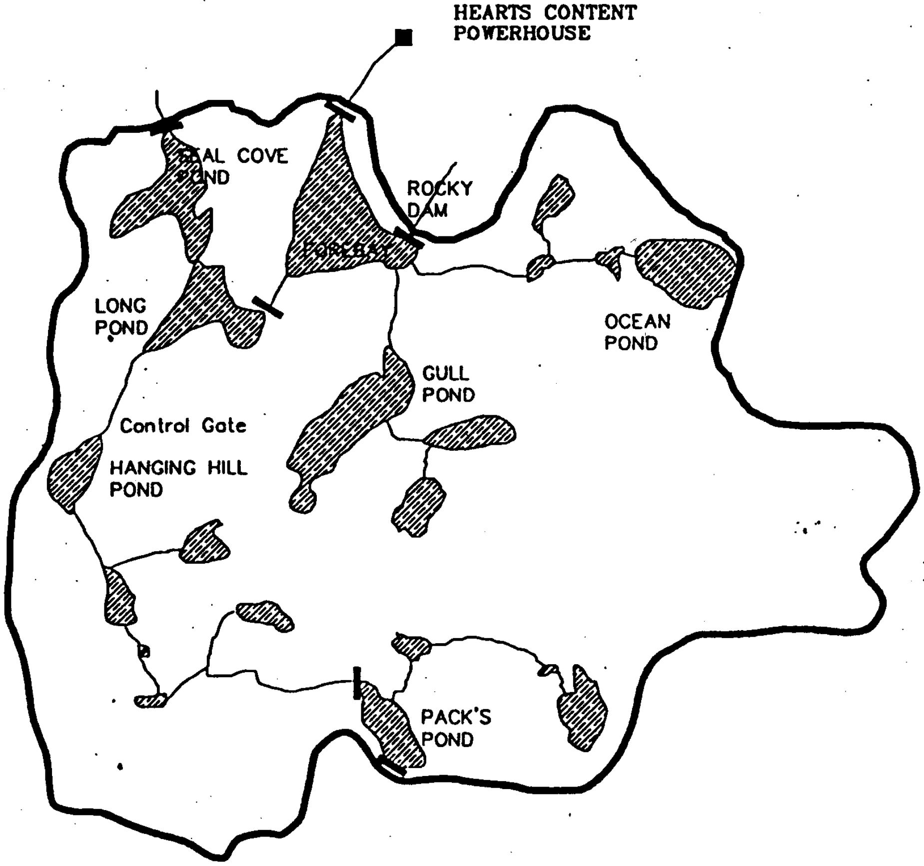
Transmission Line

The only two short sections of line that will be retired are the section from the substation to the plant and the distribution line to the Forebay.

ESTIMATED COST OF RETIRING LOCKSTON PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Powerhouse							
-superstructure	concrete	M^3	100.00	150	15,000.00	0.00	15,000.00
-Substructure	concrete	M^3	100.00	50	5,000.00	0.00	5,000.00
Turbine/Generator	Horiz. Francis	L.S	12,500.00	2	25,000.00	3,000.00	22,000.00
Powerhouse Crane	10 ton	L.S.	1,000.00	1	1,000.00	2,500.00	(1,500.00)
Tailrace	Earth Excavation	M^3	3.00	6000	18,000.00	0.00	18,000.00
-bridges	timber	L.S.	1,000.00	2	2,000.00	0.00	2,000.00
Penstock	woodstave	M^2	7.00	2,920	20,440.00	0.00	20,440.00
Intake	concrete	M^3	75.00	100	7,500.00	0.00	7,500.00
Buildings	woodframe	L.S.	1,000.00	1	1,000.00	0.00	1,000.00
Power Canal	Rock Excavation	M^3	10.00	3,400	34,000.00	0.00	34,000.00
Rattling Pond Dam & Spillway	concrete	M^3	75.00	75	5,625.00	0.00	5,625.0
Trinity Pond Outlet	Concrete	M^3	100.00	40	4,000.00	0.00	4,000.00
Trinity Pond Canal	Earth Excavation	M^3	3.00	1,850	5,550.00	0.00	5,550.00
Revegetation							
-Selected Planting		Ha	1,000.00	2	2,000.00	0.00	2,000.00
Substation		L.S.	6,000.00	1	6,000.00	4,795.00	1,205.00
Transmission Line	single pole	KM.	3,000.00	1	3,000.00	0.00	3,000.00
Mobilization/ Demobilization		L.S.	10,000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**165,115.00**	**10,295.00**	**154,820.00**
CONTINGENCIES (10%)					16,511.50		16,511.5O
ENGINEERING & SUPERVISION (5%)					8,255.75		8,255.75
ENVIRONMENTAL ASSESSMENT (6%)					9,906.98		9,906.90
SITE REMEDIATION (10%)					16,511.50		16,511.50
TOTALS					**216,300.65**	**10,295.00**	**206,005.65**

3.6

HEART'S CONTENT



Hearts Content Watershed Area

NEWFOUNDLAND POWER

HEARTS CONTENT HYDROELECTRIC DEVELOPMENT

General

The Heart's Content Development is located on the east side of Trinity Bay near the community of Heart's Content. The development originally built in 1918 and extensively renovated in 1946 has an installed capacity of 2700 kW under a head of about 46.9 m. The development consists of one generating unit in a steel frame and concrete substructure powerhouse supplied by a woodstave penstock, concrete intake and earth embankment power canal. Storage is provided by structures located at Southern Cove Pond/Rocky Pond (Forebay), Seal Cove Pond, Long Pond and Packs Pond. Storage reservoirs at Ocean Pond, Gull Pond and control structures at Hanging Hill Pond and Packs Pond are not presently in use.

Powerhouse

The powerhouse is 14.6 m x 8.4 m x 7.8 m high and consists of a concrete substructure with steel framing and vertical asbestos siding. The powerhouse also includes a 15 ton mechanically operated crane.

Turbine-Generator

There is one 2400 kW vertical francis turbine manufactured by English Electric and commissioned in 1969. The generator was manufactured by Bruce Peebles and Co. Ltd.

Tailrace

The tailrace is excavated for a distance of about 60 m from the powerhouse to the shoreline of Heart's Content Harbour.

Penstock

The penstock is comprised of a 558 m long 1829 mm diameter woodstave section constructed in 1946 and a 21 m long 1829 mm diameter steel section built in 1959. Concrete anchor blocks are provided on the steel penstock section near the steel/woodstave connection and at the powerhouse entrance.

Intake and Forebay Dam

The intake is of reinforced concrete construction with concrete wingwalls. It includes a timber gate, screw stem lift, upstream stop logs, steel trashracks, control equipment and a wooden gatehouse. The wingwalls are situated on either side of the intake for a combined length of 19 m with a height of about 1.2 m.

Power Canal and Dyke

The power canal has an average width of about 36 m and is formed by an earth embankment dyke on one side and a natural hillside on the other side. The dyke is about 130 m long and 2 m high and includes a central steel core. It was constructed in 1988 to replace a timber crib structure.

Southern Cove Pond Dam

The structure is of earthfill construction about 120 m long and 2.0 m high. It was constructed in 1988 to replace a 90 m long timber crib section and incorporated an existing 30 m long earthfill section. The structure has a central steel core about 90 m long and is constructed contiguous to the power canal dyke.

Rocky Pond Dam, Spillway and Dewatering Outlet

The structure is of earthfill construction and is about 127 m long with a maximum height of about 2.8 m. It includes a 76 m long earthfill/rockfill overflow spillway with a steel sheet pile core as well as a 6 m wide rockfill treated timber crib outlet structure with a 1.5 m X 1.5 m timber gate and screw stem lift. The structure was built in 1990 to replace a timber crib dam.

Long Pond Dam Spillway and Outlet

The structure consists of a 145 m long by 3 m high homogeneous earthfill section, a 30 m long rockfill overflow spillway with a sheet steel pile core and a timber crib gate structure with timber gate and screw stem lift. The gate structure was rebuilt in 1988 and the dam and spillway were rebuilt in 1994.

Seal Cove Pond Diversion Dam and Spillway

The structure is of rockfill timber crib construction with upstream timber face and is about 210 m long with a maximum height of about 3.0 m. The spillway section is about 16 m long and 1.0 m high and includes timber decking. This dam was rehabilitated in 1993 with reconstruction of the spillway, replacement of the timber face, replacement of rock ballast and placement of an upstream blanket.

Packs Pond Main Dam and Freeboard Dams

The main dam was reconstructed in 1989 to replace the original rockfill timber crib dam and is about 125 m long with a maximum height of about 3.5 m. It is constructed of earthfill/rockfill with a galvanized steel central core.

One freeboard dam is located to the right of the main dam and is about 46 m long with a maximum height of 1.0 m. It is of earthfill construction with timber plank facing.

The other freeboard dam is located to the left of the main dam and consists of earthfill covering the remnants of timber piling. The structure may have been used as a spillway.

Packs Pond Canal and Outlet Structure

The canal is a shallow narrow channel about 92 m long and 1.8 m wide with a maximum depth of 0.9 m. The outlet structure was of rockfill treated local timber construction about 6 m wide and 2.3 m high with a 1.5 m wide gate opening. The outlet structure is presently abandoned and all material is removed permitting water to run freely into the canal.

Hanging Hill Pond Outlet Structure

This structure was of rockfill local timber crib construction. It was 7.3 m long and about 2.1 m high with a gate section about 0.9 m wide x 2.1 m high. It is presently abandoned and only a few remnants remain.

Gull Pond Dam. Spillway and Outlet

This structure was of rockfill local timber crib construction. It was 121 m long and 4.7 m high and incorporated a 16 m long spillway and a 1.8 m x 5.5 m high gate section. The structure is presently abandoned with exposed timber removed, rockfill leveled and the outlet widened.

Ocean Pond Dam. Spillway and Outlet

This structure was of rockfill local timber crib construction about 148 m long, and up to 4.3 m high. It incorporated a 19 m long spillway and a 1.8 m x 5.2 m high gate section. The structure is presently abandoned with exposed timber removed, rockfill leveled and the outlet widened.

Substation

The generated voltage of 2.4 kV is stepped down to 120/208V for the station service, and is stepped up to 66 kV for transmission and 12.5 kV for distribution. Feeder is supplied via the 66 kV bus through a stepdown transformer.

Transmission

All lines are part of the main grid except for the 2.4 kV line from the plant to the substation.

DECOMMISSIONING SCENARIO FOR HEART'S CONTENT

General

Decommissioning will include demolition of practically all hydraulic structures in this development with the exception of the structures on Southern Cove Pond, which will remain to the extent necessary to maintain the water supply for the Town of Heart's Content. This is the only expected direct environmental impact with the decommissioning of the plant.

Material to be sold as scrap will be transported 138 km for sale and materials requiring disposal at approved site will be hauled 18 km. Contaminated material will be transported and disposed of at an approved treatment facility.

Powerhouse

The powerhouse superstructure because it is located in the community will be sold. The market value for this type of building in Heart's Content would be minimal and therefore its value would be low. The powerhouse crane will be removed and sold or reused at another location.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

The tailrace will be backfilled with adjacent earthfill and beach material. The area beyond the beach will be landscaped.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The concrete anchor blocks will be demolished and buried in the tailrace. The steel penstock will be cut up and sold for scrap. The soil under the woodstave footprint will be excavated and transported to a soil treatment facility. The penstock route will be graded and landscaped.

Intake and Forebay Dam

The intake will be demolished and debris will be buried in the power canal. Minor items may be salvaged for use at other sites or sold for scrap. The site will be backfilled and graded.

Power Canal and Dyke

The dyke will be demolished and material will be used to backfill the power canal. The site will be graded and landscaped.

Southern Cove Pond Dam

The dam will be modified to provide a low freeboard dam designed to maintain sufficient water levels in the pond for the town water supply. The dam will be extended across the entrance to the power canal. Flow from this pond will enter Rocky Pond and then Rocky River.

Rocky Pond Dam, Spillway and Dewatering Outlet

The outlet structure will be demolished with timber and transported to an approved disposal site. The opening will be widened to pass a continuous flow into Rocky River. The steel core in the spillway will be removed and buried on site. The earthfill dam and spillway will be leveled to match the contours of the natural terrain. The site will be landscaped.

Long Pond Dam, Spillway and Outlet

The structure will be demolished with all timber and transported to an approved disposal site. Rockfill will be leveled and the outlet opening will be widened to pass flood flows. The gate lift and stem will be salvaged for use at other sites.

Seal Cove Pond Diversion Dam and Spillway

The structure will be demolished with all timber and transported to an approved disposal site. Rockfill will be leveled and an opening will be excavated to permit the flow to return to the natural channel at Seal Cove Brook.

Packs Pond Main Dam and Freeboard Dams

The structures will be demolished with all timber transported to an approved disposal site. Rockfill and earthfill will be leveled and landscaped. An opening will be excavated to permit the flow to return to the natural channel through several ponds and the Salmon Cove River.

Packs Pond Canal and Outlet Structure

The structures are presently demolished and no additional work is anticipated.

Hanging Hill Pond Outlet Structure

The structure is presently demolished but a small amount of additional work will be required to remove and bury the remaining remnants of the structure.

Gull Pond Dam, Spillway and Outlet

The structure is presently demolished and no additional work is anticipated.

Ocean Pond Dam, Spillway and Outlet

The structure is presently demolished and no additional work is anticipated.

Substation

The section of the substation associated with the generated voltage will be taken out of service and equipment will be salvaged. The remainder of the substation will remain.

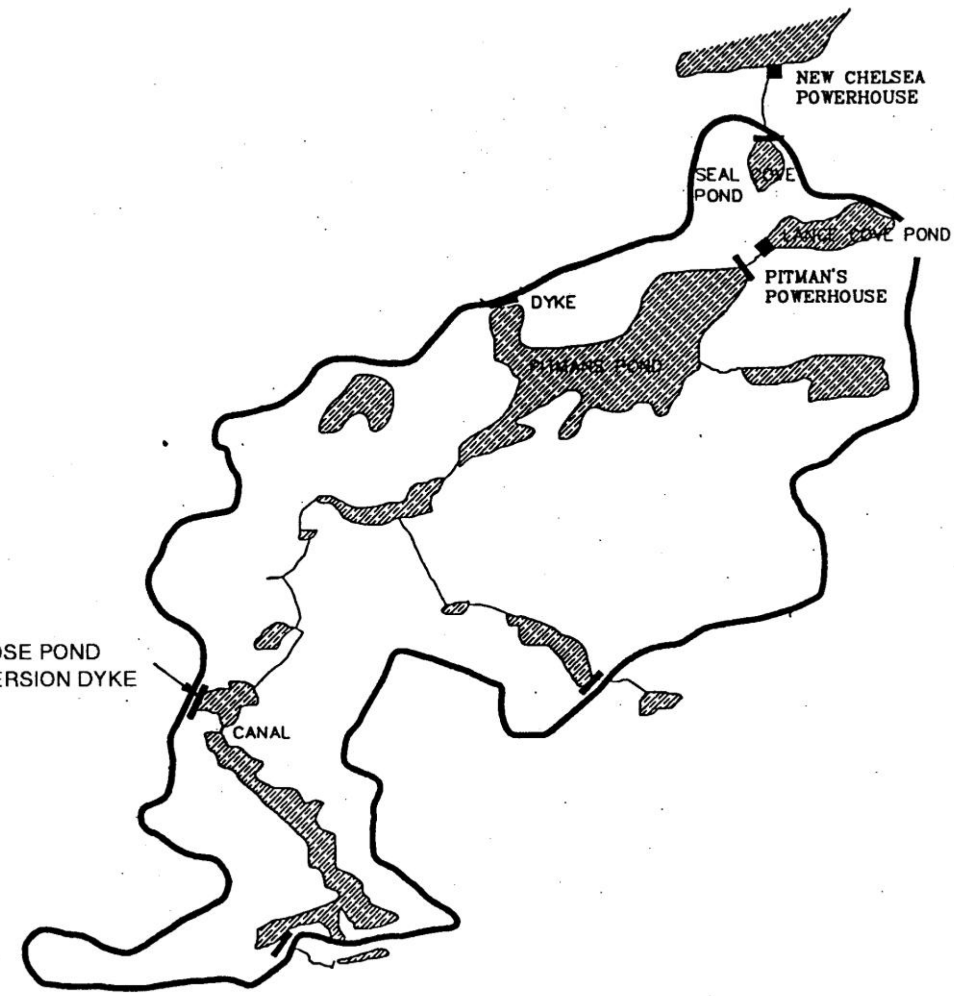
Transmission Line

Transmission lines associated with this development will remain in place after decommissioning.

ESTIMATED COST OF RETIRING HEART'S CONTENT PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST**	**ESTIMATED QUANTITY**	**ESTIMATED COST**	**SALVAGE VALUE**	**TOTAL COST**
Powerhouse					(44,000.00)	0.00	(44,000.00)
Turbine/Generator	Vert-francis	L.S.	20,000.00		20,000.00	2,685.00	17,315.00
Powerhouse crane	15 ton.	L.S	1000.00	1.00	1,000.00	2,500.00	(1,500.00)
Tailrace	earth exc.	M^3	3.00	100	300.00	0.00	300.00
-retaining wall	concrete	M^3	75.00	5	375.00	0.00	375.00
Penstock	woodstave	M^2	7.00	3,208	22,456.00	0.00	22,456.00
	steel	M^2	14.50	121	1,754.50	0.00	1,754.50
Anchor Blocks	concrete	M^3	100.00	40	4,000.00	0.00	4,000.00
Forebay Dam & Intake	concrete	M^3	100.00	35	3500.00	0.00	3,500.00
-gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-gate equipment		L.S.			1,000.00	2,000.00	(1,000.00)
Power Canal Dyke	earthfill	M^3	5.00	1,820	9,100.00	0.00	9,100.00
Southern Cove Pond Dam	earthfill	M^3	5.00	400	2,000.00	0.00	2,000.00
-new dam	earthfill	M^3	14.00	500	7,000.00	0.00	7,000.00
Rocky Pond Dam	earthfill	M^3	5.00	2,000	10,000.00	0.00	10,000.00
outlet	timber crib	M^3	20.00	90	1,800.00	2,000.00	(200.00)
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Long Pond Dam & Spillway	timber crib	M^3	20.00	900	18,000.00	0.0	18,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Seal Cove Pond Diversion Dam & Spillway	Timber crib	M^3	20.00	1313	26,260.00	0.00	26,260.00
			20.00	1,313	26,260.00	0.00	26,260.00
Packs Pond Dam	earth/rockfill	L.S.	5.00	4,375	21,875.00	0.00	21,875.00
Freeboard Dams	earthfill	L.S.	2500.00	2	5,000.00	0.00	5,000.00
Hanging Hill Pond							
- Outlet	timber crib	M^3	20.00	100	2,000.00	0.00	2,000.00
Revegetation					1		
- hydroseeding		M^2	2.00	500	1,000.00	0.00	1,000.00
- selected planting		Ha	1000.00	2	2000.00	0.00	2,000.00
Substation		L.S.	5000.00	1	5,000.00	5,397.00	(397.00)
Transmission	single pole	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Mobilization/ Demobilization		L.S.	20,000.00	1	20,000.00	0.00	20,000.00
SUBTOTALS					189,420.50	62,582.00	126,838.5O
CONTINGENCIES (10%)					18,942.05		18,942.O5
ENGINEERING & SUPERVISION (5%)					9,471.03		9,471.03
ENVIRONMENTAL ASSESSMENT (6%)					11,365.23		11,365.23
SITE REMEDIATION (10%)					18,942.05		18,942.05
TOTALS					248,140.86	62,582.00	185,558.86

3.7

NEW CHELSEA & PITMANS POND



New Chelsea/Pitmans
Watershed Area

NEWFOUNDLAND POWER

NEW CHELSEA/PITMANS POND HYDROELECTRIC DEVELOPMENT

General

The New Chelsea/Pittman's Pond Development is located on the east side of Trinity Bay near the community of New Chelsea. Pittmans Pond and New Chelsea powerhouses are in series and have installed capacities respectively of 4200 kW under a net head of 83.8 m and 900 kW under a net head of 21.3 m.

New Chelsea powerhouse, located near sea level, contains one generating unit supplied by a combination woodstave/steel penstock and a concrete intake at Seal Cove Pond.

Pitmans Pond powerhouse, located upstream of Lance Cove Pond, contains one generating unit supplied by a woodstave penstock and concrete intake at Pittman's Pond.

Storage reservoirs are provided by structures located at Seal Cove Pond/Lance Cove Pond and Pittman's Pond.

Powerhouse (New Chelsea)

The powerhouse is 8.5 m x 12.8 m x 12.2 m high and consists of a concrete substructure and superstructure.

Turbine-Generator (New Chelsea)

There is one 4100 kW vertical francis turbine, manufactured by Dominion Engineering and commissioned in 1956. The generator was manufactured by Westinghouse.

Powerhouse Crane (New Chelsea)

There is a 15 ton electrically operated crane spanning 12.5 m.

Tailrace (New Chelsea)

The tailrace is short and consists of two concrete retaining walls from the plant to the sea.

Penstock (New Chelsea)

The penstock is comprised of an 867 m long 1829 mm diameter woodstave section supported by wooden cradles and a 236 m long 1524 mm diameter steel section near the plant which is buried.

Seal Cove Pond Dam, Spillway and Intake

The dam is an earthfill structure about 180 m long with a maximum height of 12.0 m. The spillway section is a 36 m long low concrete gravity structure incorporated into the left abutment of the dam.

The intake structure is of concrete construction and is incorporated into the center of the dam. It includes a concrete box culvert through the dam, a steel gate and handwheel, steel trashracks, upstream removable stoplogs, control equipment, and a wooden gatehouse.

Powerhouse (Pittman's Pond)

The powerhouse is 11.0 m x 13.7 m x 7.6 m high and consists of a concrete substructure and superstructure.

Turbine Generator (Pittman's Pond)

There is one 895 kW horizontal Francis turbine, manufactured by Gilkes and commissioned in 1959. The generator was manufactured by Westinghouse.

Powerhouse Crane (Pittman's Pond)

There are two hand operated 5 ton cranes spanning 9.9 m.

Tailrace (Pittman's Pond)

The tailrace is excavated from the plant to the shoreline of Lance Cove Pond.

Penstock (Pittman's Pond)

The penstock is a 1372 mm diameter 385 m long above ground woodstave pipe supported by timber cradles.

Pitman's Pond Dam, Spillway and Intake

The dam is an earthfill structure about 300 m long with a maximum height of 11.6 m. It incorporates a low concrete spillway at its right abutment that is 44 m long and 1.2 m high. A 2.4 m high concrete wing wall separates the dam and spillway.

The intake is a concrete structure incorporated into the center of the dam. It includes a 2.1 m x 1.9 m concrete box culvert through the dam, a 1.5 m X 1.5 m steel gate and handwheel, steel trashracks, upstream removable stoplogs and control equipment.

Pitmans Pond West Dyke

The dyke is an earthfill freeboard structure approximately 366 m long with a maximum height of 3.0 m.

Ocean Pond Dyke

The dyke is a very small rockfill freeboard structure used to plug a small stream.

No Name Pond Dyke

The dyke is a very small rockfill freeboard structure used to plug a small stream.

Moose Pond Diversion

Moose Pond diversion consists of a small earthfill diversion dam and a 200 m long habitat compensation channel.

Substation (New Chelsea)

The substation steps up the generated voltage from 6.9 kV to 66 kV for transmission and 12.5 kV for distribution and steps down the voltage to 600 V for the station service.

Transmission Line (New Chelsea)

The lines include two 66 kV transmission lines, two 12.5 kV distribution lines, the 12.5 kV line to Pitman's Pond Substation, the 6.9 kV line from the plant, and the station service line to the plant.

Transmission Line (Pitman's Pond)

The transmission line is a 12.5 kV line to New Chelsea Substation.

Substation (Pitman's Pond)

The substation steps down the generated voltage from 2.4 kV to 120/240 V for the station service and also steps up the voltage to 12.5 kV for the distribution line to New Chelsea Substation.

Access Roads

There is approximately 3 km of access roads operated by the company associated with this development. These roads include various small culverts and one large culvert where the road crosses a canal downstream of Pitmans Pond powerhouse.

DECOMMISSIONING SCENARIO FOR NEW CHELSEA/PITMAN'S POND

General

It is assumed that both plants in this development will be retired simultaneously. All hydraulic structures will be demolished. Most of the substation and transmission structures at New Chelsea will remain except those required only for generation from the two plants. No significant environmental impact with the decommissioning of this development is anticipated.

Materials from this development that will be sold for scrap will be transported 150 km. Materials required to be disposed of at approved sites will be transported 36 km. Contaminated materials will be transported and disposed at an approved treatment facility.

Powerhouse (New Chelsea)

The powerhouse superstructure will be demolished and all debris will be buried at an approved waste disposal site. The foundation will be backfilled and landscaped and the tailrace opening will be sealed with concrete.

Turbine-Generator (New Chelsea)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Powerhouse Crane (New Chelsea)

The crane will be removed and salvaged.

Tailrace (New Chelsea)

The tailrace will be backfilled with rock as required. The very short length of the tailrace channel and its proximity to the sea result in a limited amount of remedial work requirements.

Penstock (New Chelsea)

The woodstave section will be demolished and disposed of at an approved waste disposal site. The steel section will be cut up and sold for scrap. The soil under the penstock footprint will be excavated and transported to the nearest soil treatment facility. The penstock route will be graded and landscaped.

Seal Cove Pond Dam, Spillway and Intake

The entire structure will be demolished and all debris will be disposed of at the site. The concrete spillway and intake structure will be demolished to ground level and the foundations will be backfilled. Concrete debris will be buried on site. Minor items from the intake may be salvaged for use at other sites. The earthfill section will be leveled to match the contours of the surrounding terrain. An opening will be excavated to route water into the original river channel. The site will be landscaped after the completion of demolition.

Powerhouse (Pitman's Pond)

The powerhouse superstructure will be demolished and all debris will be buried in the tailrace. The foundation will be backfilled and landscaped.

Turbine-Generator (Pitman's Pond)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Powerhouse Crane (Pitman's Pond)

The cranes will be removed and salvaged.

Tailrace (Pitman's Pond)

The tailrace will be backfilled with adjacent material and landscaped.

Penstock (Pitman's Pond)

The woodstave penstock will be demolished and disposed of at an approved waste disposal site. The soil under the penstock footprint will be excavated and transported to the nearest soil treatment facility. The penstock route will be graded and landscaped.

Pitman's Pond Dam, Spillway and Intake

The structure will be demolished and all debris will be disposed of at an approved site. The concrete spillway and intake structure will be demolished to ground level and the foundations will be backfilled. Concrete debris will be buried on site. Minor items from the intake may be salvaged for use at other sites. The earthfill section will be levelled to match the contours of the surrounding terrain. An opening will be excavated to route water into the original river channel. The site will be landscaped.

Pitman's Pond West Dyke

The structure will be leveled to match the contours of the surrounding terrain and the site will be landscaped.

Ocean Pond Dyke

The structure is very small and will not require any demolition work.

No Name Pond Dyke

The structure is very small and will not require any demolition work.

Moose Pond Diversion

The dam at Moose Pond will be demolished and the water flow will revert to its original direction. The habitat compensation channel will be closed off and backfilled.

Substation (New Chelsea)

The transformers and other equipment required to step up plant generation to 66 kV and to step down plant generation for station service will be removed and salvaged. All other equipment associated with the main grid will remain.

Transmission (New Chelsea)

The 6.9 kV line from the plant to the substation and the 600 V station service line will be removed. The conductor will be sold for scrap. All other lines will remain in service.

Substation (Pitman's Pond)

The entire substation will be dismantled. Equipment will either be salvaged for use at other sites or sold for scrap. The site will be graded and landscaped.

Transmission (Pitman's Pond)

All lines including the 12.5 kV line to New Chelsea will be removed. The conductor will be sold for scrap. Poles will be either salvaged or scrapped.

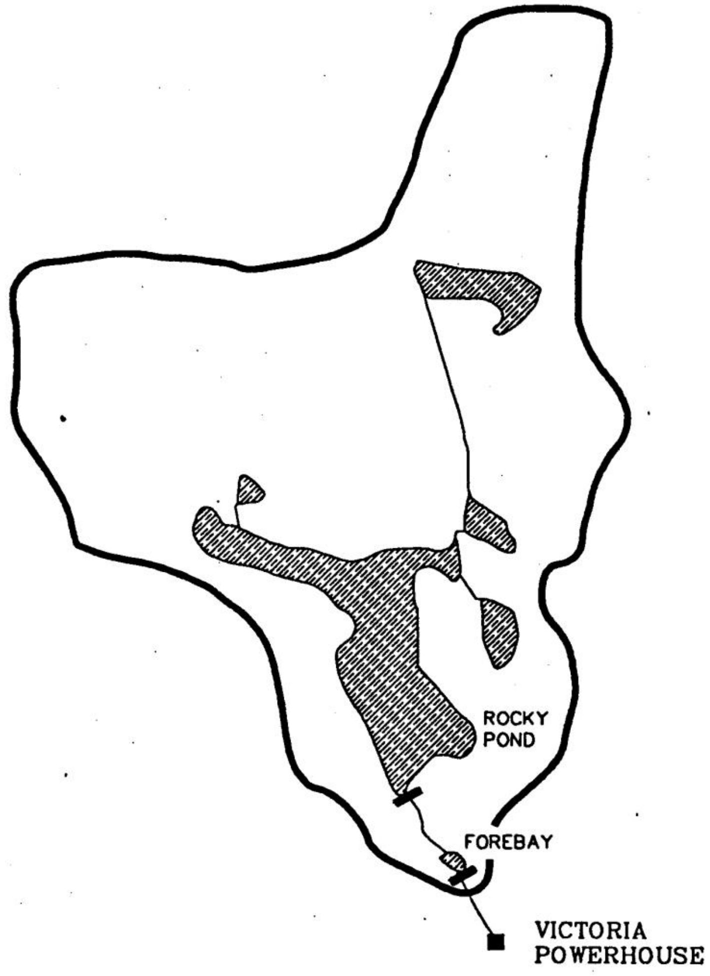
Roads

All roads associated with this development will be left in place for public use.

ESTIMATED COST OF RETIRING NEW CHELSEA/PITMANS POND HYDRO DEVELOPMENT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST ($)**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
New Chelsea Powerhouse							
-substructure	concrete	M^3	100.00	200	20,000.00	0.00	20,000.00
-superstructure	concrete	M^3	100.00	130	13,000.00	0.00	13,000.00
-powerhouse crane	15 ton	L.S.	1,000.00	1	1,000.00	2,500.00	(1,500.00)
Turbine/generator	Vert. Francis		25,000.00	1	25,000.00	4,180.00	20,820.00
Penstock	Steel	M^2	11.75	1,130	13,277.50	0.00	13,277.50
	Woodstave	M^2	7.00	4,982	34,874.00	0.00	34,874.00
Seal Cove Pond Dam	earthfill	M^3	3.00	1,224	3,672.00	0.00	3,672.00
Spillway	concrete	M^3	75.00	12	862.50	0.00	862.50
Intake	concrete	M^3	100.00	60	6,000.00	0.00	6,000.00
Gatehouse equipment		L.S.	1,000.00	1	1,000.00	2,000.00	(1,000.00)
Gatehouse		L.S	1,000.00	1	1,000.00	0.00	1,000.00
Pitman's Powerhouse							
superstructure	concrete	M^3	100.00	86	8,600.00	0.00	8,600.00
substructure	concrete	M^3	100.00	42	4,150.00	0.00	4,150.00
Turbine/generator	Horiz Francis	L.S	20,000.00	1	20,000.00	900.00	19,100.00
Powerhouse Crane	5 ton		750.00	2	1,500.00	2,500.00	(1,000.00)
Penstock	Woodstave	M^2	7.00	1,660	11,620.00	0.00	11,620.00
Pitmans Pond Dam	earthfill	M^3	3.00	13,911	41,733.00	0.00	41,733.00
Spillway	concrete	M^3	75.00	54	4012.50	0.00	4012.50
intake a Conduit	concrete	M^3	100.00	374	37,400.00	0.00	37,400.00
Gatehouse equipment		L.S.	1,000.00	1	1,000.00	2,000.00	(1,000.00)
Gatehouse	woodframe	L.S.	1,000.00	1	1,000.00	0.00	1,000.00
Pitmans Pond West							
Dyke	earthfill	M^3	3.00	1,885	5,655.00	0.00	5,655.00
Revegetation							
-Selective Planting		Ha	1,000.00	2	2,000.00	0.00	2,000.00
Pitmans Substation		L.S.	5,000.00	1	5,000.00	2,000.00	3,000.00
Pitmans Transmission Lines		KM	3,000.00	5	15,000.00	0.00	15,000.00
New Chelsea Substation		L.S.	5,000.00	1	5,000.00	19,932.00	(14,932.00)
Mobilization/Demobilization		L.S	1,500.00	1	15,000.00	0.00	15,000.00
SUBTOTALS					**298,356.50**	**36,012.00**	**262,344.50**
CONTINGENCIES (10%)					29,835.65		29,835.65
ENGINEERING & SUPERVISION (5%)					14917.825		149,17.825
ENVIRONMENTAL ASSESSMENT (6%)					14,917.83		14,917.83
SITE REMEDIATION (10%)					29,835.65		29,835.65
TOTALS					**387,863.45**	**36,012.00**	**351,851.45**

3.8

VICTORIA



Victoria
Watershed Area

NEWFOUNDLAND POWER

VICTORIA HYDROELECTRIC DEVELOPMENT

General

The Victoria Development is located on the northwest side of Conception Bay near the community of Victoria. It was commissioned in 1904 and has a total capacity of 500 kW under a net head of 64.3 m. It consists of one generating unit in a concrete powerhouse supplied by a combination woodstave and steel penstock and an intake incorporated into a rockfill concrete faced forebay dam. There is one storage reservoir located at Rocky Pond.

Powerhouse

The powerhouse is 22.9 m x 6.1 m x 3.7 m high and is of rock masonry construction. Approximately half of the building houses the present generating unit and the remainder has been refurbished as a museum containing the original turbine-generators and other exhibits.

Turbine-Generator

There is one 450 kW Voith turbine installed in 1914. The generator was manufactured by Westinghouse.

Penstock

The penstock is 494 m long with changes in diameter and construction along its length. The first 238 m starting at the intake, is 1097 mm diameter woodstave penstock, changing to a 1219 mm diameter woodstave penstock for the next 174 m then to a 1067 mm diameter steel penstock for 82 m to the powerhouse. The woodstave section is supported by timber cradles while the steel section rests on concrete supports.

Tailrace

The tailrace is excavated for about 40 m from the powerhouse to the existing river channel.

Blue Hill Pond (Forebay) Dam, Spillway, Outlet and Intake

The structure is of rockfill construction with reinforced concrete upstream and downstream facing and crest. It is about 37 m long with a maximum height of 6.1 m. A 9 m long overflow spillway is incorporated into the right side of the dam. An unwatering conduit consisting of a steel pipe, with a handwheel operated gate, extends through the dam. The intake for the penstock consists of steel trashracks and an 1100 mm diameter steel pipe controlled by a 1.4 m x 1.4 m steel gate and handwheel.

Rocky Pond Dam, Spillway and Outlet

The structure is of concrete gravity construction and had a downstream protective layer installed in 1983 and an upstream layer in 1995. It is about 90 m long with a maximum height of 7.6 m and incorporates an 17 m long overflow spillway and a dewatering outlet. A new 1.5 m X 1.5 m steel gate operated by screw stem lift was also installed in 1995.

Substation

The substation steps up the generation voltage of 2.4 kV, and also steps down the 66 kV transmission line for 12.5 kV distribution feeders. The substation also steps down 12.5 kV to 120/240 V for the yard station service and steps down 2.4 kV to 120/240 V for the plant service.

Transmission

All lines are part of the main grid except those between the substation and the plant.

Washrooms

Washroom facilities for the Victoria Plant Museum are of wood frame construction measuring 2.0 m x 3.6 m with a 150 mm concrete slab on grade substructure.

Spillway Canal Bridge

The spillway canal (Spout Brook) bridge on the plant access road consists of steel beams supported by rock wall abutments. It has timber decking and rails, and is 4.8 m long x 3.5 m wide.

Parking Lot

A 750 m^2 parking lot with a road gravel surface and wooden posts and railing on one side is provided for the museum.

DECOMMISSIONING SCENARIO FOR VICTORIA

General

Decommissioning will include demolition of practically all hydraulic structures except those associated with the museum. The only potential environmental impact is due to the Town of Victoria water supply located in a brook between Blue Hill Pond and Rocky Pond. The removal of dams will not interfere with the operation of the water supply since its intake is not located in a storage reservoir.

Materials to be sold as scrap will be transported 115 km for sale. Materials requiring disposal at an disposal site will be transported 5 km. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse

Equipment not of historical significance will be removed and sold for scrap and the museum section will be retained and expanded.

Turbine-Generator

Equipment of historical significance will be refurbished and put on display. Other equipment including switchgear will be removed and sold for scrap.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The steel section will be cut up and sold for scrap. The soil under the penstock footprint will be excavated and transported to the nearest soil treatment facility. The penstock route will be graded and landscaped.

Tailrace

The tailrace will be completely backfilled and landscaped using material transported to the site.

Blue Hill Pond (Forebay) Dam. Spillway, Outlet and Intake

The dam will be demolished and all waste material will be buried at an approved location near the site. The site will be graded and landscaped.

Rocky Pond Dam. Spillway and Outlet

The dam will be demolished and all waste material will be buried at an approved location near the site. The site will be graded and landscaped.

<u>Substation</u>

The substation will remain except for equipment used to step up generated voltage to 12.5 kV and to step down voltage for the plant service. The equipment will be salvaged for use at other sites.

<u>Transmission</u>

All transmission lines will remain except those between the plant and substation.

<u>Washrooms</u>

Washroom facilities will remain for the use of museum users.

<u>Spillway Canal Bridge</u>

The bridge will remain to provide access to the museum.

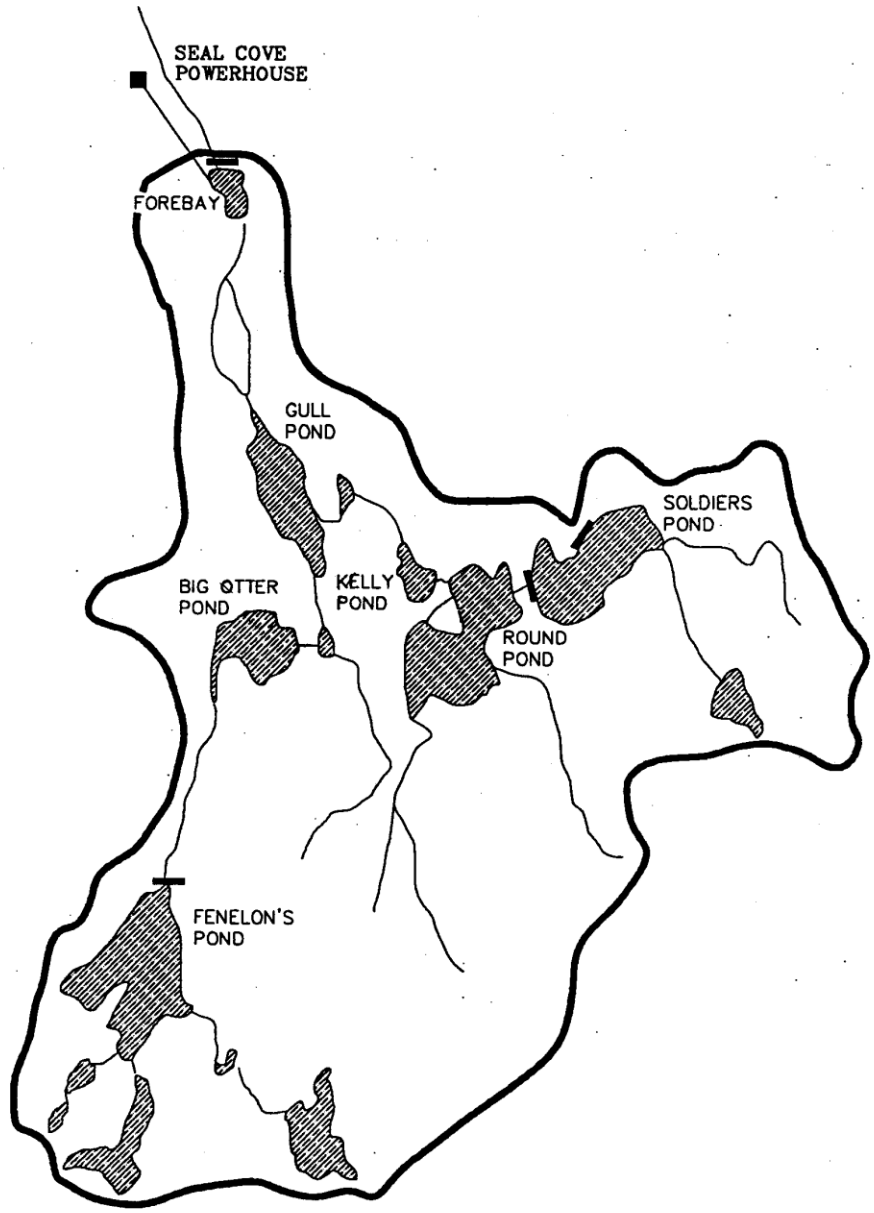
<u>Parking Lot</u>

The parking lot will remain for museum users.

ESTIMATED COST OF RETIRING VICTORIA PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY $**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse					To Be Left Intact		
Turbine/Generator					To Be Left Intact		
Penstock	Woodstave	m^2	7.00	1,487	10,406.20	0.00	10,406.20
	Steel	m^2	14.50	275	3,987.50	0.00	3,987.50
Blue Hills Pond							9,487.50
Forebay	concrete	m^3	75.00	127	9,487.50	0.00	
	rockfill	m^3	5.00	268	1,340.00	0.00	1,340.00
Gate Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Rocky Pond Dam	Concrete	m^3	100.00	1,230	123,000.00	0.00	123,000.00
Gate Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Revegetation							
-selective Planting		Ha.	1000.00	0.25	250.00	0.00	250.00
Substation		L.S.	4000.00	1	4,000.00	2,500.00	1,500.00
Mobilization/		L.S.	10000.00	1	10,000.00	0.00	10,000.00
Demobilization							
SUBTOTALS					**164,471.20**	**6,500.00**	**157,971.20**
CONTINGENCIES (10%)					16,447.12		16,447.12
ENVIRONMENTAL (6%)					9,868.27		9,868.27
ENGINEERING & SUPERVISION (5%)					8,223.56		8,223.56
SITE REMEDIATION (10%)					16,447.12		16,447.12
TOTALS					**215,457.27**	**6,500.00**	**208,957.27**

3.9

SEAL COVE



Seal Cove
Watershed Area

NEWFOUNDLAND POWER

SEAL COVE HYDROELECTRIC DEVELOPMENT

General

The Seal Cove Development is located on the southern part of Conception Bay near the Community of Seal Cove. It has a total capacity of 3400 kW under a net head of 55.5 m. The development was commissioned in 1924 and consists of two generating units in a concrete powerhouse supplied by a woodstave penstock and concrete intake. Storage is provided by structures located at White Hill Pond (Forebay), Fenelons Pond, and Soldiers Pond. Storage reservoirs at Gull Pond, Kelly's Pond, Round Pond, Big Otter Pond, and Five Mile Pond are not presently in use.

Powerhouse

The powerhouse is 24.5 m x 8.9 m x 9.1 m high and consists of a concrete substructure, three concrete walls, a masonry block wall and a wooden roof. Also included in the powerhouse is a 10 ton mechanically operated crane.

Turbines and Generators

The two turbines have a combined output of 3400 kW. One unit consists of a Voith turbine with Westinghouse generator. The other consists of an Allis Chalmers turbine and generator.

Tailrace

The tailrace is excavated for a distance of about 30 m from the powerhouse to the Seal Cove River.

Penstock

The penstock is 1220 m long, 2134 mm diameter and is of above ground treated woodstave construction supported on timber cradles. Stay brace cradles were installed on 1,025 m of the penstock length in 1993.

Intake

The intake is of reinforced concrete construction with concrete wing walls on both sides. It includes a steel sluice gate, gate lift, wooden trashracks, control equipment, and a wooden gatehouse.

White Hill Pond (Forebay) Dam and Spillway

The dam is a concrete slab and buttress structure that is 365 m long and has a maximum height of about 4.0 m. There is also a sluice gate for dewatering the forebay. The spillway is a separate low concrete gravity structure about 55 m long with a maximum height of about 1.2 m. In 1993 the dam was rehabilitated by placement of rock fill on the downstream and concrete repairs to the upstream face. Also carried out at this time were creation of an auxiliary spillway and placement of an impervious blanket upstream.

Soldiers Pond Dam and Spillway

The structure is of earthfill and rockfill treated timber cribwork with a treated timber upstream face. It is about 3.1 m high and 185 m long. The spillway section is incorporated into the dam and is about 15 m long. It includes a treated timber apron. The treated timber face was replaced in 1994.

Soldiers Pond Outlet

This structure was rebuilt in 1992 to replace the deteriorated timber crib outlet. This structure now consists of a 100 m section of homogeneous earthfill and timber crib outlet structure with gabion wingwalls. The maximum height of the structure is 4 m and the gate is 1,500 mm x 1,500 mm and is of timber construction and operated by a screw stem lift.

Fenelons Pond Dam, Spillway and Outlet

The structure was rebuilt in 1985, and consists of earthfill construction covering the original timber cribwork and earthfill dam. The 221 m long structure incorporates a 26 m long rockfill treated timber crib spillway, and an outlet consisting of a galvanized culvert extending through the earthfill dam and regulated by a timber gate and screw stem gate lift situated in a timber well near the center of the dam.

Gull Pond Dam, Spillway and Outlet

The structure was of reinforced concrete slab and buttress construction about 145 m long with a maximum height of about 5.3 m. It has been completely demolished and is abandoned.

Kelly's Pond Dam, Spillway and Outlet

The structure was of reinforced concrete slab and buttress construction about 260 m long with a maximum height of about 5.2 m. It has been completely demolished and is abandoned.

Round Pond East Dam

The structure was a vertical concrete wall about 140 m long with an average height of about 1.8 m. It has been completely demolished and is abandoned.

Round Pond West Dam, Spillway, and Outlet

The structure was of concrete gravity construction about 50 m long with a maximum height of about 4.0 m. It has been completely demolished and is abandoned.

Big Otter Pond Dam, Spillway and Outlet

The structure was of rockfill local untreated timber crib construction. It was about 135 m long with a maximum height of about 4.9 m. The structure is presently abandoned, timber has been removed and remaining rock impounds water for recreational use at Butterpot Provincial Park.

Five Mile Pond Dam and Outlet

The structure was a short, low, rockfill local timber crib structure. It was demolished more than 25 years ago and is presently abandoned.

Seal Cove Substation

The substation has a number of functions including stepping up the generated voltage of 2.4 kV to 66 kV, stepping down 66 kV to 12.5 kV for distribution feeders, and stepping down 2.4 kV to 120/240 V for the station service.

Transmission Line

The substation is part of the main grid. The only separate lines are an underground 2.4 kV line from the plant to the substation and the returning station service.

Other

A series of gravel roads including several small bridges provide access to the various dams. The roads and bridges are in very poor condition. There is also a storage shed near the powerhouse.

DECOMMISSIONING SCENARIO FOR SEAL COVE

General

Decommissioning would include demolition of practically all structures except for the substation, transmission line and remnants of Big Otter Pond Dam which would be upgraded due to the recreational use of the pond.

The closest waste disposal site is located near the Community of Foxtrap approximately 18 km away. A scrap metal dealer is located in Long Pond, approximately 6 km away. Contaminated materials would be transported and disposed at an approved treatment facility.

Powerhouse

The powerhouse superstructure will be demolished with material buried in the tailrace. The foundation will be backfilled and hydroseeded. The crane will be salvaged during decommissioning.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

The tailrace will be backfilled with adjacent material and hydroseeded.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The soil under the penstock footprint will be excavated and transported to the nearest soil treatment facility. The penstock route will be graded and hydroseeded.

Intake

The intake will be demolished to ground level and all debris will be disposed of at an approved location on site. The gate lift and other minor items will be salvaged for use at other sites. The site will be backfilled and selectively planted.

White Hill Pond (Forebay) Dam and Spillway

The structure will be demolished and all waste material will be buried at an approved location on site. The site will be graded and selectively planted. Normal flow will be directed through the sluice gate site.

Soldiers Pond Dam and Spillway

The dam will be demolished and leveled and all timber will be transported to an approved disposal site. The site will be graded and selectively planted.

Soldiers Pond Outlet

The structure will be demolished with all timber transported to an approved disposal site. The opening will be widened to pass flood flows and the site will be graded and selectively planted.

Fenelons Pond Dam, Spillway and Outlet

The structure will be demolished and leveled. All timber will be transported to an approved disposal site. The opening will be widened to pass flood flows. The galvanized culvert and gate well will be removed and also transported to an approved disposal site. The gate lift and other minor items will be salvaged for use at other sites. The site will be graded and selectively planted.

Gull Pond Dam, Spillway and Outlet

The structure is presently demolished and no additional work is required.

Kelly's Pond Dam, Spillway and Outlet

The structure is presently demolished and no additional work is required.

Round Pond East Dam

The structure is presently demolished and no additional work is required.

Round Pond West Dam, Spillway and Outlet

The structure is presently demolished and no additional work is required.

Big Otter Pond Dam, Spillway and Outlet

The remnants of the structure are located in Butterpot Provincial Park on a pond which is important for recreational use. It is expected that a minor amount of work will be carried out and the structure will be turned over to the Provincial Park authority.

Five Mile Pond Dam and Outlet

The structure is presently demolished and no additional work is required.

Seal Cove Substation

The substation will remain except for the equipment used to step up voltage from generation voltage by 2.4 kV to 66 kV and to step down voltage to the 120/240 V for station service. The equipment will be salvaged for use at other sites.

Transmission Line

All lines will remain except for the underground 2.4 kV line from the powerhouse and the station service line. Conductor will be removed and sold for scrap.

Other

The storage shed will be demolished with material disposed of at the waste disposal site. The roads will be left in place to maintain access for others. Any bridges that were part of the development will be removed.

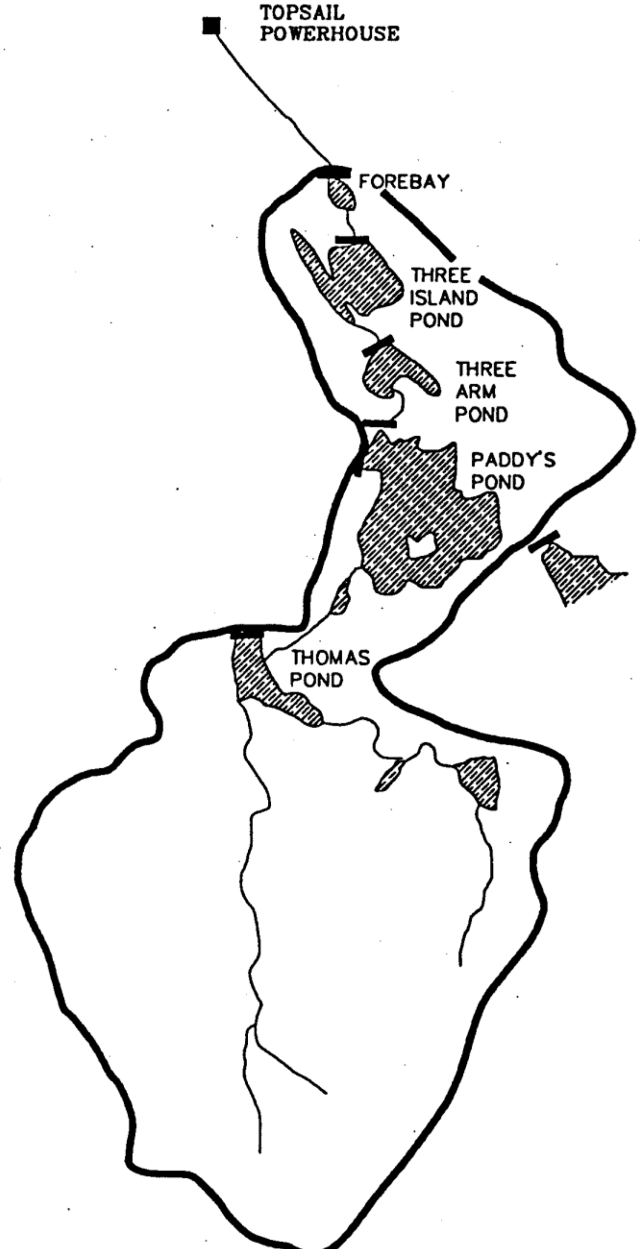
ESTIMATED COST OF RETIRING SEAL COVE PLANT

DESCRIPTION	TYPE	UNIT	UNIT COST $	ESTIMATED QUANTITY	ESTIMATED COST $	SALVAGE VALUE $	TOTAL COST $
Powerhouse							
-superstructure	concrete	m^3	100.00	183	18,300.00	0.00	18,300.00
-substructure	concrete	m^3	100.00	150	15,000.00	0.00	15,000.00
-powerhouse crane	10 ton	L.S.	1000.00	1	1,000.00	2,500.00	(1,500.00)
Turbine/Generator	horiz.francis	L.S.	15,000.00	2	30,000.00	3,595.001	26,405.00
Tailrace	earthfill	m^3	3.00	500	1,500.00	0.00	1,500.00
Penstock	woodstave	m^2	7.00	8,179	57,253.00	0.00	57,253.00
Intake							
-substructure	concrete	m^3	100.00	50	5,000.00	2,000.00	3,000.00
-superstructure	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-Gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Forebay dam	concrete	m^3	100.00	580	58,000.00	0.00	58,000.00
-spillway	concrete	m^3	75.00	52	3,900.00	0.00	3,900.00
-rockfill	rockfill	m^3	5.00	5,800	29,000.00	0.00	29,000.00
-gabions	gabions	m^3	20.00	150	3,000.00	0.00	3,000.00
Soldier's Pond							
Dam & Spillway	timber crib	m^3	20.00	900	18,000.00	0.00	18,000.00
-outlet	timber crib	m^3	20.00	635	12,700.00	0.00	12,700.00
-Gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Fenelons Pond							
Dam & Outlet	earthfill	m^3	5.00	2,445	12,225.00	2,000.00	10,225.00
	timber crib	m^3	20.00	2,544	50,880.00	0.00	50,880.00
-Gate equipment		L.S.	1,000.00	2,000.00	(1,000.00)		
Fenelons Pond							
spillway	timber crib	m^3	20.00	426	8,520.00	0.00	8,520.00
Big Otter Pond Dam							
Spillway & outlet modifications		m^3	20.00	814	16,280.00	0.00	16,280.00
Other							
-storage shed	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-bridges	misc.	L.S.	2400.00	2	4,800.00	0.00	4,800.00
Revegetation							
-Hydroseeding		m^2	2.00	6,400	12,800.00	0.00	12,800.00
-Selected Planting		Ha.	1,000.00	1	1,000.00	0.00	1,000.00
Substation		L.S.	5000.00	1	5,000.00	42,000.00	(37,000.00)
Transmission		L.S.	3000.00	1	3,000.00	0.00	3,000.00
Mobilization/Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**382,158.00**	**58,095.00**	**324,063.00**
CONTINGENCIES (10%)					38,215.80		38,215.80
ENVIRONMENTAL (6%)					22,929.48		22,929.48

ESTIMATED COST OF RETIRING SEAL COVE PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
ENGINEERING & SUPERVISION.(5%)					19,107.90		19,107.90
SITE REMEDIATION (10%)					38,215.80		38,215.80
TOTALS					**500,626.98**	**58,095.00**	**442,531.98**

3.10

TOPSAIL



Topsail Watershed Area

NEWFOUNDLAND POWER

TOPSAIL HYDROELECTRIC DEVELOPMENT

General

Topsail Development is located on the southern part of Conception Bay near the community of Topsail. It has a total capacity of 2300 kW under a net head of about 111.2 m and was commissioned in 1932. The development consists of one generating unit in a concrete powerhouse supplied by an above ground woodstave penstock, concrete intake, earth embankment power canal and small concrete forebay dam at Topsail Pond. Additional storage reservoirs are located at Three Island Pond, Three Arm Pond, Paddy's Pond and Thomas Pond.

Powerhouse

The powerhouse is 9.9 m x 6.8 m x 8.2 m high consisting of a reinforced concrete substructure, concrete walls, and a built-up roof. A 10 ton mechanically operated crane is installed in the powerhouse.

Turbine-Generator

The turbine was manufactured by Barber and commissioned in 1983. The generator was manufactured by Ideal Electric. The unit replaced the original 1200 kW unit.

Tailrace

The tailrace is excavated earth about 45 m in length and 3 m wide with sloping slides covered with riprap.

Penstock

The penstock is a 1915 m long 1067 mm diameter pipeline installed in 1983 to replace the original 914 mm diameter woodstave penstock. The first 300 m downstream from the intake is buried, while the remainder is constructed above ground on timber cradles. A concrete anchor block is constructed around the penstock at one location.

Forebay Dam, Spillway and Intake

The dam located at the end of the canal is a low concrete gravity structure about 18 m long and 0.9 m high. It abuts the intake and incorporates a 7.6 m long overflow and gated spillway consisting of concrete piers and steel gates. This structure was rebuilt in 1997.

The intake is about 1.8 m high and is of reinforced concrete construction topped with a wooden gatehouse. It includes steel trash racks, steel gate and control equipment. The structure was extended in 1983.

Power Canal

The power canal is an excavated river bed with rock retaining walls along most of its length. It varies in height and is from 3 m to 9 m in width. It is approximately 200 m in length from Topsail Pond to the intake.

Three Island Pond Dam, Spillway and Outlet

The structure is of rockfill treated timber crib construction which was rebuilt in 1987. The structure is about 31 m long with a maximum height of about 1.8 m. An outlet with a 2.5 m wide x 1.0 m high timber gate and screw stem lift is located in the center of the structure. Two overflow spillways with lengths of 11.4 m and 13.0 m are located on either side of the outlet. A backfilled timber cutoff wall about 9 m long extends from the right abutment of the dam to higher ground elevation.

Three Arm Pond Dam, Spillway and Outlet

This structure was rebuilt in 1992 and is about 46 m long with a maximum height of about 1.9 m and is of rockfill treated timber crib construction. The spillway is about 12 m long and the outlet opening is about 1.0 m x 2.4 m. A new gate and screw stem lift were installed during the reconstruction.

Paddy's Pond Outlet Structure

The structure was rebuilt in 1986 of rockfill treated timber crib construction. It is about 9.0 m long with a maximum height of about 2.7 m and includes a 1.8 m wide x 0.9 m high timber gate with screw stem lift. A low treated timber freeboard wall about 0.7 m high with a total length of about 85 m extends from the dam abutments to higher ground elevation.

Paddy's Pond Dam and Spillway

This structure was rebuilt in 1993/94 with an inverted filter placed downstream in 1993 and in 1994 a new timber face and timber crib overflow spillway were constructed. The dam is about 145 m long with a maximum height of about 3.0 m. The overflow spillway section about 31 m long is incorporated into the central section of the dam.

Paddy's Pond Freeboard Dams

The two freeboard dams are constructed of rockfill treated timber cribbing with upstream timber facing. One structure is about 20 m long while the other is about 10 m long. Both structures are about 0.9 m high. The timber facing was replaced in 1994.

Thomas Pond Dam, Spillway and Outlet

The structure is primarily of earthfill construction, incorporating a reinforced concrete spillway at the left abutment and a reinforced concrete outlet at the right abutment. The main earthfill dam section is about 520 m long with a maximum height of 10.7 m.

The concrete overflow spillway is about 50 m long with a maximum height of about 2.1 m. It includes timber stoplogs along the crest, a concrete retaining wall on the right abutment and a gabion retaining wall on the left abutment.

The outlet structure consists of two concrete buttress abutments separated by a 1.8 m wide x 2.0 m high timber gate controlled by a screw stem lift. The structure is about 20 m long with a maximum height of about 5.0 m.

Thomas Pond Canal

Thomas Pond Canal is excavated through a low area to Paddy's Pond. It is 1.83 m wide and 1372 m long, of which over half is in bedrock.

Substation

The substation steps up the generated voltage of 2.4 kV to 25 kV for distribution feed, and steps it down to 120/240 V for the station service.

Transmission Line

There is no transmission going into, or coming out of Topsail Substation other than the underground line from the plant.

DECOMMISSIONING SCENARIO FOR TOPSAIL

General

Decommissioning will include demolition of the powerhouse, penstock and structures at Three Arm Pond and Thomas Pond. Water levels at Topsail Pond, Three Island Pond, and Paddy's Pond will be maintained for recreational use and the seaplane base at Paddy's Pond.

The closest waste disposal site is located near Foxtrap, approximately 18 km away. A scrap metal dealer is located in Long Pond, approximately 6 km away. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse

The powerhouse superstructure will be demolished with material buried in the tailrace. The foundation will be backfilled and hydroseeded. The property that the powerhouse, staff house and substation occupy would be sold. The powerhouse crane would be salvaged for sale or use at another site.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace

The tailrace will be backfilled with local material and hydroseeded.

Penstock

The woodstave penstock including the concrete anchor block will be demolished and buried at an approved waste disposal site. Contaminated soil under the penstock footprint will be excavated and transported to an approved soil treatment facility. The penstock route will be graded and hydroseeded.

Forebay Dam, Spillway and Intake

The intake will be demolished to ground level and all debris will be disposed of at an approved waste disposal site. Minor items may be salvaged for use at other sites. The site will be backfilled and hydroseeded.

The concrete spillway section will remain to maintain water levels on Topsail Pond for residential properties. The dam will be turned over to a municipal authority.

Power Canal

The existing canal will be retained without changes.

Three Island Pond Dam, Spillway and Outlet

The existing structure will be repaired and or rebuilt and the structure will then be turned over to a municipal authority to maintain water levels in the pond.

Three Arm Pond Dam, Spillway and Outlet

The structure will be demolished and all material will be disposed of at an approved waste disposal site. The site will be graded and hydroseeded.

Paddy's Pond Outlet Structure

The existing structure will be demolished and all material will be buried at an approved location near the site. A new earthfill dyke will be constructed in the same location to seal the existing channel.

Paddy's Pond Dam and Spillway

The existing structure will be repaired or rebuilt to maintain water levels for a seaplane base and recreational users. The structure will then be turned over to the Provincial Government. Normal flows will be directed through an opening in the Spillway.

Paddy's Pond Freeboard Dams

These structures will not be required with the lower water levels. They will be demolished and all material will be buried at an approved location near the site. The site will be selectively planted.

Thomas Pond Dam, Spillway and Outlet

The concrete spillway will be demolished and all material will be buried at an approved location. The earthfill section of the dam will be leveled to match the surrounding conditions. The concrete outlet will be demolished, all material will be buried in the outlet channel, and the opening will be sealed with material excavated from the main dam. Water from Thomas Pond will then flow through the spillway channel into Manuels River. The site will be hydroseeded.

Thomas Pond Canal

The canal will be filled in with adjacent material and then selectively planted.

Substation

The substation will be totally dismantled and replaced with a set of switches. All unsalvageable equipment will be sold for scrap.

Transmission Lines

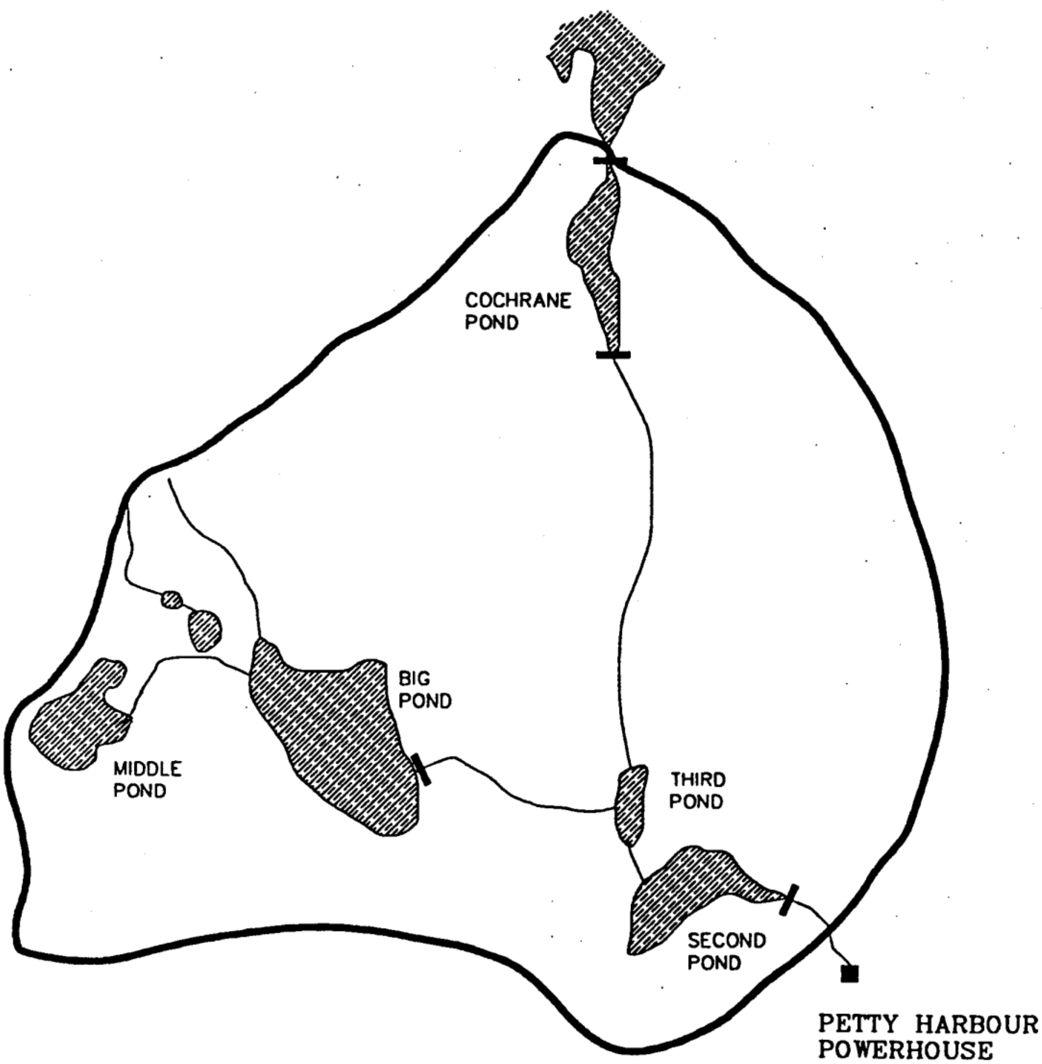
No transmission dismantling is necessary.

ESTIMATED COST OF RETIRING TOPSAIL HYDRO PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse							
-superstructure	concrete	m3	100.00	89	8,900.00	0.00	8,900.00
-substructure	concrete	m3	100.00	67	6,700.00	0.00	6,700.00
-Powerhouse crane	10 ton	L.S.	1000.00	1	1,000.00	2,500.00	(1,500.00)
Turbine-Generator	Horiz.Francis	L.S.	15,000.00	1	15,000.00	2,185.00	12,815.00
Tailrace	Earth embankment	m3	3.00	500	1,500.00	0.00	1,500.00
Penstock							
-above ground	woodstave	m2	7.00	5,420	37,940.00	0.00	37,940.00
-buried	woodstave	m3	10.00	1,000	10,000.00	0.00	10,000.00
-anchor block	concrete	m3	100.00	15	1,500.00	0.00	1,500.00
Forebay							
spillway	concrete	m3	650.00	3	1,950.00	0.00	1,950.00
Intake							
-substructure	concrete	m3	100.00	15	1,500.00	2,000.00	(500.00)
-superstructure	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-supply and place fill	earthfill	m3	10.00	50	500.00	0.00	500.00
Three Island Pond							
Dam (repairs)	timber crib	m3	250.00	100	25,000.00	0.00	25,000.00
Gate Equipment		L.S	2,000.00	1	1,000.00	2,000.00	(1,000.00)
Three Arm Pond Dam							
Spillway & Outlet	timber crib	m 3	20.00	150	3,000.00	0.00	3,000.00
Gate Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Paddy's Pond							
Outlet (rebuild)	timber crib	m3	250.00	40	10,000.00	0.00	10,000.00
Gate Equipment		L.S.	2,000.00	1	1,000.00	2,000.00	(1,000.00)
Paddy's Pond Dam							
& Spillway repairs	Timber crib	m3	250.00	400	100,000.00	0.00	100,000.00
Paddys Pond							
Freeboard Dams	timber crib	m3	250.00	54	13,500.00	0.00	13,500.00
Thomas Pond Dam	earthfill	m3	3.00	12,382	37,146.00	0.00	37,146.00
-spillway	concrete	m3	75.00	172	12,900.00	0.00	12900
-outlet	concrete	m3	100.00	20	2,000.00	0.00	2,000.00
Gate Equipment		L.S.	2,000.00	1	1,000.00	2,000.00	(1,000.00)
Thomas Pond Canal	earthfill	m3	3.00	3,000	9,000.00	0.00	9,000.00
Revegetation							
-selective planting		Ha.	1,000.00	1	1,000.00	0.00	1,000.00
-hydroseeding		m2	2.00	27,000	54,000.00	0.00	54,000.00
Mobilization/Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00

ESTIMATED COST OF RETIRING TOPSAIL HYDRO PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Substation		L.S.	5400.00	1	5,400.00	20,000.00	(14,600.00)
Distribution		L.S.	3000.00	1	3,000.00	0.00	3,000.00
SUBTOTALS					**377,436.00**	**34,685.00**	**342,751.00**
CONTINGENCIES (10%)					37,743.60		37,743.60
ENGINEERING & SUPERVISION (5%)					18,871.80		18,871.80
ENVIRONMENTAL ASSESSMENT (6%)					22,646.16		22,646.16
SITE REMEDIATION (10%)					37,743.60		37,743.60
TOTALS					**494,441.16**	**34,685.00**	**459,756.16**

3.11

PETTY HARBOUR



Petty Harbour Watershed Area

NEWFOUNDLAND POWER

PETTY HARBOUR HYDROELECTRIC DEVELOPMENT

General

Petty Harbour Development is located on the east coast of the Avalon Peninsula. The powerhouse is situated in the community of Petty Harbour. The original development was constructed in 1900 and various changes have been made since. The development presently has an installed capacity of 5300 kW under a net head of approximately 57.9 m. There are three turbine-generators in a concrete/masonry powerhouse supplied by a woodstave penstock and a concrete intake. Storage is provided by structures located at First Pond (Forebay), Cochrane Pond, and Bay Bulls Big Pond. A storage reservoir at Middle Pond is no longer in use.

Powerhouse

The powerhouse is about 49.0 m x 9.0 m x 8.0 m high and consists of a concrete substructure, concrete/masonry walls and steel roof with masonry deck.

Powerhouse Crane

The powerhouse crane is 15 ton and is electrically operated. This is a new crane installed in 2000.

Turbine-Generator

There are three horizontal Francis turbines and generators in the plant. The first unit was commissioned in 1900 and the other units were commissioned in 1908 and 1926. The total installed capacity of the three units is about 5300 W

Tailrace

The tailrace channel is excavated through bedrock for a distance of about 140 m from the powerhouse to a natural river channel.

Surge Tank

A steel surge tank approximately 5.0 m in diameter and 15 m high is located north of the plant at the location of the original penstock route. The structure is joined into the penstock by a 2.0 m diameter steel pipe about 95 m long. The surge tank has a treated wood frost cover.

Penstock

The penstock is approximately 975 m long and 2286 mm diameter. The upstream section, approximately 225 m is of woodstave construction supported by timber cradles. The remainder is of steel construction supported on concrete piers. This section was replaced in 1999.

Forebay (First Pond) Dam, Spillway and Intake

The dam is a concrete gravity structure about 75 m long with a maximum height of about 9 m. The overflow spillway section is approximately 40 m long and is incorporated into the dam. The intake is also built into the dam and includes steel trashracks, gate, screw stem lift, control equipment, and a wooden gatehouse.

Bay Bulls Big Pond Dam, Spillway and Outlet

This structure consists of an earthfill dam and an adjacent rockfill overflow spillway. The dam is about 120 m long with a maximum height of about 9 m. The structure was originally constructed in 1900 but rebuilt in 1945 by backfilling the original timber crib structure, installing a 60 m long steel sheet pile core east of the outlet, and a central concrete core west of the outlet. The dam was reconstructed in 1988/99 with a zoned earthfill embankment structure downstream of the original dam. The outlet structure incorporated into the main dam consists of a 1.8 m x 1.8 m concrete box culvert with two cast iron gates operated by screw stem lifts in a wooden gatehouse.

The spillway section was reconstructed in 1988 as an earthfill/rockfill structure with a galvanized steel central core. The structure is about 40 m long with a maximum height of about 1.8 m.

Bay Bulls Big Pond is a major water supply for the City of Mount Pearl, the western section of the City of St. John's, and several other communities in the northeast Avalon Peninsula.

Goose Pond Dam

This structure was abandoned in 1999 and is no longer required.

Middle Pond Dam, Outlet and Spillway

The structure was of earthfill construction about 60 m long with a maximum height of about 4.5 m and incorporating a timber crib outlet structure. A low timber spillway about 20 m long was located about 180 m from the main dam. The structures are presently abandoned, timber sections have been removed, and the outlet opening has been widened.

Cochrane Pond Dam and Spillway

The dam is about 340 m long with a maximum height of about 3.0 m. The dam is of earthfill construction with an upstream riprap layer except for a section of the structure which has an upstream layer of sand which is used as a public beach. A 20 m long reinforced concrete overflow spillway about 2.0 m high was reconstructed in 1996 and is incorporated into the dam. The structure is located in Cochrane Pond Park.

Cochrane Pond Outlet

The structure is about 4.5 m long and 0.9 m high. This rockfill treated timber crib structure with a timber stoplog gate was reconstructed in 1988.

Other

There are various roads associated with the development as well as a bridge on the access to the powerhouse and a trestle supporting the penstock near the powerhouse.

Substation

The substation steps up plant voltage from 2400 V to 33 kV and also steps down the voltage from 33 kV to 4160 V for the Petty Harbour distribution feeder.

Transmission Line

There is a 33 kV transmission line that extends from Petty Harbour to Goulds.

DECOMMISSIONING SCENARIO FOR PETTY HARBOUR

General

The powerhouse will be retained for historical purposes. The penstock, surge tank, and forebay dam will be demolished. Bay Bulls Big Pond Dam will be retained for use for the regional water supply. Cochrane Pond Dam will remain, and the spillway and outlet will be used to maintain water levels for the provincial park. Minor demolition work will be required at Middle Pond Dam.

The closest waste disposal site is located near the Community of Bay Bulls, approximately 7 km away. A scrap metal dealer is located 18 km away in the City of St. John's. Contaminated materials will be transported and disposed at an approved water disposal facility.

Powerhouse

The building has historical significance because it is the oldest hydroelectric plant in Newfoundland. Equipment not of historical significance will be removed and sold for scrap and the building will be refurbished as a museum or historical site. The building will be either retained by the company or donated to another interested organization.

Powerhouse Crane

The powerhouse crane would be left in place as part of the equipment.

Turbine Generator

Equipment in the plant including switchgear not of historical significance will be dismantled and sold for scrap.

Tailrace

The tailrace will be backfilled and graded as required using material adjacent to the site.

Surge Tank

The steel surge tank and steel pipe will be removed, cut up and sold for scrap.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The steel section will be cut up and sold for scrap. Contaminated soil under the penstock will be excavated and disposed at an approved soil treatment facility.

Forebay (First Pond) Dam, Spillway and Intake

The dam will be demolished to ground level and all waste material will be disposed of at an approved waste disposal site. Minor items may be salvaged for use at other sites or sold for scrap. Landscaping will be minimal because the area consists primarily of exposed bedrock. Water levels will be maintained upstream of the bridge by the natural shoal near the bridge.

Bay Bulls Big Pond Dam, Sgillway and Outlet

The existing structure will remain in place to maintain the regional water supply. The dam will be turned over to the regional water authority. Modifications to the dam will likely include removal of the gate and modifications to the spillway to allow for continuous passage of water.

Goose Pond Dam

The existing structure is no longer required as the new highway approach acts to maintain freeboard for the regional water supply.

Middle Pond Dam, Outlet and Spillway

The structures are presently demolished and no further work will be required.

Cochrane Pond Dam and Spillway

The earthfill section of the dam will remain in place to maintain the beach and swimming area in the provincial park. The concrete spillway will be raised to the elevation of the earthfill and spill will then be handled at the outlet.

Cochrane Pond Outlet

The timber crib outlet will be demolished with debris buried on site and the structure will be replaced with a low concrete gravity overflow spillway. The spillway elevation will be designed to maintain a water level suitable for users of Cochrane Pond Provincial Park.

Other

Most of the roads that form part of the development will be left in place to maintain access to other facilities and property. The bridge to the powerhouse will also remain. The penstock trestle and various storage sheds will be removed.

Substation

The section of the substation required for generation will be taken out of service and equipment will be salvaged. The remainder of the substation associated with the distribution feeder will remain.

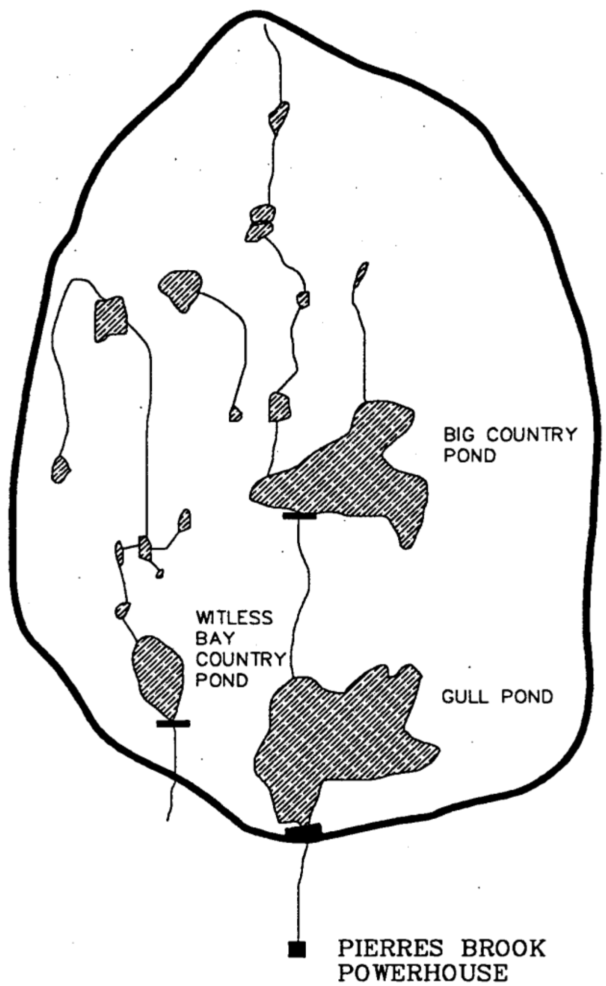
Transmission Line

The existing transmission line will remain in service for the distribution feeder.

ESTIMATED COST OF RETIRING PETTY HARBOUR PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE COST $**	**TOTAL VALUE $**
Powerhouse					To Be Left Intact		
Turbine/Generator					To Be Left Intact		
Powerhouse Crane	15 ton				To Be Left Intact		
Tailrace	Rock Excavation	M 3	3.00	850	2,550.00	0.00	2,550.00
Penstock	Steel	M 2	14.50	583	8,453.50	0.00	8,453.50
	Woodstave	M 2	7.00	6,485	45,395.00	0.00	45,395.00
Surge Tank	Steel	L.S.	40000.00	1	40,000.00	0.00	40,000.00
Penstock Trestle	Structural Steel	L.S.	6000.00	1	6,000.00	0.00	6,000.00
Forebay Dam	Concrete	M 3	100.00	1,025	102,500.00	0.00	102,500.00
Gatehouse Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Gatehouse	Woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Bay Bulls Big Pond Dam Modifications		L.S.	10000.00	1	10,000.00	0.00	10,000.00
Gatehouse Equipment		L.S.	2000.00	1	2,000.00	0.00	2,000.00
Gatehouse		L.S.	1000.00	1	1,000.00	0.00	1,000.00
Cochrane Pond Spillway	Concrete	M 3	20.00	102	2,040.00	0.00	2,040.00
Earthfill Replacement		M 3	12.00	300	3,600.00	0.00	3,600.00
Cochrane Pond Outlet	Timber Crib	M 3	20.00	54	1,080.00	0.00	1,080.00
-gate lift		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Cochrane Pond Outlet Replacement	Concrete	M 3	650.00	50	32,500.00	0.00	32,500.00
Substation		L.S.	4000.00	1	4,000.00	4,552.00	(552.00)
Mobilization/		L.S.	5000.00	1	5,000.00	0.00	5,000.00
Demobilization							
SUBTOTALS					**269118.50**	**8,552.00**	**260,566.50**
CONTINGENCIES (10%)					30,911.85		30,911.85
ENVIRONMENTAL (8%)					24,729.48		24,729.48
ENGINEERING & SUPERVISION (5%)					15,455.93		15,455.93
SITE REMEDIATION (10%)					30,911.85		30,911.85
TOTALS					**371,127.61**	**8,552.00**	**362,575.61**

3.12

PIERRE'S BROOK



Pierres Brook Watershed Area

NEWFOUNDLAND POWER

PIERRE'S BROOK HYDROELECTRIC DEVELOPMENT

General

The Pierre's Brook Development is situated northwest of the community of Witless Bay on the east coast of the Avalon Peninsula. The development was commissioned in 1931 and has a capacity of 3400 kw under a net head of 80 m. There is a single generating unit in a concrete powerhouse supplied by a woodstave and steel penstock and a concrete intake. Storage reservoirs are provided by structures located at Gull Pond (Forebay), Witless Bay Country Pond and Big Country Pond.

Powerhouse

The powerhouse is 14.0 m x 10.0 m x 10.6 m high. The substructure is concrete and the superstructure is a combination concrete and masonry. The roof has a steel deck supported on steel beams. The powerhouse also includes a 25 ton overhead crane.

Turbine-Generator

There is one 4000 kw vertical Francis unit. The turbine was manufactured by J. M. Voith and the generator by General Electric.

Penstock

The penstock consists of a 63 m long 1829 mm diameter steel section and a 2470 m long 1829 mm diameter treated woodstave section. The woodstave section is above ground and is supported on timber cradles. The steel section is supported on concrete cradles and is covered by a weatherproof wooden enclosure. The woodstave section was reconstructed in 1965.

Surge Tank

The structure was reconstructed in 1991 and is 43 m high and consists of a steel tank on top of a steel support structure. There is a 1.8 m diameter internal riser and the main tank is over 21 rn high and 4.3 m in diameter. The tank and riser are covered with a frost casing. The surge tank tee is encased in a concrete anchor block and the structure legs are supported on concrete foundations.

Gull Pond (Forebay) Dam and Intake

The structure is an earthfill/rockfill dam about 120 m long and 7.6 m high with an impervious concrete core. The concrete core is the original concrete gravity dam that was encased with fill in

1982. The intake consists of a concrete box culvert through the dam, a 1.2 m x 1.5 m gate, a gate hoist, steel trashracks, a concrete gate shaft, control equipment and a wooden gatehouse.

Gull Pond Spillway

The spillway section is a concrete overflow structure about 30 m long and 2.0 m high. The spillway is topped by steel flashboard guides and a walkway. The structure was constructed in 1982 to replace the original spillway in the old concrete gravity dam.

Gull Pond Freeboard Dam

The dam is about 380 m long with a maximum height of 6.0 m. It is an earthfill structure which was raised 0.9 m in 1986.

Witless Bay Country Pond Dam and Outlet

The earthfill dam is approximately 7.6 m high and 60 m long. The outlet consists of a 0.9 m diameter corrugated steel pipe, sluice gate, concrete gate shaft, a screw stem lift and a wooden gatehouse.

Witless Bay Country Pond Diversion Canal

This canal is approximately 1370 m in length and carries water from Witless Bay Country Pond to Gull Pond. The canal is narrow and shallow with a water surface 2.5 m wide at full flow and a depth of approximately 1.5 m.

Witless Bay Country Pond Spillway

The spillway was rebuilt in 1992/93 to replace the old rockfill timber crib spillway. The new spillway is a concrete gravity overflow structure that has concrete wing walls and earthfill abutments. The total length including earthfill is 120 m with the overflow section being 40 M.

Big Country Pond Dam and Outlet

The structure is a zoned earthfill structure reconstructed in 1997 to replace the rockfill timber crib dam that was encased with earthfill in 1987. The dam is approximately 90 m long and 6.0 m high and includes a reinforced concrete gate section with concrete guide walls. The timber gate is 1.5 m x 1.6 m and is operated by a manual screw stem lift.

Big Country Pond Spillway

The structure is a rockfill overflow spillway with a galvanized steel core. It is approximately 52 m long and 2.0 m high. The spillway was reconstructed in 1987 to replace the old timber crib structure.

Rocky Pond Freeboard Dams

The two freeboard dams impound water when the level in Big Country Pond is high. The earthfill dams were constructed by backfilling old timber crib structures. Both dams were raised in 1986. One dam is approximately 1.8 m high and 36 m long and the other is 2.5 m high and 50 m long.

Substation

The generated voltage is stepped up from 6.9 kV to 33 kV for transmission and is stepped down for station service and for the distribution line to the forebay.

Transmission Line

The transmission line is a 33 kV line from Pierre's Brook to Mobile a distance of about 5.5 km.

Other

There are storage sheds, various roads that provide access to the dams and powerhouse, and a bridge near the powerhouse.

DECOMMISSIONING SCENARIO FOR PIERRE'S BROOK

General

The development will have most structures removed during decommissioning. It is not expected that any environmental problems will be encountered. The cabins on Gull Pond and Big Country Pond are not expected to be affected because water levels will not be reduced from normal low water levels.

The closest waste disposal site is located near the Community of Bay Bulls, approximately 7 km away. A scrap metal dealer is located approximately 35 km away in the City of St. John's. Contaminated material will be transported and disposed at an approved waste disposal facility.

Powerhouse

Due to the proximity to the community the powerhouse will be sold after removal of all equipment. The tailrace will be filled in and graded to allow natural drainage. The crane will be removed and salvaged.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The steel section of penstock will be cut up and sold for scrap. The wooden enclosure for the steel penstock will be demolished and buried on site. The penstock route will be graded and landscaped. Contaminated soil under the penstock will be excavated and disposed at a approved waste disposal facility.

Surge Tank

The structure will be taken down, cut up and sold for scrap. The frost covering will be removed and disposed of at a waste disposal site. The concrete foundations and anchor block will be demolished as required and buried on site. The site will be graded and landscaped.

Gull Pond (Forebay) Dam and Intake

The dam will be demolished and debris will be buried in the spillway channel. A rock berm will be left in place to maintain normal low water level. Natural flows will flow through the spillway channel to the sea. The earthfill section will be leveled to match the surrounding contours. Minor items such as the gate and lift will be removed and salvaged. The site will be landscaped.

Gull Pond Spillway

The concrete overflow section will be demolished and buried in the spillway channel with material from the main dam. The site will be landscaped.

Gull Pond Freeboard Dam

This dam will be leveled to match surrounding contours and the site will be landscaped.

Witless Bay Country Pond Dam and Outlet

The dam will be leveled to match the contours of the surrounding terrain. The intake will be demolished with the gate and lift salvaged and the remainder of the debris buried on site. The area will be landscaped.

Witless Bay Country Pond Spillway

The spillway will be demolished and debris will be buried at an approved location. The natural flow from this drainage area will then be directed through the spillway channel. The site will be landscaped.

Witless Bay Country Pond Diversion Canal

The canal will be backfilled with material adjacent to site and will be left to revegetate naturally.

Big Country Pond Dam

The earthfill dam will be leveled. The outlet will be demolished and opened up to handle continuous flows. The gate and lift will be removed and salvaged. The area will be landscaped.

Big Country Pond Spillway

The metal core will be removed and buried at an approved site. The area will then receive selected planting.

Rocky Pond Dams

The dams will be leveled to blend with the surrounding environment. The area will require selected planting.

Substation

The substation will be removed from service and salvageable equipment will be returned to stock. Other equipment not salvageable will be disposed of at approved disposal sites.

Transmission Line

The entire length of 33 kV transmission line will be removed from service. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

Other

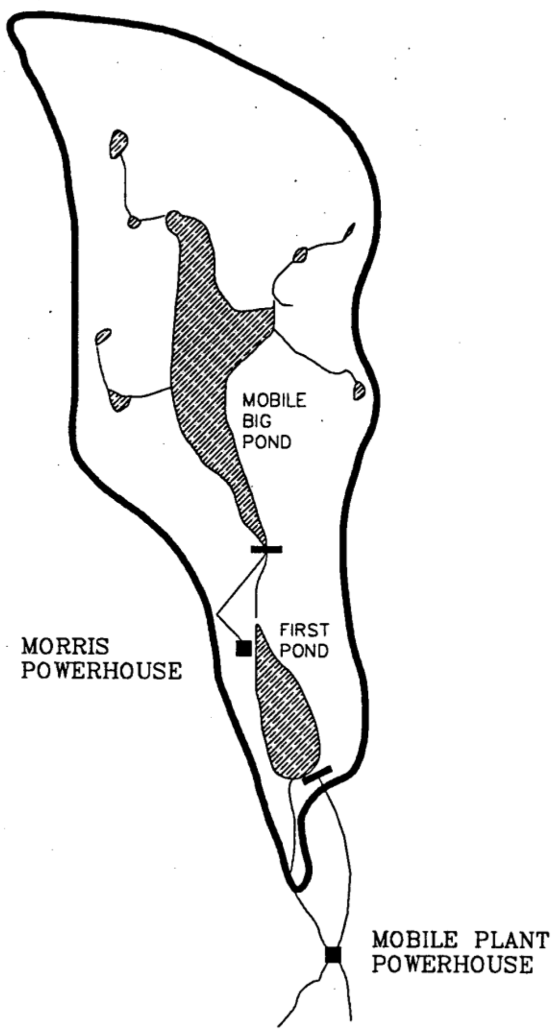
The storage sheds will be demolished and materials will be disposed of at approved sites. The bridge will be demolished and access will be blocked. Other roads will be left in place for public use.

ESTIMATED COST OF RETIRING PIERRE'S BROOK PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse	Concrete/masonry				0.00	55,000.00	(55,000.00)
-powerhouse crane	25 ton	L.S.	1000.00	1	1,000.00	4,000.00	(3,000.00)
Tailrace	earthfill	M 3	3.00	500	1,500.00	0.00	1,500.00
Turbine/Generator	Vertical Francis	L.S.	20,000.00	1	20,000.00	3,995.00	16,005.00
Penstock	woodstave	M 2	7.00	14,203	99,421.00	0.00	99,421.00
	steel	M 2	14.50	364	5,278.00	0.00	5,278.00
-anchors & cradles	concrete	M 3	75.00	8	600.00	0.00	600.00
Surge Tank							
-tank & riser	steel	L S.	30000.00	1	30,000.00	0.00	30,000.00
-piers & anchor	concrete	M 3	75.00	80	6,000.00	0.00	6,000.00
Gull Pond Forebay Dam	earthfill	M 3	5.00	2,170	10,850.00	0.00	10,850.00
(earthfill with concrete core)	concrete	M 3	75.00	280	21,000.00	0.00	21,000.00
concrete core)	earthfill	M 3	3.00	1,575	4,725.00	0.00	4,725.00
Intake	concrete	M 3	100.00	120	12,000.00	0.00	12,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Gull Pond Spillway							
-spillway	concrete	M 3	125.00	166	20,750.00	0.00	20,750.00
-wing walls	concrete	M 3	75.00	240	18,000.00	0.00	18,000.00
Gull Pond Free-board dam	earthfill	M	3.00	1,436	4,308.00	0.00	4,308.00
Witless Bay Country							
Pond Dam & Outlet	earthfill	M 3	3.00	960	2,880.00	1,000.00	1,880.00
-gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Witless Bay Country							
Pond Spillway	concrete	M 3	75.00	195	14,625.00	0.00	14,625.00
	earthfill	M 3	5.00	2,650	13,250.00	0.00	13,250.00
Witless Bay Country							
Diversion Canal.	earthfill	M 3	3.00	5,150	15,450.00	0.00	15,450.00
Big Country Pond Dam	earthfill	M 3	5.00	900	4,500.00	0.00	4,500.00
-Outlet	concrete	M 3	100.00	300	30,000.00	0.00	30,000.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
-spillway	earthfill	M 3	5.00	104	520.00	0.00	520.00
Rocky Pond Dam	earthfill	M 3	3.00	173	519.00	0.00	519.00
	timber crib	M 3	20.00	150	3,000.00	0.00	3,000.00
other - sheds	woodframe	L.S.	1000.00	2	2,000.00	0.00	2,000.00
- bridge	misc.	L.S.	2400.00	1	2,400.00	0.00	2,400.00
Revegetation							
-hydroseeding		M 2	2.00	1000	2,000.00	0.00	2,000.00

ESTIMATED COST OF RETIRING PIERRE'S BROOK PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
-selected planting		Ha.	1,000.00	3	3,000.00	0.00	3,000.00
Substation		L.S.	7800.00	1	7,800.00	8,100.00	(300.00)
Transmission	single pole	KM.	10,000.00	5	50,000.00	0.00	50,000.00
-forebay line	single pole	KM.	3,000.00	3	9,000.00	0.00	9,000.00
Mobilization/Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**430,376.00**	**78,095.00**	**352,281.00**
CONTINGENCIES (10%)					43,037.60		43,037.60
ENVIRONMENTAL (6%)					25,822.56		25,822.56
ENGINEERING & SUPERVISION (5%)					20,769.80		20,769.80
SITE REMEDIATION (10%)					41,539.60		41,539.60
TOTALS					**502,629.16**	**78,095.00**	**424,534.16**

3.13

MOBILE/MORRIS



Morris/Mobile
Watershed Area

NEWFOUNDLAND POWER

MOBILE MORRIS HYDROELECTRIC DEVELOPMENT

General

Mobile/Morris Development is located on the east coast of the Avalon Peninsula near the community of Mobile. Mobile and Morris powerhouses are in series and have installed capacities respectively of 10,500 kW under a net head of 114.6 m and 1,100 kW under a net head of 30.0 m.

Mobile powerhouse, commissioned in 1951, is located near sea level and contains one generating unit supplied by a combination steel and fibreglass penstock, concrete intake, and embankment power canal.

Morris powerhouse, commissioned in 1983, is located upstream of Mobile First Pond and contains one generating unit supplied by a fibreglass penstock, concrete intake, and embankment power canal.

Storage reservoirs are provided by structures located at Mobile First Pond and Mobile Big Pond.

Powerhouse (Mobile)

The powerhouse has a concrete substructure with concrete walls and a built up wood roof. The dimensions are 13.7 m x 11.9 m x 9.1 m high. The powerhouse also includes a 36 ton electrically operated crane.

Turbine-Generator (Mobile)

There is one 10,000 kW vertical Francis turbine manufactured by Voith Hydro and commissioned in 1951. The generator was manufactured by Westinghouse.

Tailrace (Mobile)

The tailrace consists of a short channel excavated from the powerhouse to the sea.

Penstock (Mobile)

The penstock consists of 453 m of above ground 2134 mm diameter steel penstock supported by concrete leveling piers and 1115 m of buried 2286 mm diameter fiber reinforced plastic penstock (FRP). A steel tee section connects the steel penstock, the FRP penstock and the surge tank. Concrete anchor blocks are constructed at the steel section near the powerhouse, at the surge tank tee, and at three locations on the FRP section.

Surge Tank (Mobile)

The lower section of the structure consists of a 1.8 m diameter double walled steel riser 34.4 m high. The tank mounted on the riser is 5.2 m in diameter and 16.8 m high and is supported by four 43 m long steel columns with concrete footings. The tank and riser are enclosed by insulation and metal cladding. The steel surge tank tee is encased in a concrete anchor block. This structure was rebuilt in 1999.

Forebay Dam and Intake (Mobile)

The forebay dam is of earthfill construction about 183 m long and 10.5 m high. The intake is incorporated into the dam and consists of a 25 m long box culvert with vertical concrete gate shaft. The structure has manual and electric powered operators, steel trashracks, control equipment and a wooden gatehouse.

Mobile Power Canal

The canal is a sidehill cut and earthfill structure about 2135 m long with a maximum height of about 6.1 m.

Mobile Canal Stoplog Structure

The structure is of reinforced concrete construction with steel stoplog slots. The overhead steel lifting mechanism has been removed. The opening in the structure is about 6.7 m wide.

Mobile First Pond Spillway

The structure consists of a concrete gravity sill with timber stoplogs on the crest set between vertical steel guides. The structure is about 76 m long and 1.5 m high with concrete abutments and wing walls. The structure is equipped with a 1.2 m wide unwatering sluice gate with individually placed horizontal stoplogs.

Powerhouse (Morris)

The powerhouse is 14.0 m x 7.0 m x 6.1 m high. The building has a reinforced concrete substructure with a pre-engineered metal superstructure.

Turbine-Generator (Morris)

There is one 1100 kW horizontal Francis turbine manufactured by Barber Hydraulic Turbines and commissioned in 1983. The generator is a 1100 kW unit manufactured by Ideal Electric.

Tailrace (Morris)

The tailrace is of reinforced concrete construction and consists of two wingwalls extending 4.2 m from the building. Each wall tapers from 3.0 m to 0.6 m depth from the building and from 0.30 m to 1.35 m from top to bottom.

Spawning Canal

The spawning canal is a 100 m long basin with a prepared gravel bottom. The canal is an average of 20 m wide and about 1.0 m deep and is equipped with a reinforced concrete control structure at the outlet. The control structure is about 16.0 m wide x 2.0 m x 0.45 m thick.

Penstock (Morris)

The penstock is a 197 m long 1676 mm diameter buried fiber reinforced plastic (FRP) penstock.

Intake (Morris)

The structure is of reinforced concrete construction incorporated into the intake dam and includes steel trashracks, steel intake thimble, timber gate with mechanical screw stem lift, trashrack heaters, control equipment and a wooden building.

Morris Power Canal and Intake Dam

The canal is of sidehill cut and fill construction and extends 2100 m from the intake to the canal gate. The canal averages 3.0 m deep and 16.0 m wide. The intake dam is of earthfill construction and is about 30 m long and about 6.0 m high at the intake.

Morris Canal Stoplog Structure

The structure consists of a concrete sill and concrete abutments with stop log slots, concrete wing walls and a steel frame and hoist.

Morris Canal Spillway

The structure is of concrete construction and has a 17 m long sill with concrete abutments and wingwalls. It is equipped with vertical steel guides for installation of timber flashboards.

Mobile Big Pond Dam and Outlet

The structure is of earthfill construction about 500 m long and about 10 m high. The outlet is a gated 36 m long 1.8 m diameter tunnel with a concrete gate shaft extending through a high bedrock knoll near the center of the dam. A concrete headwall and trashracks are provided at the upstream side of the structure. A wood frame building on top of the gate shaft houses a mechanical gate hoist, control equipment and trashrack heaters.

Mobile Big Pond Spillway

The structure is about 54 m long and consists of a reinforced concrete sill with timber stoplogs set in vertical steel guides with reinforced concrete wingwalls. The downstream side is provided with a concrete apron averaging 5.3 m wide.

Substation (Morris)

The generated voltage of 2400 V is stepped up to 66 kV for transmission and stepped down to 120/240 V for station service.

Transmission (Morris)

There is a 66 kV transmission line which is 5.5 km to the main grid, a 2400 V line from the plant to the forebay, and a 120/240 V line from the substation to the plant.

Substation (Mobile)

The substation functions associated with the generated voltage of 6.9 kV from the plant include stepping up to 66 kV for transmission, stepping down to 120/240 V for station service, and stepping the 66 kV down to 2400 V for service to the surge tank and forebay. The substation also acts as a switching station for several transmission lines a distribution station for two local feeders.

Transmission (Mobile)

Transmission lines required for plant operation include the 7200 V line from the plant to the substation, the 240 V line from the substation to the plant, and the 2400 V line from the substation to the surge tank and forebay. Several other lines are used for transmission and local distribution.

DECOMMISSIONING SCENARIO FOR MOBILE/MORBIS

General

It is assumed that both, plants in this development will be retired. Practically all structures will be demolished except for the Mobile powerhouse and the sections of the Mobile substation required for the main electrical grid. The only direct environmental impact anticipated during decommissioning will be due to the relocation of spawning grounds in Mobile First Pond from the Morris tailrace back to the outlet of the upper part of the Mobile River.

The closest waste disposal site is near Bay Bulls located approximately 12 km from the Mobile powerhouse. A scrap metal dealer is located 40 km away in the City of St. John's. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse (Mobile)

The building will be retained for storage or other uses for employees at the Mobile Depot. After equipment is removed openings will be sealed with concrete and the building will be renovated to facilitate the new use. The crane will be salvaged during decommissioning.

Turbine-Generator (Mobile)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace (Mobile)

The tailrace will be backfilled with earthfill near the plant and beach material near the sea. The area near the plant will be landscaped.

Penstock (Mobile)

The steel penstock will be cut into sections and sold for scrap. The FRP penstock sections will be excavated and sold for purposes such as well liners or highway culverts. The concrete anchor blocks will be demolished to ground level and buried on site. The penstock route will be graded and landscaped.

Surge Tank (Mobile)

The steel surge tank will be cut into sections and sold for scrap. The metal cladding & insulation will be removed and disposed of at an approved waste disposal site. The concrete anchor block at the surge tank tee and column footings will be demolished and buried on site. The site will be graded and landscaped.

Forebay Dam and Intake (Mobile)

The earthfill section of the dam will be leveled to match the contours of the surrounding terrain. The concrete intake will be demolished and debris will be buried on site. Minor items such as the gate lift will be salvaged for use at other sites. The site will be graded and landscaped.

Mobile Power Canal

The structure will be leveled and backfilled to match the contours of the surrounding terrain. The site will be landscaped.

Mobile Canal Stoplog Structure

The structure will be demolished and all material will be buried in the power canal.

Mobile First Pond Spillway

The structure will be demolished and all material will be buried at an approved location near the site. Water will then flow from Mobile First Pond through the spillway site and into the lower section of Mobile River.

Powerhouse (Morris)

The building superstructure will be dismantled and sold for reuse at another location. The substructure will be demolished to ground elevation and waste material will be buried in the tailrace. The site will be backfilled and landscaped.

Turbine-Generator (Morris)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace (Morris)

The concrete retaining walls will be demolished and buried in the tailrace. The tailrace channel will be backfilled and landscaped.

Spawning Canal

The spawning canal will be abandoned and fish will be reintroduced to their natural spawning grounds at the location where Mobile River enters Mobile First Pond. The canal outlet structure will be demolished and buried in the canal. The site will be backfilled and landscaped.

Penstock (Morris)

The FRP penstock sections will be excavated and sold for purposes such as well liners or highway culverts. The penstock route will be graded and landscaped.

Intake (Morris)

The structure will be demolished and waste material will be buried in the power canal. Minor items such as the gate lift will be salvaged for use at other sites. The site will be backfilled and landscaped.

Morris Power Canal and Intake Dam

The structure will be leveled and backfilled to match the contours of the surrounding terrain. The site will be landscaped.

Morris Canal Stoplog Structure

The structure will be demolished and all material will be buried in the power canal.

Morris Canal Spill

The structure will be demolished and all material will be buried at an approved location near the site. Water will then flow from Mobile Big Pond through the spillway site and into the upper reach of Mobile River.

Dam and Outlet

The earthfill structure will be leveled to match the contours of the surrounding terrain. An opening will be excavated at the location of the original river channel to permit water to flow into Mobile River. The outlet structure will be demolished with debris buried on site. Minor items such as the gate lift will be salvaged for use at another site. The outlet tunnel will be backfilled and plugged with concrete on both ends. The site will be landscaped.

Mobile Big Pond Spillway

The structure will be demolished and waste material will be buried on site. The site will be backfilled and landscaped.

Substation (Morris)

The entire substation will be dismantled and equipment will be salvaged for use at another site. The site will be backfilled and landscaped.

Transmission

All transmission lines associated with the plant will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

Substation (Mobile)

The section of the substation required only for plant generation and operation will be dismantled. The transformers and other associated equipment will be salvaged for use at another site. The remainder of the substation with other transmission lines and distribution feeders will remain in service.

Transmission

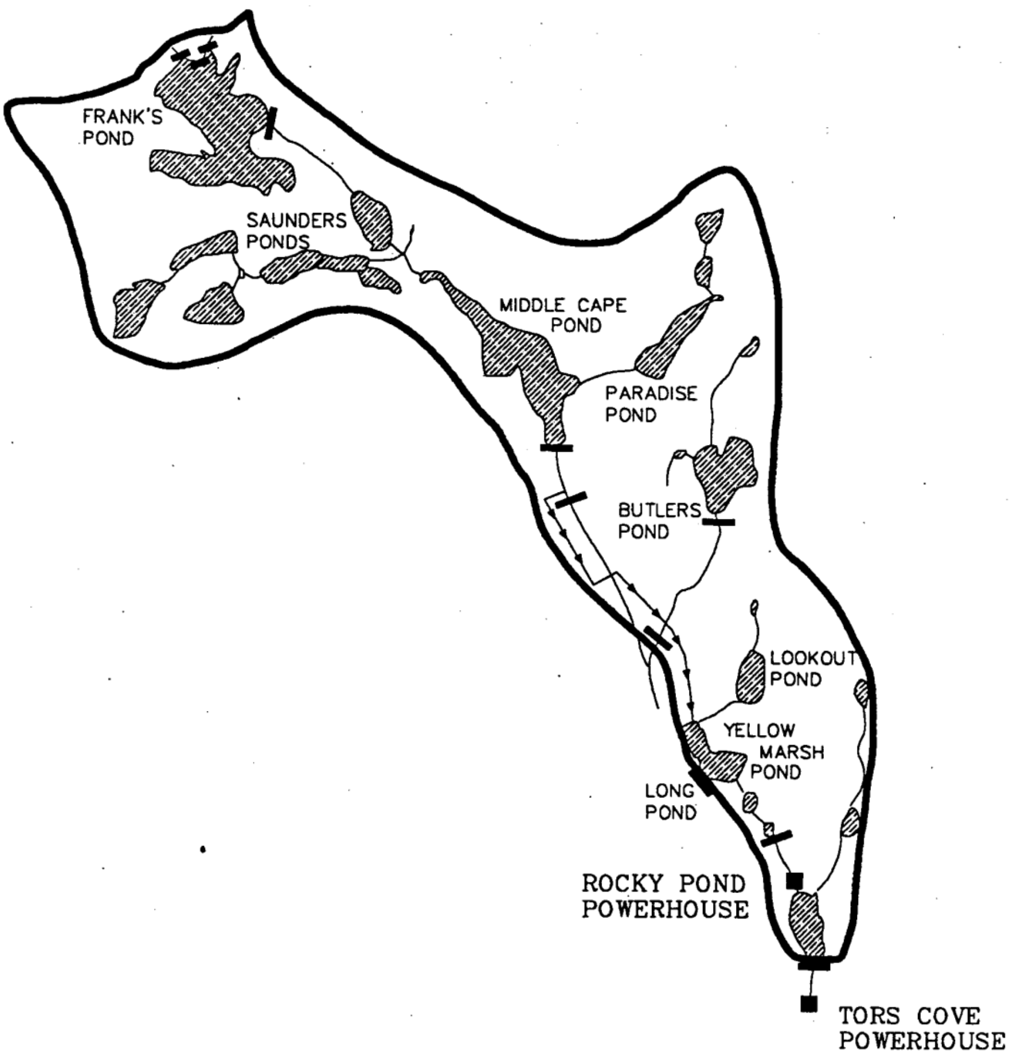
The 7200 V line from the plant to the substation, the station service line, and the line from the substation to the surge tank and Forebay will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped. All other transmission and distribution lines will remain in service.

ESTIMATED COST OF RETIRING MOBILE/MORRIS HYDRO DEVELOPMENT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Mobile Powerhouse	Concrete (install)		650.00	6	3,900.00	0.00	3,900.00
Powerhouse Crane	36 tons	L.S.	1000.00	1	1,000.00	5,100.00	(4,100.00)
Tailrace	earth	M 3	12.00	60	720.00	0.00	720.00
(Backfill)	washed stone	M 3	35.00	10	350.00	0.00	350.00
Turbine/generator	Vert. Francis	L.S.	28,000.00	1	28,000.00	9,980.00	18,020.00
Penstock	steel	M 2	14.50	3,037	44,036.50	0.00	44,036.50
	FRP	M 2	14.50	8,008	116,116.00	0.00	116,116.00
	Steel	L S.	30,000.00	1	30,000.00	0.00	30,000.00
Surge Tank - foundations	Concrete	M3	75.00	87	6,487.50	0.00	6,487.50
Pipeline Thrust Blocks	concrete	M3	75.00	137	10,275.00	0.00	10,275.00
Forebay Dam	earth	M 3	3.00	1,290	3,870.00	0.00	3,870.00
Forebay Dam Intake	concrete	M3	100.00	85	8,500.00	0.00	8,500.00
Gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Gatehouse Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Mobile Power Canal	earthfill	M 3	3.00	11,517	34,551.00	0.00	34,551.00
Canal Stoplog Structure	concrete	M 3	125.00	9	1,062.50	0.00	1,062.50
Mobile First Pond Spillway	concrete	M 3	125.00	237	29,625.00	0.00	29,625.00
Morris Spawning Canal	earth	M 3	3.00	2,000	6,000.00	0.00	6,000.00
Spawning Canal Control Structure	concrete	M 3	75.00	7	487.50	0.00	487.50
Mobile Powerhouse Substructure	concrete	M 3	75.00	165	12,375.00	0.00	12,375.00
Powerhouse bldg	pre-engineered metal	L.S.	7500.00	1	7,500.00	15,000.00	(7,500.00)
Turbine/generator	horiz francis	L.S.	14,000.00	1	14,000.00	1,200.00	12,800.00
Penstock	FRP	M 2	11.75	1,037	12,184.75	0.00	12,184.75
Intake structure	concrete	M 3	100.00	60	6,000.00	0.00	6,000.00
Gatehouse Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Gatehouse		L.S.	1000.00	1	1,000.00	0.00	1,000.00
Morris Canal	earthfill	M 3	3.00	30,000	90,000.00	0.00	90,000.00
Canal stoplog structure	concrete	M 3	100.00	18	1,800.00	0.00	1,800.00
Diversion Spillway Concrete		M 3	100.00	13	1,250.00	0.00	1,250.00
Mobile Big Pond Dam	earthfill	M 3	3.00	12,431	37,293.00	0.00	37,293.00
Mobile Big Pond Intake	concrete	M 3	100.00	21	2,100.00	0.00	2,100.00
Gatehouse	woodframe	L.S.	2000.00	1	2,000.00	0.00	2,000.00
Gatehouse Equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Mobile Big Pond Spillway	concrete	M 3	125.00	12	15,375.00	0.00	15,375.00
Selective Planting		Ha.	1,000.00	5	5,000.00	0.00	5,000.00

ESTIMATED COST OF RETIRING MOBILE/MORRIS HYDRO DEVELOPMENT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Mobile Substation		L.S.	6000.00	1	6,000.00	29,202.00	(23,202.00)
Mobile forebay line	single pole	KM.	3,000.00	2	6,000.00	0.00	6,000.00
Morris Forebay line	single pole	KM	3,000.00	1	3,000.00	0.00	3,000.00
Transmission line	single pole	KM.	10,000.00	5	50,000.00	0.00	50,000.00
Morris Substation		L.S.	4000.00	1	4,000.00	6,330.00	(2,330.00)
Mobilization/ Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**615,858.75**	**72,812.00**	**543,046.75**
CONTINGENCIES (10%)					61,585.88		61,585.88
ENVIRONMENTAL (5%)					30,792.94		30,792.94
ENGINEERING a SUPERVISION (5%)					30,792.94		30,792.94
SITE REMEDIATION (10%)					61,585.88		61,585.88
TOTALS					**800,616.38**	**72,812.00**	**727,804.38**

3.14

TORS COVE/ROCKY POND



Rocky Pond/Tors Cove Watershed Area

NEWFOUNDLAND POWER

TORS COVE/ROCKY POND HYDROELECTRIC DEVELOPMENT

General

The Tors Cove/Rocky Pond Development is located on the southeast side of the Avalon Peninsula near the community of Tors Cove. Tors Cove and Rocky Pond powerhouses are in series and have installed capacities respectively of 6,900 kW under a net head of 52.7 m and 3,200 kW under a net head of 32.6 m.

Tors Cove powerhouse, commissioned in 1940, is located near sea level and contains one generating unit supplied by a woodstave penstock and concrete intake at Tors Cove Pond.

Rocky Pond powerhouse, commissioned in 1943, is located just upstream of Tors Cove Pond and contains one generating unit supplied by a woodstave penstock and concrete intake at Rocky Pond. Storage reservoirs and diversions are provided by structures located at Tors Cove Pond, Rocky Pond/Middle Pond, Long Pond, Yellow Marsh Pond, Cape Pond, and Franks Pond. Storage reservoirs at Saunders Pond and Butlers Pond are not presently in use.

Powerhouse (Tors Cove)

The powerhouse is of concrete substructure and superstructure with a built up roof. The building is 32.8 m x 9.1 m x 7.5 m high.

Powerhouse Crane (Tors Cove)

The powerhouse crane consists of a manually operated 15 ton lift.

Turbine-Generator (Tors Cove)

There are three horizontal Francis turbines manufactured by English Electric and commissioned in 1940. The generators are also by English Electric. One generator was refurbished by Westinghouse in 1964.

Tailrace (Tors Cove)

The tailrace is very short and discharges directly into the sea.

Penstock (Tors Cove)

The penstock is an above ground woodstave conduit supported by timber cradles. It consists of a 591 m long 2743 mm diameter section and a 113 m long 2438 mm diameter section. This section was constructed in 1986 replacing the original one.

Surge Tank (Tors Cove)

The surge tank was replaced in 2000 and consists of steel construction supported on concrete piers. The tank is 7.6 m in diameter and 33.5 m high and is supported by a structural steel frame.

Tors Cove Pond East Dam, Intake and Spillway

The intake structure consists of a concrete horizontal intake with steel trashracks, a 36 m long concrete culvert with dimensions of about 2.4 m X 2.4 m, a vertical concrete gate shaft, gate hoist, control equipment, and a wooden gatehouse.

The main dam is an earthfill structure about 10.5 m high and 72 m long. It incorporates a 20 m long concrete overflow spillway with vertical steel guides for horizontal timber flashboards, and has concrete wingwalls on each abutment.

Tors Cove Pond West Dam

The structure is of earthfill construction about 10.5 m high and 138 m long.

Powerhouse (Rocky Pond)

The powerhouse has a reinforced concrete substructure and superstructure and is 11.9 m x 8.5 m x 9.5 m high with a built-up wood roof.

Powerhouse Crane (Rocky Pond)

The powerhouse crane consists of a 16.5 ton electrically operated device.

Tailrace (Rocky Pond)

The tailrace consists of a short canal excavated through earthfill to Tors Cove Pond.

Turbine-Generator (Rocky Pond)

The turbine is a vertical Francis turbine manufactured by Dominion Turbine and commissioned in 1943. The generator was manufactured by Westinghouse.

Penstock (Rocky Pond)

The penstock is a 756 m long, 2274 mm diameter woodstave conduit supported by timber cradles.

Rocky Pond Dam Intake and Spillway

The dam is an earthfill structure incorporating a reinforced concrete spillway and concrete intake. The main dam is about 240 m long and 9.0 m high. The spillway is of concrete construction about 2.4 m high and 34 m long and includes a downstream apron with baffles and concrete wingwalls at each abutment.

The intake structure consists of a 28 m long 2.0 m square concrete box culvert through the dam with a vertical concrete gate shaft. This structure also includes gate hoists, control equipment, steel trashracks, reinforced concrete guidewalls, and a wooden gatehouse.

Rocky Pond Freeboard Dams No. 1 to 3

There are three small freeboard dams at the Rocky Pond forebay. All are of earthfill construction and vary in size.

Long Pond - Middle Pond Control Structure

The control structure consists of two reinforced concrete abutments and one instream pier forming two 1.8 m wide openings in the canal. A wooden building has been removed from the structure, and the gates are not presently in use.

Long Pond Dam and Spillway

The structure is of earthfill/rockfill construction incorporating a central galvanized steel core. The dam is about 65 m long and 2.5 m high. It was reconstructed in 1985 to replace the original timber crib structure.

Lamanche Canal

Lamanche Canal is a side hill excavation and earthfill dyke structure about 5600 m long incorporating seven spillways.

Lamanche Canal Spillway No. 1

The structure is located at the entrance to the canal. It is about 11.2 m long and consists of rockfill with a concrete upstream face, crest, and abutments. The structure was rebuilt in 1986.

Lamanche Canal-Spillway No. 2

The structure is located at station 1 + 640. It is about 8.9 m long and consists of rockfill with a concrete upstream face, crest, and abutments. The structure was rebuilt in 1986.

Lamanche Canal Spillway No. 3 (Butler's Brook Spillway)

The structure is located at station 2 + 500. It is about 41.8 m long and is constructed of rockfill treated timber cribwork. Part of the structure was rebuilt in 1986 and the remaining sections were rebuilt in 1989.

Lamanche Canal Spillway No. 4

The structure is located at station 2 + 750. It is about 9.8 m long and is a concrete overflow weir. The structure was rehabilitated in 1986.

Lamanche Canal Spillway No. 5

The structure is located at station 3 + 100. It is about 10.8 rn long and consists of rockfill with a concrete upstream face, crest, and abutments. The structure was rebuilt in 1986.

Lamanche Canal Spillway No. 6

The structure is located at station 3 + 240. It is about 8.8 m long and consists of rockfill with a concrete upstream face, crest, and abutments. The structure was rebuilt in 1986.

Lamanche Canal Spillway No. 7

The structure is located at station 4 + 470. It is about 9.0 m long and consists of rockfill with a concrete upstream face, crest and abutments. The structure was rebuilt in 1986.

Butler's Pond Dam and Outlet

The structure was of rock filled timber crib construction about 2.4 m high. The structure is presently abandoned and the opening has been widened to prevent impounding of water.

Cluney's Downstream Spillway

The structure is located immediately downstream of Cluney's Weir. It is about 14.6 m long and 3.0 m high and is of rockfill treated timber crib construction. The abutments were replaced on this structure in 1995.

Cluney's Weir

A new concrete weir was constructed in 1995 to replace the old timber crib structure. This structure also includes concrete wing walls.

Cluney's Control Structure

The structure consists of two reinforced concrete abutments forming a 2.4 m x 2.4 m opening in the canal. A woodframe building mounted on the abutments houses the hoisting mechanism for the horizontal stoplogs. The building was replaced and concrete repaired in 1987. In 1995, a gabion retaining wall was removed and slope stability work was carried out.

Cluney's Upstream Spillway

The structure is located directly upstream of the control structure and is of rockfill construction with a galvanized steel core. The structure is 143 m long and about 1.0 m high. It was reconstructed in 1987 to replace the original timber crib structure.

Cluney's Canal

The canal is a sidehill excavation and earthfill dyke structure about 3700 m long incorporating two spillways.

Cluney's Canal Diversion Dam and Spillway

The structure is located immediately downstream of Cape Pond Dam and is of rockfill construction with a galvanized steel core. The structure is 45 m long and about 1.0 m high.

Cape Pond Dam, Spillway and Outlet

This structure was rebuilt in 1994 to replace the old timber crib structure. The dam now consists of a earthfill section 150 m long with a maximum height of 6 m and a concrete gravity overflow spillway 40 m in length. Also incorporated into the earthfill section is a concrete culvert outlet complete with a 2,400 mm x 1,800 mm steel gate and screw stem lift.

Saunders Pond Dam and Outlet

The structure was a small rockfill timber crib dam with earthfill abutments. The structure was about 12 m long and 2.4 m high with a 1.2 m wide outlet. It is presently abandoned with the opening widened to prevent impounding of water.

Saunders Pond Spillway

The spillway was a low rockfill timber crib structure with timber sheathing. The structure was about 17 m long and 1.2 m high. It is presently abandoned.

Franks Pond Storage Dam and Outlet

The control dam is an earthfill structure about 80 m long and 5.8 m high incorporating a gated concrete box culvert with a vertical concrete gate shaft and wooden gatehouse. The 1.2 m square culvert extends 19 m through the dam.

Franks Pond Dam Spillway No. 1

The low freeboard structure is essentially abandoned and consists of two rows of badly deteriorated vertical timbers retaining earthfill and bog. The structure has an overall length of 79 m with a maximum height of 1.5 m.

Franks Pond Dam No. 2

The structure is a low earthfill dam approximately 30 m long and 2.0 m high.

Franks Pond Dam Spillway No. 3

The structure was a rockfill timber crib structure which has been modified by backfilling with earthfill. The crest of the dam is depressed at the east abutment to form a spillway 18 m in length. The dam has an overall length of 50 m and a height of 6.0 m.

Franks Pond Dam No. 4

The structure consists of a timber crib dam that has been backfilled with earthfill. The structure has an overall length of 125 rn and a height of 6.0 m.

Franks Pond Dam Spillway No. 5

The structure consists of an earthfill/rockfill embankment with a vertical galvanized steel core which was reconstructed in 1989 to replace the original timber crib dam. The dam has an overall length of about 200 m with a maximum height of about 4.0 m. The spillway section is about 120 m long.

Franks Pond Dam No. 6

The small earthfill structure is about 1.5 m high and 85 m long.

Franks Pond Dam No. 7

The small earthfill structure is about 4.5 m high and 45 m long.

Substation (Rocky Pond)

The generated voltage of 6.9 kV provides service for the station service and is stepped up to 66 kV for transmission.

Transmission (Rocky Pond)

The transmission line from Rocky Pond Substation taps into the 66 kV line between Cape Broyle and Mobile.

Substation (Tors Cove)

The generated voltage of 6.9 kV provides service for the station service and to the forebay. The generated voltage is also stepped up to 66 kV for transmission to Mobile.

Transmission (Tors Cove)

A 66 kV transmission line extends from the substation to Mobile. There is also a 6.9 kV line from the substation to the forebay dam.

DECOMMISSIONING SCENARIO FOR TORS COVE/ROCKY POND

General

Decommissioning would include demolition of practically all hydraulic structures except those required to maintain water levels in Tors Cove Pond for summer cabins and recreational users. Transmission and substation structures will also be dismantled. The only direct environmental impact anticipated is the minimal disruption caused by demolition of structures located in the Avalon Wilderness Reserve.

Materials from this development that will be sold for scrap will be transported 40 km. Materials to be disposed of at an approved site will be hauled 10 km. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse (Tors Cove)

The structure will be demolished to ground level and all debris will be disposed of at an approved waste disposal site. Openings in the building substructure will be backfilled and sealed with concrete.

Powerhouse Crane (Tors Cove)

The crane will be removed and salvaged during decommissioning.

Turbine-Generator (Tors Cove)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace (Tors Cove)

The tailrace opening will be sealed with concrete to ensure public safety.

Penstock (Tors Cove)

The woodstave penstock will be demolished and disposed of at an approved waste disposal site. Contaminated soil under the penstock will be excavated and disposed at a approved soil treatment facility. The penstock route will be backfilled and landscaped.

Surge Tank (Tors Cove)

The surge tank will be demolished and the steel will be cut into sections and sold for scrap. The concrete surge tank tee block and concrete footings will be demolished and disposed of at an approved location. The cladding and insulation will be removed and disposed of at an approved waste disposal site. The site will be backfilled and landscaped.

Tors Cove Pond East Dam. Intake and Spill

The intake structure will be demolished and all concrete will be removed and disposed of at an approved location. Minor items such as the gate lift may be salvaged for use at another site. The earthfill section of the dam will be reconstructed to maintain water elevations in Tors Cove Pond at adequate levels for cabin owners and recreational users. The concrete spillway will be reconstructed with the spillway crest set at an elevation designed to maintain adequate water levels. A continuous flow will pass over the spillway and into the existing spillway channel.

Tors Cove Pond West Dam

The structure will remain in place to maintain water levels in Tors Cove Pond.

Powerhouse (Rocky Pond)

The powerhouse will be demolished to ground level and all debris will be buried in the tailrace. The site will be backfilled and landscaped.

Powerhouse Crane (Rocky Pond)

The crane will be removed and salvaged during decommissioning.

Tailrace (Rocky Pond)

The tailrace channel will be backfilled with adjacent material and landscaped.

Turbine-Generator (Rocky Pond)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Penstock (Rocky Pond)

The woodstave penstock will be demolished and disposed of at an approved waste disposal site. The penstock route will be backfilled and landscaped.

Rocky Pond Dam, Intake and Spillway

The entire structure will be demolished. The concrete intake will be demolished and all debris will be buried on site. Minor items may be salvaged for use at another site. The earthfill section will be leveled to blend with the surrounding terrain. The concrete spillway will be demolished and all debris will be buried on site. Water will flow unimpeded through the spillway site and into the original river channel. The entire site will be landscaped.

Rocky Pond Freeboard Dams No. 1 to 3

All three structures will be leveled to match the contours of the surrounding terrain and the sites will be landscaped.

Long Pond-Middle Pond Control Structure

The structure will be demolished and all debris will be buried at an approved location near the site. The site will be graded and landscaped.

Long Pond Dam and Spillway

The structure will be leveled to match the contours of the surrounding terrain. The steel core will be removed and buried on site. An opening will be excavated to permit water to flow from Long Pond into the spillway channel and then into Lamanche River. The site will be landscaped.

Lamanche Canal

The canal embankments will be leveled and the channel will be backfilled with adjacent material in all locations except those necessary to provide local drainage. The canal route will be landscaped.

Lamanche Canal Spillways No. 1 to 7

All seven structures will be demolished and all timber and concrete debris will be buried at approved locations in the canal. Openings will be excavated at each site to permit water to flow into the spillway channels and then into Lamanche River. The sites will be graded and landscaped.

Butler's Pond Dam and Outlet

The structure is presently demolished but a small amount of additional work will be required to remove and bury exposed timber and to further level the remaining remnants of the structure to ensure public safety.

Cluney's Downstream Spillway

The structure will be demolished and all debris will be disposed of at an approved location near the site. Water will flow through the site into the spillway channel and then into Lamanche River. The site will be graded and landscaped.

Cluney's Weir

The structure will be demolished and all concrete will be buried in the canal. The site will be backfilled and landscaped.

Cluney's Control Structure

The structure will be demolished and all debris will be buried in the canal. 'The site will be backfilled and landscaped.

Cluney's Upstream Spillway

The structure will be leveled to blend with surrounding terrain. The steel core will be removed and buried in the canal. An opening will be excavated to permit water to flow into the spillway channel and then into Lamanche River.

Cluney's Canal

The canal embankments will be leveled and the channel will be backfilled with adjacent material in all locations except those necessary to provide local drainage. The canal route will be landscaped.

Cluney's Canal Diversion Dam and Spillway

The structure will be leveled to match the contours of the surrounding terrain. The steel core will be removed and buried in the canal. An opening will be excavated to permit water to flow directly from Cape Pond into the Lamanche River.

Cape Pond Dam, Sgillway and Outlet

The structure will be demolished and all debris will be buried at an approved location near the site. Minor items such as the gate lift may be salvaged for use at other sites. Water will flow from Cape Pond through this site and into the Lamanche River. The common fill will be leveled and the site will be landscaped.

Franks Pond Storage Dam and Outlet

The structure will be demolished and all debris will be buried on site. Minor items such as the gate lift may be salvaged for use at another site. An opening will be excavated to permit water to flow into the existing canal and then into Cape Pond. The site will be graded and landscaped.

Franks Pond Dam Spillway No. 1

The structure is badly deteriorated and the only work required is to level the remaining rotten timber.

Franks Pond Dam No. 2

The structure will be leveled to blend with surrounding terrain and the site will be landscaped.

Franks Pond Dam Spillway No. 3

The structure will be leveled to match the contours of surrounding terrain. Timber exposed during demolition will be buried on site. The site will be landscaped.

Franks Pond Dam No. 4

The structure will be leveled to blend with surrounding terrain. Timber exposed during demolition will be buried on site. An opening will be excavated to permit water to flow into the existing river channel and then into Little Harbour River. The site will be landscaped.

Franks Pond Dam Spillway No. 5

The structure will be leveled to match the contours of surrounding terrain. The steel core will be removed and buried on site. An opening will be excavated to permit water to flow into the existing spillway channel and then into Little Harbour River. The site will be landscaped.

Franks Pond Dam No. 6

The structure will be leveled to blend with surrounding terrain and the site will be landscaped.

Franks.Pond Dam No. 7

The structure will be leveled to match the contours of surrounding terrain and the site will be landscaped.

Saunders Pond Dam and Outlet

The structure is presently demolished but a small amount of additional work will be required to remove and bury the remaining remnants of the structure.

Saunders Pond Dam and Outlet

The structure is presently demolished but a small amount of additional work will be required to remove and bury the remaining remnants of the structure.

Substation (Rocky Pond)

The substation will be dismantled and all equipment will be either salvaged for use at other sites or disposed of at an approved waste disposal site. The site will be backfilled and landscaped..

Transmission (Rocky Pond)

All lines associated with the plant will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

Substation (Tors Cove)

The substation will be dismantled and all equipment will be either salvaged for use at other sites or disposed of at an approved waste disposal site. The site will be backfilled and landscaped.

Transmission (Tors Cove)

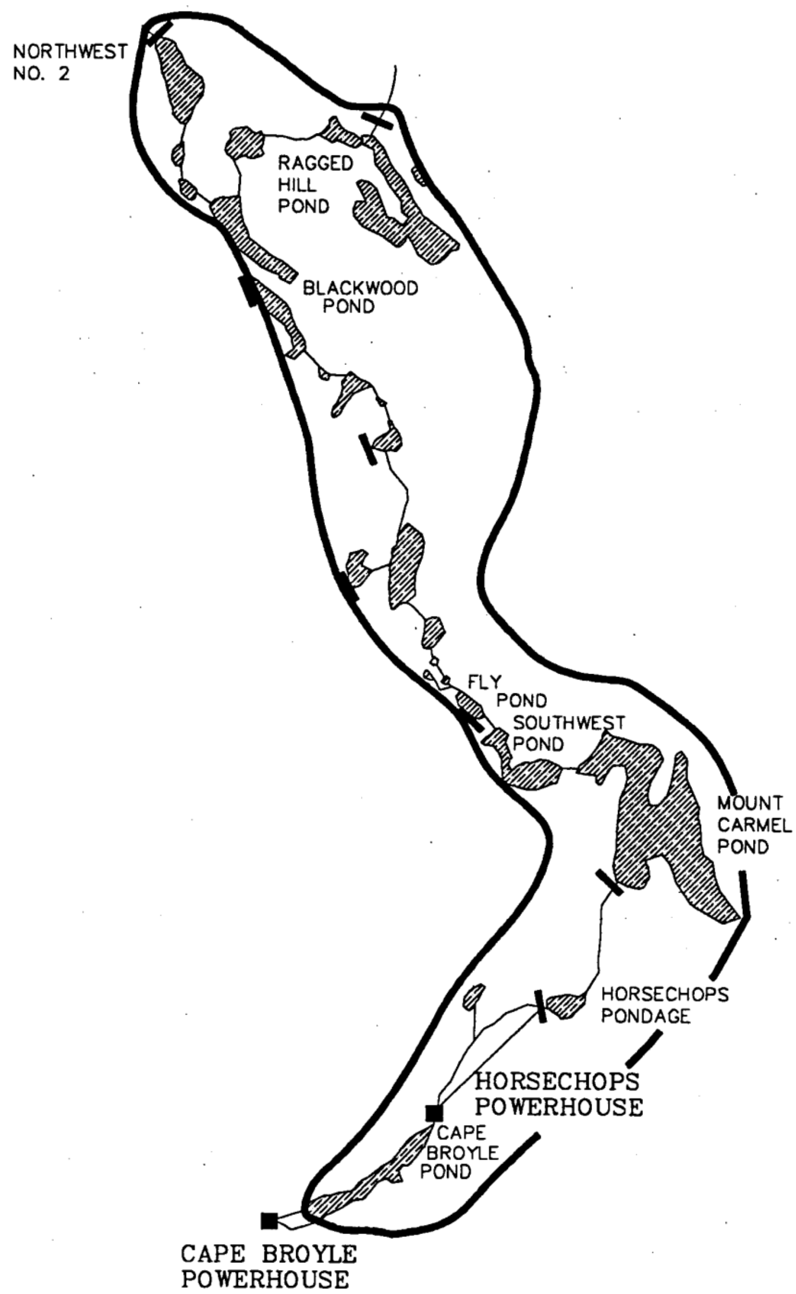
All lines associated with the plant will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

ESTIMATED COST OF RETIRING TORS COVE/ROCKY POND HYDRO DEVELOPMENT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Tors Cove Powerhouse	concrete	M 3	100.00	321	32,100.00	0.00	32,100.00
-powerhouse crane	15 ton	L.S.		1	1,000.00	3,000.00	(2,000.00)
Turbine/Generator	Horiz Francis	L.S.	13,333.33	3	40,000.00	6,915.00	33,085.00
Tailrace	concrete	M 3	650.00	4	2,600.00	0.00	2,600.00
Penstock	woodstave	M 2	7.00	5,958	41,706.00	0.00	41,706.00
Surge Tank	steel	L. S.	30,000.00	1	30,000.00	0.00	30,000.00
-foundations	concrete	M 3	75.00	80	6,000.00	0.00	6,000.00
Anchor Blocks	concrete	M 3	75.00	100	7,500.00	0.00	7,500.00
East Dam	Backfill	M 3	5.00	285	1,425.00	0.00	1,425.00
	concrete	M 3	650.00	5	3,250.00	0.00	3,250.00
Tors Cove Pond Dam Reconstruction	earthfill	L.S.	25000.00	1	25,000.00	0.00	25,000.00
Gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
.-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Rocky Pond Powerhouse	concrete	M 3	100.00	133	13,300.00	0.00	13,300.00
-powerhouse crane	16.5 ton	L.S.	1000.00	1	1,000.00	2,500.00	(1,500.00)
Tailrace	earthfill	M 3	12.00	200	2,400.00	0.00	2,400.00
Turbine/generator	Horiz-Francis	L.S	20,000.00	1	20,000.00	3,195.00	16,805.00
Penstock	woodstave	M 2	7.00	5,400	37,800.00	0.00	31,800.00
Rocky Pond Dam	earthfill	M 3	3.00	5,575	16,725.00	0.00	16,725.00
-spillway	concrete	M 3	125.00	57	7,062.50	0.00	7,062.50
-intake	concrete	M 3	100.00	130	13,000.00	0.00	13,000.00
Gatehouse		L.S.	1000.00	1	1,000.00	0.00	1,000.00
Gatehouse equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Rocky Pond freeboard dams (3)	earthfill	L.S.	3.00	1,000	3,000.00	0.00	3,000.00
Long Pond/Middle Pond structure	concrete	M 3	75.00	39	2,925.00	0.00	2,925.00
Gatehouoe	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Long Pond Spillway Dam	earthfill	M 3	5.00	819	4,095.00	0.00	4,095.00
Lamanche Canal Spillways (6)	timber crib	L.S.	1,000.00	6	6,000.00	0.00	6,000.00
Butlers Spillway	timber crib	M 3	20.00	286	5,720.00	0.00	5, 720.00
Lamanche Canal	earthfill	M 3	3.00	12,493	37,479.00	0.00	37,479.00
Butlers Pond Dam	timber crib	M 3	20.00	1,000	20,000.00	0.00	20,000.00
Cluneys Downstream Spillway	timber crib	M 3	20.00	120	2,400.00	0.00	2,400.00
Cluney's Weir	concrete	M 3	75.00	65	4,875.00	0.00	4,875.00
Cluney's Control Structure	concrete	M 3	75.00	23	1,725.00	0.00	1,725.00
	gabions	M 3	20.00	40	800.00	0.00	800.00
Gatehouse	woodframe	L.S.	1000.00	1	1,000.00	0.00	1,000.00
Cluney's upstream spillway	earthfill	M 3	5.00	890	4,450.00	0.00	4,450.00
Cluney's Diversion Dam	earthfill	M 3	5.00	1,300	6,500.00	0.00	
Cluney's Canal	earthfill	M 3	3.00	8,254	24,762.00	0.00	24,762.00

ESTIMATED COST OF RETIRING TORS COVE/ROCKY POND HYDRO DEVELOPMENT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Cape Pond Dam	earthfill	M 3	3.00	14,500	43,500.00	0.00	43,500.00
-spillway	concrete	M 3	75.00	625	46,875.00	0.00	46,875.00
-gate equipment		L.S.	1000.00	1	1,000.00	0.00	1,000.00
Saunders Pond Dam	timber crib	M 3	20.00	170	3,400.00	0.00	3,400.00
Saunders Pond							
Spillway	timber crib	M 3	20.00	75	1,500.00	0.00	1,500.00
Frank's Pond Storage Dam	earthfill	M 3	3.00	1,929	5,787.00	0.00	5,787.00
Frank's Pond Intake	concrete	M 3	100.00	33	3,300.00	0.00	3,300.00
Gatehouse	woodframe	L.S.	1,000.00	1	1,000.00	0.00	1,000.00
Gatehouse equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Franks Pond							
No. 7 Dam	earthfill	M 3	3.00	455	1,365.00	.0.00	1,365.00
No. 6 Dam	earthfill	M 3	5.00	350	1,750.00	0.00	1,750.00
No. 5 Dam	earthfill	M 3	5.00	870	4,350.00	0.00	4,350.00
No. 4 Dam	earth encased	M 3	5.00	835	4,175.00	0.00	4,175.00
No. 3 Dam	earth encased	M 3	5.00	400	2,000.00	0.00	2,000.00
No. 2 Dam	earthfill	M	3.00	120	360.00	0.00	360.00
No. 1 Dam	vertical wood	L.S.	1,000.00	N/A	1,000.00	0.00	1,000.00
Frank's Pond Canal	earthfill	M 3	3.00	5,664	16,992.00	0.00	16,992.00
Revegetation							
-Selective Planting		Ha.	11000.00	8	8,000.00	0.00	8,000.00
Transmission Lines							
-Tore Cove	single pole	KM.	10,000.00	5	50,000.00	0.00	50,000.00
-Tore Cove Forebay Line	single pole	KM	3,000.00	1	3,000.00	0.00	3,000.00
-Rocky Pond	single pole	KM.	10,000.00	1	10,000.00	0.00	10,000.00
-Rocky Pond Forebay Line	single pole	KM.	3,000.00	1	3,000.00	0.00	3,000.00
Substation							
-Tore Cove		L.S.	6200.00	1	6,200.00	18,758.00	(12,558.00)
-Rocky Pond		L.S.	6200.00	1	6,200.00	7,098.00	(898.00)
Mobilization/ Demobilization		L.S.	30000.00	1	30,000.00	0.00	30,000.00
SUBTOTALS					**688,353.50**	**47,466.00**	**640,887.50**
CONTINGENCIES (10%)					68,835.35		68,835.35
ENVIRONMENTAL (8%)					55,068.28		55,068.28
ENGINEERING & SUPERVISION (5%)					34,417.68		34,417.68
SITE REMEDIATION (8%)					55,068.28		55,068.28
TOTALS					**901,743.09**	**47,466.00**	**854,277.09**

3.15

CAPE BROYLE/HORSE CHOPS



Cape Broyle/Horsechops
Watershed Area

NEWFOUNDLAND POWER

CAPE BROYLE/HORSE CHOPS HYDROELECTRIC DEVELOPMENT

General

Cape Broyle/Horse Chops development was commissioned in 1953 and is located on the southeast part of the Avalon Peninsula near the community of Cape Broyle. Cape Broyle and Horse Chops powerhouses are in series and have installed capacities respectively of 6,000 kW under a net head of 54.8 m and 7,650 kW under a net head of 85.3 m. Cape Broyle powerhouse is located near sea level and contains one generating unit supplied by a woodstave penstock and concrete intake.

Horse Chops powerhouse is located upstream of Cape Broyle Pond and contains one generating unit supplied by a woodstave penstock, concrete intake and earth embankment power canal.

Storage reservoirs and diversions are provided by structures at Cape Broyle Pond, Horse Chops Pond, Mount Carmel Pond, Fly Pond, Fourth Blackwoods Pond, East Blackwoods Pond, Northwest Blackwoods Pond, West Ragged Hills Pond and Rock Pond.

Powerhouse (Cape Broyle)

The powerhouse is 14.0 m x 12.2 m x 9.9 m high and consists of a concrete substructure, concrete block with brick facing superstructure, and built up roof. The powerhouse also includes a 30 ton electrically operated crane.

Turbine-Generator (Cape Broyle)

There is one 6000 kW vertical Francis turbine manufactured by Canadian Vickers Ltd. and commissioned in 1953. The generator was manufactured by Westinghouse.

Tailrace (Cape Broyle)

The tailrace discharges directly into the ocean and there are no major structures incorporated in it.

Penstock (Cape Broyle)

The penstock is of woodstave construction supported by timber cradles and consists of a 383 m long 2438 mm diameter section between the intake and the surge tank and a 42 m long 2286 mm diameter section between the surge tank and the powerhouse.

Surge Tank (Cape Broyle)

The surge tank is of steel construction with treated timber frost casing and is supported on concrete footings. It consists of a 22 m high support structure and a 12 m high 5.5 m diameter tank.

Intake (Cape Broyle)

The Intake is set in a short, 10.7 m high enbankment dam adjacent to the Southern Shore highway. It is of concrete construction with a wooden gatehouse, trashracks, gate and lift, and control equipment. A buried steel pipe extends from the intake under the highway for approximately 38 m to a concrete retaining wall at the steel/woodstave interface.

Cape Broyle Dam

The structure is an earthfill embankment approximately 122 m long with a maximum height of about 12.2 m.

Cape Broyle Spillway

The spillway is located adjacent to the right abutment of Cape Broyle Dam. It is a 70 m long structure consisting of a low concrete gravity weir, between concrete abutments, topped with 1. 1 m of timber flashboards between vertical steel guides. Near the midpoint of the spillway are two gate openings 1.2 m wide and 2.4 m high with timber stoplogs.

Cape Broyle Freeboard Dam

The structure is of earthfill construction about 46 m long and 2.1 m high.

Beaver Pond Freeboard Dam

The structure is of earthfill construction about 46 m long and 1.5 m high. The crest is used as an access road to local residences.

Powerhouse (Horse Chops)

The powerhouse is 13.0 m x 11.5 m x 10.5 m high and consists of a concrete substructure and steel superstructure with corrugated asbestos sheet siding. The powerhouse also includes a 36 ton electrically operated crane.

Turbine-Generator (Horse Chops)

There is one 7650 kW vertical Francis turbine manufactured by Dominion Engineering and commissioned in 1953. The generator was manufactured by General Electric.

Tailrace (Horse Chops)

The tailrace consists of a 9 m long, 6250 mm x 3910 mm metal pipe arch adjacent to the plant, followed by a 27 m long 4880 mm x 2030 mm multiplate arch culvert then a 300 m long open channel excavated through earthfill.

Penstock (Horse Chops)

The penstock, reconstructed in 2000, is of steel construction 2134 mm diameter and 1196 m long. It is supported by concrete cradles. A surge tank is located 104 m upstream from the plant.

Sucge Tank (Horse Chops)

The surge tank reconstructed in 1999 is of steel construction with metal cladding and insulation and is supported on concrete piers. It is a 5.5 m diameter, 14 m high tank on a 64 m high steel support structure.

Intake (Horse Chops)

The intake is of concrete construction topped with a wooden gatehouse. It contains trashracks, a gate and lift, and control equipment. It is incorporated into a short earthfill dam which is essentially a section of the power canal embankment.

Horse Chops Power Canal

The canal is of sidehill cut and fill construction about 1500 m long with varying widths. It extends from the forebay to the intake and has a maximum embankment height of about 7.6 m.

Horse Chops East Dam

The structure is of earthfill construction about 90 m long with a maximum height of about 7.6 m. The right abutment of the dam ties into the spillway and the left abutment ties into the power canal.

Horse Chops Spillway

The spillway is located at the right abutment of the east dam. It is 34 m long and consists of a low concrete weir topped with timber stoplogs between vertical steel guides.

At the left abutment there is a 3.7 m wide x 4.0 m high gate containing timber stoplogs between concrete wingwalls. There is also a manually operated hoisting mechanism for raising stoplogs. This structure was rehabilitated in 2000.

Horse Chops West Dam

The structure is of earthfill construction about 340 m long with a maximum height of about 11.0 m.

Mount Carmel Pond Dam and Outlet Structure

The structure is of earthfill construction about 460 m long and approximately 12.2 m high with a centrally located outlet structure. The outlet structure consists of a 2.0 m wide x 1.8 m high concrete box culvert through the dam, a 1.8 m square steel gate operated on a vertical steel shaft and manual crank, topped with a wooden gatehouse. The structure also contains trashracks and control equipment.

Mount Carmel Pond Spillway

The spillway was rebuilt in 1994 to replace the treated timber overflow weir. The structure is a concrete overflow with a walkway and flashboards.

Fly Pond Diversion Dam and Emergency Fuse Plug Spillway

The structure is of earthfill construction about 180 m long and 4.3 m high. The emergency spillway is located at the right dam abutment. It is of earthfill construction about 1.5 m lower than the dam crest.

Fly Pond Canal and Bridge

Fly Pond Canal is 220 m long and approximately 15 m wide. The bridge spanning the canal is constructed of steel beams with wood decking. It has a span of 11.6 m between rockfill timber crib abutments.

Two Arm Pond Diversion Dam

The structure is an earthfill embankment about 45 m long and approximately 1.5 m high.

Fourth Blackwoods Pond Canal, Stoplog Structure and Bridge

The canal is about 1500 m long and approximately 6.0 m wide. The stoplog structure is located about 500 m downstream of the canal entrance and consists of concrete abutments, a steel frame with timber decking walkway and steel guides for timber stoplogs. The bridge spans about 6.0 m and is of steel girder construction with wood decking and rockfill timber crib abutments.

Fourth Blackwoods Pond Diversion Dam/Spillway

The spillway is of rockfill/earthfill overflow construction with a central steel core. it is about 55 m long and 4.6 m high.

Fourth Blackwoods Pond Freeboard Dams No. 1 and 2

The structures are each about 45 m long and about 2.5 m to 3.0 m high. They are of earthfill construction.

East Blackwoods Pond Spillway

The spillway is a rockfill/earthfill overflow structure with a central steel core. It is about 90 m long and 1.2 m high. It was reconstructed in 1989 to replace a timber crib structure.

East Blackwoods Pond Freeboard Dams No. 1 to 9

All nine structures are of earthfill construction ranging in length from about 18 m to 110 m and ranging in height from 1.2 m to 4.6 m.

Northwest Blackwoods Pond Diversion Dam and Freeboard Dam and Pond K Diversion Dam.

All three structures are located very close together and are of earth and rockfill construction. The Northwest Blackwoods Pond Diversion Dam is about 180 m long and 7.6 m high, the Freeboard Dam is about 45 m long and 2.7 m high, and the Pond K Diversion Dam is about 90 m long and 6.1 m high.

Northwest Blackwoods Pond Spillway

The structure is approximately 75 m long and 0.6 m high. It consists of untreated timber piling topped with untreated timber planks. The downstream side is riprapped.

Jordan River Diversion Dam and Freeboard Dams No. 1 and 2

The structures are all of earthfill embankment construction. The Jordan River Diversion Dam is about 90 m long and 4.3 m high. One freeboard dam is about 45 m long and 2.4 m high and the other is about 150 m long and 3.0 m high.

West Ragged Hills Spillway Dam

This structure is a rockfill treated timber dam about 75 m long with a centrally located spillway about 68 m long. It ranges in height from 0.2 m to 2.0 m. It was reconstructed in 1986 to replace the original timber crib structure.

Rock Pond Dam

Rock Pond Dam is an earthfill structure about 80 m long and up to 1.5 m high. It was reconstructed in 1986 to replace the original timber structure.

Substation (Horse Chops)

The generated voltage of 6.9 kV is stepped down to 120/240 V for the emergency station service and also for normal station service. The generated voltage is also stepped up to 66 kV for transmission.

Transmission (Horse Chops)

Transmission includes a 6.9 kV line to the forebay, a 120/240V normal station service and emergency station service from the substation to the plant and a 66 kV transmission line from the substation to a tap on the transmission line between Cape Broyle and Mobile.

Substation (Cape Broyle)

The generated voltage is stepped down to 120/240 V for the emergency station service and normal station service and is stepped up to 66 kV for transmission to Fermeuse and Mobile. The 66 kV is also stepped down to 12.5 kV for local distribution.

Transmission (Cape Broyle)

Transmission includes a 6.9 kV line from the plant, 66 kV lines to Fermeuse and Mobile, two station service lines from the substation to the plant, and one 12.5 kV distribution line.

Other

Woodframe storage sheds are located at both plants. A gravel access road extends from the main highway to Northwest Blackwoods Pond.

DECOMMISSIONING SCENARIO FOR CAPE BROYLE/HORSE CHOPS

General

Decommissioning would include demolition of practically all hydraulic structures in the development except those required to maintain adequate water levels in Cape Broyle Pond for recreational use and for cabin owners. All substation and transmission equipment except for the items required for local distribution and transmission lines will also be removed. The only direct environmental impacts anticipated are the removal of two bridges which will restrict access to the Avalon Wilderness Reserve and minimal disruption in the reserve during demolition.

Material to be sold as scrap would be hauled 60 km for sale. Material required to be disposed at an approved site will be hauled 5 km. Contaminated materials would be transported and disposed at an approved treatment facility.

Powerhouse (Cape Broyle)

The powerhouse will be demolished to ground level and all debris will be disposed of at an approved waste disposal site. Openings in the building substructure will be backfilled and sealed with concrete. The crane will be salvaged.

Turbine-Generator (Cape Broyle)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace (Cape Broyle)

The tailrace opening will be sealed with concrete to ensure public safety.

Penstock (Cape Broyle)

The woodstave penstock will be demolished and disposed of at an approved waste disposal site. The penstock route will be backfilled and hydroseeded. Contaminated soil will be excavated and transport to the nearest treatment facility.

Surge Tank (Cape Broyle)

The surge tank will be demolished and the steel will be cut into pieces and sold for scrap. The concrete surge tank tee block and concrete footings will be demolished and disposed of at an approved location. The timber frost casing will be removed and disposed of at an approved waste disposal site.

Intake (Cape Broyle)

The concrete intake will be demolished and all debris will be disposed of at an approved location. Minor items such as the gate lift will be salvaged for use at another Site. The steel pipe through the dam and underneath the highway will remain in place. It will be backfilled and sealed on both ends with concrete. The embankment section will remain to provide protection for the adjacent highway and to maintain water levels. Additional earthfill and riprap will be placed in the area in which concrete is to be removed.

Cape Broyle Dam

The structure will remain in place to maintain water levels in Cape Broyle Pond. These structures will then be turned over to the provincial government.

Cape Broyle Spillway

The structure will be reconstructed with the spillway crest set at an elevation designed to maintain water elevations in Cape Broyle Pond at adequate levels for cabin owners and recreational users. Water will then flow continuously from Cape Broyle Pond over the spillway and into the original river bed to Cape Broyle Harbour.

Cape Broyle Freeboard Dam

The structure will remain in place to maintain water levels in Cape Broyle Pond.

Beaver Pond Freeboard Dam

The structure will remain in place to provide access to local residences and to maintain water levels.

Powerhouse (Horse Chops)

The powerhouse will be demolished to ground level. The steel superstructure will be dismantled and sold for scrap. the asbestos siding will be removed and disposed of at an approved waste disposal site. Concrete debris will be buried in the tailrace. The site will be backfilled and selectively planted. The crane will be salvaged.

Turbine-Generator (Horse Chops)

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Tailrace (Horse Chops)

The corrugated metal arch structures will be demolished and buried in the tailrace channel. The channel will be backfilled and leveled using adjacent material. The site will be selectively planted.

Penstock (Horse Chops)

The woodstave penstock will be demolished and disposed of at an approved waste disposal site. The penstock route will be backfilled and selectively planted.

Surge Tank (Horse Chops)

The structure will be demolished and the steel will be cut into pieces and sold for scrap. The concrete surge tank tee block and concrete footings will be demolished and disposed of at an approved location on site. The cladding and insulation will be removed and disposed of at an approved waste disposal site.

Intake (Horse Chops)

The concrete structure will be demolished and all debris will be buried in the power canal. Minor items may be salvaged for use at other sites. The earthfill section will be leveled to blend with the surrounding terrain. The site will be selectively planted.

Horse Chops Power Canal

The canal embankment will be leveled and the channel will be backfilled with adjacent material. The site will be graded and selectively planted.

Horse Chops East Dam

The structure will be leveled to blend with surrounding terrain. An opening will be excavated to permit water to flow unimpeded into the original river channel. The site will be selectively planted.

Horse Chops Spillway

The structure will be demolished and all material will be buried in the power canal. Water will then flow through the site and into the original river channel.

Horse Chops West Dam

The structure will be leveled to blend with surrounding terrain and the site will be selectively planted.

Mount Carmel Pond Dam and Outlet Structure

The concrete outlet structure will be demolished and all debris will be buried on site. The outlet opening will be widened to permit unimpeded flow from Mount Carmel Pond to Hayden's Pond and then into the Horse Chops River. The earthfill section will be leveled to blend with the surrounding terrain and will be selectively planted.

Mount Carmel Pond Spillway

The structure will be demolished and all debris will be buried at an approved location near the site. The site will be backfilled and selectively planted.

Fly Pond Diversion Dam and Fly Pond Spillway

The structure will be leveled to blend with surrounding terrain. An opening will be excavated to permit water to flow through the dam site and into various ponds to Cape Broyle River. The site will be selectively planted.

Fly Pond Canal and Bridge

The canal will remain but the bridge will be demolished and all debris will be buried on site. The site will be graded and selectively planted.

Two Arm Pond Diversion Dam

The structure will be leveled to blend with surrounding terrain. An opening will be excavated to permit water to flow through the dam site and into various ponds to Spout River. The site will be selectively planted.

Fourth Blarkwoods Pond Canal, Stoplog Structure and Bridge

The canal will remain but the bridge and stoplog structure will be demolished and all debris will be buried on site. The sites will be graded and selectively planted.

Fourth Blackwoods Pond Diversion Dam/Spillway

The structure will be leveled to blend with surrounding terrain. The steel membrane will be removed and buried on site. An opening will be excavated to permit water to flow through the dam site and into various ponds to Spout River. The site will be selectively planted.

Fourth Blackwoods Pond Freeboard Dams No. 1 and 2

The structures will be leveled to blend with surrounding terrain. The sites will be selectively planted.

East Blackwoods Pond Spillway

The structure will be leveled to blend with surrounding terrain. The steel membrane will be removed and buried on site. An opening will be excavated to permit water to flow through the spillway site. The site will be selectively planted.

East Blackwoods Pond Freeboard Dams No. 1 to 2

All nine structures will be leveled to blend with surrounding terrain. Openings will be excavated where required to permit water to flow through the dam sites. The sites will be selectively planted.

Northwest Blackwoods Pond Diversion Dam and Freeboard Dam and Pond K Diversion Dam

The three structures will be leveled to blend with surrounding terrain. Openings will be excavated where required to permit water to flow through the dam sites and eventually into Northwest Brook. The sites will be selectively planted.

Northwest Blackwoods Pond Spillway

The structure will be demolished and all debris will be buried at an approved location near the site.

Jordan River Diversion Dam and Freeboard Dams No. 1 and 2

The three structures will be leveled to blend with surrounding terrain. Openings will be excavated where required to permit water to flow through the dam sites and eventually into Northwest Brook. The sites will be landscaped.

Wet Ragged Hills Spillway Dam

The structure will be demolished and all timber will be disposed of at an approved location near the site. An opening will be excavated to permit water to flow through the dam site and eventually into Crossing Place River. The site will be selectively planted.

Rock Pond Dam

The structure will be leveled to blend with the surrounding terrain. An opening will be excavated to permit water to flow through the dam site and eventually into Crossing Place River. The site will be selectively planted.

Substation (Horse Chops)

The substation will be dismantled and all equipment will be either salvaged for use at other sites or disposed of at an approved waste disposal site. The site will be backfilled and selectively planted.

Transmission (Horse Chops)

All lines associated with the plant will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped.

Substation (Cape Broyle)

Equipment used to step up the generated voltage to 66kV for transmission and to step down voltage for the station service lines will be removed and salvaged for future use at another site. Other equipment associated with the main grid will remain in service.

Transmission (Cape Broyle)

The 6.9 kV line from the plant and the station service lines will be dismantled. Conductor will be sold for scrap and poles will be either salvaged or scrapped. The other lines will remain in service.

Other

The woodframe storage sheds will be dismantled and removed from the sites. The access road will not be accessible beyond Mount Carmel Pond because the removal of the dam will create an open river channel. The remainder of the access road will remain for public use.

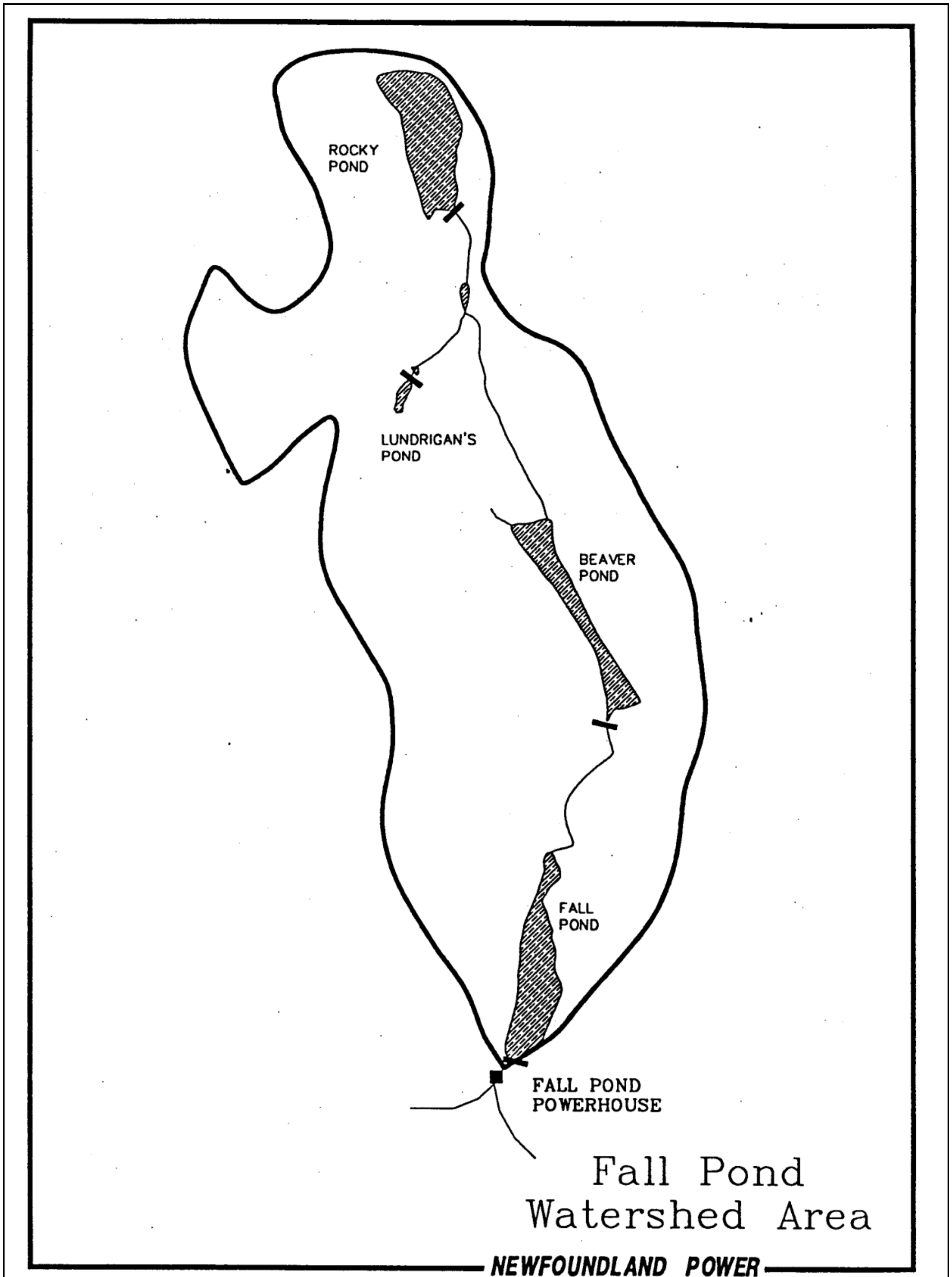
ESTIMATED COST OF RETIRING CAPE BROYLE/HORSE CHOPS HYDRO DEVELOPMENT							
DESCRIPTION "CAPE BROYLE"	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE COST $**	**TOTAL VALUE $**
Powerhouse							
-Superstructure	Masonry	M 3	75.00	156	11,700.00	0.00	11,700.00
-Substructure	Concrete	M 3	100.00	50	5,000.00	0.00	5,000.00
-Powerhouse crane	30 ton	L.S.	1000.00	1	1,000.00	4,000.00	(3,000.00)
Turbine/Generator	Vertical francis	L.S.	25,000.00	1	25,000.00	5,990.00	19,010.00
Tailrace							
-installed concrete	concrete	M 3	650.00	4	2,275.00	0.00	2,275.00
Penstock	woodstave	M 2	7.00	3,236	22,652.00	0.00	22,652.00
-backfill	misc.	M 3	3.00		1,500.00	0.00	1,500.00
Surge Tank	Steel	L S.	30,000.00	1	30,000.00	0.00	30,000.00
-foundations	concrete	M 3	75.00	80	6,000.00	0.00	6,000.00
Intake	Concrete	M 3	100.00	35	3,500.00	0.00	3,500.00
- backfill	Misc	M 3	3.00	175	525.00	0.00	525.00
-installed concrete	concrete	M 3	650.00	3	1,950.00	0.00	1,950.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Cape Broyle Spillway	Timber	M 3	40.00	70	2,800.00	0.00	2,800.00
-installed concrete	concrete	M 3	650.00	9	5,850.00	0.00	5,850.00
"HORSE CHOPS"							
Powerhouse							
-superstructure	steel	M 3	15.20	1,570	23,864.00	0.00	23,864.00
-substructure	concret	M 2	100.00	112	11,200.00	0.00	11,200.00
-siding	asbestos	M 2	23.00	515	11,845.00	0.00	11,845.00
-powerhouse crane	36 ton	L.S.	1000.00	1	1,000.00	4,000.00	(3,000.00)
Turbine/Generator	Vertical Francis	L.S.	25,000.00	1	25,000.00	7,500.00	17,500.00
Tailrace							
- culverts	steel	M 3	12.50	180	2,250.00	0.00	2,250.00
- backfill	misc.	M 3	3.00	1,008	3,024.00	0.00	3,024.00
Penstock	woodstave	M 2	7.00	8,018	56,126.00	0.00	56,126.00
Surge Tank	steel	L. S.	30,000.00	1	30,000.00	0.00	30,000.00
-foundations	concrete	M 3	75.00	80	6,000.00	0.00	6,000.00
Intake	concrete	M 3	100.00	35	3,500.00		3,500.00
-gate equipment		L.S	1000.00	1	1,000.00	2,000.00	(1,000.00)
Embankment	earthfill	M 3	3.00	700	2,100.00	0.00	2,100.00
Horse Chops Power Canal	earthfill	M 3	3.00	13,000	39,000.00	0.00	39,000.00
Horse Chops East dam	earthfill	M 3	3.00	1,215	3,645.00	0.00	3,645.00
Horse Chops spillway	concrete	M 3	125.00	40	5,000.00	0.00	5,000.00
Horse Chops West Dam	earthfill	M 3	3.00	8,164	24,492.00	0.00	24,492.00
Mount Carmel Pond Dam	earthfill	M 3	3.00	11,265	33,795.00	0.00	33,795.00

ESTIMATED COST OF RETIRING CAPE BROYLE/HORSE CHOPS HYDRO DEVELOPMENT							
DESCRIPTION "CAPE BROYLE"	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE COST $**	**TOTAL VALUE $**
-outlet	concrete	M 3	100.00	130	13,000.00	0.00	13,000.00
-spillway	conc.	M 3	75.00	246	18,450.00	0.00	18,450.00
-backfill	misc.	M 3	3.00	1,100	3,300.00	0.00	3,300.00
-gate equipment		L.S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Fly Pond Diversion Dam & Emergency							
Plug Spillway	earthfill	M 3	3.00	1,380	4,140.00	0.00	4,140.00
Fly Pond Canal Bridge	steel & timber	L.S.	3900.00	1	3,900.00	0.00	3,900.00
Two Arm Pond Diversion Dam	earthfill	M 3	3.00	1,300	3,900.00	0.00	3,900.00
Fourth Blackwoods Pond Canal Bridge and							
Stoplog Structure	concrete	M 3	125.00	10	1,250.00	0.00	1,250.00
Fourth Blackwoods ond Diversion							
Dam/Spillway	earthfill	M 3	5.00	358	1,790.00	0.00	1,790.00
Fourth Blackwood Pond Freeboard Dams (1&2)	earthfill	M 3	3.00	300	900.00	0.00	900.00
East Blackwoods Pond Spillway	earthfill	M 3	5.00	306	1,530.00	0.00	1,530.00
East Blackwoods							
East Blackwoods Pond Freeboard Dams (1-9)	earthfill	M 3	3.00	1,960	5,880.00	0.00	5,880.00
Northwest Blackwoods Pond							
-diversion dam	earthfill	M 3	3.00	2,126	6,378.00	0.00	6,378.00
-freeboard dam	earthfill	M 3	3.00	150	450.00	0.00	450.00
Pond K Diversion Dam	earthfill	M 3	3.00	840	2520.00	0.00	2,520.00
Jordan River							
-diversion dam	earthfill	M 3	3.00	495	1,485.00	0.00	1,485.00
-freeboard dam (1&2)	earthfill	M 3	3.00	650	1,950.00	0.00	1,950.00
West Ragged Hills Spillway Dam	Timber crib	M 3	20.00	301	6,020.00	0.00	6,020.00
Rock Pond Dam	earthfill	M 3	3.00	107	321.00	0.00	321.00
Revegetation							
-selected planting		Ha	1,000.00	6	6,000.00	0.00	6,000.00
-hydroseeding		M 2	2.00	1,400	2,800.00	0.00	2,800.00
"OTHER"							
storage sheds	woodframe	L S.	2000.00	1	2,000.00	0.00	2,000.00
concrete		M 3	100.00	11	1,100.00	0.00	1,100.00
Substation (Horsechops)		L.S	6200.00	1	6,200.00	13,400.00	(7,200.00)
Transmission (Horsechops)							
-Forebay Line	single pole	KM	3,000.00	1	3,000.00	0.00	3,000
-Transmission Line H-frame		KM.	13,000.00	6	78,000.00	0.00	78,000.00
Substation (Cape Broyle)		L.S.	11,200.00	1	11,200.00	15,801.00	(4,601.00)
Mobilization/ Demobilization		L.S.			40,000.00	0.00	40,000.00
SUBTOTALS					**632,057.00**	**56,691.00**	**575,366.00**

ESTIMATED COST OF RETIRING CAPE BROYLE/HORSE CHOPS HYDRO DEVELOPMENT							
DESCRIPTION "CAPE BROYLE"	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE COST $**	**TOTAL VALUE $**
CONTINGENCIES (10%)					63,205.70		63,205.70
ENVIRONMENTAL (8%)					50,564.56		50,564.56
ENGINEERING & SUPERVISION (5%)					31 602.85		31,602-85
SITE REMEDIATION (8%)					50,564.56		50,564.56
TOTALS					**827,994.67**	**56,691.00**	**771,303.67**

3.16

FALL POND


ROCKY POND
LUNDRIGAN'S POND
BEAVER POND
FALL POND
FALL POND POWERHOUSE
Fall Pond Watershed Area
NEWFOUNDLAND POWER

FALL POND HYDROELECTRIC DEVELOPMENT

General

Fall Pond Development is located on the southern part of the Burin Peninsula near the community of Little St. Lawrence. It was commissioned in 1939 and has a capacity of 400 kW under a net head of about 15.2 m. The development consists of one generating unit in a concrete powerhouse supplied by a woodstave penstock. A reinforced concrete buttress dam incorporating a spillway, intake and outlet conduit is located at the Forebay. Storage reservoirs at Beaver Pond, Lundrigan's Pond, and Rocky Pond are not presently in use.

Powerhouse

The powerhouse is 8.4 m x 10.3 m x 3.7 m high and consists of a concrete substructure, concrete walls and wood truss roof.

Turbine-Generator

There is one 380 kW horizontal Francis turbine manufactured by Voith and installed in 1939. The generator was manufactured by Westinghouse.

Penstock

The penstock is a 13 meter long 1219 mm diameter woodstave pipe which is supported above ground by concrete cradles.

Forebay Dam, Spillway, Intake and Unwatering Conduit

The dam is about 129 m long with a maximum height of about 11 m. The structure consists of an upstream concrete slab supported by concrete buttresses and enclosed by a downstream concrete wall. The overflow spillway section of the dam is 33 m long and is incorporated in the center section of the dam. The intake structure for the plant including trashracks, screw stem and gate is located near the north end of the dam. The woodstave unwatering conduit including the circular metal gate and screw stem lift topped with a wooden gatehouse is located near the south end of the dam.

Beaver Pond Dam and Outlet

The structure was of rockfill untreated timber crib construction about 113 m long with a maximum height of about 5 m. The structure is presently abandoned with much of the exposed timber removed, rockfill leveled and the opening widened.

Beaver Pond Spillway

The timber crib spillway was about 22 m long and 1.5 m high. The entire structure was washed away more than 25 years ago and no remnants remain. The structure is presently abandoned.

Lundrigan's Pond Dam, Spillway and Outlet

The structure was of rockfill untreated timber crib construction about 117 m long with a maximum height of about 4 m. The structure is presently abandoned with much of the exposed timber removed, rockfill leveled and openings widened.

Rocky Pond Dam. Spillway and Outlet

The structure was of rockfill untreated timber crib construction about 234 m long with a maximum height of about 3 m. The structure has been abandoned for many years with much of the exposed timber removed, rockfill leveled and the opening widened.

Substation

The substation consists of a transformer and associated equipment that steps up generation voltage from 2400 V to 12.5 kV and is tied to a distribution feeder from Laurentian Substation.

Transmission Line

The substation is tied into a distribution feeder out of Laurentian Substation so there is no separate transmission line for this development.

DECOMMISSIONING SCENARIO FOR FALL POND

General

The Forebay Dam, penstock and powerhouse will be demolished. A new low dam will be constructed to maintain the town water supply. The Beaver Pond, Lundrigan's Pond, and Rocky Pond structures will be leveled and openings excavated as required. The only significant environmental impact with the decommissioning of this development is the required alterations to accommodate the town water supply.

Material to be sold for scrap from this development will be transported 40 km for sale. Material required to be disposed at an approved waste disposal site will be hauled 4 km. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse

The building is located in the original river channel so it will be demolished and material will be disposed of at an approved waste disposal site. The foundation will be demolished to ground level and all remaining openings will be filled and sealed with concrete.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Penstock

The penstock and concrete cradles will be demolished and material will be disposed of at an approved waste disposal site. Contaminated soil under the penstock will be excavated and disposed at an approved soils treatment facility.

Forebay Dam, Spillway, Intake and Unwatering Conduit

The dam will be demolished and all waste material will be disposed of at an approved waste disposal site. Minor items such as control equipment and gate lifts will be salvaged for use at other plants. The site will be graded and hydroseeded. In place of the existing dam a small dam will be constructed to create a water supply reservoir for the community of Little St. Lawrence. This dam will then be turned over to the town.

Beaver Pond Dam and Outlet

The structures are presently demolished but a small amount of additional work will be required to widen openings and to ensure public safety.

Beaver Pond Spillway

The structure has washed away and no additional work is required.

Lundrigan's Pond Dam, Spillway, and Outlet

The structures are presently demolished but a small amount of additional work will be required to widen openings and to ensure public safety.

Rocky Pond Dam, Spillway, and Outlet

The structures are presently demolished but a small amount of additional work will be required to widen openings and to ensure public safety.

Substation

The substation will be removed from service and replaced with a set of switches. All material and equipment retired will be salvaged or scrapped.

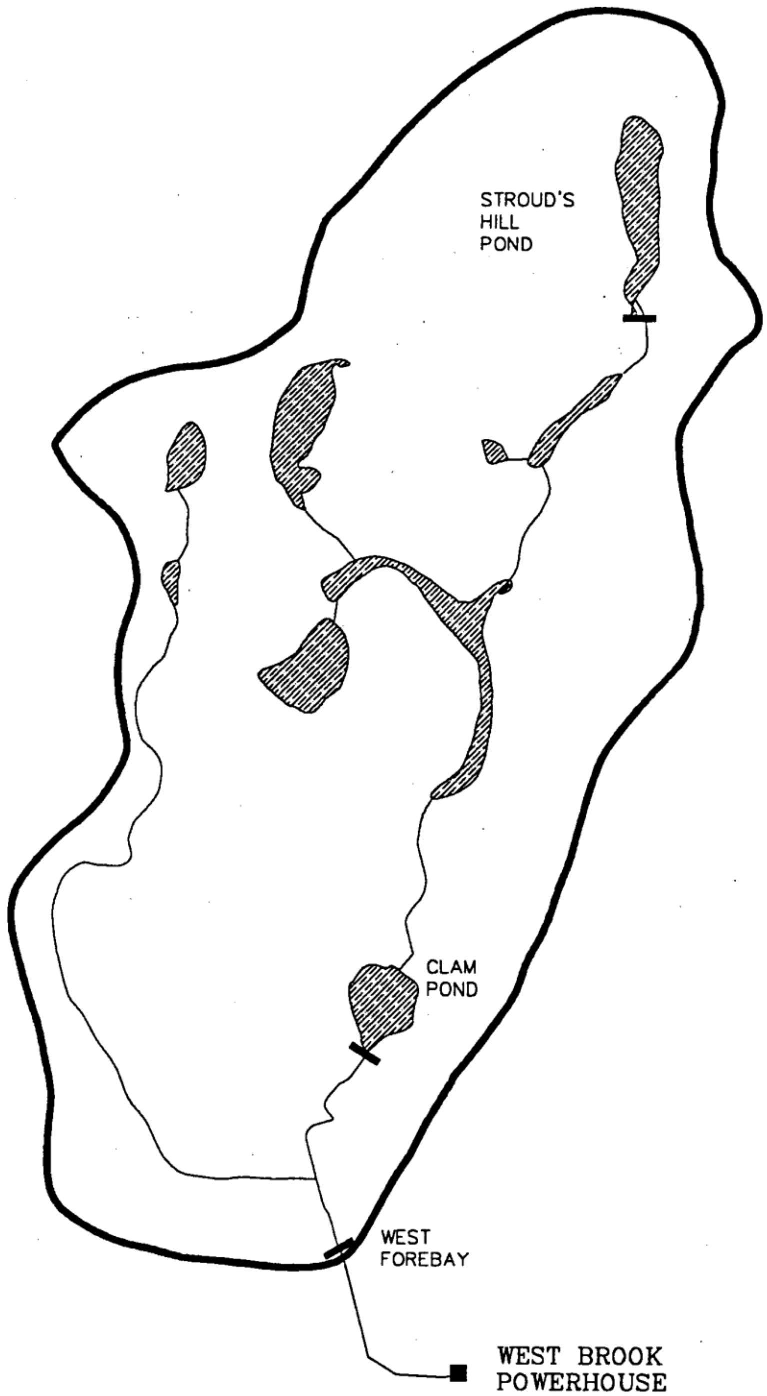
Transmission Line

There will not be any transmission line taken out of service.

ESTIMATED COST OF RETIRING FALL POND PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse							
-Superstructure	Concrete	M 3	100.00	52	5,200.00	0.00	5,200.00
-Substructure	Concrete	M 3	100.00	26	2,600.00	0.00	2,600.00
Turbine/Generator	Horiz. Francis	L.S.	15,000.00	1	15,000.00	400.001	14,600.00
Penstock	Woodstave	M 2	7.00	50	350.00	0.00	350.00
Forebay Structures	Concrete	M	100.00	1,450	145,000.00	0.00	145,000.00
-Replacement Dam	Concrete	L.S.	75,000.00	1	75,000.00	0.00	75,000.00
Beaver Pond Dam	Timber Crib	L.S.	5000.00	1	5,000.00	0.00	5,000.00
Lundrigan's Pond	Timber Crib	L.S.	5000.00	1	5,000.00	0.00	5,000.00
Rocky Pond Structure	Rockfill	L.S.	5000.00	1	5,000.00	0.00	5,000.00
Revegetation							
-Selected Planting		Ha.	1,000.00	1	1,000.00	0.00	1,000.00
Mobilization/Demonilization		L.S.	10,000.00	1	10,000.00	0.00	.10,000.00
Substation		L.S.	5000.00	1	5,000.00	8,600.00	(3,600.00)
SUBTOTALS					**274,150.00**	**9,000.00**	**265,150.00**
CONTINGENCIES (10%)					27,415.00		27,415.00
ENVIRONMENTAL (5%)					13,707.50		13,257.50
ENGINEERING & SUPERVISION (5%)					13,707.50		13,707.50
SITE REMEDIATION (10%)					27,415.00		27,415.00
TOTALS					**356,395.00**	**9,000.00**	**347,395.00**

3.17

WEST BROOK



West Brook
Watershed Area

NEWFOUNDLAND POWER

WEST BROOK HYDROELECTRIC DEVELOPMENT

General

West Brook Development is located on the southern part of the Burin Peninsula near the community of St. Lawrence. It was constructed in 1942 and has a capacity of 700 kw under a net head of about 47.0 m. The development consists of one generating unit in a concrete powerhouse supplied by a buried fibreglass penstock, concrete intake, and earth embankment power canal. A concrete storage dam and spillway is located at the Forebay. Storage reservoirs at Clam Pond and Stroud's Hill Pond are not presently in use.

Powerhouse

The powerhouse is 8.4 m x 6.9 m x 4.6 m high and consists of a concrete substructure, concrete walls and a wood truss roof.

Turbine-Generator

There is one 750 kw Francis turbine manufactured by Leffel and commissioned in 1942. The generator was manufactured by Westinghouse.

Tailrace

The tailrace was excavated from the powerhouse to a natural river channel a distance of approximately 110 m.

Penstock

The penstock is a 536 m long 1372 mm diameter fibreglass reinforced plastic (FRP) pipeline which is completely buried with earthfill. This penstock was installed in 1987 to replace the original 1219 mm diameter woodstave penstock.

Intake

The intake is reinforced concrete topped with a wooden gatehouse. The intake is equipped with upstream trashrack, stoplog slots, and miscellaneous control equipment. The bottom of the intake gate is approximately 2500 mm below full supply level.

Canal

The canal is 1250 m in length and on average 4.9 m wide and 4.6 m deep. The canal is a sidehill earth structure generally consisting of original ground on the west side and an earthfill dyke on the east side. The water supply intake for the Town of St. Lawrence is located in the canal approximately 30 m upstream of the penstock intake.

Canal Spillway

A reinforced concrete spillway about 4.9 m wide and 5.5 m high is located on the east side of the canal adjacent to the intake.

Forebay Dam, Spillway and Canal Inlet

The structure is of reinforced concrete gravity construction about 6.1 m high at the highest section. It consists of four parts which are a 79 m long main spillway section, a 21 m long arched dam section, a 5 meter long spillway section, and a canal inlet structure.

Clam Pond Dam, Spillway and Outlet

The structure was of rockfill untreated local timber crib construction about 110 m long with a maximum height of about 4 m. The structure is presently abandoned, exposed timber has been removed, rockfill has been leveled and openings have been widened.

Stroud's Hill Pond Freeboard Dam, Main Dam, Spillway and Outlet

The structures were constructed of rockfill untreated local timber cribbing. The freeboard dam was 425 m long, the spillway section was 155 mm long, and the main dam was 85 m long. The structures were generally low with a maximum height at the outlet of about 4 meters. All structures are presently abandoned with exposed timber removed, rockfill leveled and the outlet widened.

Substation

The substation steps up the generated voltage from 2400 V to 12.5 kV The 12.5 kV bus is tied to the 12.5 kV distribution feeder from Laurentian Substation.

Transmission Line

The transmission line is essentially a tap off the 12.5 kV distribution feeder from Laurentian Substation.

DECOMMISSIONING SCENARIO FOR WEST BROOK

General

The Forebay Dam and Spillway will be retained to provide a water supply source for the Town of St. Lawrence. The water supply intake remains in place and the canal will be regraded. The powerhouse will be sold. The penstock, intake, and canal spillway will be demolished. The tailrace channel will be backfilled. Clam Pond and Stroud's Hill Pond structures will be leveled and openings excavated as required.

The only significant environmental impact with the decommissioning of this development is the required alterations to the town water supply.

Materials to be sold as scrap for this development would have to be transported 44 km to market however materials for waste disposal need only be transported 1 km. Contaminated material will be transported and disposed at an approved treatment facility.

Powerhouse

The building will be sold after equipment is removed.

Tailrace

The man made section of the tailrace will be backfilled with adjacent material and selectively planted.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Penstock

The penstock will be excavated and sections sold for uses such as wells or road culverts. The area will be graded and hydroseeded.

Intake

The intake will be demolished to ground elevation and the foundation will be backfilled and landscaped. Some minor items will be salvaged for use at other sites. The site will be graded and hydroseeded.

Canal

The canal will be regraded and cleaned out. An earthfill dam will be constructed just downstream of the town water supply intake. The canal will be used only for town water supply and will be turned over to the Town of St. Lawrence.

Canal Spillway

The spillway will be demolished to ground level and the concrete will be buried in the canal. The site will be graded and hydroseeded.

Forebay Dam, Spillway and Canal Inlet

The dam and spillway will remain to provide a pond for the town water supply. It is expected that there will be considerable concrete repairs carried out, similar to those carried out in 1990 before the dam is turned over to the Town of St. Lawrence.

Clam Pond Dam, Spillway and Outlet

The structures are presently demolished and no additional work is required.

Stroud's Hill Pond Freeboard Dam. Main Dam. Spillway and Outlet

The structures are presently demolished but a small amount of additional work will be required to widen openings and to ensure public safety.

Substation

The substation will be completely removed from service and replaced with a set of switches.

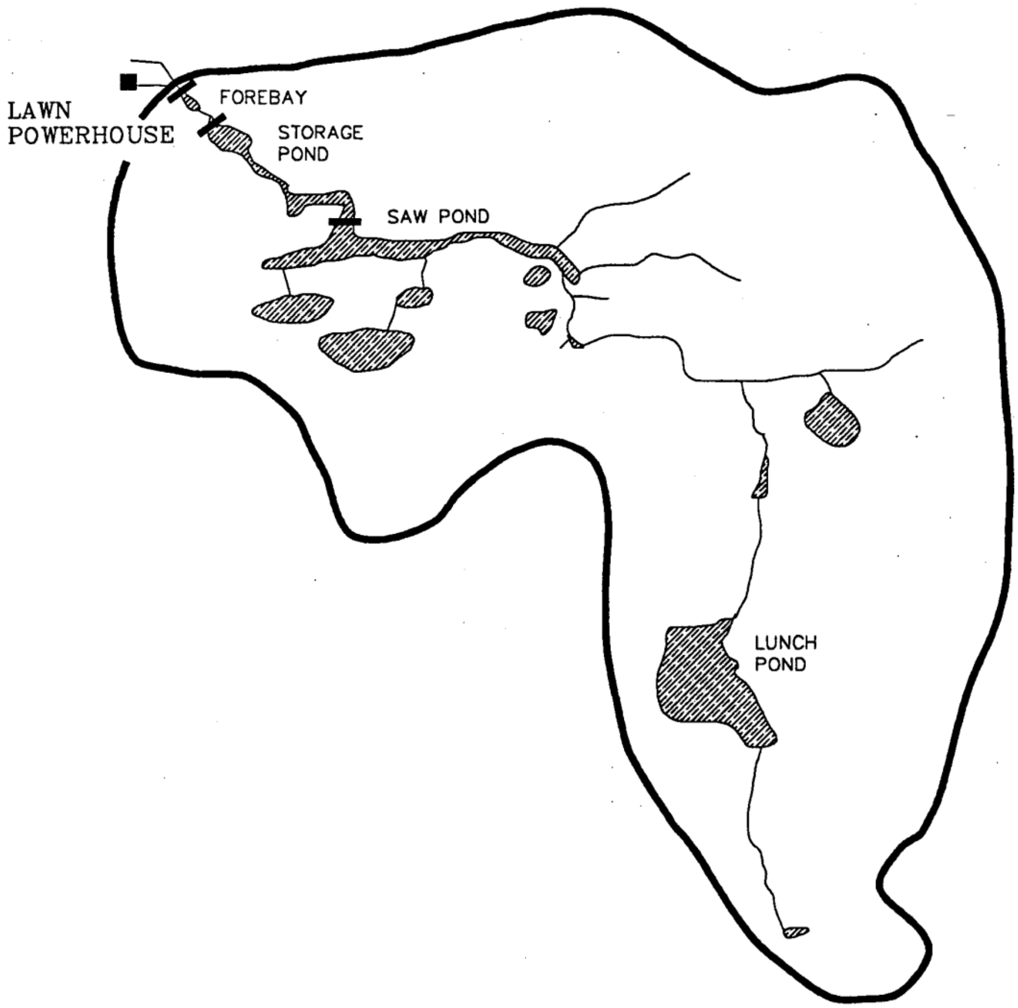
Transmission Line

The distribution line will be left in place to service the powerhouse building.

ESTIMATED COST OF RETIRING WEST BROOK PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST ($)**	**SALVAGE VALUE ($)**	**TOTAL COST ($)**
Powerhouse	Concrete				0.00	5,000.00	(5,000.00)
Turbine/Generator	Horiz-Francis	L.S.	15,000.00	1	15,000.00	775.00	14,225.00
Tailrace	Earth Excavation	M 3	3.00	321	963.00	0.00	963.00
Penstock	Fiberglass	M 2	11.75	2,311	27,154.25	0.00	27,154.25
Intake & Canal Spillway	Concrete	M 3	100.00	15	1,500.00	0.00	1,500.00
Replacement Dam	Earthfill	M 3	10.00	675	6,750.00	0.00	6,750.00
Power Canal Rehab		L.S.	15000.00	1	15,000.00	0.00	15,000.00
Repairs to Forebay Dam	Concrete	M 3	650.00	150	97,500.00	0.00	97,500.00
Strouds Hill							
Strouds Hill Pond Structure	Timber crib	M 3	20.00	200	4,000.00	0.00	4,000.00
Selected Planting	Revegetation	Ha.	1,000.00	1	1,000.00	0.00	
Substation		L.S.	4000.00	1	4,000.00	2,520.00	1,480.00
Mobilization/ Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**182,867.25**	**8,295.00**	**174,572.25**
CONTINGENCIES (10%)					18,286.73		18,286.73
ENVIRONMENTAL (5%)					9,143.36		9,143.36
ENGINEERING & SUPERVISION (5%)					9,143.36		9,143.36
SITE REMEDIATION (10%)					18,286.73		18,286.73
TOTALS					**237,717.43**	**8,295.00**	**229,432.43**

3.18

LAWN



Lawn
Watershed Area

NEWFOUNDLAND POWER

LAWN HYDROELECTRIC DEVELOPMENT

General

Lawn Development is located on the southern part of the Burin Peninsula near the community of Lawn. The development was commissioned in 1930 and since refurbishing in 1983 it has a capacity of 170 m under a net head of about 24.3 m. The development consists of one generating unit in a concrete powerhouse fed by a woodstave penstock. A concrete encased rockfill dam incorporating the intake and outlet structures and a separate concrete overflow spillway structure is located at the Forebay. Storage reservoirs at Storage Pond and Sawpit Pond are not presently in use.

Powerhouse

The powerhouse is 18.9 m x 5.0 m x 4.3 m high and consists of a concrete substructure, concrete walls and wood truss roof.

Turbine-Generator

There is one 670 kW horizontal Francis turbine manufactured by Barber and installed in 1983. The generator was manufactured by Ideal Electric. The new unit replaced the original two 190 m Voith turbines.

Penstock

The penstock is a 286 m long 1067 mm diameter woodstave pipeline which is supported by timber cradles. The penstock was installed in 1981 to replace the original woodstave penstock.

Forebay Dam, Intake, and Dewatering Outlet

The dam is constructed of concrete encased rockfill. The structure is approximately 45 m long with a maximum height of about 9 m. The intake structure is incorporated into the dam and is equipped with upstream trash racks, a screw stem lift and timber gate, control equipment and a wooden gatehouse. In 1995, Rockfill was added to the upstream and downstream of the dam to improve dam stability. At this time the sluice gate was also closed off.

Forebay Spillway

The spillway was rebuilt in 1995 and is a concrete gravity overflow weir about 52 m long and about 1.5 m high located in a rock cut adjacent to the main dam. The downstream spillway channel was also modified to handle higher flows and now splits into two routes.

Storage Pond Dam, Spillway and Outlet

The structure was of rockfill untreated local timber crib construction about 150 m long with a maximum height of about 4.5 m. The structure is presently abandoned, exposed timber has been removed, rockfill has been leveled to a stable slope and the opening has been widened.

Sawpit Pond Dam

The structure was of rockfill timber crib construction that was abandoned and completely removed several years ago.

Substation

The substation steps up the generated voltage from 600 V to 25 kV for local distribution feeders.

Transmission Line

There is no separate transmission line for the substation as it is tied in with the distribution feeder from St. Lawrence.

DECOMMISSIONING SCENARIO FOR LAWN

General

The forebay dam, spillway and penstock will be demolished. A new low dam will be constructed to maintain the town water supply. The powerhouse will be sold. The Storage Pond and Sawpit Pond structures will not require additional work.

There should be no significant environmental impact with the decommissioning of this development as the town water supply no longer is associated with the forebay reservoir.

Materials from this development will have to be transported 50 km for sale. Materials to be disposed will be transported 3 km to the approved waste disposal site. Contaminated material wil be transported and disposed at an approved treatment facility.

Powerhouse

The building will be sold after equipment is removed.

Turbine-Generator

Equipment in the plant including switchgear will be dismantled and sold for scrap.

Penstock

The woodstave penstock will be demolished and buried at an approved waste disposal site. The penstock route will be graded and hydroseeded. Contaminated soil under the penstock will be excavated and disposed at the nearest soil treatment facility.

Forebay Dam, Intake, and Dewatering Outlet

The dam will be demolished and all waste material will be disposed of at an approved waste disposal site. Minor items such as control equipment and gate lift will be salvaged for use at other plants. Silt deposited upstream of the existing dam will be excavated and hauled to an approved site. The site will be graded and hydroseeded.

Forebay Spillway

All concrete will be demolished and disposed of at an approved waste disposal site.

Storage Pond Dam, Spillway and Outlet

The structures are presently demolished and no additional work is required.

Sawpit Pond Dam

The structures are presently demolished and no additional work is required.

Substation

The substation will be removed from service and replaced with a set of switches.

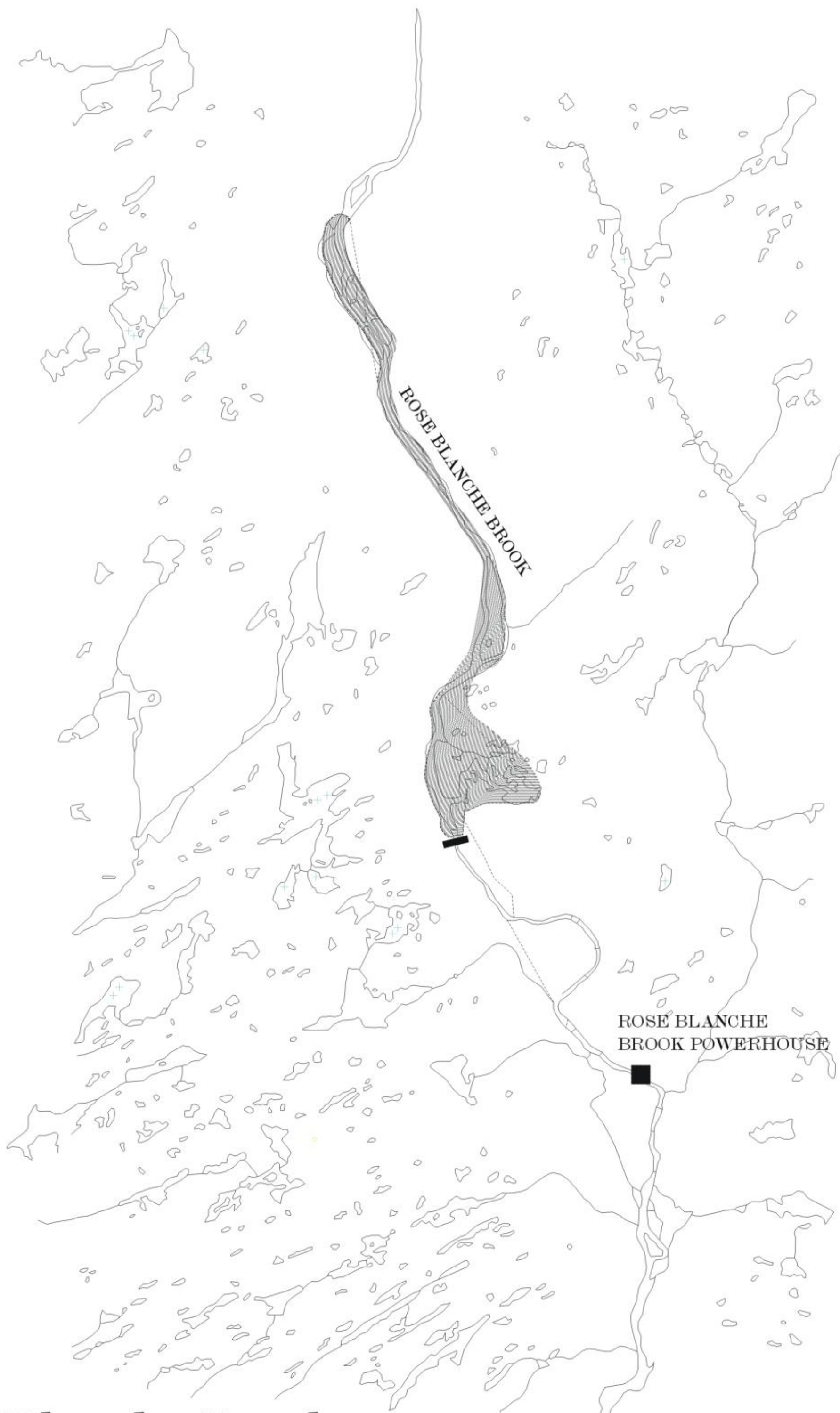
Transmission Line

There will be no decommissioning necessary for transmission lines associated with the plant.

ESTIMATED COST OF RETIRING LAWN PLANT							
DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse	Concrete				0.00	8,000.00	(8,000.00)
Turbine/ Generator	Horiz.Francis	L.S.	15,000.00	1	15,000.00	740.00	14,260.00
Penstock	Woodstave	M^2	7.00	960	6,720.00	0.00	6,720.00
Forebay Dam	(Conc. encased)	L.S	47000.00	1	47,000.00	0.00	47,000.00
	Rockfill	M^3	5.00	1,200	6,000.00	0.00	6,000.00
	Gatelift	L S.	1000.00	1	1,000.00	2,000.00	(1,000.00)
Replacement Dam	Concrete	L.S.	50000.00	1	50,000.00	0.00	50,000.00
Forebay Spillway	Concrete	M^3	75.00	15	1,125.00	0.00	1,125.00
Revegetation							
-Hydroseeding		H 2	2.00	900	1,800.00	0.00	1,800.00
Substation		L.S.	5500.00	1	5,500.00	16,000.00	(10,500.00)
Mobilization/ Demobilization		L.S.	10000.00	1	10,000.00	0.00	10,000.00
SUBTOTALS					**144,145.00**	**26,740.00**	117,405.00
CONTINGENCIES (10%)					14,414.50		14,414.50
ENVIRONMENTAL (5%)					7,207.25		7,207.25
ENGINEERING & SUPERVISION (5%)					7,207.25		7,207.25
SITE REMEDIATION (10%)					14,414.50		14,414.50
TOTALS					**187,388.50**	**26,740.00**	**160,648.50**

3.19

ROSE BLANCHE



Rose Blanche Brook Watershed Area

NEWFOUNDLAND POWER

ROSE BLANCHE HYDROELECTRIC DEVELOPMENT

General

Rose Blanche Development is located on the Southwest Coast of the island near the community of Rose Blanche. The plant was commissioned in 1988 and has an installed capacity of 6.0 mw under a net head of 115 m. The development consists of two horizontal francis turbines with a single generator, contained in a reinforced concrete and steel powerhouse. Water is supplied to the powerhouse through a steel penstock with storage provided by a rockfilled dam with a reinforced concrete face. The spillway is located in a side channel excavated through rock approximated 500 m east of the Forebay Dam.

Powerhouse

The powerhouse is 12.2 m x 20.7 m x 6.0 m high and consists of a reinforced concrete substructure, and structural steel superstructure. A 30 tonne overhead crane is located in the powerhouse.

Turbine-Generator

The turbines consist of Sulzer Hydro Dual Horizontal Francis units rated at 3 Mw each,with a General Electric Air Cooled single generator, located between the turbines. The generator is rated at 7.625 Mva with an output voltage of 6 Kv at 900 rpm.

Penstock

The penstock is a 1300 m long, 1676 mm diameter spiral wound steel pipe supported on reinforced concrete supports and anchor blocks. A bifurcation, located at the entrance to the powerhouse, splits the flow into the two turbines.

Tailrace

The tailrace consists of a reinforced concrete pool and weir downstream of the powerhouse, and a 200 m excavated channel lined with riprap that exits into the main river.

Forebay Dam, Spillway and Intake

The dam is located in a narrow gorge with a maximum height of approximately 30 m and a crest length of 50 m. The intake, located through the left abutment, consists of a reinforced concrete box culvert, steel gate with mechanical lift and a woodframe gatehouse.

North Dyke

The North Dyke is situated at the entrance to the Habitat Compensation Channel and acts to regulate flows into the channel. It consists of a zoned earthfill embankment approximated 4 m high with a crest length of 20 m.

South Dyke

The South Dyke is also located downstream of the plant and prevents water from overflowing into the Habitat Compensation Channel during high water levels. It consists of a zoned earthfill embankment approximated 3 m high will a crest length of 30 m.

Habitat Compensation Channel

The Habitat Compensation Channel is a natural channel approximately 1 km long with flow regulated through a culvert in the North Dyke. Spawning gravels have been placed at various locations along the channel to enhance fish habitat.

Fishways

Fishway #1 is an existing structure located on the Town of Rose Blanche water supply dam. The structure has been modified with the addition of pools and weirs on the downstream end. Fishway #2 is a rustic style fishway located 400 m upstream from the sea. It consists of a narrow channel excavated though rock around the existing falls and a vertical rise of 4.2 m. Fishway #3 is a reinforced concrete structure located 700m upstream from the sea. It consists of a vertical slot type consisting of 28 pools along a vertical rise of 8.5 m.

Substation

The generated voltage is stepped up from 6.9 kv to 25 kv for transmission and is stepped down for station service and the distribution line to the forebay.

Transmission

The transmission line is a single pole 25 kv feeder off the line from Long Lake to Rose Blanche. The line follows the access road to the plant, a distance of 5.5 km. A single pole distribution line provides power to the intake.

DECOMMISSIONING SCENARIO FOR ROSE BLANCHE

General

The development will have most structure removed during decommissioning. No adverse environmental problems are anticipated. The access road, North and South Dykes, Habitat Compensation Channel and fishways will remain.

The closest waste disposal site is located near the Community of Rose Blanche, approximately 6 km from the site. A scrap metal dealer is located in Port Aux Basques, approximately 42 km from the site. No contaminated material is anticipated at this site.

Powerhouse

The building will be dismantled and structural steel salvaged and sold for reuse at another location. The concrete substructure will be demolished to ground level and waste material will be buried on site. The powerhouse crane will be salvaged and sold for reuse at another location.

Turbine – Generator

Equipment in the plant including switchgear will be dismantled and sold for reuse at another location.

Penstock

The steel penstock will be cut in pieces and sold for scrap or salvaged for reuse at another location. The concrete supports and anchor block will be demolished and concrete rubble will be buried on site. The penstock route will be graded and landscaped.

Tailrace

The tailrace concrete will be demolished and concrete rubble buried on site. The remaining channel will be backfilled, graded and landscaped.

Forebay Dam, Spillway, and Intake

The upstream concrete, and intake will be demolished and concrete rubble removed and buried in the nearby borrow pit. Water will then flow through the original river channel.

The spillway weir will remain to direct water through the original river channel.

North and South Dykes

These structures will remain to maintain flow into the Habitat Compensation Channel.

Habitat Compensation Channel

The Channel will remain to enhance fish habitat in Rose Blanche Brook.

Fishways

These structures will remain to enhance fish migration in Rose Blanche Brook. These structures will be turned over to the Dept. of Fisheries and Oceans.

Substation

The entire substation will be dismantled and equipment will be salvaged for re-use at another site. The site will be backfilled and landscaped.

Transmission Line

The 25 kv feeder line and forebay line will be dismantled. Conductor and poles will be either sold for scrap or salvaged for re-use at another location.

DESCRIPTION	**TYPE**	**UNIT**	**UNIT COST $**	**ESTIMATED QUANTITY**	**ESTIMATED COST $**	**SALVAGE VALUE $**	**TOTAL COST $**
Powerhouse							
-superstructure	steel	m^3	$15.20	1085	$16,492.00	$5,000.00	$11,492.00
-substructure	concrete	m^3	$100.00	1015	$101,500.00	$0.00	$101,500.00
-Powerhouse crane	30 ton	L.S.	$1,000.00	1	$1,000.00	$2,500.00	-$1,500.00
Turbine-Generator	Dual Horiz.Francis	L.S.	$100,000.00	1	$100,000.00	$500,000.00	-$400,000.00
Tailrace	-concrete -excavation	m^3 m^3	$100.00 $5.00	123 1200	$12,300.00 $6,000.00	$0.00 $0.00	$12,300.00 $6,000.00
Penstock							
-above ground	steel	m^2	$11.75	6765	$79,488.75	$0.00	$79,488.75
-anchor blocks	concrete	m^3	$100.00	1200	$120,000.00	$0.00	$120,000.00
Forebay Dam	-concrete -rockfill	m^3 m^3	$100.00 $5.00	1010 26600	$101,000.00 $133,000.00	$0.00 $0.00	$101,000.00 $133,000.00
spillway	concrete	m^3	$100.00	67	$6,700.00	$0.00	$6,700.00
Intake	concrete	m^3	$100.00	680	$68,000.00	$0.00	$68,000.00
Gate Equipment		L.S.	$1,000.00	1	$1,000.00	$2,000.00	-$1,000.00
Revegetation							
-selective planting		Ha.	$1,000.00	1	$1,000.00	$0.00	$1,000.00
-hydroseeding		m^2	$2.00	5000	$10,000.00	$0.00	$10,000.00
Mobilization/ Demobilization		L.S.	$10,000.00	1	$10,000.00	$0.00	$10,000.00
Substation		L.S.	$5,400.00	1	$5,400.00	$20,000.00	-$14,600.00
Transmission		L.S.	$10,000.00	5	$50,000.00	$10,000.00	$40,000.00
SUBTOTALS					**$822,880,75**	**$539,500.00**	**$283,380.75**
CONTINGENCIES (10%)					$82,288.08		$82,288.08
ENGINEERING & SUPERVISION (5%)					$41,144.04		$41,144.04
ENVIRONMENTAL ASSESSMENT (6%)					$49,372.85		$49,372.85
SITE REMEDIATION (10%)					$82,288.08		$82,288.08
TOTALS					**$1,077,973.78**	**$539,500.00**	**$538,473.78**

Thermal Plants Decommissioning Report

Thermal Plant Decommissioning Update

August 2010

NEWFOUNDLAND POWER
A FORTIS COMPANY

Executive Summary

The primary objective of this report is to:

1. Provide an update to the previous decommissioning report compiled in 2005, outlining any plants that have been retired or added to Newfoundland Power's thermal power assets during the period of 2005-2010.
2. Summarize estimated decommissioning costs associated with the thermal power plants currently in-service by Newfoundland Power in Canadian 2010 dollars.

The total estimated decommissioning costs in previous reports were determined by contacting contractors familiar with demolition work, and from estimates provided by for demolition associated with previous rehabilitation projects. In instances, where contractor estimates were not available, unit prices were derived using common estimating practices. To establish the cost estimates for the 2010 report the unit prices were adjusted to account for increased costs related to market conditions, environmental regulations, inflation etc.

A summary of the decommissioning costs associated with the thermal plants that Newfoundland Power currently has in-service is provided in the table below:

Thermal Plant	Decommissioning Cost
Port Union Diesel	**$50,900**
Port aux Basques Diesel Plant	**$146,200**
Greenhill Gas Turbine	**-$45,600**
Wesleyville Gas Turbine	**-$445,600**
Mobile Gas Turbine	**-$980,000**
Mobile Diesel #3	**-$880,000**

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1.0 Introduction

Newfoundland Power currently owns and operates 6 thermal units. The total installed net capacity is 49.4 MW. The thermal plants consist of three gas turbines and three diesel plants. The unit net capacities range from 0.5 MW to 22.0 MW. The facilities are located in Port Union, Port aux Basques, Wesleyville, and Grand Bank. Port Union Diesel is in the process of being retired. The 6 thermal units do not include the leased diesel of which Newfoundland Power has no ownership and will not be evaluated in this report.

Maintenance levels on the various plants have varied. Over the past fifteen to twenty years there has been minimal work and replacements completed on the diesels at Port Aux Basques and Port Union. The maintenance has tended to be only that required to obtain site operational capability. The intention of Newfoundland Power is to decommission these plants as they reach the end of their useful lives. However, it should be noted that the maintenance carried out on gas turbines in the past 15 years has been significant. The Gas Turbines will continue to receive capital improvements in order to extend their lives.

The decommissioning of the thermal plants is a fairly straightforward process as the facility is typically limited to a building, prime mover equipment contained in the building and an external fuel tank. The decommissioning scenario involves preparation of the site for work, removal of the physical equipment, demolition of the building and external auxiliaries and site remedial work. The areas will be reclaimed to the conditions required for the area which may include covering the site with topsoil and hydroseeding and the selective planting of native trees. All above ground facilities will be demolished and removed, and foundations removed to 500 mm below grade. Equipment and materials will be sold for scrap or disposed of in approved landfills.

The costs estimates associated with environmental cleanup are very speculative. The costs may vary significantly from site to site based on the results of environmental investigations that would take place prior to decommissioning a site.

2.0 Decommissioning Scenarios

When the decommissioning of a plant is executed it is assumed that the plants will be removed entirely and that the sites will be restored to an acceptable condition for the surrounding properties. All above ground structures will be removed and foundations demolished to below grade. All fuel storage tanks and fuel conveyance systems will be removed and disposed of in an environmentally acceptable manner. All waste will be removed to a landfill or waste disposal site suitable for the material being disposed.

The demolition procedure for the plants utilized to generate a cost associated with the retirement of a thermal plant is outlined in Section 2.2 of the October 2000 "Thermal Plants Decommissioning Update" report located in Appendix A of this report.

3.0 Decommissioning Descriptions and Estimates

The total projected decommissioning costs in the 2005 report were determined by contacting contractors familiar with demolition work. In instances, where contractor estimates were not available, unit prices were derived using common estimating practices. The unit prices associated with the demolition of a plant used in the 2005 report were reviewed, and appeared to be reasonable for that particular time frame. To establish the cost estimates for this report the unit prices utilized in the 2005 report were adjusted to account for increased costs related to market prices, environmental regulations, inflation etc. Additional cost associated with contingency, environmental, engineering and supervision were added to the demolition cost to give the total projected decommissioning price.

The adjusted unit prices utilized to determine the decommissioning costs for this report are as follows:

Item Description	Unit Price
Steel Building Demolition	$20.00/m^2
Equipment Demolition and Salvage	Variable
Asbestos Siding Removal	$36.50/m^2
Transmission (Single Pole)	$18,000/km
Transmission (Double Pole)	$20,000/km
Distribution (Single Pole)	$5,000/km
Common Fill (Supply & Place)	$20.00/m^3
Selective Planting	$1,500/Ha
Hydro Seeding	$3.00/m^2

3.1 Port Union Diesel Plant

The Port Union Diesel Plant is located in Port Union on the Bonavista Peninsula. The unit is contained in the Port Union Hydroelectric Development Powerhouse. The machine is comprised of a 500 kW diesel generator set, one fuel tank, controls and auxiliaries. The unit was commissioned in 1962. A detailed description of the plant and equipment is located in Section 3.2.1 of the October 2000 "Thermal Plants Decommissioning Update" report located in Appendix A of this report. This plant is no longer operational and plans are ongoing to retire this unit.

Port Union Diesel Plant Estimated Decommissioning Costs:

Item Description	Cost
Salvage Value	-($1,000)
Equipment Removal	$15,000
Fuel Tank Demolition	$5,000
Decommissioning Subtotal	**$19,000**
10% Contingency	$1,900
Environmental	$25,000
Engineering and Supervision	$5,000
Decommissioning Total	**$50,900**

3.2 Port aux Basques Diesel Plant (PAB #10 Diesel)

The Port aux Basques #10 Diesel Plant is a 3250 kVa packaged diesel generator set located adjacent to the main control building. Auxiliaries include coolers, fuel tank and controls. A more detailed description of the plant is located in Section 3.4.1 of the October 2000 "Thermal Plants Decommissioning Update" report located in Appendix A of this report.

Port aux Basques Diesel Plant Estimated Decommissioning Costs:

Item Description	Cost
Salvage Value	-($2,000)
Equipment Removal	$38,000
Building Demolition	$18,000
Substation Demolition	$12,000
Site work	$6,000
Decommissioning Subtotal	**$72,000**
10% Contingency	$7,200
Environmental	$60,000+
Engineering and Supervision	$7,000
Decommissioning Total	**$146,200**

3.3 Mobile Diesel #3

Mobile Diesel #3 was purchased from Detroit Diesel and commissioned in 2004. The unit is a 2.5 MW Diesel engine complete with switchgear and a MVA transformer. The entire unit is mounted on one oversized mobile trailer.

Mobile Diesel #3 Estimated Decommissioning Costs:

Since this diesel was only purchased in 2004 it is assumed that the engine would have a significant salvage value.

Item Description	Cost
Salvage Cost	-($900,000)
Environmental	$15,000
Engineering and Supervision	$5,000
Decommissioning Total	**-$880,000**

3.4 Greenhill Gas Turbine

This plant is located in the community of Grand Bank on the Burin Peninsula. The plant is made up of a gas generator, power turbine, electrical generator and auxiliaries such as coolers, switchgear and controls. The equipment is partially housed in a service building. The plant is rated at 25 MW and was commissioned in 1975. A more detailed description of the units is located in Section 3.6.1 of the October 2000 “Thermal Plants Decommissioning Update” report located in Appendix A of this report.

Greenhill Gas Turbine Estimated Decommissioning Costs:

Item Description	Cost
Salvage Value	-($350,000)
Equipment Removal	$50,000
Building Demolition	$75,000
Fuel Tank Demolition	$30,000
Substation Demolition	$17,000
Sitework	$12,000
Decommissioning Subtotal	**-(166,000)**
10% Contingency	$18,400
Environmental	$90,000
Engineering and Supervision	$12,000
Decommissioning Total	**-(45,600)**

3.5 Wesleyville Gas Turbine

This plant was originally located in the town of Salt Pond on the Burin Peninsula. In 2003, it was relocated to the town of New-Wes-Valley on the north coast of Bonavista Bay. The plant is made up of a gas generator, power turbine, electrical generator and auxilaries such as pumps, heat exchangers, switchgear and controls. The gas generator was manufactured by Rolls Roce and the power turbine and generator by Associated Electrical Industries (AEI). The package was assembled by AEI and commissioned in 1969. The unit is rated at 14.7 MW.

A new powerhouse was constructed in New-Wes-Valley in 2002 in preparation for the unit relocation in 2003. The original Avon engine supplied with the AEI package was overhauled in 1988 and, in 2005 was replaced with another overhauled Avon engine. This replacement engine was built in February 1967.

Wesleyville Gas Turbine Estimated Decommissioning Costs:

Item Description	Cost
Salvage Value	-($750,000)
Equipment Removal	$50,000
Building Demolition	$75,000
Fuel Tank Demolition	$30,000
Substation Demolition	$17,000
Site Work	$12,000
Decommissioning Subtotal	**-($566,000)**
10% Contingency	$18,400
Environmental	$90,000
Engineering and Supervision	$12,000
Decommissioning Total	**-($445,600)**

3.6 Mobile Gas Turbine

This plant is made up of three road trailers. The first trailer houses the gas generator, power turbine and electrical generator; the second contains the plant controls, switchgear and transformer and the third is the fuel tanker. This plant is rated at 7300 kW and was commissioned in 1974. In 2003 a major refurbishment of the unit was completed. Upgrades included an overhaul of the gas generator, power transformer and breaker, refurbishment of the unit and protection controls, the addition of a new re-closure, the replacement of the fuel system, and the refurbishment and repainting of the stacks. In addition, the trailer was painted and new signage installed. Sections of the roof were also replaced. A more detailed description of the unit is located in Section 3.8.1 of the October 2000 "Thermal Plants Decommissioning Update" report located in Appendix A of this report.

Mobile Gas Turbine Estimated Decommissioning Costs:

Item Description	Cost
Salvage Value	-($1,000,000)
Environmental	$15,000
Engineering and Supervision	$5,000
Decommissioning Total	**-($980,000)**

Appendix A

Decommissioning For Thermal Plants Update October 2000

NEWFOUNDLAND POWER

THERMAL PLANTS DECOMMISSIONING

UPDATE

OCTOBER 2000

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1. INTRODUCTION

Newfoundland Power owns and operates 9 thermal units in 8 operational plants. The Gander Diesel plant is no longer operational but was included in this report due to future decommissioning costs. The total installed capacity is 54 MW and generation is an average of 1.44 GWh per year (1996 – 1999). The thermal plants consist of three gas turbine plants, 1 low speed diesel plant, four high speed diesel plants. The unit capacities range from 500 kW to 25,000 kW. The developments are located in St. John's, Grand Bank, Salt Pond, Gander, Port Aux Basques, and Port Union. A leased diesel is temporarily stationed in Trepassey. The oldest unit was installed in 1953 in St. John’s and the newest unit is the gas turbine located in Grand Bank installed in 1975. This study excludes the leased diesel of which Newfoundland Power has no ownership.

Maintenance levels on the various plants have varied. Over the past ten to fifteen years there has been minimal work and replacements done on many of the diesels. The maintenance has tended to be that required to obtain site operational capability. However, the maintenance carried out on gas turbines in the past 10 years has been significant. The Gas Turbines will continue to receive capital improvements in order to extend their lives. The intention of Newfoundland Power is to decommission these plants as they reach the end of their useful lives. There have been 3 low speed diesel plants decommissioned and the older diesel units from the Port Aux Basques Diesel plant have been removed since the last update of this study.

The decommissioning of the thermal plants is a fairly straightforward process as the facility is typically limited to a building, prime mover equipment contained in the building and external fuel tank. The decommissioning scenario involves preparation of the site for work, removal of the physical equipment, demolition of the building and external auxiliaries and site remedial work. The areas will be reclaimed to the conditions required for the area which may include covering the site with topsoil and hydroseeding and the selective planting of native trees. All above ground facilities will be demolished and removed and foundations removed to 500 mm below grade. Equipment and materials will be sold for scrap or disposed of in approved landfills. As much of the power equipment is obsolete, it has been assumed that it has no salvage value or that it will equal the trucking costs required to haul it away.

The main concern with the demolition will be the environmental issues and costs. The St. John's Diesel Plant contains asbestos which must be removed prior to equipment removal and building demolition. Fuel tanks and pipes must be emptied, degassed and cleaned prior to demolition. All waste oils must be disposed of in an environmentally acceptable manner. Any contamination of the property will have to be cleaned up as part of the decommissioning process. Typically, an environmental site assessment with several phases, will be required prior to decommissioning of the thermal plant site.

The cost estimates for demolition of sites were, where applicable, supplied by contractors familiar with demolition work. In instances where contractors estimates were not available, unit prices were derived using common estimating practices.

ITEM DESCRIPTION	UNIT PRICE
Steel Building Demolition	$15.20/m^3
Steel Building Salvage	$ 2.65/m^3
Equipment Demolition & Salvage	$ 5000/unit
Asbestos Siding Removal	$25.00/m^2
Transmission (Single Pole)	* $10,000/km
Transmission (Double Pole)	* $13,000/km
Distribution (Single Pole)	* $ 3,000/km
Common Fill (Supply & Place)	$ 12.00/m^3
Selective Planting	$ 1,000/Ha
Hydro Seeding	$ 2.00/m^2

* Salvage value factored into unit price.

2. DECOMMISSIONING SCENARIOS

2.1 General

The purpose of the thermal generating plants is merely to generate electricity so at the end of their useful lives there is no justification for their continued existence. It is assumed that the plants will be removed entirely and that the sites will be restored to an acceptable condition for the surrounding properties. All above ground structures will be removed and foundations demolished to below grade. All fuel storage tanks and fuel conveyance systems will be removed and disposed of in an environmentally acceptable manner. All waste will be removed to a landfill or waste disposal site suitable for the material being disposed.

2.2 Procedure

The demolition procedure for the plants is described generally in this section. The major activities that will occur during the demolition process are preparation, demolition and site restoration.

The assumptions used for the demolition and the estimation of costs were:

1. Asbestos and hazardous materials will be removed prior to demolition.
2. Quantities were obtained from field measurement and drawing review.
3. Where possible, demolition costs were obtained from contractors based on site visits and determined quantities. Contractors prices include credits for salvaged materials.

a) Also actual costs experience associated with recent decommissioning of several diesel plants.

4. Where Contractor's prices were not available, costs were derived using common estimating practices. Salvage value is allowed for in the per unit costs.

5. The prime movers are assumed to be obsolete and will not be able to be sold for re-use.

2.2.1 Preparation for Demolition

Prior to demolition work beginning any asbestos and other hazardous materials in the plant will be removed. Asbestos material will be disposed of in a local landfill site in accordance with Provincial Regulations governing the substance. Other materials will be disposed of in accordance with applicable regulations.

2.2.2 Demolition

The prime movers and associated equipment will be removed and cut up for disposal. Usable motors and switchgear will be removed for salvage. After the equipment has been removed the turbine hall floor will be removed by demolishing the concrete slabs and the building demolished by cutting and dropping the structural steel.

Material to be salvaged will be segregated and loaded into trucks. Material uneconomical for salvage will be removed to the local landfill site.

2.2.3 Site Reclamation

Most thermal plant sites are located in industrial settings and as such there is no need for extensive seeding or tree planting. Concrete foundations will be demolished to below grade and the areas overlying the foundations backfilled and graded. An environmental site assessment will have to be conducted on the site and to determine if further site cleanup is required. If contaminated soils are encountered, the material will require removal and disposal in an approved treatment facility.

2.3 Summary of Decommissioning Costs

Plant	Decommissioning Cost
St. John's Diesel Plant	$ 136,500
Port Union Diesel Plant	$ 16,500
Gander Diesel Plant	$ 75,000
Port aux Basques Diesel Plant	$ 115,000
Mobile Diesel Plants (2)	$ 10,000
Greenhill Gas Turbine	$ 165,000
Salt Pond Gas Turbine	$ 110,000
Mobile Gas Turbine	$ 10,000
Leased Diesel	$ 0

3. DECOMMISSIONING ESTIMATES

3.1.1 St. John's Diesel Plant Description

The St. John's Diesel Plant is located on the Southside of St. John's harbour on the Southside road. The powerhouse contains one 2500 kW diesel generator set with auxiliaries and was commissioned in 1953. A fuel tank is located adjacent to the entrance of the powerhouse.

Powerhouse

The powerhouse is approximately 21 m long by 12 m wide by 10 m high and consists of a structural steel substructure on a concrete foundation. The building walls have asbestos cladding.

Turbine-Generator

The diesel engine was manufactured by Nordberg and the generator by General Electric. Auxiliaries include controls, lube oil cooler, cooling water cooler and fuel day tank.

Fuel Tank

The fuel tank is a 22,700 litre self dyked steel storage tank. There is # 2 diesel fuel stored in the tank.

Substation

The substation steps the generator voltage down from 6900 V to 4160 V for transmission to the grid. There are 3 - 1500 kVa transformers and two station service transformers associated with this plant

Transmission Line

This plant ties directly to a distribution line and does not have a transmission line associated with it.

3.1.2 St. John's Diesel Plant Decommissioning Costs

Asbestos Removal	$26,000
Equipment Removal	$23,000
Building Demolition	$21,000
Fuel Tank Demolition	$ 1,500
Substation Demolition	$ 2,500
Site Work	$ 1,000
Decommissioning Subtotal	**$75,000**
10% Contingency	$ 7,500
Environmental	$ 50,000
Engineering & Supervision	$ 4,000
Decommissioning Total	**$136,500**

3.2.1 Port Union Diesel Plant Descriptions

General

The Port Union Diesel Plant is located in Port Union on the Bonavista Peninsula. The unit is contained in the Port Union Hydroelectric Development Powerhouse. The machine is comprised of a 500 kW diesel generator set, one fuel tank, controls and auxiliaries. The unit was commissioned in 1962.

Powerhouse

The powerhouse contains the diesel set and two hydroelectric generating units. The cost of demolition of the powerhouse is covered in the report on the Hydroelectric plants.

Turbine-Generator

The diesel engine was manufactured by Caterpillar. The generator was manufactured by General Electric and is rated at 625 kVa. Auxiliaries include controls, and cooling system.

Fuel Tank

The self-dyked fuel tank has a capacity of 9100 litres of # 2 fuel and is of steel construction.

Substation

The substation equipment is common for the diesel set and the hydro sets. Costs for decommissioning are addressed in the Hydroelectric Plant Decommissioning report.

Transmission Line
There is no transmission line associated with this unit.

3.2.2 Port Union Diesel Plant Decommissioning Costs

Equipment Removal	$ 4,000
Fuel Tank Demolition	$ 1,000
Decommissioning Subtotal	**$ 5,000**
10% Contingency	$ 500
Environmental	$ 10,000
Engineering & Supervision	$ 1,000
Decommissioning Total	**$ 16,500**

3.3.1 Gander Diesel Plant Description

General

The Gander Diesel Plant is located in Gander near the airport. Three 1000 kW diesel generator sets and auxiliaries have been removed from the plant. Transport Canada retains ownership of the building and the property.

Powerhouse

As the powerhouse is not owned by Newfoundland Power there is no cost associated with decommissioning it.

Fuel Tanks

There were two fuel tanks with capacities of 45,400 litres each. Both tanks were of steel construction and have been removed from site.

Environmental

Due to the nature of this facility having been taken over from the Department of National Defense and the unknown environmental issues with tanks beyond our control, a contingency of $50,000 has been added to the environmental costs.

3.3.2 Gander Diesel Plant Decommissioning Costs

Environmental	$ 70,000
Engineering & Supervision	$ 5,000
Decommissioning Total	***$ 75,000***

3.4.1 Port aux Basques Diesel Plant Description

General

The Port aux Basques Diesel Plant is located in the community of Port aux Basques. The six diesel generator sets ranging in size from 262 kVa to 438 kVa have been removed from the main powerhouse. A 3250 kVa packaged diesel generator set is located adjacent to the main building. Auxiliaries include coolers, fuel tank and controls.

Powerhouse

The powerhouse is mainly of concrete construction with a wooden frame extension built on. The building measures approximately 26 m long by 7.5 m wide by 5 m high.

Turbine-Generators

The packaged diesel-generator set installed adjacent to the powerhouse was manufactured by General Motors and installed in 1969. This unit is rated at 3250 kVa. Auxiliaries for this unit include a cooling tower and control room.

Fuel Tank

The remaining diesel generator is supplied with # 2 fuel from one 22,700 litre steel self-dyked tank located outside the powerhouse.

Substation

The packaged diesel generates at 4.16 kV and does not require transformation.

Transmission Line

This plant ties directly into the Port aux Basques substation and does not have a transmission line associated with it.

3.4.2 Port aux Basques Diesel Plant Decommissioning Costs

Equipment Removal	$31,000
Building Demolition	$15,000
Substation Demolition	$ 7,000
Sitework	$ 3,000
Decommissioning Subtotal	**$56,000**
10% Contingency	$ 5,600
Environmental	$ 50,000
Engineering & Supervision	$ 3,400
Decommissioning Total	**$115,000**

3.5.1 Mobile Diesels

General

The Mobile Diesel units consists of one 700 kW and one 670 kW diesel generator package mounted in self contained high bed road trailers and include all auxiliaries controls, fuel tanks, switchgear and transformers. Unit #1 was purchased in 1973 and Unit # 2 in 1976.

Powerhouses

All equipment is contained in the trailers. There are steel frame structures with sheet metal siding.

Turbine-Generators

The diesel engines were both manufactured by Caterpillar. Unit # 1 generator was made by Tamper-Camron and is rated at 700 kW. Unit # 2 generator was manufactured by Brown-Boveri and is rated at 670 kW.

Fuel Tank

In both units, the fuel tanks are located on the trailers and are relatively small in size.

Substation

The transformers associated with these units are mounted on the trailer.

Transmission Line

There is no transmission line associated with either unit.

3.5.2 Mobile Diesel Decommissioning Cost

Assumptions

1. As these units are mobile, it is assumed that the decommissioning costs will be minimal and will equal the salvage value.

Decommissioning Cost	$0
Environmental	$9,000
Engineering & Supervision	$1,000
Decommissioning Total	$10,000

3.6.1 Greenhill Gas Turbine Description

General

This plant is located in the community of Grand Bank on the Burin Peninsula. The plant is made up of a gas generator, power turbine, electrical generator and auxiliaries such as coolers, switchgear and controls. The equipment is partially housed in a service building. The plant is rated at 25 MW and was commissioned in 1975. One 800,000 litre tank supplies the fuel. One other 800,000 litre tank was removed from service in 1994 as it was not being used.

Powerhouse

The powerhouse is approximately 21 m long by 21 m wide by 5 m high and consists of a structural steel substructure on a concrete foundation. The walls are constructed of steel metal siding. The generator and auxiliaries are contained in the service building. The gas generator and power turbine are located outside the main building in an enclosure consisting of a structural steel substructure and acoustic steel panel siding. The enclosure is mounted on a concrete foundation.

Turbine-Generator

The gas generator was manufactured by Rolls-Royce, the power turbine by Curtiss-Wright and the generator by Brush Electrical Machines. The package was assembled by Curtiss Wright. Auxiliaries include external coolers, pumps, air compressors and controls. The unit is rated at 25 MW

Fuel Tanks

Fuel is supplied from one 800,000 litre steel tank. This tank is located in an earth dyke with a rubber liner. Fuel forwarding equipment is located in a small pre-engineered building adjacent to the tanks.

Substation

The substation steps the generator voltage up from 13.8 kV to 66 kV for transmission to the grid. There is one 30 MVA transformer and one station service transformer associated with this plant.

Transmission Line

This plant ties into the Greenhill Substation which services the town of Grand Bank and does not have a transmission line associated with it.

3.6.2 Greenhill Gas Turbine Decommissioning Cost

Equipment Removal	$ 27,000
Building Demolition	$ 44,000
Fuel Tank Demolition	$ 18,000
Substation Demolition	$ 6,000
Site Work	$ 5,000
Decommissioning Subtotal	**$100,000**
10% Contingency	$ 10,000
Environmental	$ 50,000
Engineering & Supervision	$ 5,000
Decommissioning Total	**$165,000**

3.7.1 Salt Pond Gas Turbine Description

General

This plant is located at Salt Pond, Burin on the Burin Peninsula. The plant is made up of a gas generator, power turbine, electrical generator and auxiliaries such as coolers, switchgear and controls. The plant is rated at 14.7 MW and was commissioned in 1969.

Powerhouse

The powerhouse is approximately 18 m long by 12 m wide by 5 m high. The building is pre-engineered and consists of a structural steel substructure on a concrete foundation. The walls and roof are constructed of metal panels and fibreglass insulation. This building was constructed in 1993 to replace the original pre-fabricated enclosures which had deteriorated.

Turbine-Generator

The gas-generator was manufactured by Rolls Royce, the power turbine and generator by Associated Electrical Industries (AEI). The unit is rated at 14700 kW and the package was assembled by AEI. Auxiliaries includes, lube oil pumps, lube oil heat exchangers and controls.

Fuel Tanks

Fuel is supplied from two 113,500 litre steel fuel tanks. These tanks are contained in an earth dyke. Fuel forwarding equipment is located in a small wooden structure building adjacent to the tanks. The original tanks are being replaced in late 2000 with two new tanks.

Substation

The substation steps the generator voltage up from 13.2 kV to 66 kV for transmission to the grid. There is one 20 MVA transformer and three 50 kVa station service transformers associated with this plant.

Transmission Line

As this plant feed directly into the Salt Pond Substation, there is no transmission line associated with this plant.

3.7.2 Salt Pond Gas Turbine Decommissioning Cost

Equipment Removal	$25,000
Building Demolition	$11,000
Fuel Tank Demolition	$ 9,000
Substation Demolition	$ 4,000
Decommissioning Subtotal	**$49,000**
10% Contingency	$ 5,000
Environmental	$ 50,000
Engineering & Supervision	$ 6,000
Decommissioning Total	**$110,000**

3.8.1 Mobile Gas Turbine Description

General Powerhouse

The gas generator, power turbine and generator are contained in a single trailer unit of steel frame construction and sheet metal siding. Acoustic steel panels are on the interior walls. The controls are housed in a similar structure and also contains an auxiliary power unit and the unit transformer.

Turbine-Generator

This plant consists of a gas generator, power turbine and generator packaged by Orenda, a division of Hawker Siddeley. The unit is rated at 7300 kW. All auxiliaries such as coolers and switchgear are contained on the trailers.

Fuel Tank

The fuel is supplied from a 32,000 litre tanker. The tank itself is of aluminum construction and is mounted on a steel trailer frame.

Substation

All necessary substation equipment is mounted on the control module trailer.

Transmission Line

There is no transmission line associated with this plant.

3.8.2 Mobile Gas Turbine Decommissioning Cost

Assumption

1. As all components are mobile, it is assumed that the decommissioning costs will be minimal and will equal the salvage value.

Decommissioning Cost	$ 0
Environmental	9,000
Engineering and Supervision	1,000
Decommissioning Total	**$10,000**