Power Plant Review

CA-17 (n)
Attachment A

November 1993

NEWFOUNDLAND POWER
A FORTIS COMPANY

NEWFOUNDLAND POWER

POWER PLANT REVIEW

M.C. Hunter
November 1993

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

1.0 INTRODUCTION

Newfoundland Power owns and operates several hydraulic and thermal power plants on the island of Newfoundland. Twenty two hydro plants containing a total of 31 units provide a generation capacity of 87,141 kw and average production of 417,400,000 kwhrs. One steam plant consisting of two units provide a capacity of 30,000 kw and annual average generation of 8,465,740 kwhrs. Three gas turbine plants have a total rated capacity of 47,000 kw and an average generation of 1,464,790 kwhrs. The remaining 8 thermal plants are comprised of 8 low and 10 high speed diesel generators for a total capacity of 14,219 kw and an average production of 158,741 kwhrs.

The following table details plant data;

Headquarters	Plant	# Units	Capacity kw	Ave. Generation kwhr
Cape Broyle	Cape Broyle	1	6,400	34,900,000
	Horse Chops	1	7,600	44,100,000
	Rocky Pond	1	3,100	14,100,000
Mobile Depot	Tors Cove	3	6,750	26,100,000
	Mobile	1	11,968	47,400,000
	Morris	1	1,135	7,500,000
	Pierres Brook	1	4,000	24,900,000
Petty Harbour	Petty Harbour	3	5,250	22,300,000
	Topsail	1	2,376	13,000,000
	Seal Cove	2	3,180	10,300,000
Hearts Content	New Chelsea	1	3,725	13,900,000
	Pitmans Pond	1	610	2,300,000
	Hearts Content	1	2,650	8,300,000
	Victoria	1	450	3,000,000
Salt Pond	Salt Pond Diesel	3	1,500	11,736

	Salt Pond G.T.	1	14,700	309,250
	Greenhill G.T.	1	25,000	968,440
	West Brook	1	761	3,800,000
	Fall Pond	1	350	1,100,000
	Lawn	1	625	2,900,000
Port Union	Port Union Diesel	1	500	3,900
	Port Union	2	511	2,900,000
	Lockston	2	3,000	6,800,000
Rattling Brook	Gander Diesel	3	3,000	3,780
	Rattling Brook	2	11,500	71,700,000
	Sandy Brook	1	5,700	25,900,000
Stephenville	Lookout Brook	2	5,500	30,200,000
	Aguathuna Diesel	1	1,200	8,520
Port Aux Basques	Port Aux Basques Diesel	7	4,149	103,675
	Mobile Gas Turbine	1	7,300	187,100
	Mobile Diesels	2	1,370	n/a
St. John's Thermal Plant	St. John's Steam Plant	2	30,000	8,465,740
	St. John's Diesel	1	2,500	27,130
	TOTAL	54.00	178,360.00	427,489,271.00

2.0 CAPE BROYLE GROUP

The headquarters for these plants is at the Cape Broyle powerhouse. A synopsis of the systems is as follows;

Current Staffing: 1 supervisor/2 unattended plant operators

Number of Hydro Plants: 3
Number of Hydro Generators: 3
Number and Type of Penstocks: 3 woodstave
Number and Type of Surge Tanks:2 steel/wood frost casing

Number of Dams: 39
Number of Spillways: 24
Number of Outlets: 9
Number of Canals: 5
Number of Bridges: 2

2.1 CAPE BROYLE/HORSE CHOPS HYDROELECTRIC DEVELOPMENT

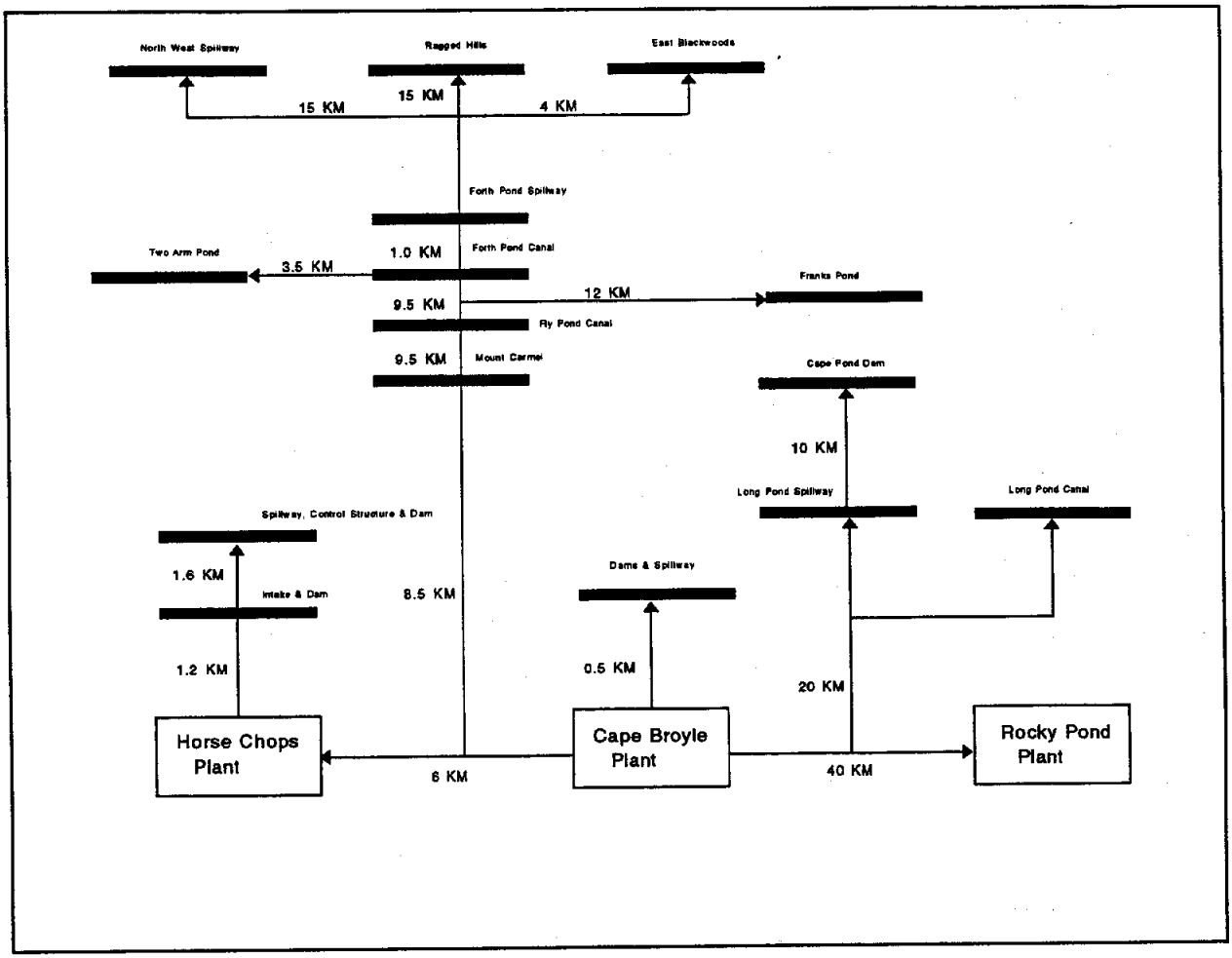
General

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.

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 embankment 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 stoplogs 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.

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 is of woodstave construction 2134 mm diameter and 1196 m long. It is supported by treated timber cradles. A surge tank is located 104 m upstream from the plant.

Surge Tank (Horse Chops)

The surge tank is of steel construction with timber frost casing and is supported on concrete piers. It is a 5.5 m diameter, 14 m high tank on a 64 m high 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.

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 is a treated timber overflow weir with timber stoplogs set between vertical timber guides. It also includes a short downstream timber apron. The structure is about 73 m long.

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 girders with wood decking. It has a span of 10.7 m between rockfill timber crib abutments. The bridge was rebuilt in 1992.

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 6.1 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. The bridge was rebuilt in 1992.

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.

Water Rights History:

By an application recorded in the Department of Mines, Agriculture and Resources on March 14, 1951, Newfoundland Light & Power applied under Part IV of The Crown Lands Act, 1930, and Acts in amendment thereof, for a license to use the waters of Horse Chops River, Cape Broyle for the purpose of the development of hydro-electric power at a proposed power development at Upper pond, Cape Broyle and at a further proposed power development at Peter's Cove, Cape Broyle, and to divert certain waters into the watershed of Horse Chops River (the particulars of which application were published in the Newfoundland Gazette on the 3rd. day of April, A.D. 1951.

An Interim License was granted the Company on November 29, 1954 authorizing the Company for a period of three (3) years from July 15. 1952 to enter upon, use and occupy certain lands and to divert, use and store certain waters in the interim license.

On June 4, 1958 an Amending license was granted the Company under the provisions of the Crown Lands Act, C.174 R.S.N. 1952 authorizing the Company to make changes and additions in the works involved in the development, such changes and additions not altering in any way the overall scheme of the power development required by the interim license.

The Crown on December 28, 1962 issued a Final License for a term of fifty (50) years from the July 14, 1955 for the works.

NEWFOUNDLAND POWER

DAM LISTING - CAPE BROYLE/HORSECHOPS SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Cape Broyle Pond	Dam	C	Earthfill	1953	122.0	12.2
	Spillway	C	Concrete Gravity	1988	70.0	1.2
	Freeboard Dam	C	Earthfill	1953	46.0	2.1
	Beaver Pond Freeboard Dam	C	Earthfill	1953	46.0	1.5
Mount Carmel Pond	Dam/Outlet	B	Earthfill	1952	457.0	12.2
	Spillway	B	Timber Crib	1952	73.0	0.6
Horsechops Forebay	Dam	C	Earthfill	1953	427.0	7.6
	Spillway	C	Concrete Gravity	1953	34.0	0.9
Horsechops Canal	Intake	C	Concrete	1953	3.5	4.6
	Canal		Earthbank	1953	1500.0	7.6
Blackwoods Diversion	Northwest Blackwoods Dam	C	Earthfill	1953	183.0	7.6
	Northwest Blackwoods Freeboard Dam	C	Earthfill	1953	46.0	2.7

NEWFOUNDLAND POWER

DAM LISTING - CAPE BROYLE/HORSECHOPS SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Blackwoods Diversion	Pond "K" Dam	C	Earthfill	1953	91.0	6.1
	Northwest Blackwoods Spillway	C	Timber	1984	76.0	0.6
	Jordan River Dam	C	Earthfill	1953	91.0	4.3
	Jordan River Freeboard Dam 1	C	Earthfill	1953	46.0	2.4
	Jordan River Freeboard Dam 2	C	Earthfill	1953	152.0	3.0
	East Blackwoods Diversion Dams 1 -9	C	Earthfill	1953	107.0	4.6
	East Blackwoods Spillway	C	Earthfill Steel Membrane	1989	82.0	1.2
	Fourth Blackwoods Dam/Spillway	C	Earthfill Steel Membrane	1979	55.0	4.6
	Fourth Blackwoods Freeboards Dams 1, 2	C	Earthfill	1953	46.0	3.0
	Canal	C	Earthbank	1953	1525.0	

NEWFOUNDLAND POWER

DAM LISTING - CAPE BROYLE/HORSECHOPS SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Blackwoods Diversion	Canal Control Structure (Stoplogs)	C	Concrete	1953	6.1	0.6
West Ragged Hills Ponds	Dam/Spillway	C	Timber Crib	1986	80.0	1.5
	Spillway				68.0	
	Rock Pond Dam	C	Earthfill	1986	75.0	1.5
Two Arm Pond	Diversion Dam	C	Earthfill	1953	45.0	1.5
Fly Pond	Diversion Dam	C	Earthfill	1953	185.0	4.0
	Emergency Spillway (Fuse Plug)	C	Earthfill	1953	90.0	2.0

CAPE BROYLE HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: CAB-G1

Turbine Horsepower	7500
Turbine Type	Vertical Francis
Generator (KVA)	7000
Power Factor	0.85
RPM	360
CFS	417
Gross Head (m)	
Net Head (m)	54.8
Penstock	383m - 2438mm woodstave between intake and surge tank; 42m - 2286mm woodstave between surge tank and powerhouse
Drainage Area (Sq. Km.)	188.0
Plant Factor (Kwh/cfsd)	260
Surge Tank	12m high - 5.5m diameter; on a 22m high support structure
Year Commissioned	1953
Water Rights Expiry (year)	2005

HORSECHOPS HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: HCP-G1

Turbine Horsepower	**10000**
Turbine Type	**Vertical Francis**
Generator (KVA)	**9000**
Power Factor	**0.85**
RPM	
CFS	**354**
Gross Head (m)	
Net Head (m)	**85.3**
Penstock	**2134m - 1196mm woodstave**
Drainage Area (Sq. Km.)	**158.5**
Plant Factor (Kwh/cfsd)	**404**
Surge Tank	**14m high - 5.5m diameter; on a 64m high support structure**
Year Commissioned	**1953**
Water Rights Expiry (year)	**2005**

2.2 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.

The Tors Cove Plant and watershed is operated and maintained by the Mobile Group while the Racy Pond plant and watershed is operated and maintained by the Cape Broyle Group.

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.

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 penstock was constructed in 1986 replacing the original one.

Surge Tank (Tors Cove)

The surge tank is of steel construction and is supported on concrete piers. The tank is 7.6 m in diameter and 33.5 m high. It 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 stoplogs, 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.

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 tops the structure. 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

The 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 a rockfill core with 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 a rockfill core with 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 m long and consists of a rockfill core with 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 a rockfill core with 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 a rockfill core with 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.

Cluney's Canal

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

Cluney's Weir

Cluney's Weir consists of rockfill timber cribs with vertical sheathing guide walls and a timber sheathing deck.

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.

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 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

The structure is of rockfill timber crib construction incorporating two spillway sections, two outlet structures, and one gatehouse containing the gate hosting mechanism. The structure is about 160 m long and about 3.5 m high. The spillway sections are 50 m and 30 m long respectively.

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 m 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.

Water Rights History:

Final Licence issued October 13, 1956 for a term of 50 years from January 1, 1945. In 1924 Reid Nfld. Co. sold to Newfoundland Light & Power all rights to the use of water power in connection with Tors Cove and Pierres Brook as granted by Section 1, St. John's Street Railway Act, 1923.

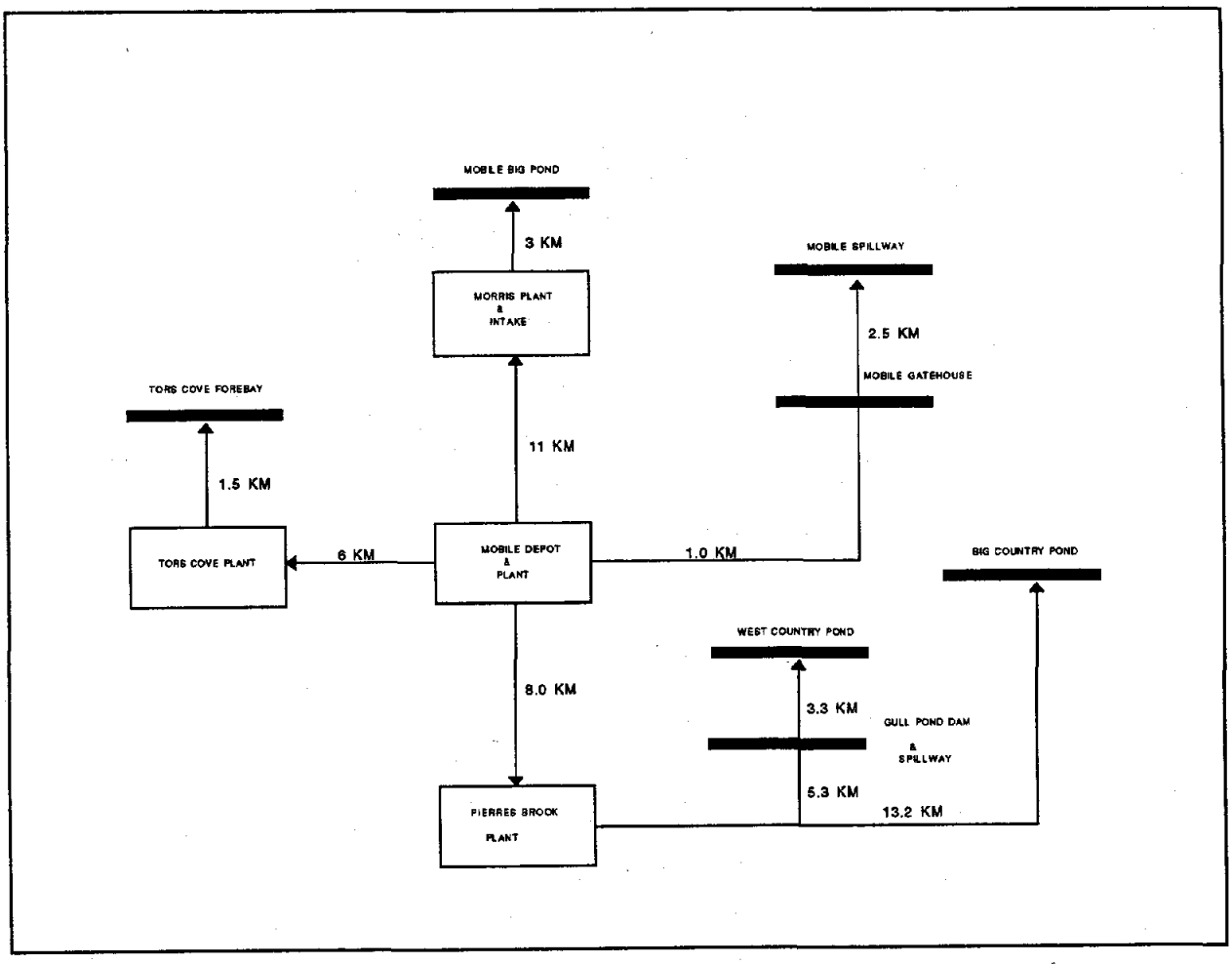
3.0 MOBILE GROUP

The headquarters for these plants is at the Mobile Depot. A synopsis of the systems is as follows;

Current Staffing:	1 supervisor/2 plant maintenancemen/2 maintenance mechanics* see note
Number of Hydro Plants:	4
Number of Hydro Generators:	6
Number and Type of Penstocks:	4 2 - woodstave; 2 - fibreglass
Number and Type of Surge Tanks:	3 steel/wood frost casing

Number of Dams:	10
Number of Spillways:	7
Number of Outlets:	6
Number of Canals:	3

Note: The two mechanics though based in Mobile are utilized throughout the Avalon Peninsula groups of plants.



3.1 MOBILE/MORRIS HYDROELECTRIC DEVELOPMENT

General

Mobile/Morris Development is located on the east coast of the Avalon Peninsula near the community of Mobile (Mobile at latitude 47° 13' and longitude 52° 50' and Morris at latitude 47° 15' and longitude 52° 56'). 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.

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 levelling piers and 1,115 m of buried 2286 mm diameter fibre 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 a treated timber frost casing. The steel surge tank tee is encased in a concrete anchor block which also supports a wooden building containing heating equipment.

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 and an overhead steel lifting mechanism with a winch. 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 fibre 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 centre

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 2400V 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 legal 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.

Water Rights History:

By a lease dated November 23, 1946 and as amended October 21, 1949 the St. John's Municipal Council granted and demised to the Newfoundland Light & Power Company all the rights of the Council under Section 195 of

the St. John's Municipal Act 1921, C.13 as amended.

3.2 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 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 m high and 4.3 m in diameter. The surge tank tee is encased in a concrete anchor block and the structure legs are supported on concrete foundations. A replacement surge tank was installed in 1991.

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 reconstructed 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 diameter corrugated steel pipe, sluice gate, concrete gate shaft, a screw stem lift and a wooden gatehouse.

Witless Bay Country Pond Spillway

The spillway is a concrete gravity structure with an Ogee crest with two earthfill abutments. The spillway is 40 M long and has a walkway with provisions for flashboards. This structure was rebuilt in 1992.

Big Country Pond Dam and Outlet

The structure is a 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 treated rockfill timber crib gate section with rockfill gabion 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.

Water Rights History:

Final Licence issued 1959 for a term of 50 years from May 1, 1953. In 1924 Reid Nfld. Co. sold to Newfoundland Light & Power all rights to the use of water power in connection with Tors Cove and Pierres Brook as granted by Section 1, St. John's Street Railway Act, 1923.

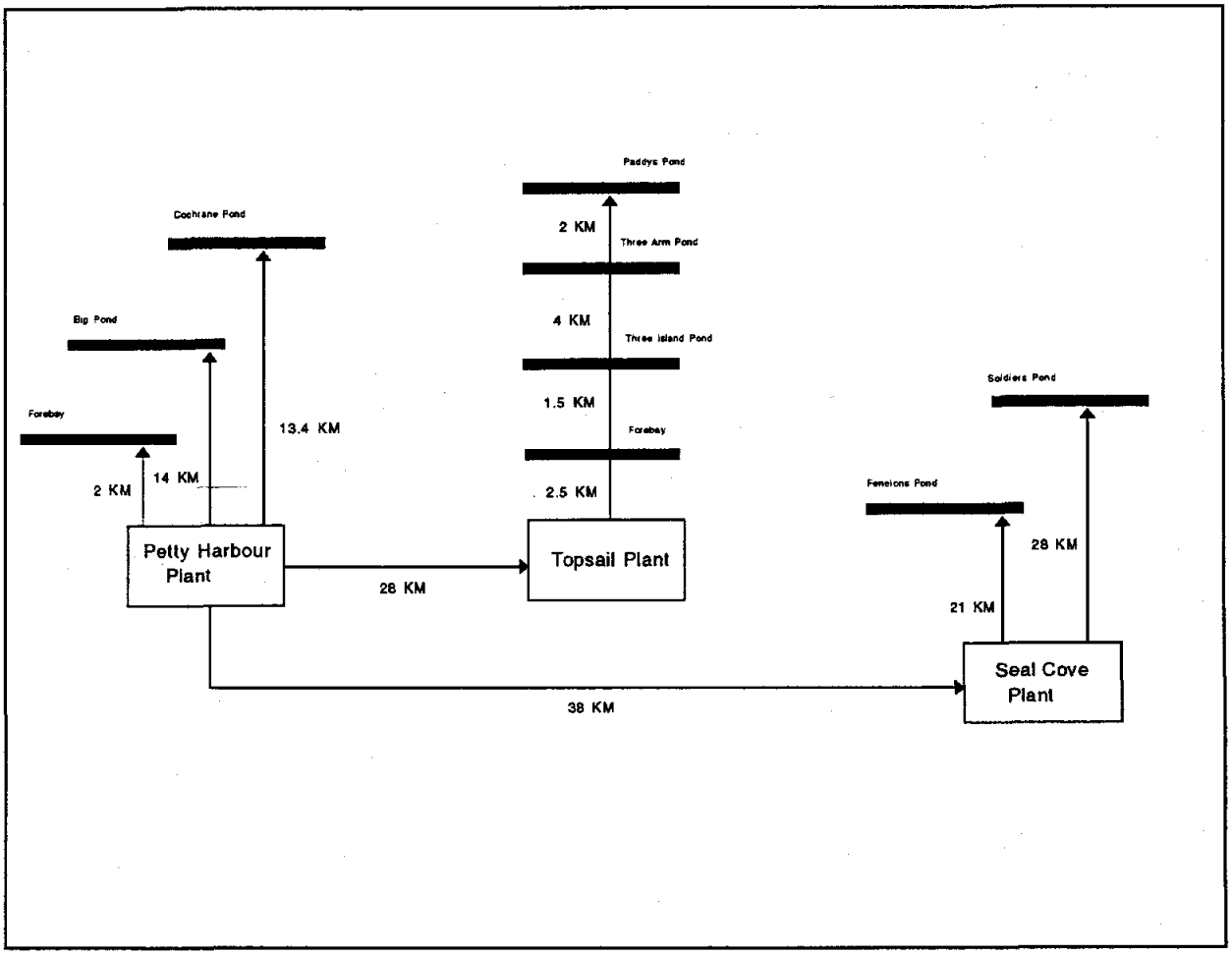
4.0 PETTY HARBOUR GROUP

The headquarters for these plants is at the Petty Harbour Plant. A synopsis of the systems is as follows;

Current Staffing: 1 supervisor/2 plant maintenancemen

Number of Hydro Plants: 3
Number of Hydro Generators: 6
Number and Type of Penstocks: 3 woodstave
Number and Type of Surge Tanks: 1 steel/wood frost casing

Number of Dams: 14
Number of Spillways: 11
Number of Outlets: 10
Number of Canals: 2



4.1 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 at latitude 47° 28' and longitude 52° 43'. 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 manually operated.

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 kW.

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. Both the pipe and surge tank have a treated wood frost cover.

Penstock

The penstock is approximately 975 m long and 2286 mm diameter. It is primarily of woodstave construction supported by timber cradles except for a short steel section supported by a steel trestle at a river crossing.

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. In 1992 the dam was stabilized with the installation of rock anchors every meter across the crest.

Bay Bulls Big Pond Dam, Spillway and Outlet

This structure consists of an earthfill dam and an adjacent 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 outlet structure is incorporated into the main dam and 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 is about 30 m long and 0.9 m high and is constructed of close faced untreated timber.

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 480 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 due to use as a public beach. A 15 m long rockfill treated timber crib spillway about 2.0 m high is incorporated into the dam. The structure is located in Cochrane Pond Provincial Park.

Cochrane Pond Outlet

The dam is about 4.5 m long and 0.9 m high. The 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.

Water Rights History:

All rights and properties concerning Petty Harbour Development were conveyed to the Company by a deed dated February 18, 1924 and registered in Volume 86, Folios 1-9 at the Registry of Deeds.

Petty Harbour 1896 -	60 Victoria Chapter 20 Amendments in 1899, 1944, 1946.

May 7, 1904 Crown Grant to Reid Newfoundland Company Volume 71 No 170R.

Grant in fee simple to Reid Newfoundland Company and its assigns - 22,686 acres of land together with the woods, ways, water courses, mines, ores and minerals of every kind, including precious metals etc.

On December 6, 1920 Reid Newfoundland Company sold and conveyed to the St. John's Light & Power Company (i) the power system of Reid Newfoundland Co. Ltd. comprising the Power House with the dam at the forebay and the supply system and storage system of the drainage area controlled by Reid Nfld. Co. Ltd. with all lands etc. belonging to or capable of being used in connection therewith. (ii) the transmission system including the transmission lines from the Power House at Petty Harbour to the substation at St. John's with all lands etc. (iii) the converting system in St. John's which was installed in the substation building. (iv) the distribution system in St. John's and vicinity including all poles, wires, transformers, meters etc.

On February 18, 1924 Reid Newfoundland Co. Ltd., St. John's Light and Power Co. Ltd. and Mines and Forests (Nfld.) Ltd. sold and conveyed to the Newfoundland Light and Power Company Limited the undertaking assets and goodwill of the St. John's Light and Power Company as a going concern as well as a portion of Reid Lot 170.

Under this deed Newfoundland Light and Power Company Limited became absolute owners of the following particular properties and rights:

1. The Water Power system and rights in connection with the Power development at Petty Harbour including (a) Power house and generating station, penstock, flume, tunnel , tail race, dams and works of all kinds. (b) The right to the use of the waters and water power of Petty Harbour Brook, Petty Harbour First Pond and tributary streams and ponds and in particular, the right to the exclusive use of Petty Harbour First Pond for the purpose of providing power for the Electric Railway. (c) All rights to the use of water and water power from Cochrane Pond with all streams and all appurtenant lands and easements. (d) (i) Land acquired from Patrick Howlett on Dec. 16, 1904 Reg. Vol 28/489 at Registry of deeds. (d) (ii) Part of Reid Lot 170 as may be appurtenant to the water power system and rights in connection with the power development at Petty Harbour and as may be reasonably necessary to the future extension and further development of the water power system and the supply and storage systems incidental thereto and which lands shall deem to include:- (1) Land on the left bank of Petty Harbour Brook ---- (2) Land on the right bank of Petty Harbour Brook ---- (3) Land around Bay

Bulls Big Pond and Middle Pond as lies within lines drawn 50 feet distant from a line drawn at a level of 15 feet above the present (1924) flood elevation of the said ponds. Including 50 feet along each side of the outlet stream of Bay Bulls Big Pond and the stream connecting Middle Pond with Big Pond - excepting the Railway right-of-way and public road reservations. (4) All rights of flooding in connection with the water power supply and storage systems. (5) All such further land forming part of Reid Lot 170 a may be reasonably required for the purpose of any further future development of the water power supply and storage system in connection with the water power development at Petty Harbour which may be feasible. (d) (iii) All rights to the use of water power in connection with Tors Cove Brook and Pierres Brook as granted by the St. John's Street Railway Act 1923, that is, the exclusive use of the waters of Tors Cove Brook flowing into Tors Cove, and of Pierres Brook flowing into Witless Bay as a source of supply for the production of hydro electric energy.

2. The transmission System from the Power House at Petty Harbour to the substation at St. John's together with appurtenant rights-of-way.

3. The Converting System in St. John's now installed in the substation building and all rights to a new substation or site therefore and for a street railway terminal under the Railway Settlement Act of 1923. (Clause 8(d) of the A Schedule Agreement of that Act stated that the Government shall provide the St. John's Light and Power Company with a free site either in the Municipal Basin, or on the dump or made land west of the Gas Works, for the erection of a new substation at St. John's and the provision of terminal facilities for the street railway, before requiring possession of the present (1923) substation and street railway terminal).

4. The Distribution System in St. John's and vicinity.

5. Stock in Trade.

6. All rights, privileges, franchise, powers, immunities and exemptions under the St. John's Street Railway Charter 1896 and other Statutes including the Railway Settlement Act 1923 and the St. John's Street Railway Act 1923.

7. All Deeds and Records necessary for the purpose of the business.

8. The St. John's Light and Power Company's existing tenancies of the substation, the street railway terminal, portions of the Angel premises and the store on King's Road.

NEWFOUNDLAND POWER

DAM LISTING - PETTY HARBOUR SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Bay Bulls Big Pond	Dam/Spillway/Outlet	A	Earthfill	1945	120.0	9.0
	Goose Pond Dam	A	Timber		30.5	0.9
	Spillway	A	Earthfill/Rockfill; Central Steel Core	1988	40.0	1.8
Cochrane Pond	Dam	C	Earthfill		480.0	3.0
	Spillway	C	Rockfill, Timber Crib		15.0	2.0
	Outlet	C	Rockfill, Timber Crib	1988	4.5	0.9
First Pond	Dam/Spillway/Intake	A	Concrete Gravity	1900	76.0	9.1
	Spillway				40.0	

PETTY HARBOUR HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: PHR-G1

Turbine Horsepower	2100
Turbine Type	Horizontal Francis
Generator (KVA)	2000
Power Factor	0.80
RPM	327
CFS	429
Gross Head (m)	61.9
Net Head (m)	57.9
Penstock	975m - 2286mm woodstave
Drainage Area (Sq. Km.)	141
Plant Factor (Kwh/cfsd)	267
Surge Tank Height (m)	15m high - 5.0m diameter
Year Commissioned	1900
Water Rights Expiry (year)	No Expiry

PETTY HARBOUR HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: PHR-G2

Turbine Horsepower	2150
Turbine Type	Horizontal Francis
Generator (KVA)	1585
Power Factor	0.95
RPM	450
CFS	
Gross Head (m)	
Net Head (m)	
Penstock	
Drainage Area (Sq. Km.)	
Plant Factor (Kwh/cfsd)	
Surge Tank Height (m)	
Year Commissioned	1908
Water Rights Expiry (year)	

PETTY HARBOUR HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: PHR-G3

Turbine Horsepower	**2700**
Turbine Type	**Horizontal Francis**
Generator (KVA)	**2250**
Power Factor	**0.80**
RPM	**514**
CFS	
Gross Head (m)	
Net Head (m)	
Penstock	
Drainage Area (Sq. Km.)	
Plant Factor (Kwh/cfsd)	
Surge Tank Height (m)	
Year Commissioned	**1926**
Water Rights Expiry (year)	

4.2 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.

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 with 2134 mm diameter and is of above ground treated woodstave construction supported on timber cradles. The penstock was upgraded in 1993 with the installation of stay brace cradles along the entire penstock.

Intake

The intake is of reinforced concrete construction with concrete wing walls on both sides. It includes a steel sluice gate, gate lift, steel 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 order to stabilize the dam in 1993, the dam had rockfill added to the downstream. This effectively has changed the dam into a rockfill dam with an upstream concrete face. In addition, at this time an upstream blanket was placed to reduce leakage.

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.

Soldiers Pond Outlet

The structure is earthfill with a treated timber crib gate structure. The earthfill section is approximately 105 M. The gate structure is 4 M high with a 1.5 M x 1.5 M gate.

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 centre 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.

Water Rights History:

The Company has water rights in the Seal Cove area based on Section 18 (3) of the Conception Bay Electric Company Act (3), Geo. V 1913 Cap 4, and Minute of Council dated November 14, 1919 (see also April 23, 1919).

In order to establish what property and water rights the Company has in the Seal Cove area, it is necessary to begin with the incorporation of "The Conception Bay Electric Company" in 1913.

Under subsection (1) of Section 18 of the Conception Bay Electric Company Act 3 Geo. V. 1913 Cap. 4 "The Conception Bay Electric Company" was

granted the exclusive right and franchise for a period of 50 years to construct, install and operate a plant for lighting with electric light the streets and buildings of the villages and country within a radius to be fixed by the Governor-in-Council. Under subsection (2) of Section 18 of the said Act, the Conception Bay Electric Company was given the right to acquire and develop a suitable water power in, adjacent to, or within the radius to be fixed by the Governor-in-Council and the right to use the waters of any brook or brooks, with tributaries and lakes within or adjacent to the same.

On June 30, 1914 the Conception Bay Electric Company assigned and transferred unto the United Towns Electric Company the unexpired term of the exclusive right and franchise and all rights and privileges granted to the Conception Bay Electric Company. The necessary approval was granted and the radius was defined by Minutes of Council dated the l4th. day of November, 1919 (see also Minutes of Council dated the 23rd. day of April, 1919).

The Minutes of Council stated: "For the purposes of Section 18 of the Act 3, Geo. V (1913) Cap. 4 approval is hereby granted for the acquisition and development by the Company of the water power of Seal Cove Brook within the radius fixed under Section 9 of the said Act with all their tributaries and lakes draining into the same". The said Minutes of Council had stated that for the purpose of Section 9 of the Act 3 Geo. V (1913) C.4 the radius therein referred to shall be fixed as including all towns and settlements in the Electoral District of Harbour Main.

The exclusive right and franchise expired in 1963 but under Section 18(3) of the Conception Bay Electric Act. 3 Geo. V. 1913 C.4 the United Towns Electric Company still had the right to use the water power of Seal Cove Brook with all the tributaries and lakes draining into the same until the Government exercises its right of pre-emption.

The water rights expired in 1963 but are self renewing on an annual basis.

NEWFOUNDLAND POWER

DAM LISTING - SEAL COVE SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
White Hill Pond	Dam	B	Concrete Buttress	1943	365.0	4.0
	Spillway	B	Concrete		55.0	1.2
Soldiers Pond	Dam/spillway	C	Earthfill & Rockfill, Timber Crib	1963/ 1992	185.0	3.1
	Spillway	C			15.0	
	Outlet	C	Rockfill, Timber Crib		31.0	3.1
Fenelons Pond	Dam/Spillway/Outlet	C	Earthfill	1985	221.0	5.5
	Spillway	C			26.0	

SEAL COVE HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: SCV-G1

Turbine Horsepower	1500
Turbine Type	Horizontal Francis
Generator (KVA)	1500
Power Factor	0.85
RPM	450
CFS	260
Gross Head (m)	57.9
Net Head (m)	55.5
Penstock	1220m - 2134mm woodstave
Drainage Area (Sq. Km.)	77.7
Plant Factor (Kwh/cfsd)	278
Surge Tank Height (m)	
Year Commissioned	1924
Water Rights Expiry (year)	Expired in 1963 but is self renewing on an annual basis

SEAL COVE HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: SCV-G2

Turbine Horsepower	**3040**
Turbine Type	**Horizontal Francis**
Generator (KVA)	**3000**
Power Factor	**0.85**
RPM	**514**
CFS	
Gross Head (m)	
Net Head (m)	
Penstock	
Drainage Area (Sq. Km.)	
Plant Factor (Kwh/cfsd)	
Surge Tank Height (m)	
Year Commissioned	**1926**
Water Rights Expiry (year)	

4.3 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.

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 spillway consisting of concrete piers and timber stop logs.

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 60 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 centre 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

The structure 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 2.4 m X 1.05 m. This structure was partially rebuilt in 1992.

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

The structure is of rockfill treated timber crib construction with upstream timber facing. It is about 145 m long with a maximum height of about 3.0 m. An overflow spillway section about 25 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.

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 out 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 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.

Water Rights History:

Final licence issued May 10, 1961 for a term of 50 years from October 1, 1960. Origin - Subsection 1 of Section 18 of the Conception Bay Electric Co. Act 3, Geo. V 1913, C.4 and Minute of Council dated November 14, 1919. (See also April 23, 1919.)

In order to establish what property and water rights Newfoundland Light has in the Topsail area, we must begin with the incorporation of "The Conception Bay Electric Company" in 1913.

Under subsection (I) of Section 18 of the Conception Bay Electric Co. Act. 3 Geo. V. 1913 C.4; the Conception Bay Electric Company was granted the exclusive right and franchise for a period of fifty (50) years to construct, install and operate a plant for lighting with electric lights the streets and buildings of the Towns of Brigus, Clarke's Beach, Cupids, Port de Grave, Bay Roberts, Spaniard's Bay, and the villages and country within a radius to be fixed by the Governor-in-Council, to heat by electricity the buildings of the said towns and vicinity, and to generate and supply electricity for power purposes and to construct and operate tramways and street railways

in and near the said towns and vicinity.

Under subsection (2) of Section 18 of the said Act, the Conception Bay Electric Company was given the right to acquire and develop a suitable water power in, adjacent to, or within the radius to be fixed by the Governor-in-Council and the right to use the waters of any brook or brooks, with tributaries and lakes within or adjacent to same.

By an Indenture of Agreement dated the 3Oth. day of June, 1914 the Conception Bay Electric Company assigned and transferred unto the United Towns Electric Company the unexpired term of the exclusive right and franchise and all rights and privileges granted to the Conception Bay Electric Company.

The necessary approval was granted and the radius was defined under Minutes of Council dated the l4th. day of November, 1919 (see also April 23, 1919).

The Minutes of Council stated: "For the purposes of Section 18 of Act 3, Geo. V (1913) Cap. 4, approval is hereby granted for the acquisition and development by the Company of the water power of Seal Cove Brook, Manuels River, and the Topsail Hill Brook within the radius fixed under Section 9 of the said Act, with all their tributaries and lakes draining into the same.

The said Minutes of Council had stated that for the purpose of Section 9 of the Act 3, Geo. V (1913) C.4 the radius therein referred to shall be fixed as including all Towns and Settlements in the Electoral District of Harbour Main, "subject to the rights conferred by the Legislature on the St. John's Street Railway Company and the United Towns Electric Company, and subject also to any existing rights granted to any person under any Act of the Legislature; or by the Governor-in-Council; or which may have been acquired by any person in any manner.

On February 28, 1928 United Towns received a certified copy of the plan of survey of Manuels and Topsail Rivers with the tributaries and lakes draining into same from the Minister of Agriculture and Mines. Work was started at Topsail and the plant started operation in 1931.

Apparently the rights which were granted under Section 18 of the Conception Bay Electric Act 1913, 3. Geo. V. Cap 4. were not sufficiently clear so in 1955 U.T.E. applied for a license which would give the Company authority to develop hydro-electric power from the waters of the Topsail River and Manuels River drainage systems.

This application, made under Part III of the Crown Lands Act, R.S.N. 1952 C.174 was registered at the Department of Mines and Resources on October 3, 1955 and published in the Gazette on October 28, 1958.

On August 18, 1960 U.T.E. received an Interim License for a term of two months for the purposes to use certain lands and to divert, use and store certain waters and requiring the construction or certain works. By authority of the Interim License certain waters were diverted from Thomas Pond on Manuels River via a canal into Topsail Pond Brook watershed thence from the outlet of Topsail Pond through a pipeline to the power plant located at tidewater at the mouth of the brook at Topsail Beach.

United Towns Electric Company completed the works required to be completed by the Interim License and, thus, became entitled to have a Final License issued in its favour.

On May 10, 1961 the Final License was issued for a term of 50 years from October 1, 1960.

NEWFOUNDLAND POWER

DAM LISTING - TOPSAIL SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Topsail Pond	Dam/Spillway/Intake	C	Concrete Gavity	1931	18.3	0.9
	Spillway	C			7.6	
Three Island Pond	Dam/Spillway/Outlet	C	Rockfill, Timber Crib	1987	31.0	1.8
	Spillway # 1	C			11.4	
	Spillway # 2	C			13.0	
Three Arm Pond	Dam/Spillway/Outlet	C	Rockfill, Timber Crib	1992	45.7	1.9
	Spillway	C			6.0	
Paddy's Pond	Outlet Structure	C	Rockfill, Timber Crib	1986	9.0	2.7
	Dam/Spillway	C	Rockfill, Timber Crib	1962	145.0	3.0
	Spillway	C			25.0	
	Freeboard Dam # 1	C	Rockfill, Timber Crib		18.3	1.5
	Freeboard Dam # 2	C	Rockfill, Timber Crib		9.1	1.5

NEWFOUNDLAND POWER

DAM LISTING - TOPSAIL SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Thomas Pond	Dam/Spillway/Outlet	C	Earthfill, Concrete Spillway	1956	520.0	10.7
	Spillway	C			50.0	2.1
	Outlet Structure	C			20.0	5.0
	Canal				1372.0	

TOPSAIL HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

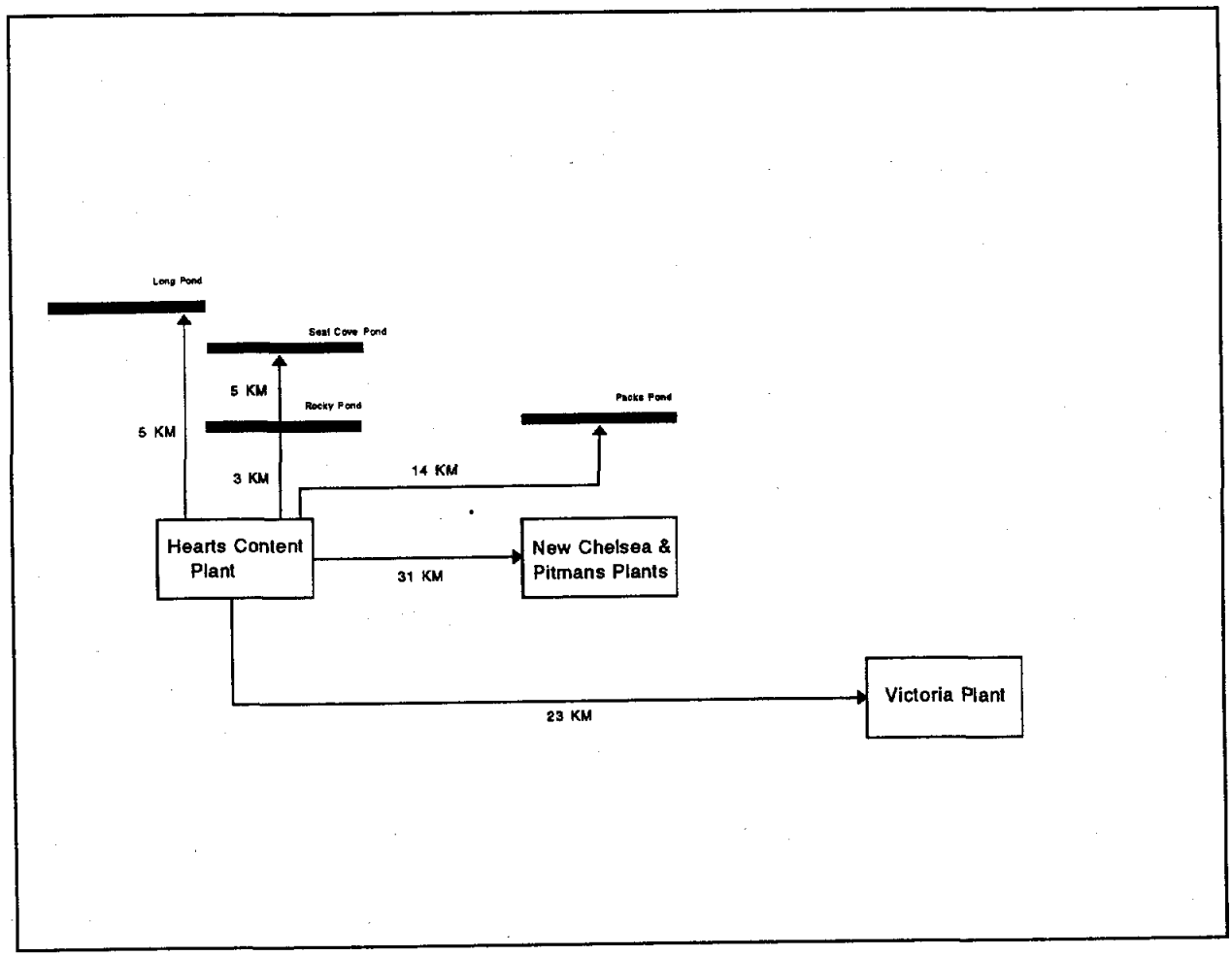
Generator: TOP-G1

Turbine Horsepower	3300
Turbine Type	Francis
Generator (KVA)	2368
Power Factor	0.95
RPM	720
CFS	108
Gross Head (m)	
Net Head (m)	111.2
Penstock	1915m - 1067mm woodstave
Drainage Area (Sq. Km.)	59.8
Plant Factor (Kwh/cfsd)	475
Surge Tank Height (m)	
Year Commissioned	1932
Water Rights Expiry (year)	2010

5.0 HEARTS CONTENT GROUP

The headquarters for these plants is at the Hearts Content Plant. A synopsis of the systems is as follows;

Current Staffing:	1 supervisor/2 plant maintenancemen
Number of Hydro Plants:	4
Number of Hydro Generators:	4
Number and Type of Penstocks:	4 woodstave
Number of Dams:	15
Number of Spillways:	7
Number of Outlets:	8
Number of Canals:	2
Number of Bridges:	1



5.1 HEART'S 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 the control structure at

Hanging Hill Pond is 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.

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 lower 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 is of rockfill treated timber crib construction, approximately 180 m long with a maximum height of 3.0 m. The spillway is located near the centre of the dam and is 15 m long. It has a close sheeted timber face and crest. The outlet structure was reconstructed in 1988 and included a new timber gate with screw stem lift.

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. The upstream timber face was replaced in 1993 at which time an impervious blanket was installed upstream to seal the numerous leaks. The upstream blanket consisted of a mat of bentonite covered with 300 mm of impervious fill.

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 levelled 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 levelled 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.

Water Rights History:

Under Section 1 of the Public Service Company Act, 1917, 8 Geo. Cap 4 the Company was granted the right to the exclusive use of the waters of Heart's Content Stream and the waters of all streams tributary thereto, for the period of 50 years from August 18, 1917.

P.S.E. was also granted all licenses, rights and privileges necessary for the proper and efficient use of electric energy for the production of light, heat and power on all that peninsula of land separating Trinity Bay from Conception Bay subject nevertheless to the rights of U.T.E.

In 1932 U.T.E. acquired all the shares of P.S.E.

A 50 year lease for part of the development, Southern Cove Pond, was issued in 1990.

The water rights expired in 1967.

NEWFOUNDLAND POWER

DAM LISTING - HEART'S CONTENT SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Packs Pond	Dam	B	Earthfill Steel Membrane	1989	91.0	3.0
	Freeboard Dam	B	Earthfill	1918	46.0	1.2
	Canal	B	Earthbank	1918	91.0	0.9
Seal Cove Pond	Dam	C	Timber Crib	1918	213.0	3.0
	Spillway	C	Timber Crib	1918	16.2	0.9
Rocky Pond	Dam/Spillway	B	Earthfill Steel Membrane	1990	127.0	2.8
	Spillway	B			76.0	
Southern Cove Pond	Dam/Canal Inlet	B	Earthfill	1988	120.0	2.0
Long Pond	Dam/Spillway/Outlet	B	Timber Crib	1918	183.0	3.0
	Spillway	B			15.0	
Power Canal and Dyke	Canal	B	Earth Embankment	1918	130.0	2.0
Intake and Forebay Dam	Dam/Intake	B	Timber Crib, Concrete	1918	19.0	1.2

HEART'S CONTENT HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: HCT-G1

Turbine Horsepower	3600
Turbine Type	Vertical Francis
Generator (KVA)	3000
Power Factor	0.85
RPM	514
CFS	260
Gross Head (m)	48.8
Net Head (m)	46.9
Penstock	558m - 1829mm woodstave 21m - 1829mm steel
Drainage Area (Sq. Km.)	89.1
Plant Factor (Kwh/cfsd)	210
Surge Tank	
Year Commissioned	1969
Water Rights Expiry (year)	Expired in 1967

5.2 NEW CHELSEA/PITMANS POND HYDROELECTRIC DEVELOPMENT

General

The New Chelsea/Pitman's Pond Development is located on the east side of Trinity Bay near the community of New Chelsea. Pitmans 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 at latitude 48° 02' and longitude 53° 13', 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 at latitude 48° 04' and longitude 53° 12', contains one generating unit supplied by a woodstave penstock and concrete intake at Pitman's Pond.

Storage reservoirs are provided by structures located at Seal Cove Pond/Lance Cove Pond and Pitman'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

centre 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 (Pitman'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 (Pitman'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 (Pitman's Pond)

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

Tailrace (Pitman's Pond)

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

Penstock (Pitman'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 centre 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.

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 600V 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 120/240V for the station service and also steps up the voltage to 12.5 kV for the distribution line to New Chelsea Substation.

Water Rights History:

Applied for under Part III C.L.A., Chapter 174. Final licence was issued for this development for a term of 50 years from January 1, 1958.

A lease for 50 years from April 23,1986 is also issued for part of this development. The annual lease fee is $1,111.91.

5.3 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 was refurbished in 1983. It is about 90 m long with a maximum height of 7.6 m and incorporates an 11 m long overflow spillway and a dewatering outlet with a 1.5 m X 1.5 m steel gate operated by a handwheel.

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

Water Rights History:

Under Section 29 of the U.T.E. Act 1902, 2 Edward VII Cap 8 the Company was granted an exclusive right to the use of the waters of certain lakes for a period of 50 years from April 22, 1902.

On August 20, 1918 approval was given to U.T.E.'s application for the right to use waters of Fourteen Island Pond, Little and Big Monument Ponds and Packs Big Pond and the ponds forming the sources thereof.

In 1904 the company acquired a crown grant for 43 acres which made the site of the powerhouse.

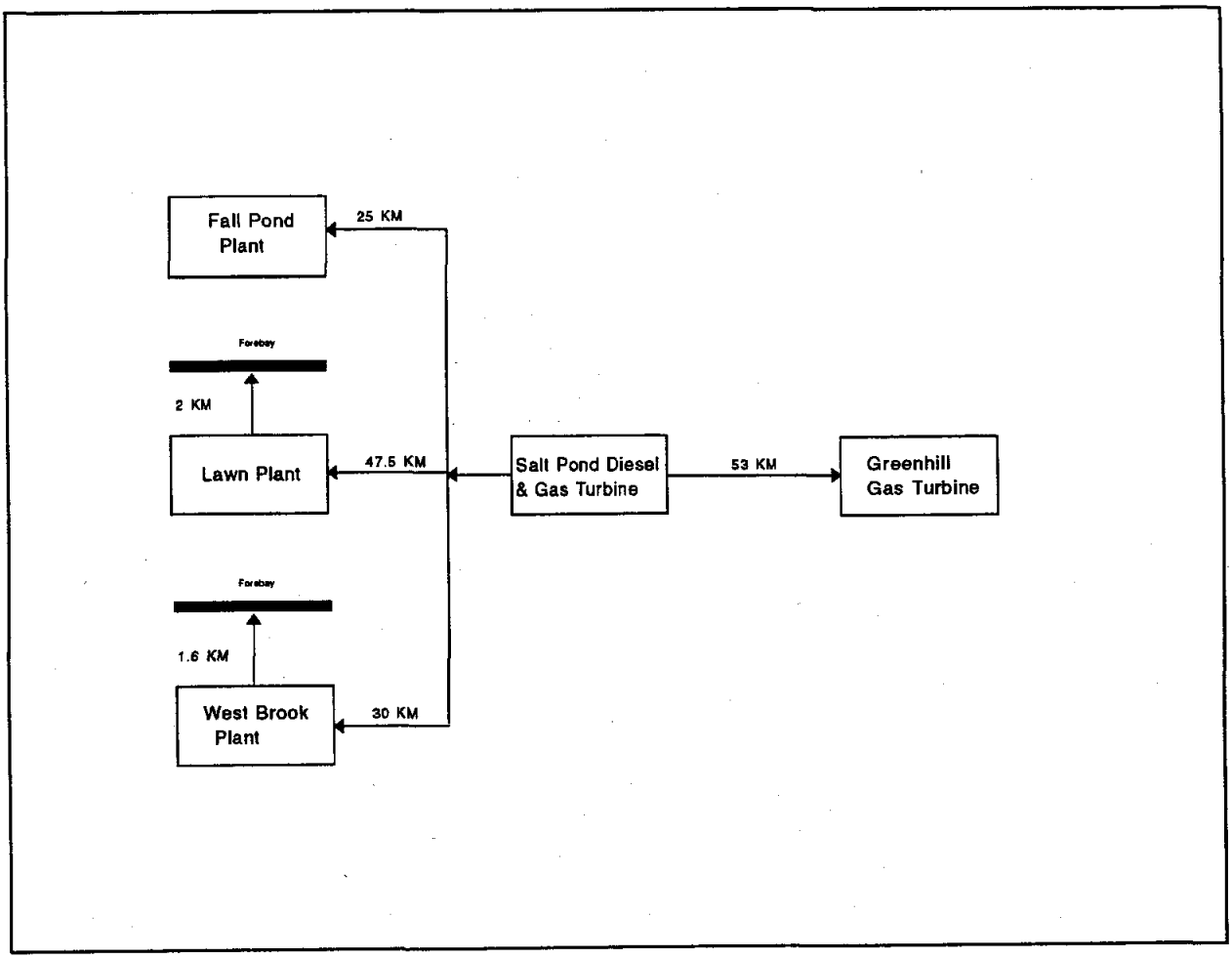
Grant of part of this development, Rocky Pond Dam, was issued in 1989.

The water rights expired in 1952 but are self renewing on an annual basis.

6.0 BURIN GROUP

The headquarters for these plants is at the Salt Pond Area Office. A synopsis of the systems is as follows;

Current Staffing:	1 foreman/3 unattended plant operators/2 maintenancemen (part time)
Number of Hydro Plants:	3
Number of Hydro Generators:	3
Number and Type of Penstocks:	3 2 - woodstave; 1 fibreglass
Number of Dams:	3
Number of Spillways:	3
Number of Outlets:	6
Number of Canals:	1
Number of Diesel Plants:	1
Number of Diesel Generators:	3
Number of Fuel Tanks:	1
Number of Gas Turbines Plants:	2
Number of Gas Turbines:	2
Number of Fuel Tanks:	4



6.1 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 centre 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 stemlift 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 levelled 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 levelled 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 levelled 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.

Water Rights History:

By the Electric Power Service (Burin) Acts 1929-1938 passed October 18, 1938, the Governor-in-Council granted the Company the exclusive right to the use of waters of Waterfall Brook at Little St. Lawrence for the purpose of the development of electrical energy for the production of light, heat and power for a term of fifty (50) years from June 1, 1929. This grant was and is subject to the provisions of the 1929 Act 20, Geo. V. Cap. 4.

NEWFOUNDLAND POWER

DAM LISTING - FALL POND SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Fall Pond	Dam/Spillway/Intake	B	Concrete Buttress	1939	129.0	11.0
	Spillway				33.0	

FALL POND HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: FPD-G1

Turbine Horsepower	**500**
Turbine Type	**Horizontal Francis**
Generator (KVA)	**500**
Power Factor	**0.80**
RPM	**600**
CFS	**121**
Gross Head (m)	**16.2**
Net Head (m)	**15.2**
Penstock	**13m - 1219mm woodstave**
Drainage Area (Sq. Km.)	**33.9**
Plant Factor (Kwh/cfsd)	**76**
Surge Tank	
Year Commissioned	**1939**
Water Rights Expiry (year)	**Expired in 1979**

6.2 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 kW 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 kW 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. The outlet gate is also equipped with a screw stem and gate.

Forebay Spillway

The spillway is a simple concrete overflow weir about 24 m long and about 0.9 m high located in a rock cut adjacent to the main dam.

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 levelled to a stable slope and the opening has been widened.

Sawpit Pond Dam

The structure was of rockfill timber crib construction which 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.

Water Rights History:

By an Act 20 Geo. V Cap IV entitled Electric Power Service (Burin) Act, passed June 1, 1929 the U.T.E. was granted the right to use such part of the power of the waters of North East Brook at Lawn for a period of 50 years from June 1, 1929.

The company purchased the site which included the area of the forebay pond and powerhouse from the Aluminum Company of Canada, Limited in 1981.

Water rights expired in 1979.

6.3 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 levelled 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 levelled 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.

Water Rights History:

December 16, 1940, United Towns Electric Co. Ltd. applied for a 50 year lease under Section 28 of the Crown Lands Act and Amendments thereto. Interim and final licence prepared but never executed.

The plant was rushed to completion before the Interim licence was granted, at request of the Commission for Public Utilities in order to speed up the production of fluorspar which was urgently needed for war purposes.

A copy of the prepared licence is attached. Final licence was applied for in 1990.

Several parcels of land for this development were acquired from Walter E. Seibert in 1943.

6.4 SALT POND GAS TURBINE

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 gas generator, power turbine and generator were originally located in a single enclosure made up of a structural steel substructure and acoustic steel panels. The controls were located in a separate similar structure adjacent to the gas turbine. The batteries were housed in a wooden frame structure with metal siding. In 1993, these structures were replaced with a pre-engineered building.

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 17700 kW and the package was assembled by AEI. Auxiliaries includes, lube oil pumps, lube oil heat exchangers and controls. The gas generator was completely factory overhauled in 1987.

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.

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.

6.5 GREENHILL GAS TURBINE

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. Two 800,000 litre tanks supply the fuel.

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. The gas generator was completely factory overhauled in 1992 following a flame tube cooling ring failure.

Fuel Tanks

Fuel is supplied from two 800,000 litre steel tanks. These tanks are 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.

6.6 SALT POND DIESEL PLANT

General

The Salt Pond Diesel Plant is located in Salt Pond, Burin on the Burin Peninsula. The powerhouse contains three 500 kW diesel generator sets and auxiliaries. This plant was commissioned in 1963. Two 22,700 litre #2 fuel tanks are located outside the powerhouse.

Powerhouse

The powerhouse is approximately 22 m long by 21 m wide by 10 m high and consists of a steel superstructure on a concrete foundation. The walls of the building are constructed of steel siding.

Turbine-Generators

All three diesel-engines were manufactured by Worthington. The generators were manufactured by Electric Machinery and are rated at 625 kVa each. Auxiliaries include lube oil coolers, cooling water system, controls and fuel day tanks.

Fuel Tanks

The two fuel tanks have capacities of 22,700 litres each and are of welded steel construction. The tanks are contained in a concrete dyke. Only one tank is currently used for fuel storage.

Substation

The substation steps the generators' voltage up from 4.16 kV to 66 kV for transmission to the grid. There are three 667 kVa transformers and one 112.5 kVa station service transformer associated with this plant.

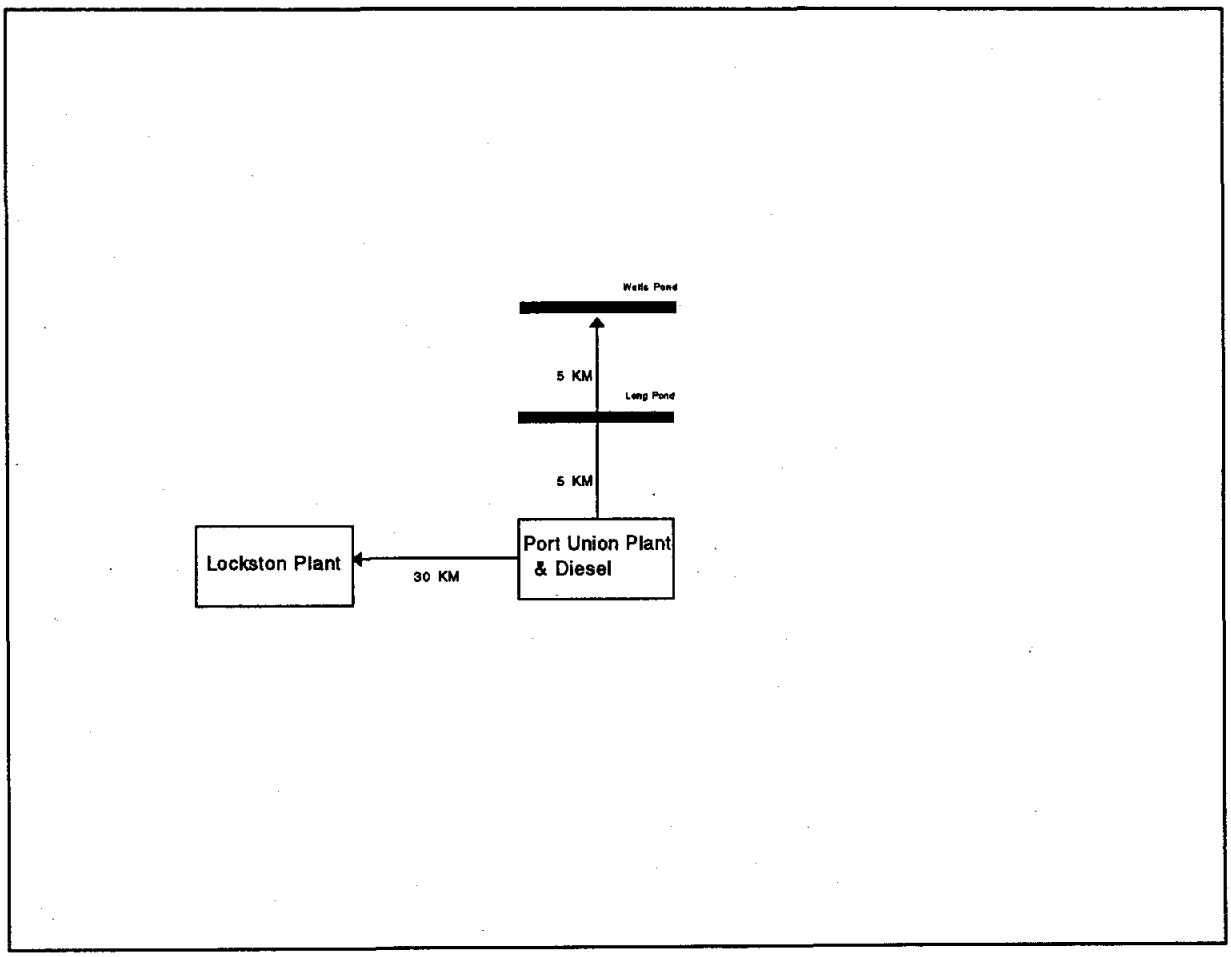
Transmission Line

As the diesel plant feeds directly into the Salt Pond Substation, there is no transmission line associated with the plant.

7.0 BONAVISTA GROUP

The headquarters for these plants is at the Port Union Plant. A synopsis of the systems is as follows;

Current Staffing:	1 supervisor/2 unattended plant operators
Number of Hydro Plants:	2
Number of Hydro Generators:	4
Number and Type of Penstocks:	2 woodstave
Number of Dams:	6
Number of Spillways:	5
Number of Outlets:	8
Number of Canals:	3
Number of Diesel Plants:	1
Number of Diesel Generators:	1
Number of Fuel Tanks:	1



7.1 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, Wells Pond and Halfway Pond. A storage reservoir at Island Pond is 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. Two small bridges over the power canal provide access to the forebay and Whirl Pond Dam.

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 1986 entirely as a spillway. The dam also includes a sluice gate with screw stem lift for unwatering purposes.

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.

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. Repairs were made to the third rockfill timber crib freeboard dam in 1985.

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 timber spillway structure. The timber crib spillway structure was replaced 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.

Water Rights History:

Origin - Act 6 Geo. V Cap 1 (Union Electric Light Co. Act) 1916, Section 14 of the above Act was repealed by Section 19 of the Act, 1944, No. 3, and Union Electric Light and Power Company Act, 1944, No 4. Read in

conjunction with each other, they are cited as Union Electric Light and Power Company Acts (1916-1944).

A grant for 80 acres was given around 1918 and can be found in Volume 105 Fol. 13.

The grant was issued for part of the development in 1990.

Water rights expired in 1964.

7.2 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.

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 treated timber superstructure.

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 timber gates 1.4 m wide X 1.6 m high. The gate operators consist of screw stems and handwheels mounted on steel frames. The canal is about 3.7 m wide and excavated through a low spot to connect to a natural channel draining to Rattling Pond.

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.

Water Rights History:

Origin - Act 6 Geo. V Cap 1 (Union Electric Light Co. Act) 1916, Section 14 of the above Act was repealed by Section 19 of the Act, 1944, No. 3, and Union Electric Light and Power Company Act, 1944, No 4. Read in conjunction with each other, they are cited as Union Electric Light and Power Company Acts (1916-1944).

By an Agreement dated October 29, 1954 between the Government and Union Electric, the Government granted to the Company certain exclusive franchises, rights, licenses, concessions and privileges on the Bonavista Peninsula. This Franchise Agreement was ratified and confirmed by statute in 1955 (see 1955 No. 44). Under the Franchise Agreement the Company agreed to establish a hydro electric plant on the Bonavista Peninsula and to supply hydro power to certain areas therein described. Under Clause 2(a) of the Agreement the Government agreed that it would grant to the Company (during the term of fifty (50) years from October 29, 1954) a lease of and the right to use and develop the water power in (i) the drainage area of Trinity Pond and Trinity River, that river draining Trinity Pond into Trinity Bay, at Lockston. (ii) The drainage area of Trouty Brook which flows into Trinity Bay at Trouty.

The Government has not given such a lease. Union Electric had applied for the Lease but the correspondence on the application ended in 1962.

A lease for 50 years from June 7,1985 is issued for part of this development.

NEWFOUNDLAND POWER

DAM LISTING - LOCKSTON SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Trinity Pond	Outlet	C	Concrete	1955	5.5	1.6
Rattling Pond	Dam	C	Concrete Gravity	1955	24.0	2.5
	Spillway	C	Concrete Gravity	1955	16.5	1.2
Canal/Forebay	Dam/ Canal Walls/Intake	C	Concrete	1955		1.2
	Canal				565.0	

LOCKSTON HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: LOK-G1

Turbine Horsepower	2000
Turbine Type	Horizontal Francis
Generator (KVA)	1500
Power Factor	0.80
RPM	720
CFS	
Gross Head (m)	82.3
Net Head (m)	82.2
Penstock	610m - 1524mm woodstave
Drainage Area (Sq. Km.)	40.1
Plant Factor (Kwh/cfsd)	412
Surge Tank	
Year Commissioned	1956
Water Rights Expiry (year)	

LOCKSTON HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: LOK-G2

Turbine Horsepower	**2000**
Turbine Type	**Horizontal Francis**
Generator (KVA)	**1500**
Power Factor	**0.80**
RPM	**720**
CFS	
Gross Head (m)	
Net Head (m)	
Penstock	
Drainage Area (Sq. Km.)	
Plant Factor (Kwh/cfsd)	
Surge Tank	
Year Commissioned	**1956**
Water Rights Expiry (year)	

7.3 PORT UNION DIESEL PLANT

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 9100 litre fuel tank, controls and auxiliaries. The unit was commissioned in 1962.

Powerhouse

The powerhouse contains the diesel set and two hydroelectric generating units.

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 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.

Transmission Line

There is no transmission line associated with this unit.

8.0 RATTLING BROOK GROUP

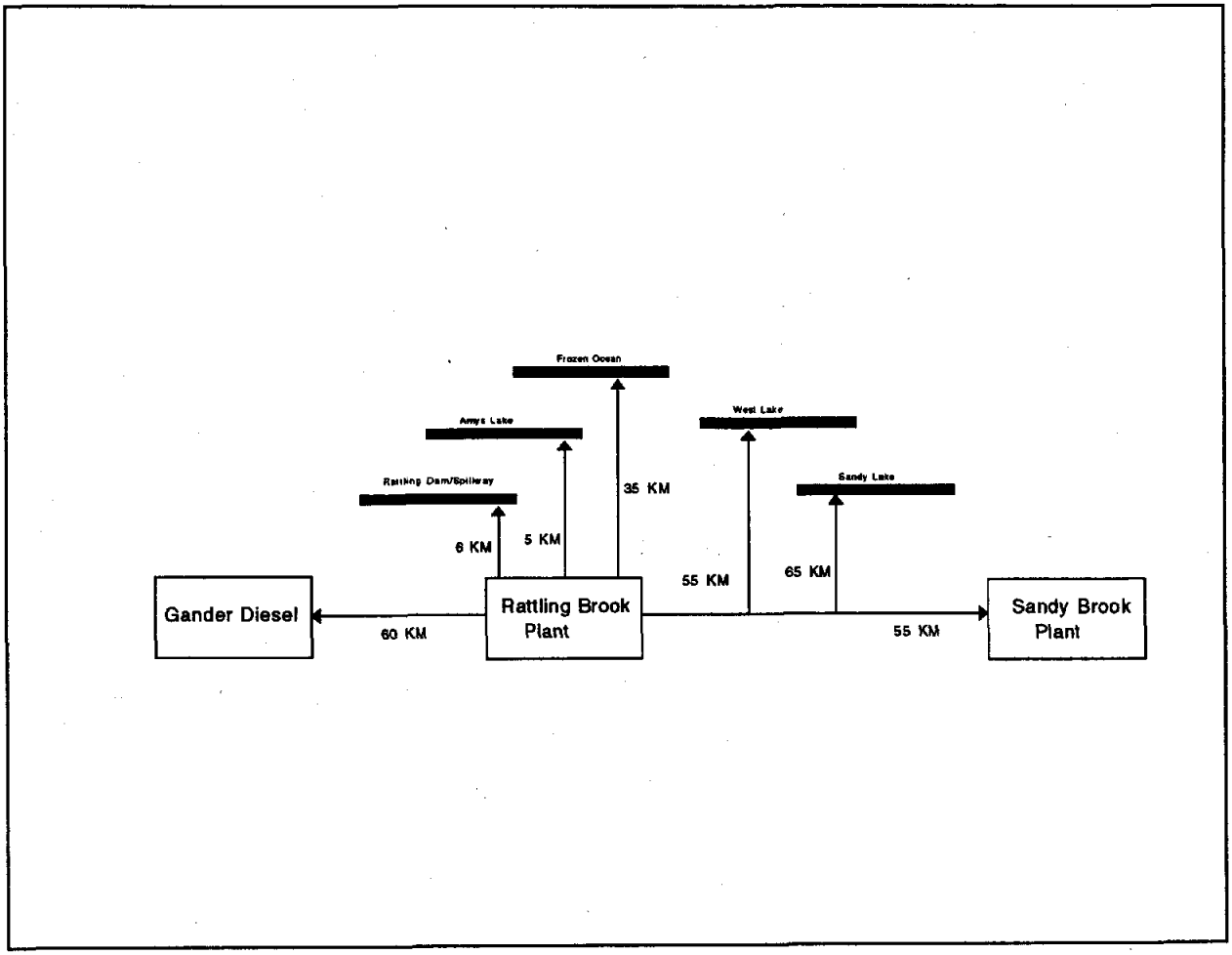
The headquarters for these plants is at the Rattling Brook Plant. A synopsis of the systems is as follows;

Current Staffing: 1 supervisor/2 plant maintenancemen

Number of Hydro Plants: 2
Number of Hydro Generators: 3
Number and Type of Penstocks: 2 woodstave
Number and Type of Surge Tanks:2 steel/wood frost casing

Number of Dams: 9
Number of Spillways: 7
Number of Outlets: 6

Number of Diesel Plants: 1
Number of Diesel Generators: 3
Number of Fuel Tanks: 1



8.1 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.

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 spillwater 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 are about 30 m high and are supported by 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 levelled and the opening has been

widened.

Substation

The generated voltage of 6.9 kV is stepped down to 230 V for the station service and 120/208 V for normal supply to the Central Control Centre. 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. Also formerly associated with this development but not part of it is the Central Control Centre which is on the same property.

Water Rights History:

An Interim Licence for a three year period was issued for Rattling Brook January 1, 1957. There is no final licence. Water rights were acquired for part of the development from Reid Newfoundland Company Limited, Mines and Forests (Newfoundland) Limited, Gander Valley Power and Paper Company Limited and The Royal Trust Company in an agreement dated September 11, 1957 for a term of fifty years. The land required for the project were purchased from Reid Nfld. Company Limited and Mines and Forests (Newfoundland) Limited, February 26, 1964. Registered in Volume 669, Folios 295-309.

8.2 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 kW 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, Diversion Lake and Sandy Lake. Several structures located on West Brook and Sandy Brook are badly deteriorated and have been abandoned.

Powerhouse

The powerhouse is 13.6 m X 13.6 m X 7.6 m high and consists of a steel frame building on a reinforced concrete foundation.

Turbine Generator

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

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 timber gate and a mechanically operated gate lift is located in the spillway section near the left abutment.

West Brook Dams

West Brook has several structures originally built to store water for logging operations by Abitibi-Price Inc. Structures are located at Island Pond, Cripple Back Pond, Three Angle Pond, Leonard's Lake, Baker's Steady and Fudge's Steady.

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 an old 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 removed in 1992.

Three Angle Pond Dam was an old 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 removed in 1992.

Leonard's Lake Dam was an old 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 removed in 1992.

Baker's Steady Dam was an old 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 removed in 1992.

Fudge's Steady Dam was an old rockfill timber crib structure approximately 30 m long. The outlet consisted of two gate openings, each approximately 2.4m wide X 2.4 m high. This structure was removed 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 spillway 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.

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.

Water Rights History:

By Agreement dated June 5, 1963 Anglo Newfoundland Development Co. Ltd. assigned to Newfoundland Light & Power certain rights to Sandy Brook as granted Anglo Newfoundland Development Co. Ltd. by an Act to encourage manufacturing of pulp and paper being Cap. 10, V Edward VII.

There is another agreement dated March 30, 1984 between Abitibi-Price Inc. and Newfoundland Light & Power Co. Limited which transferred the rights to use and develop the rivers and waters for a renewable term of ninety-nine years calculated from January 12, 1905.

8.3 GANDER DIESEL PLANT

General

The Gander Diesel Plant is located in Gander near the airport. The plant contains three 1000 kW diesel generator sets and auxiliaries. The plant was commissioned in 1949 with one engine. The other engines were installed in 1953 and 1957. Two 45,400 litre #2 fuel tanks are located outside the building. The plant was originally owned by the Ministry of Transport and was transferred to Newfoundland Power in 1962. Transport Canada retains ownership of the building and the property.

Powerhouse

The powerhouse is not owned by Newfoundland Power.

Turbine-Generators

Two diesel engines were manufactured by Nolab-Polar with the third built by Polar Atlas. The generators were manufactured by General Electric and are each rated at 1250 kVa. Auxiliaries include coolers, fuel pumps, day tanks and associated controls and switchgear.

Fuel Tanks

The two fuel tanks have capacities of 45,400 litres each. Both tanks are of steel construction. Only one tank is currently used and this is surrounded by a steel dyke.

Substation

The substation steps the generators voltage up from 2.4 kV to 12.5 kV via three 1000 kVa transformers. There are three small station service transformers associated with this plant.

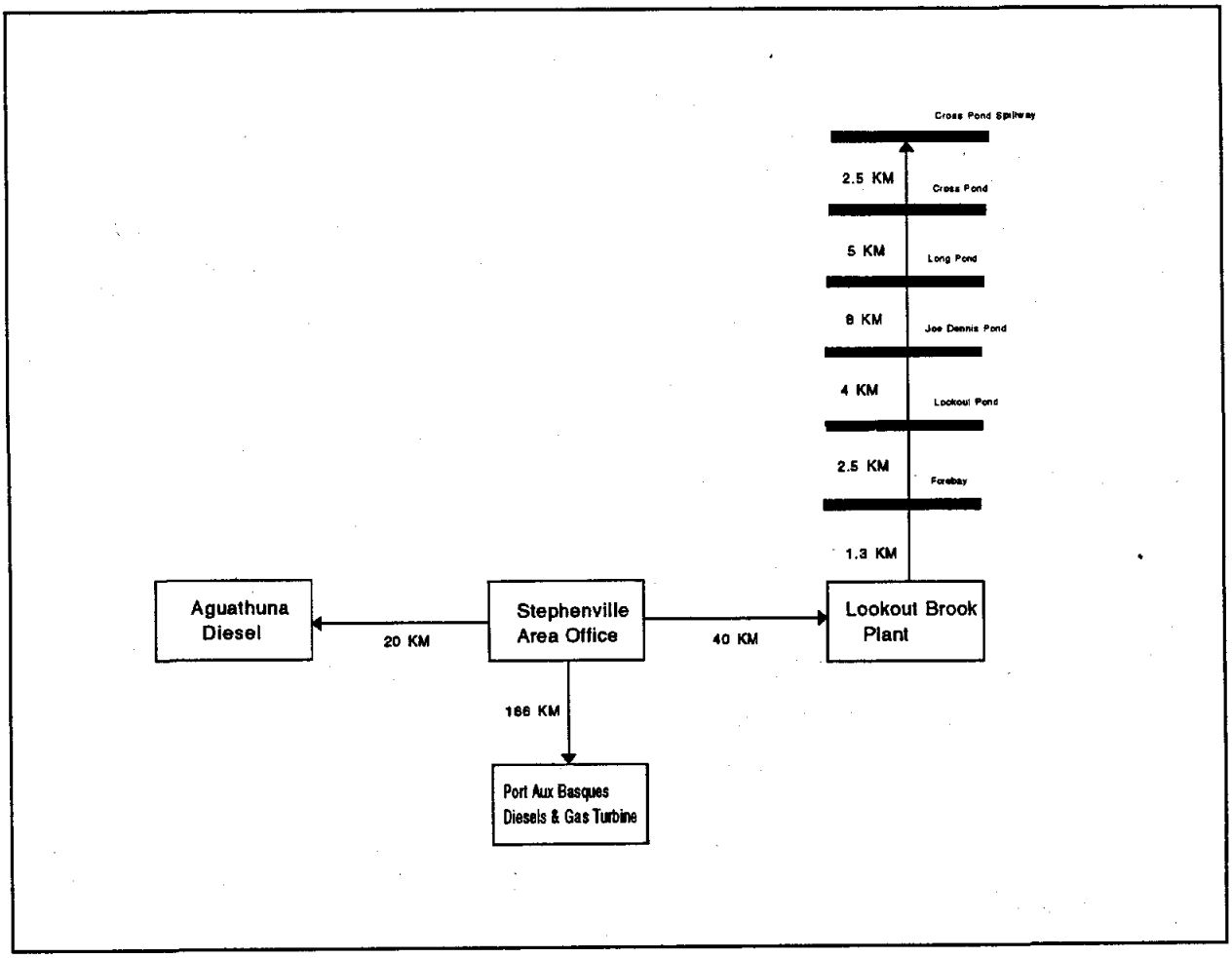
Transmission Line

The diesel plant connects to a distribution line and does not have a transmission line associated with it.

9.0 STEPHENVILLE GROUP

The headquarters for these plants is at the Salt Pond Area Office. A synopsis of the systems is as follows;

Current Staffing:	1 supervisor/3 unattended plant operators/2 maintenancemen (part time)/1 diesel operator (part time)
Number of Hydro Plants:	1
Number of Hydro Generators:	2
Number and Type of Penstocks:	1 fibreglass/steel
Number of Dams:	3
Number of Spillways:	4
Number of Outlets:	4
Number of Diesel Plants:	4
Number of Diesel Generators:	10
Number of Fuel Tanks:	6
Number of Gas Turbines Plants:	1
Number of Gas Turbines:	1
Number of Fuel Tanks:	1



9.1 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 5000 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, Long Pond and Cross Pond. A storage reservoir at Lookout Pond is 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 pitch and gravel roof.

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 fibreglass 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 fibreglass 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 dam with an upstream concrete face about 66 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.

A concrete overflow spillway with an ogee crest and 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.

Joe Dennis Pond Dam, Spillway, Outlet and Side Dyke

The main 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 structure with a 1.8 m X 1.8 m timber gate and a screw stem gate lift 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 gate section and adjacent earthfill was reconstructed in 1992 to replace the gate structure that was washed out in that same year.

Long Pond Dam, Spillway and Outlet

The dam is about 198 m long with a maximum height of about 3.6 m and incorporates an overflow spillway and outlet structure. The entire dam is of rockfill untreated local timber crib construction. The spillway section is about 30 m long and was rebuilt in 1987 with untreated local timber cribbing enclosed by treated timber decking. The outlet is 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 with vertical timber stoplogs.

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.

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 levelled 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 large metal pipe arch culvert which replaced a timber bridge, and various small drainage culverts provide access to the development.

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

Water Rights History:

On July 25, 1944 West Coast Power Company Limited, St. George's Lumber Company, and the Royal Trust Company signed an agreement whereby West Coast Power Company Limited received certain rights (including, but not necessarily limited to, water power rights) at Lookout Brook for a term of 99 years from April 17, 1913.

Subsequently the West Coast Power Company Limited established and operated a hydro-electric power plant (installed capacity 3800 H.P.) on Lookout Brook.

In January, 1951 West Coast Power Company Limited applied under Section 28, Crown Lands Act, 1930 to divert the waters of Cross Pond watershed into Lookout Brook watershed to augment the water supply from the Lookout Brook watershed.

On December 8, 1951 the Company was informed that its application was approved at a meeting of the Executive Council held on June 28, 1951 and that the Department of the Attorney General was preparing the necessary Interim Licence as required under the C.L.A. 1930. This licence was granted subject to the condition that the Company relinquish its "exclusive" right (as set forth in the Act No. 58 of 1944) in that section of its franchise area from Heatherton to and including the Codroy Valley if others can provide electric service therein before it does.

This the Company agreed to but still retained a non-exclusive franchise to supply the area.

The Interim Licence was executed on December 11, 1952, the works specified in the licence, i.e., construction of dam across Cross Pond Brook and canal from Cross Pond to Long Pond were completed and put into operation.

The Company then requested that a Final Licence be issued for a period of fifty (50) years from January 1, 1953. This Final Licence was not received.

The agreement between West Coast Power Company Limited, St. George's Lumber Company and the Royal Trust Company referred to in the first paragraph of this report, gave the Company its rights to use the water power of Lookout Brook watershed. This deed is registered in Volume 1985, Folios 233-239 inclusive at the Registry of Deeds for Newfoundland.

NEWFOUNDLAND POWER

DAM LISTING - LOOKOUT BROOK SYSTEM

Reservoir	Structure	Class	Type	Year Built	Length (m)	Height (m)
Forebay	Dam/Spillway/Intake	C	Concrete, Rock Grouted in Place	1989	66.0	5.4
	Spillway	C	Concrete		16.0	
Joe Dennis Pond	Main Dam/Spillway /Steel Membrane	C	Earthfill	1990	135.0	6.0
	Spillway				30.0	
	Side Dam	C	Earthfill	1990	240.0	2.0
	Side Dyke	C	Earthfill	1990	92.0	3.0
Long Pond	Dam/Spillway/Outlet	C	Timber Crib	1945	198.0	3.7
	Spillway		Timber Crib	1987	30.0	
Cross Pond	Canal				92.0	
	Dam/Spillway	C	Earthfill, Steel Membrane	1983	76.0	4.6

LOOKOUT BROOK HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: LBK-G3

Turbine Horsepower	3600
Turbine Type	Horizontal Francis
Generator (KVA)	3000
Power Factor	0.80
RPM	900
CFS	69.5
Gross Head (m)	167.7
Net Head (m)	154.6
Penstock	974m - 1525mm fibreglass; 2 - 640m - 914mm steel
Drainage Area (Sq. Km.)	82.4
Plant Factor (Kwh/cfsd)	834
Surge Tank	
Year Commissioned	1958
Water Rights Expiry (year)	2012

LOOKOUT BROOK HYDROELECTRIC DEVELOPMENT

PLANT DATA SHEET

Generator: LBK-G4

Turbine Horsepower	**4108**
Turbine Type	**Francis**
Generator (KVA)	**2889**
Power Factor	**0.90**
RPM	**900**
CFS	
Gross Head (m)	
Net Head (m)	
Penstock	
Drainage Area (Sq. Km.)	
Plant Factor (Kwh/cfsd)	
Surge Tank	
Year Commissioned	**1983**
Water Rights Expiry (year)	

9.2 AGUATHUNA DIESEL PLANT

General

The Aguathuna Diesel Plant is located at Aguathuna on the Port aux Port Peninsula. The powerhouse contains one 1200 kW diesel generator set and auxiliaries. This plant was commissioned in 1962. A 91,000 litre #2 diesel fuel tank is located next to the powerhouse.

Powerhouse

The powerhouse is approximately 25 m long by 17 m wide by 8 m high and consists of a structural steel substructure on a concrete foundation. The building walls are constructed of metal siding.

Turbine-Generator

The diesel engine was manufactured by Harland and Wolff and is rated at 2000 HP. The generator was also manufactured by Harland and Wolff and has a rating of 1200 kW. The plant also contains auxiliaries such as lube oil cooler, pumps, day tank, switchgear and compressors.

Fuel Tank

The fuel tank is a 91,000 litre tank of steel construction. The tank is surrounded by a concrete dyke. There is # 2 diesel fuel stored in the tank.

Substation

The substation steps the generator voltage up from 2.4 kV to 66 kV for transmission to the grid. There is one 1.5 mVa transformer and two small station service transformers associated with this plant.

Transmission Line

The transmission line is a 1.23 km long, 66 kV, single pole structure that runs to the Aguathuna Tap.

9.3 PORT AUX BASQUES DIESEL PLANT

General

The Port aux Basques Diesel Plant is located in the community of Port aux Basques. The powerhouse contains six diesel generator sets ranging in size from 262 kVa to 438 kVa. A 3250 kVa packaged diesel generator set is located adjacent to the main building. Auxiliaries include coolers, fuel tanks, day tanks 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 six diesel generator sets installed in the powerhouse were all manufactured by Caterpillar. The capacities of the sets are 438 kVa, 262 kVa, 312 kVa, 312 kVa, 438 kVa and 282 kVa. These units were installed between 1945 and 1965. 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 separate control room.

Fuel Tanks

All of the diesel generators are supplied with # 2 fuel from two 26,000 litre steel tanks. Three 2300 litre day tanks are located outside the powerhouse. The two main tanks are contained in a concrete dyke as are the three day tanks.

Substation

The voltage of the six generators in the main powerhouse is stepped up from 2.4 kV to 4.16 kV by the substation. The packaged diesel generates at 4.16 kV and does not require transformation. There is one 600 kVa transformer, one 1 MVa transformer and one station service transformer associated with this plant.

Transmission Line

This plant ties directly into the Port aux Basques substation and does not have a transmission line associated with it.

9.4 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. These units are currently stationed at the Grand Bay Substation in Port Aux Basques.

Powerhouses

All equipment is contained in the trailers. There are steel frame structure 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.

9.5 MOBILE GAS TURBINE

General

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. This unit is currently stationed at the Grand Bay Substation in Port Aux Basques.

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. The gas generator was completely factory overhauled in 1990 following failure of the unit thrust bearing.

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.

10.0 ST. JOHN'S THERMAL

The headquarters for these plants is at the St. John's Steam Plant. A synopsis of the systems is as follows;

Current Staffing:	1 superintendent (acting)/4 plant operators/ 1 utility man
Number Of Steam Plants:	1
Number of Turbine Generators:	2
Number of Fuel Tanks:	2
Number of Diesel Plants:	6
Number of Diesel Generators:	6
Number of Fuel Tanks:	6

Note: The personnel at the Steam Plant are used for power plant maintenance for the entire system when the plant is not in operation. They are also responsible for the regular maintenance of the emergency diesels located at Head Office, Duffy Place, System Control Centre, Carbonear and Central Control Centre.

10.1 ST. JOHN'S STEAM PLANT

General

The St. John's Steam Plant is located on the Southside Road in St. John's. Unit # 1, a 10 MW steam unit was commissioned in 1956 and Unit # 2, a 20 MW steam unit was commissioned in 1959. The turbines, boilers and associated auxiliaries are housed in a common powerhouse. A 8,700,000 litre Bunker "C" fuel tank located on the hill above the plant used to be the main fuel supply. The current fuel supply of # 2 diesel is taken from a 45,400 litre self dyked tank located in front of the powerhouse. Makeup water is taken from Soldiers Pond which is located on Southside Hill above the powerhouse.

Powerhouse

The powerhouse is approximately 40 m long X 30 m wide X 14 m high and consists of a structural steel substructure and concrete foundation. The walls are made from asbestos panelling. The interior of the building is insulated with asbestos board and sprayed on asbestos.

Turbine-Generator/Boilers

Unit # 1 consists of a 10 MW Metropolitan Vickers steam turbine and generator. The boiler was manufactured by Babcock and Wilcox and is rated at 110,000 lb/hr at 410 psi and 750 F. Unit # 2 is comprised of a 20 MW Metropolitan Vickers steam turbine and generator. The boiler was manufactured by Babcock and Wilcox and is rated at 190,000 lb/hr at 850 psi and 900 F.

Auxiliaries consist of feedwater heaters, cooling water pumps, boiler feed pumps, condensate extraction pumps and forced and induced draft fans.

Fuel Tank

The unused Bunker 'C' fuel tank is of steel construction and has a capacity of 8,700,000 litres. This is surrounded by a concrete dyke. The current fuel supply is a self dyked 45,400 litre tank of steel construction. This tank holds # 2 fuel which is burnt at the plant instead of Bunker 'C'.

Water Supply

The makeup water supply consists of a 1045 m long pipeline, a concrete dam, a pumphouse, a timber construction spillway dam, a pressure reducing tank and approximately 1220 m of 2 phase distribution line.

Substation

The substation steps the generator voltage up from 13.8 kV to 66 kV for transmission to the main grid. There is one 10 MVA transformer and one 20 MVA transformer associated with this plant. There are also two station service transformers which supply 575 volts to the powerhouse for auxiliaries.

Transmission Line

The transmission line is a 2.41 km long, 66 kV, H frame structure that runs to the St. John's Main Substation.

10.2 ST. JOHN'S DIESEL PLANT

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 and auxiliaries and was commissioned in 1953. A 35,500 litre # 2 diesel fuel tank is located on the back 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 are constructed of asbestos siding.

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 35,500 litre steel tank of rivitted construction. The tank is partially surrounded by a concrete dyke. 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 kV 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.

11.0 POWER PLANT PERSONNEL DUTIES

The Supervisors of Power Plants report to the Superintendent of Generation. They along with their staff are responsible for the operation and maintenance of all plants under their jurisdiction, including all ancillary facilities such as dams, plant equipment, fuel tanks and substations. Specifically, the Supervisor is responsible for;

- supervision of staff
- operation and maintenance of the generating plants
- operation and maintenance of the water systems supplying the plants ensuring the efficient use of the water
- making regular equipment and dam inspections and submit reports on conditions
- preparation of switching orders and carrying out switching duties on lines and generation facilities
- ensuring adequate maintenance is performed on dams, canals, pipelines, surge tanks, power equipment, buildings, fuel tanks and other equipment related to the operation
- assisting with major unit overhauls and capital projects
- maintain adequate spares
- gathering required field data such as water levels
- monitoring and controlling expenditures related to the facilities
- preparing and participating in the capital and operating budget process
- planning, organizing directing and controlling the activities of staff ensuring compliance with Company policy and regulatory bodies
- liaising with local councils, companies and private citizens affected by the Company's activities
- enforcing safety
- administering the Labour Collective Agreement
- completing necessary administrative duties

A maintenance foreman or lead hand is required to provide support to the Power Plant Supervisor in properly operating and maintaining the power plant and ancillary systems. A foreman is required when a group of plants is remote from the Supervisor's headquarters such that the Supervisor cannot adequately control the day to day activities at the plants. The foreman is responsible for many of the same duties as the Supervisor except those of a completely supervisory or management nature.

Appendix A lists the type and frequency of necessary operating and maintenance duties necessary for hydro, diesel and gas turbine plants. Appendix C contain examples of the inspections necessary for the safe and reliable operation of the power plant facilities.

12.0 PROPOSED STAFFING

Necessary staffing for the various plants has been reviewed based on the number of plants in a group, required duties and physical distances involved. Time required to perform the necessary power plant maintenance and operation activities were tabulated using the duty lists contained in Appendix A. In general, a typical hydro plant requires a total labour requirement of 556 days per year, a gas turbine plant requires 157 day per year, a normal standby diesel plant 115 days per year and an essential standby diesel plant 246 days per year (Appendix B). The necessary staffing per area was determined using 194 available work day per year to account for vacation, sick leave, statutory holidays, etc. In addition to normal scheduled work, the typical hydro plant requires two temporary labourers for 4 to 5 months per year to assist with activities such as clearing brush, treating and repairing pipelines, treating and repairing surge tanks, debris clearing, dam repair, spillway repair and general watershed maintenance. The typical hydro plant number was based on Cape Broyle/ Mobile groups. The number of plants and the nature of the areas covered by other plant groups were taken into account and the required workforce varied to accommodate the differences from the typical plant.

This review is summarized in the following table;

Plant Group	Supervisor	Lead Hand	Temp. Labourer	Plant Maintenance man
Cape Broyle	1		2	2
Mobile	1		2	2
Petty Harbour	1			2
New Chelsea	1			2
Burin	1			3[1]
Bonivista		1		1
Rattling Brook	1		2	2
Stephenville	1			4[2]

Notes:
1.) This includes 1 gas turbine/diesel operator
2.) This includes 1 gas turbine/diesel operator and 1 part time (as needed for operation) gas turbine/diesel operator

A summary of the power plant groups and the required worker-days is presented below;

PLANT GROUP	# HYDRO PLANTS	# STRUCTURES	# PIPELINES	# GAS TURBINES	# DIESELS	WORKER-DAYS REQUIRED
Cape Broyle	3 (3 units)	79	3	0	0	756
Mobile	4 (6 units)	26	4	0	0	756
Petty Harbour	3 (6 units)	37	3	0	0	556
New Chelsea	4 (4 units)	33	4	0	0	556
Burin	3 (3 units)	13	3	2 (2 units)	1 (3 units)	675
Bonivista	2 (4 units)	22	2	0	1 (1 unit)	362
Rattling Brook	2 (3 units)	22	2	0	1 (3 units)	756
Stephenville	1 (2 units)	11	1	1 (1 unit)	4 (10 units)	814

In addition to the above personnel a regular maintenance group is required to perform necessary maintenance on plants that fall outside the scope of the plant personnel's duties. This would include work such as capital works, major overhauls, preventative maintenance, major annual inspections, plant assessments and trouble resolution. It is proposed that this maintenance group be comprised of two crews each made up of one lead hand and two maintenance mechanics. The crews would report to a supervisor for a total maintenance staff of seven people. These people would be stationed in St. John's but be responsible for maintenance activities on all types of plants across the island. They would be trained in the operation of the mobile generation equipment and be utilized in the event of system problems. The group would also be responsible for the routine maintenance on the St. John's Steam Plant, St. John's Diesel Plant and system emergency diesels located at Kenmount Road, Topsail Road, Duffy Place, Carbonear and Rattling Brook.

APPENDIX A

POWER PLANT MAINTENANCE PERSONNEL

The Power Plant Maintenance Personnel shall be assigned to a group of plants and shall perform tasks necessary for the maintenance and operation of his respective plants and ancillary facilities.

Without limiting the generality of the foregoing statement, the duties will include:

NO.	DESCRIPTION	SEMI-WEEKLY	WEEKLY	MONTHLY	BI-MONTHLY	SEMI-ANNUALLY	AS REQ'D
1.	Start and Stop Plant.						X
2.	Stand shift and operate plant.						X
3.	Visit each powerhouse.	X					X
4.	Routine check of all generating equipment and facilities.	X					X
5.	Dust machinery, wipe up oil spills, routine clean up & touch up painting.		X				X
6.	Check and record bearing temperatures and oil levels.	X					X
7.	Add oil &/or grease to rotating equipment.		X				X
8.	Inspect generator brush gear.	X					X
9.	Clean commutator, slip rings and all water strainers.		X				X
10.	Check battery water levels and record specific gravity and voltage readings.			X			X
11.	Add water to battery and record.						X
12.	Assist maintenanceman when doing work at respective plants.						X
13.	Prepare reports.						X
14.	Replace burnt out light bulbs, etc.						X

DIESEL PLANT MAINTENANCE

& OPERATIONS

NO.	DESCRIPTION	SEMI WEEKLY	WEEKLY	MONTHLY	BI-MONTHLY	ANNUALLY	AS REQ'D
1.	Operate Plant						X
2.	Turn Engine		X				
3.	Run Engine SNL			X			
4.	Run Engine to Full Load				X		
5.	Fuel Tank Level		X				
6.	Production/Station Service Readings			X			
7.	Generation/Operation Data Log				X		
8.	Visit Powerhouse		X				
9.	Check All Equipment		X				
10.	Clean machinery, wipe up oil spills		X				
11.	Check oil and coolant levels		X				
12.	Grease/Oil Equipment		X				
13.	Clean commutator/slip rings/strainers			X			
14.	Check Battery Water Levels & Record Specific Gravity & Maintain			X			X
15.	Check Air Compressors & Air Pressure			X			

GAS TURBINE PLANT MAINTENANCE

& OPERATIONS

NO.	DESCRIPTION	SEMI WEEKLY	WEEKLY	MONTHLY	BI-MONTHLY	ANNUALLY	AS REQ'D
1.	Operate Plant						X
2.	Perform Normal Start & Run to Full Load			X			
3.	Perform Black Start			X			
4.	Check Fuel Tank Level		X				
5.	Production/Station Service Readings			X			
6.	Generation/Operation Data Log			X			
7.	Visit Powerhouse		X				
8.	Check Control Panel, Bulbs, Charts, etc.		X				
9.	Check Inverter			X			
10.	Check Battery Charger			X			
11.	Check Battery Water Levels, Record Specific Gravity and Maintain			X			X
12.	Check Oil and Coolant Levels			X			
13.	Check Oil and Coolant Levels		X				
14.	Grease/Oil Equipment		X				
15.	Check Air Compressors & Air Pressure			X			

APPENDIX B

HYDRO PLANT MAINTENANCE & OPERATION
STAFF REQUIREMENTS

Based on task lists contained in Appendix A

ACTIVITY	HRS/WEEK	HRS/MONTH	HRS/YEAR
1&2			25
3			
4			
5	1		
6			
7&8	1		
9	1		
10&11	1		
12			25
13			
15&16			25
17&18	5		
19	1		
20	1		
21	1		
22,26&31	20		
23			5
24	2		
25	6		
27	8		
28			
29	4		
TOTALS	52		80
TOTALS/YR	541 day/yr		16 day/yr

Total labour requirement is 556 days per year. Using a total of 194 available work days per worker, the total required workforce is 3 workers for the average hydro plant. group.

GAS TURBINE PLANT MAINTENANCE & OPERATION
STAFF REQUIREMENTS

Based on task lists contained in Appendix A

ACTIVITY	HRS/WEEK	HRS/MONTH	HRS/YEAR
1			50
3		2	
4	1		
8	1		
9,10&11	1		
12		2	
13	2		
15	1		
16		1	
17		1	
18		1	
19	1		
20		0.5	
21			
22			25
23	2		
24	1		
25	1		
27			25
TOTALS	11	9.5	100
TOTALS/YR	114 day/yr	23 day/yr	20 day/yr

Total labour requirement is 157 days per year. Using a total of 194 available work days per worker, the total required workforce is 1 worker for the average gas turbine plant.

STANDBY DIESEL PLANT (OTHER) MAINTENANCE & OPERATION
STAFF REQUIREMENTS

Based on task lists contained in Appendix A

ACTIVITY	HRS/WEEK	HRS/MONTH	HRS/YEAR
2	1		
3		1	
4		0.5	
5	0.5		
6&7			
8			
9	1		
10	1		
11	0.5		
12	0.5		
13		1	
14	1		
15		0.5	
16			
17		0.5	
18		0.5	
19	1		
20			25
23	2		
24	1		
26			5
27			
TOTALS	9.5	4	30
TOTALS/YR	99 day/yr	10 day/yr	6 day/yr

Total labour requirement is 115 days per year. Using a total of 194 available work days per worker, the total required workforce is 0.6 worker for the average standby diesel plant.

STANDBY DIESEL PLANT (PAB) MAINTENANCE & OPERATION
STAFF REQUIREMENTS

Based on task lists contained in Appendix A

ACTIVITY	HRS/WEEK	HRS/MONTH	HRS/YEAR
2	4		
3		4	
4	0.5		
5			
9	3		
10	4		
11	2		
12	2		
13		3	
14	1		
15		0.5	
17		2	
18		2	
19	1		
20			25
23	2		
24	1		
27			5
TOTALS	20.5	11.5	30
TOTALS/YR	213 day/yr	27 day/yr	6 day/yr

Total labour requirement is 246 days per year. Using a total of 194 available work days per worker, the total required workforce is 1 worker for the average standby diesel plant.

Newfoundland Light & Power Co. Limited

Form No. 406

PLANT OPERATOR'S INSPECTION REPORT

790.30

Form will be Handwritten

POWER PLANT Lockston

✓ OK X Needs Attention O Adjustment Made – Not Applicable

CHECK LIST	REMARKS – ACTION TAKEN
✓ Powerhouse Security	
✓ Powerhouse Heating System	– The Concrete Structure in the tailrace Needs Repairs.
✓ Powerhouse Ventilation System	
✓ Turbine Bearing Temperatures	
✓ Turbine Bearing Oil/Grease	– Leaks in the Penstock.
✓ Generator Bearing Temperatures	
✓ Generator Bearing Oil/Grease	– Water Leaking through Cracks in the Concrete retaining Wall at the forebay.
✓ Generator Stator Temperatures	
✓ Generator Brush Gear	
✓ Governor Oil System	– The Gate at Thinity Pond Dam needs Repairs.
– Backup Oil System	
✓ Cooling Water System	
✓ Air Compressor	– The Concrete Structure at Thinity pond Dam needs Repairs.
✓ Switchgear	
✓ Battery Specific Gravity	
✓ Battery Water Level	– The Road to Lockston forebay needs repairs.
✓ Battery Charger	
– Standby Generator	
✓ Substation Yard Security	
✓ Substation Yard Switchgear	
✓ Power Transformer	Running Time 720 HRS.
X Tailrace	
– Surge Tank	
X Penstock	
X Forebay	
✓ Gate - House	
X Gate	
– Trashracks	
X Canals	
X Dams	
✓ Control Structures	
✓ Spillways	
X Other	

	GEN. No. 1	GEN. No. 2	GEN. No. 3	STATION SERVICE LIGHT	STATION SERVICE POWER
END of MONTH	0728.5	4627.5		0331.9	
BEG. of MONTH	0010.0	4625.7		0260.4	
DIFFERENCE	718.5	1.8		71.5	
MULTIPLIER	1000	1000		80	
KWH for MONTH	718,500	1,800		5,720	

TOTAL GROSS 720,300 TOTAL SERVICE 5,720 NET 714,580

Operator Robert Keay Supervisor H. Jones

Time 10:00 Am. Date 93, 03, 01 (Yr. Mo. Day)

Date 93, 03, 01 (Yr. Mo. Day)

White Copy: Supt. Hydro Generation
Yellow Copy: File at Power Plant

Revised Oct. / 85

DIESEL PLANT INSPECTION
WEEKLY/MONTHLY

PLANT: _____

DATE: _____ INSPECTED BY: _____

[✓] OK [X] Needs Attention [O] Adjustment Made [-] Not Applicable

CHECKLIST	REMARKS - ACTION TAKEN
☐ Control Panel	_____
☐ Breakers & Switches	_____
☐ Indication Bulbs	_____
☐ Recording Charts	_____
☐ Battery Charger	_____
☐ Batteries	Amps:_____ Volts: _____ S.G.: ___
☐ Telephone	_____
☐ Lighting	_____
☐ Station Service Voltage	_____ Volts: _____
☐ Air Compressors	_____
☐ Starting Air Pressure	_____ Pressure: _____
☐ Fire Extinguishing Systems	_____
☐ Engine Base Oil Level	_____
☐ Lube Oil Sump Level	_____
☐ Engine Coolant Level	_____
☐ Engine/Generator Filters	_____
☐ Cooling Water Pump	_____
☐ Fuel Oil Pump	_____
☐ Lube Oil Pump	_____
☐ Generator Heaters	_____
☐ Generator Grounding Brush	_____
☐ Sliprings/Brushes	_____
☐ Heat Exchangers/Radiators	_____
☐ Switchgear Heaters	_____
☐ Exhaust Fans	_____
☐ Air Intake Louvres	_____
☐ Fuel Tank	_____
☐ Fuel Tank Dyke & Drain Valve/Locks	_____
☐ Fuel Filling Valve/Locks	_____
☐ Fuel Day Tanks	_____
☐ Building Heaters	_____
☐ Building Security	_____
☐ Building Housekeeping	_____

1. Start lube pump and turn engine on weekly basis.
2. Run unit on speed-no-load monthly.
3. Run unit on full load quarterly.
4. Take weekly fuel level readings and reconsile (reverse of form).
5. Take monthly production/station service (reverse of form).
6. Log quarterly generation data (reverse of form).

NEWFOUNDLAND LIGHT & POWER CO. LIMITED
GREENHILL GAS TURBINE

☑ O.K. ☒ Needs Attention ⊙ Adjustment Made ⊟ Not Applicable

	Remarks - Action Taken
ck Status of Control Panel (OK)	
eck all Brkers & Switches Norm. (OK)	
Check all indication bulbs (OK)	
Check all recording charts (OK)	
Check all temp & speed readouts (OK)	
Check Inverter (OK)	
Check Battery Charger (OK)	
Check Remote Control Equipment (OK)	
Check Telephone (OK)	
Check all A-C lighting (OK)	
Check all D-C lighting (OK)	
Check Station service voltage (OK)	
Check starting air pressure (OK)	
Check compressors (OK)	
Check fire extinguishing systems (OK)	
Check PT Lube Level (OK)	
Check PT Lube Oil Spills (OK)	
Check PT Lube Oil Heaters (OK)	
Check Batteries (OK)	
Check all space heaters working (OK)	
Check thermostat settings (OK)	
Check generator stator heaters (OK)	
ck Gen. Exhaust Louvre closed (OK)	
eck Gen. Air Intake Louvre open (OK)	
Check Generator Air Filters (OK)	
Check Gen. Rotor Grounding Brush (OK)	
Check Gen. Switchgear Heaters (OK)	
Check Fuel Recirc Heaters (OK)	
heck GG Lube Level (OK)	
heck GG Lube Heaters (OK)	
Check GG Air Inlet Filters (OK)	
heck Condition Air Inlet Housing (OK)	
heck GG, PT & Exhaust Housing (OK)	
Check PT Lube Oil Coolant Level (OK)	
heck Air reservoir for water (OK)	
heck Air Reservoir Heaters (OK)	
Check Fuel Forwarding Pumphouse (OK)	
heck Fuel Tanks (OK)	
heck Fuel Dyke & Drain Valve (OK)	
Check Fuel Filling Valves (OK)	
heck Fuel off Loading Pumphouse (OK)	
heck Security of all Doors (OK)	
Check all areas tidy-garbage removed(OK)	
heck Weekly Readings (OK)	
ed PT Break Air System (OK)	

Note any abnormalities in log and report to Supervisor

Date: _____ Signature: _____

Hydro Plant Log Sheet

NEWFOUNDLAND POWER

NEWFOUNDLAND POWER LOG SHEET # _____ HYDRO PLANT _____

DATE	GENERATOR			ELECTRICAL				EXCITER		MECHANICAL								
										Bearing Temp.				Flow Meters			Bearing Oil Indicators	Governor Oil Pressure
	#	On	Off	Amps	Volts	Load KWS	Stator Temp	Amps	Volts	U. Guide	L. Guide	Thrust	Turbine	U. Guide	L. Guide	Turbine		

REMARKS: _____

SIGNED BY: _____

White - Head Office; Yellow - Hydro Plant

Form No. 580

CAPE BROYLE/HORSE CHOPS
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Rock Pond Dam — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____

West Ragged Hills Dam/Spillway — Date: _____

Water Level: _____
Weather: _____
Upstream Face: _____
Crest: _____
Downstream Channel (include picture): _____
Abutments: _____
Leakage Measurement (include picture): _____
Comments: _____

Pond 'K' Diversion — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement: _____
Comments: _____

Northwest Blackwoods Freeboard Dam — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement (include picture): _____
Wet Areas at D/S toe (include picture): _____
Comments: _____

(over)

Northwest Blackwoods Diversion Dam/Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement (include picture): _____
Spillway Timber: _____
Comments: _____
_____

Jordan River

Freeboard Dam # 1 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Ponded Water: _____
Comments: _____
_____

Freeboard Dam # 2 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Ponded Water: _____
Comments: _____
_____

Diversion Dam Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Ponded Water: _____
Comments: _____
_____

East Blackwoods Pond

Freeboard Dam # 1 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____

Freeboard Dam # 2 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____

Freeboard Dam # 3 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____

Freeboard Dam # 4 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Ponded Water: _____
Comments: _____

Freeboard Dam # 5 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Ponded Water: _____
Comments: _____

(over)

Freeboard Dam # 6 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement near unwatering
Culvert (include picture): _____
Comments: _____
_____

Freeboard Dam # 7 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____
_____

Diversion Dam/Spillway Date:

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Soft Areas Along Downstream Toe: _____
Leakage Measurement Along Downstream Toe: _____
Downstream Channel (include picture): _____
Comments: _____
_____

Freeboard Dam # 8 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____
_____

Freeboard Dam # 9 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____
_____

Fourth Blackwoods Pond

Freeboard Dam # 1 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Ponded Water: _____
Downstream Slope: _____
Comments: _____

_____

Freeboard Dam # 2 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____

_____

Stoplog Structure and Canal Date:

Concrete Abutments: _____
Stoplogs and Supports: _____
Walkway: _____
Handrailing: _____
Obstructions in Canal: _____
Comments: _____

_____

Diversion Dam/Spillway Date:

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Downstream Channel: _____
Abutments: _____
Settlement Along Cut-off Wall (include picture): _____
Comments: _____

_____

(over)

Two Arm Pond Diversion Dam & Canal Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Obstructions in Canal: _____
Comments: _____
_____

Fly Pond Diversion Dam/Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Spillway Approach Channel: _____
Comments: _____
_____

Mount Carmel Pond Dam, Spillway & Outlet Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Spillway Walkway: _____
Spillway Channel: _____
Gate Opening: _____
Gate Operation: _____
Gabions at Outlet Channel: _____
Comments: _____
_____

Horse Chops

Main Dam and Intake Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement at Unwatering Culvert
(include picture): _____
Gate Operation: _____
Gatehouse: _____
Comments: _____
_____

Spillway Date:

Water Level: _____
Weather: _____
Spillway Channel: _____
Abutments: _____
Stoplogs and Supports: _____
Walkway: _____
Sluice Gate Operation: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Alignment: _____
Drainage Ditches: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Anchor Blocks: _____
Steel Thimbles: _____
Comments: _____
_____

Cape Broyle

Beaver Pond Dam Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Toe: _____
Comments: _____
_____

Freeboard Dam Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Seepage at D/S Toe (include picture): _____
Comments: _____
_____

(over)

Main Dam, Spillway and Intake Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Abutments: _____
Seepage at D/S Toe (include picture): _____
Spillway Concrete: _____
Spillway Abutments (include picture): _____
Walkway: _____
Sluice Gate: _____
Stoplogs: _____
Gatehouse: _____
Gate Operation: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Concrete Headwall (include picture): _____
Alignment: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Anchor Blocks: _____
Comments: _____
_____

MOBILE/MORRIS
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Mobile Big Pond — Date: _____

Water Level: _____
Weather: _____
Crest Rutting: _____
Downstream Alder Growth: _____
Downstream Slope Erosion (include picture): _____
Outlet Channel Gabions (if visible): _____
Outlet Tunnel Rock Stability: _____
Gate Lift/Gatehouse Condition: _____
Spillway:
- Debris in channel: _____
- Concrete Condition: _____

Comments: _____

Morris Canal — Date: _____

Water Level (or flow): _____
Weather: _____
Leak (400' upstream from intake - include picture):
- Weir Measurement (if possible): _____
- Colour of Leakage Water: _____

Erosion (crest): _____
Alder Growth: _____
Gabion Guide Wall: _____
Canal Spillway (general condition): _____
Canal Stoplog structure (general condition): _____
Intake/Gatehouse (general condition): _____
Comments: _____

Morris Penstock — Date: _____

Weather: _____
Bed Drainage: _____
Backfill Erosion: _____
Comments: _____

(over)

First Pond Date:

Water Level: _____
Weather: _____
Concrete Condition (Include pictures): _____
Debris in Downstream Channel: _____
Stoplog Condition: _____
Access Road Condition: _____
Comments: _____
_____

Mobile Canal Date:

Water Level (or flow): _____
Weather: _____
Seepage/Leakage (include picture & location): _____
Vegetation: _____
Crest rutting/freeboard: _____
Erosion: _____
Canal Stoplog Structure (general condition): _____
Intake Embankment (general condition): _____
Intake/gatehouse (general condition): _____
Comments: _____
_____

Mobile Penstock/Surge Tank Date:

Weather: _____
Fibreglass Section:
- Bed Drainage: _____
- Backfill Erosion: _____
Surge Tank:
- Frost Casing: _____
- Internal Riser: _____
- Main Tank: _____
- Foundation: _____
Steel Section:
- Corrosion: _____
- Leakage: _____
- Cradles: _____
- Bed: _____

Comments: _____
_____

PIERRES BROOK
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Big Country Pond Dam & Spillway — Date: _____

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Spillway Channel: _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Crest: _____
Gate Opening: _____
Gate Operation: _____
Upstream Wingwall (Gabions/Rockwall): _____
Downstream Wingwall (Gabions/Timber): _____
Timber Crib Outlet Structure: _____
Comments: _____

Rocky Pond Freeboard Dams — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Comments: _____

Witless Bay Country Pond Spillway — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Walkway: _____
Flashboards: _____
Abutments: _____
Spillway Concrete: _____
Spillway Channel: _____
Comments: _____

(over)

Witless Bay Country Pond Dam & Outlet Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Crest: _____
Gatehouse: _____
Gate Opening: _____
Gate Operation: _____
Outlet Conduit: _____
Downstream Channel: _____
Comments: _____
_____

Witless Bay Country Pond Canal: Date:

Water Level (or flow): _____
Weather: _____
Seepage/Leakage: _____
Alder Growth: _____
Erosion: _____
Obstructions in Canal: _____
Comments: _____
_____

Gull Pond Freeboard Dam Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Crest: _____
Leakage Measurement (include picture): _____
Comments: _____
_____

Gull Pond Dam, Intake and Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Gatehouse: _____
Gate Opening: _____
Gate Operation: _____
Intake: _____
Walkway (Intake): _____
Downstream Culvert: _____
Spillway Concrete: _____
Walkway/Flashboards: _____
Safety Fence: _____
Spillway Channel: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Alignment: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Drainage Ditches: _____
Steel Penstock: _____
Anchor Blocks: _____
Comments: _____
_____

Surge Tank Date:

Weather: _____
Frost Casing: _____
Internal Riser: _____
External Riser: _____
Main Tank: _____
Ladder/Catwalk: _____
Heaters: _____
Steel Supports: _____
Foundation: _____
Comments: _____
_____

SEAL COVE
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Fenelon's Pond — Date: _____

Water Level: _____
Weather: _____
Spillways timber: _____
Spillway channel: _____
Gate Opening: _____
Gate Operation: _____
Upstream slopes: _____
Downstream slopes: _____
Outlet culvert: _____
Leakage measurement at culvert (include picture): _____
Comments: _____

_____

Soldier's Pond Dam & Outlet — Date: _____

Water Level: _____
Weather: _____
Upstream Face: _____
Crest: _____
Downstream Slope (include picture): _____
Gabion Retaining Walls: _____
Gate Opening: _____
Gate Operation: _____
Outlet Structure: _____
Comments: _____

_____

Soldier's Pond Spillway — Date: _____

Water Level: _____
Weather: _____
Upstream Face: _____
Cribbing Ballast: _____
Abutments: _____
Spillway timber: _____
Spillway Channel: _____
Comments: _____

(over)

White Hill Pond Dam (Forebay) Date:

Water Level: _____
Weather: _____
Walkway: _____
Buttresses: _____
Upstream face: _____
Condition of Plywood Patches: _____
Measurement of Leakage (include picture & location) _____
Sluice gate: _____
Spillway concrete (include picture): _____
Spillway erosion protection: _____
Spillway channel: _____
Comments: _____
_____

Intake and Penstock Date:

Water Level: _____
Weather: _____
Intake Concrete: _____
Gate Operation: _____
Trashracks: _____
Wooden Gates: _____
Gatehouse: _____
Penstock Alignment: _____
Woodstaves: _____
Cradles: _____
Bands (include picture): _____
Bed: _____
Drainage ditches: _____
Culverts: _____
Leakage measurements: _____
Rockwall below bridge: _____
Steel penstock: _____
Air vent: _____
Anchor Blocks: _____
Comments: _____
_____

TOPSAIL
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Thomas Pond Dam — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Vegetation Cover: _____
Measure Seepage at Unwatering Culvert: _____
Spillway Concrete: _____
Channel Erosion: _____
Gate Operation: _____
Gate Opening: _____
Security Fence: _____
Concrete structure: _____
Canal: _____
Comments: _____

Paddys Pond Dam & Spillway — Date: _____

Water Level: _____
Weather: _____
Upstream Face: _____
Crest: _____
Downstream Slope: _____
Downstream Filter: _____
Spillway Decking: _____
Walkway: _____
Cribbing Ballast: _____
Leakage Measurements (include picture): _____
Comments: _____

Paddy's Pond Outlet and Freeboard Dams — Date: _____

Water Level: _____
Weather: _____
Upstream Face: _____
Crest: _____
Downstream Slope: _____
Gate Operation: _____
Gate Opening: _____
Cribbing Ballast: _____
Downstream Canal: _____
Comments: _____

(over)

Three Arm Pond Dam Date:

Water Level: _____
Weather: _____
Gate Opening: _____
Gate Operation: _____
Timber Face: _____
Cribbing Ballast: _____
Comments: _____

Three Island Pond Dam Date:

Water Level: _____
Weather: _____
Gate Opening: _____
Gate Operation: _____
Timber Face: _____
Cribbing Ballast: _____
Downstream Erosion: _____
Spillway Channel: _____
Comments: _____

Forebay Intake and Canal Date:

Water Level: _____
Weather: _____
Bridge Openings: _____
Culverts: _____
Spillway Concrete: _____
Leakage Measurement: _____
Canal Wall near Intake (include picture): _____
Gate Operation: _____
Trashracks: _____
Wooden Gates: _____
Gatehouse: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Air Vent: _____
Relief Valves: _____
Alignment: _____
Bed: _____
Drainage Ditches: _____
Culverts: _____
Woodstaves: _____
Butt Joints: _____
Cradles: _____
Bands: _____
Anchor Blocks: _____
Comments: _____

PETTY HARBOUR
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Bay Bulls Big Pond — Date: _____

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Spillway Channel: _____
Upstream Slope: _____
Downstream slope: _____
Leakage Measurement: _____
Gate Opening: _____
Gate Operation: _____
Outlet Conduit: _____
Downstream Slope Protection: _____
Comments: _____
_____

Cochrane Pond Dam & Spillway — Date: _____

Water Level: _____
Weather: _____
Upstream slope: _____
Crest: _____
Downstream slope: _____
Spillway Timber (include picture) _____
Cribbing Ballast: _____
Leakage measurement (include picture): _____
Comments: _____
_____

Cochrane Pond Outlet — Date: _____

Water Level: _____
Weather: _____
Timber decking: _____
Cribbing Ballast: _____
Gate Operation: _____
Outlet Channel: _____
Comments: _____
_____

(over)

Forebay Dam Date:

Water Level: _____
Weather: _____
Upstream face: _____
Crest: _____
Downstream face: _____
Spillway channel: _____
Leakage measurement: _____
Trashracks: _____
Gate Operation: _____
Gatehouse: _____
Security fence: _____
Abutments: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Alignment: _____
Bed: _____
Rockwall Bed Support: _____
Penstock Trestle: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Steel Penstock (river crossing): _____
Steel Penstock: _____
Anchor Blocks: _____
Comments: _____
_____

Surge Tank Date:

Weather: _____
Frost Casing: _____
Internal Riser: _____
Main Tank: _____
Foundation: _____
Comments: _____
_____

PORT UNION
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Halfway Pond Dam — Date: _____

Water Level: _____
Weather: _____
Spillway
- Crib Settlement: _____
- Seepage: _____
- Erosion at downstream toe: _____

Spillway Abutments
- Fill Settlement: _____
- Erosion of Backfill: _____
- Seepage: _____

Spillway channel: _____
Earthfill Dam (include picture): _____
Gate Opening: _____
Gate Structure: _____
Leakage Measurement (include picture): _____
Comments: _____

Wells Pond Dam — Date: _____

Water Level: _____
Weather: _____
Earthfill (include picture): _____
Gate Opening: _____
Gate Structure (include picture): _____
Leakage Measurement: _____
Comments: _____

Long Pond Dam — Date: _____

Water Level: _____
Weather: _____
Gate Opening: _____
Gate Operation: _____
Leakage Measurement (include picture): _____
Upstream face and decking: _____
Timber Crib: _____
Abutments: _____
Comments: _____

(over)

Whirl Pond Dam Date:

Water Level: _____
Weather: _____
Upstream Face: _____
Gate Opening: _____
Gate Operation: _____
Gate cribbing and ballast (include picture): _____
Fish Screen: _____
Spillway concrete: _____
Spillway leakage measurement: _____
Comments: _____
_____

Forebay Spillway and Canal Date:

Water Level: _____
Weather: _____
Upstream Face & Decking: _____
Ballast (Rockfill): _____
Sluice gate leakage: _____
Power canal gate: _____
Power canal freeboard: _____
Canal spillway (include picture): _____
Comments: _____
_____

Intake & Penstock Date:

Water Level: _____
Weather: _____
Trashracks: _____
Gate Opening: _____
Gate Operation: _____
Timber Gates: _____
Penstock Alignment: _____
Bed: _____
Cradles: _____
Bands: _____
Staves: _____
Anchor Block: _____
Comments: _____
_____

LOOKOUT BROOK
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Cross Pond Dam & Spillway — Date:

Water Level: _____
Weather: _____
Condition of Riprap on Dam (include picture): _____
Driftwood/Debris: _____
Leakage Measurement: _____
Abutments (include picture): _____
Comments: _____

Cross Pond Outlet — Date:

Water Level: _____
Weather: _____
Gate Opening: _____
Condition of concrete: _____
Driftwood/Debris: _____
Comments: _____

Long Pond Dam, Spillway & Outlet — Date:

Water Level: _____
Weather: _____
Upstream Face: _____
Cribbing Timber (include picture): _____
Ballast: _____
Driftwood/Debris: _____
Gate Opening: _____
Condition of Channel: _____
Spillway (include picture): _____
Flashboards: _____
Comments: _____

(over)

Joe Dennis Pond Dam, Spillway & Outlet Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Abutments: _____
Seepage
- Downstream Toe: _____
- Near outlet conduit: _____
- Near abutment: _____
Outlet Conduit: _____
Walkway: _____
Gate Opening: _____
Gate Operation: _____
Side Dyke: _____
Spillway: _____
Downstream Channel: _____
Comments: _____
_____

Lookout Pond Date:

Water Level: _____
Weather: _____
Bridge: _____
Outlet Channel (include picture): _____
Comments: _____
_____

Forebay Dam Date:

Water Level: _____
Weather: _____
Sluice Gate Operation: _____
Intake Gate Operation: _____
Trashracks: _____
Condition of Concrete: _____
Condition of Rockfill: _____
Spillway
- Abutments: _____
- Downstream Toe: _____
- Crest: _____
- Expansion Joints: _____
Walkway
Gatehouse: _____
Spillway channel: _____
Comments: _____

Penstock

Date:

Weather: _____
Slope near Forebay (include picture): _____
Air Vent: _____
Alignment: _____
Backfill: _____
Anchor Blocks: _____
Ditching: _____
Culverts: _____
Steel penstock: _____
Concrete saddles: _____
Expansion joints: _____
Comments: _____

SANDY BROOK
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Island Pond — Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Vegetation: _____
Seepage Measurement Near Abutment
(include picture): _____
Comments: _____

West Lake — Date:

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Upstream Slope: _____
Settlement: _____
Downstream Slope (include picture): _____
Driftwood/debris: _____
Spillway Abutments: _____
Outlet Structure: _____
Gate Opening: _____
Gate Operation: _____
Comments: _____

Sandy Lake — Date:

Water Level: _____
Weather: _____
Spillway Riprap (include picture): _____
Upstream Slope: _____
Settlement: _____
Seepage through cutoff wall: _____
Downstream Slope (include picture): _____
Driftwood/Debris: _____
Spillway Abutments: _____
Outlet Structure (inspect with gate closed): _____
Leakage Measurement near outlet (include picture): _____
Concrete Walls: _____
Gate Opening: _____
Gate Operation: _____
Comments: _____

(over)

Forebay Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope (include picture): _____
Driftwood/Debris: _____
Spillway:
- Downstream Channel: _____
- Gates & Hoist: _____
- Walkway: _____
Outlet Channel: _____
Downstream Retaining Wall: _____
Gate Operation: _____
Comments: _____
_____

Emergency Spillway Date:

Water Level: _____
Weather: _____
Condition of Timber (include picture): _____
Driftwood/Debris: _____
Downstream Channel (include picture): _____
Comments: _____
_____

Penstock Date:

Weather: _____
Alignment: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Comments: _____
_____

Surge Tank Date:

Weather: _____
Frost Casing: _____
Internal Riser: _____
Main Tank: _____
Foundation: _____
Comments: _____

RATTLING BROOK February 1993
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

Frozen Ocean Lake Dam Date:

Water Level: _____
Weather: _____
Upstream slope: _____
Crest: _____
Vegetation: _____
Downstream Slope: _____
Ponded Water: _____
Gate Structure (include picture): _____
Gate Opening: _____
Gate Operation: _____
Spillway Abutments: _____
Spillway Riprap Upstream (include picture): _____
Spillway Riprap Downstream (include picture): _____
Spillway Debris _____
Downstream Channel: _____
Comments: _____

Rattling Dam and Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope (include picture): _____
Crest: _____
Downstream Slope: _____
Vegetation: _____
Ponded Water: _____
Debris: _____
Spillway Concrete: _____
Flashboards: _____
Flashboard and Walkway Supports: _____
Walkway: _____
Security Fence: _____
Spillway Channel: _____
Comments: _____

Rattling/Amy's and Freeboard Dams Date:

Water Level: _____
Weather: _____
Upstream Slopes (include picture): _____
Crest: _____
Downstream Slope: _____
Vegetation: _____
Debris: _____
Gate Opening: _____
Gate Operation: _____
Gatehouse: _____
Outlet Channel: _____
Comments: _____

Forebay Dam & Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Vegetation: _____
Ponded Water: _____
Gate Operation: _____
Gatehouse: _____
Spillway Crest: _____
Cribbing Ballast: _____
Debris: _____
Spillway Channel: _____
Comments: _____

Penstock Date:

Weather: _____
Alignment: _____
Drainage Ditches: _____
Culverts: _____
Bed: _____
Woodstaves (include picture): _____
Cradles: _____
Bands: _____
Anchor Blocks (include picture): _____
Steel Penstock: _____
Concrete Saddles: _____
Expansion Joints: _____
Comments: _____

Surge Tank Date:

Weather: _____
Foundations: _____
Anchor Bolts: _____
Legs: _____
Bracing: _____
Ladder: _____
Outer casing (include picture): _____
Tank: _____
Inner Riser: _____
Walkway: _____
Baffles: _____
Cover: _____
Comments: _____

WESTBROOK
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Stroud's Hill Dam — Date:

Water Level: _____
Weather: _____
Main Dam (include picture): _____
Opening: _____
Comments: _____

Main Dam — Date:

Water Level: _____
Weather: _____
Upstream Face: _____
Downstream Face: _____
Walkway: _____
Spillway: _____
Comments: _____

Power Canal & Intake — Date:

Water Level: _____
Weather: _____
Concrete Canal Section: _____
Metal Culvert Section: _____
Canal Leakage Measurement (include picture): _____
Vegetation Coverage: _____
Canal Spillway: _____
Intake Concrete (include picture): _____
Trashracks: _____
Gate Operation: _____
Gatehouse: _____
Control Shed: _____
Comments: _____

Penstock — Date:

Weather: _____
Alignment: _____
Slope Stability: _____
Vegetation: _____
Ditches: _____
Culverts: _____
Comments: _____

LAWN
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Second Storage Pond — Date:

Water Level: _____
Weather: _____
Opening (include picture): _____
Comments: _____

Forebay Dam — Date:

Water Level: _____
Weather: _____
Crest: _____
Upstream Face: _____
Downstream Face (include picture): _____
Seepage/Leakage Measurement: _____
Sluice Gate: _____
Intake Gate Operation: _____
Trashracks: _____
Gatehouse: _____
Security Fence: _____
Spillway Concrete: _____
Spillway Channel: _____
Comments: _____

Penstock — Date:

Weather: _____
Alignment: _____
Bed: _____
Slope Protection (include picture): _____
Woodstaves: _____
Butt Joints (include picture): _____
Bands: _____
Cradles: _____
Drainage: _____
Anchor Block: _____
Comments: _____

LOCKSTON
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Trinity Pond Dam — Date:

Water Level: _____
Weather: _____
Gate Opening: _____
Gate Operation: _____
Concrete (include picture): _____
Comments: _____

Rattling Pond Dam — Date:

Water Level: _____
Weather: _____
Concrete: _____
Sluice Gate: _____
Spillway: _____
Spillway Channel: _____
Comments: _____

Power Canal & Intake

Power Canal Gate: _____
Power Canal Concrete: _____
Leakage Measurement (include picture): _____
Intake Concrete Upstream Face: _____
Downstream Face (include picture): _____
Trashracks: _____
Gates: _____
Gatehouse: _____
Sluice Gate: _____
Comments: _____

Penstock — Date:

Weather: _____
Alignment: _____
Bed: _____
Drainage Ditches: _____
Culverts: _____
Cradles: _____
Bands: _____
Woodstaves: _____
Steel Bifurcation: _____
Concrete Supports: _____
Comments: _____

FALL POND
OPERATOR'S DAM SAFETY INSPECTION CHECKLIST

February 1993

Fall Pond Dam, Spillway & Intake — Date: _____

Water Level: _____
Weather: _____
Upstream Dam Face: _____
Dam Crest: _____
Downstream Dam Face: _____
Upstream Spillway Face: _____
Spillway Crest: _____
Downstream Spillway Face: _____
Spillway Walkway/Flashboards: _____
Security Fence/Handrails: _____
Gatehouse: _____
Gate Opening: _____
Gate Operation: _____
Unwatering Conduit: _____
Penstock: _____

Interior Inspection

Bay # 1
- Upstream Face: _____
- Downstream Face: _____
- Buttresses: _____
- Floor: _____
- Comments: _____

Bay # 2
- Upstream Face: _____
- Downstream Face: _____
- Buttresses: _____
- Floor: _____
- Comments: _____

Bay # 3
- Upstream Face: _____
- Downstream Face: _____
- Buttresses: _____
- Floor: _____
- Comments: _____

Bay # 4
- Upstream Face: _____
- Downstream Face: _____
- Buttresses: _____
- Floor: _____
- Leakage Measurement: _____
- Comments: _____

(over)

Bay # 5
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 6
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Intake and Valve Operator
- Leakage Measurement
- Comments

Bay # 7
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Penstock
- Penstock Thrust Block
- Leakage Measurement
- Comments

Bay # 8
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 9
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 10
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 11
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 12
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 13
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 14
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 15
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 16
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

Bay # 17
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Woodstave unwatering conduit
- Leakage Measurement
- Comments

Bay # 18
- Upstream Face
- Downstream Face
- Buttresses
- Floor
- Leakage Measurement
- Comments

(over)

Bay # 19

- Upstream Face _____
- Downstream Face _____
- Buttresses _____
- Floor _____
- Leakage Measurement _____
- Comments _____

Comments: _____

NEW CHELSEA/PITMAN'S POND
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Pitman's Pond — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Spillway Channel: _____
Spillway Crest: _____
Spillway Abutments: _____
Gate Opening: _____
Gate Operation: _____
Comments: _____
_____

East and West Dykes — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Comments: _____
_____

Penstock - Pitman's Pond — Date: _____

Weather: _____
Alignment: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Comments: _____
_____

(over)

Seal Cove Pond (New Chelsea) Date:

Water Level: _____
Weather: _____
Upstream Slope (include picture): _____
Downstream Slope: _____
Crest: _____
Seepage Measurement Near Unwatering
Culvert (include picture): _____
Spillway Channel: _____
Spillway Crest: _____
Gate Operation: _____
Comments: _____

Penstock - New Chelsea Date:

Weather: _____
Alignment: _____
Bed: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Steel Penstock: _____
Comments: _____
_____

HEART'S CONTENT
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Pack's Pond — Date:

Water Level: _____
Weather: _____
Leakage (estimate flow - include picture): _____
Rockfill height (include picture): _____
Freeboard Dam:
- Timber Condition _____
- Erosion _____
Comments: _____
_____

Seal Cove Pond — Date:

Water Level: _____
Weather: _____
Upstream Face: _____
Timber Condition: _____
Leakage (estimate flow - include picture): _____
Vegetation at Downstream Toe: _____
Obstructions in Downstream Spillway Channel: _____
Comments: _____
_____

Long Pond — Date:

Water Level: _____
Weather: _____
Timber Condition:
- Crib Timbers: _____
- Facing: _____
Leakage: _____
Vegetation (up and downstream): _____
Obstructions in Spillway Channel: _____
Leakage through outlet structure (include picture): _____
Crib Ballast (include picture): _____
Upstream Cofferdam: _____
Gate Lift Operation: _____
Comments: _____
_____

(over)

Rocky Pond Date:

Water Level: _____
Weather: _____
Fisheries Release: _____
Leakage/Seepage (include pictures):
- Around Outlet Structure: _____
- Toe of Dam Sections: _____
- Toe of Spillway: _____
Fill Settlement (include picture): _____
Riprap Condition: _____
Erosion (downstream toe): _____
Comments: _____
_____

Southern Cove Pond Date:

Water Level: _____
Weather: _____
Seepage (downstream slope - include picture): _____
Erosion (downstream toe & slope): _____
Intake Concrete Condition: _____
Gate Lift Operation: _____
Comments: _____
_____

Penstock Date:

Weather: _____
Woodstave Section:
- Bedding _____
- Woodstaves: _____
- Alignment: _____
- Bed: _____
- Bands: _____
- Cradles: _____
Steel Section (general condition): _____
Comments: _____
_____

VICTORIA
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Rocky Pond — Date: _____

Water Level: _____
Weather: _____
Upstream Concrete Condition (include picture): _____
Downstream Concrete Condition (include picture): _____
Spillway Crest/Flashboards (include picture): _____
Gatehouse Condition: _____
Gate Lift Operation: _____
Gate Leakage (when closed): _____
Outlet Wall Concrete Condition: _____
Handrails/Walkway: _____
Stoplog Condition: _____
Comments: _____

Blue Hill Pond — Date: _____

Water Level: _____
Weather: _____
Upstream Concrete Condition (include picture): _____
Downstream Concrete Condition: _____
Leakage (under unwatering pipe-include picture): _____
Handrails/Walkway: _____
Gate Lift Operation: _____
Spillway:
- Downstream Toe Erosion (include picture): _____
- Leakage: _____
- Downstream Channel: _____
- Stoplog Condition: _____

Comments: _____

Penstock — Date: _____

Weather: _____
Woodstave Section:
- Woodstaves: _____
- Bed: _____
- Rockwall Bed Support: _____
- Cradles: _____
- Bands: _____

Steel Section:
- Corrosion: _____
- Leakage: _____
- Concrete Cradles: _____
- Bed: _____

Comments: _____

TORS COVE
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Tors Cove West Dam — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement (include photo): _____
Comments: _____

_____

Tors Cove East Dam, Spillway & Intake — Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Gate Operation: _____
Gatehouse: _____
Intake: _____
Spillway Concrete: _____
Walkway/Flashboards: _____
Spillway Channel/Concrete Walls: _____
Comments: _____

Tors Cove Penstock — Date: _____

Weather: _____
Alignment: _____
Bed: _____
Rockwall Bed Support: _____
Drainage Ditches: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Anchor Blocks: _____
Trestle Steel: _____
Trestle Concrete: _____
Comments: _____

_____

(over)

Surge Tank

Date:

Weather: _____
Frost Casing: _____
Internal Riser: _____
External Riser: _____
Main Tank: _____
Ladder/Catwalk: _____
Heaters: _____
Steel Supports: _____
Foundation: _____
Comments: _____
_____

ROCKY POND
OPERATOR'S DAM SAFETY INSPECTION
CHECKLIST

February 1993

Franks Pond Dam # 1 Date: _____

Water Level: _____
Weather: _____
Timber: _____
Leakage Measurement: _____
Comments: _____
_____

Franks Pond Dam # 2 Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Downstream Slope: _____
Crest: _____
Comments: _____
_____

Franks Pond Dam # 3 & Spillway Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Spillway Riprap: _____
Spillway Channel: _____
Comments: _____
_____

Franks Pond Dam # 4 Date: _____

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope (include photo): _____
Leakage Measurement (include photo): _____
Comments: _____
_____

(over)

Franks Pond Dam # 5 & Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope/Riprap _____
Timber/Metal Cutoff: _____
Downstream Slope/Riprap (include photo): _____
Spillway Channel: _____
Comments: _____
_____

Franks Pond Dam # 6 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____
_____

Franks Pond Dam # 7 Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Comments: _____
_____

Franks Pond Control Dam & Outlet Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Gate Opening: _____
Gate Operation: _____
Outlet Conduit: _____
Comments: _____
_____

Franks Pond Canal Dyke Date:
Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leakage Measurement (include photo): _____
Comments: _____

Franks Pond Canal Spillway Date:

Water Level: _____
Weather: _____
Timber Decking: _____
Cribbing/Ballast: _____
Comments: _____
_____

Cape Pond Dam, Spillway and Outlet Date:

Water Level: _____
Weather: _____
Upstream Timber Decking: _____
Spillway Timber Decking Crest: _____
Cribbing/Ballast: _____
Gate Opening: _____
Gate Operation: _____
Operating Gate & Concrete: _____
Non-operating Stoplogs and Concrete: _____
Leak Measurement: _____
Comments: _____
_____

High Speed Canal Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope/Riprap: _____
Metal Cutoff: _____
Downstream Slope/Riprap (include photo): _____
Spillway Channel: _____
Leak Measurement (include photo): _____
Comments: _____
_____

Cluneys Canal Dyke Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Leak Measurement (include photo): _____
Comments: _____
_____

(over)

Cluneys Upstream Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope/Riprap: _____
Metal Cutoff: _____
Downstream Slope/Riprap: _____
Spillway Channel: _____
Leak Measurement (include photo): _____
Comments: _____
_____

Cluneys Control Structure Date:

Water Level: _____
Weather: _____
Gate Opening: _____
Gate Operation: _____
Concrete: _____
Gabions: _____
Comments: _____
_____

Cluneys Weir Date:

Water Level: _____
Weather: _____
Timber Facing: _____
Cribbing/Ballast: _____
Comments: _____
_____

Cluneys Downstream Spillway Date:

Water Level: _____
Weather: _____
Timber Decking: _____
Cribbing/Ballast: _____
Spillway Channel: _____
Leakage Measurement (include photo): _____
Comments: _____
_____

Lamanche Canal Dyke Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Alder Growth: _____
Downstream Slope: _____
Restrictions in Canal: _____
Leakage Measurements (include photos): _____
Comments: _____

Lamanche Canal Spillway # 1 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Comments: _____
_____

Lamanche Canal Spillway # 2 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Comments: _____
_____

Lamanche Canal (Butler's Brook) Spillway # 3 Date:

Water Level: _____
Weather: _____
Timber Decking: _____
Cribbing/Ballast: _____
Spillway Channel: _____
Leakage Measurement: _____
Comments: _____
_____

Lamanche Canal Spillway # 4 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Leakage Measurement (include photo): _____
Comments: _____
_____

Lamanche Canal Spillway # 5 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Comments: _____
_____

(over)

Lamanche Canal Spillway # 6 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Comments: _____
_____

Lamanche Canal Spillway # 7 Date:

Water Level: _____
Weather: _____
Concrete: _____
Spillway Channel: _____
Comments: _____
_____

Long Pond Dam & Spillway Date:

Water Level: _____
Weather: _____
Upstream Slope/Riprap: _____
Metal Cutoff: _____
Downstream Slope/Riprap (include photo): _____
Spillway Channel/Road culvert: _____
Leakage Measurement (include photo): _____
Comments: _____
_____

Rocky Pond Freeboards Dams Date:

Water Level: _____
Weather: _____
Upstream Slope (Dam # 1): _____
Crest (Dam # 1): _____
Downstream Slope (Dam # 1): _____
Upstream Slope (Dam # 2): _____
Crest (Dam # 2): _____
Downstream Slope (Dam # 2): _____
Upstream Slope (Dam # 3): _____
Crest (Dam # 3): _____
Downstream Slope (Dam # 3): _____
Comments: _____
_____

Rocky Pond Dam, Spillway and Intake Date:

Water Level: _____
Weather: _____
Upstream Slope: _____
Crest: _____
Downstream Slope: _____
Intake/Walkway: _____
Gate Operation: _____
Gatehouse: _____
Spillway Concrete: _____
Spillway Channel: _____
Comments: _____

Rocky Pond Penstock Date:

Weather: _____
Alignment: _____
Bed: _____
Drainage Ditches: _____
Woodstaves: _____
Bands: _____
Cradles: _____
Concrete Headwall at Intake: _____
Comments: _____
_____