

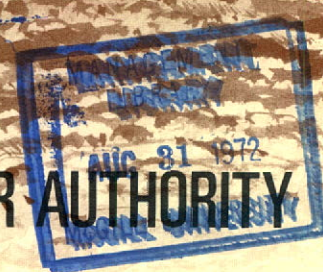
1871



1971

**NINTH ANNUAL REPORT**  
**Year Ended 31 March 1971**

**BRITISH COLUMBIA HYDRO AND POWER AUTHORITY**





COVER DESIGN: Gas lamps similar to the one shown in the front cover painting were used to light the streets of Victoria at the time British Columbia joined Canadian Confederation in 1871. Gas was supplied by B.C. Hydro's earliest predecessor, Victoria Gas Company Limited. In vivid contrast to the scene of 100 years ago, the photograph at left depicts the glitter of Vancouver at night in 1971.

*Outside front cover painting by Robert J. Banks, based on an authentic photograph of a street scene in Victoria in the 1870's.*

*Inside front cover photograph by Duncan McDougall, F.R.P.S.*

*Back cover photographs courtesy of Photographic Branch, Government of British Columbia Department of Travel Industry.*

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PROVINCE OF  
BRITISH COLUMBIA  
**PRIME MINISTER**  
VICTORIA

1 9 7 1

June 17th

Colonel the Honourable John R. Nicholson, P.C.,  
O.B.E., Q.C., LL.D.,  
Lieutenant-Governor of the Province of British Columbia.

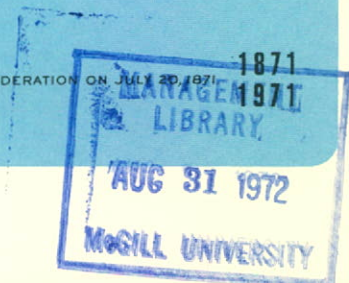
MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present  
the Annual Report of British Columbia Hydro and Power Authority  
for the year ended 31st March 1971.

W. A. C. Bennett



1971 MARKS THE 100TH ANNIVERSARY OF THE ENTRY OF BRITISH COLUMBIA INTO CANADIAN CONFEDERATION ON JULY 20, 1871



## BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Head Office: 970 Burrard Street, Vancouver 1, British Columbia, Canada

### DIRECTORS AND OFFICERS

JOHN DUNSMUIR  
\*EINAR M. GUNDERSON  
\*THE HONOURABLE W. KENNETH KIERNAN  
FRED D. MATHERS  
\*GORDON M. SHRUM *Chairman*  
FREDERICK A. SMITH  
\*JOHN H. STEEDE  
\*THE HONOURABLE RAY G. WILLISTON  
*\*Member of Executive Management Committee*  
  
GEOFFREY G. WOODWARD *Secretary*  
ELIZABETH B. FULWELL *Assistant Secretary*

*Auditors:* PRICE WATERHOUSE & CO.

*Bankers:* CANADIAN IMPERIAL BANK OF COMMERCE

*Securities issued by British Columbia Hydro and Power Authority:*

*Registrar, Canadian issues:* B.C. HYDRO

*Registrar, United States issues:* THE CANADIAN BANK OF COMMERCE  
TRUST COMPANY, New York

*Securities issued by the former British Columbia Electric Company Limited:*

*Registrar, Perpetual Callable Bonds and 25-year Bonds:* MONTREAL  
TRUST COMPANY

*Registrar and Trustee, First Mortgage Bonds:* MONTREAL TRUST  
COMPANY

*Registrar and Trustee, Debentures:* THE ROYAL TRUST COMPANY

*Securities issued by the former British Columbia Power Commission:*

*Registrar:* B.C. HYDRO

### THE BUSINESS OF B.C. HYDRO AND THE AREAS SERVED

#### **Electric Service**

Generation and transmission of electricity.

Distribution of electricity throughout areas of British Columbia containing more than 90% of the population of the Province.

#### **Gas Service**

Distribution of natural gas in Greater Vancouver and in the Fraser Valley eastward to Hope.

Distribution of liquefied petroleum gas-air in Greater Victoria.

#### **Passenger Transportation Service**

Urban passenger transportation in Greater Vancouver and in Greater Victoria.

Interurban passenger transportation in Greater Vancouver, in the Fraser Valley eastward to Hope, between Vancouver and Victoria and between Vancouver and Nanaimo.

#### **Rail Freight Service**

Rail freight operations in Greater Vancouver and in the Fraser Valley.

# BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

OFFICE OF THE CHAIRMAN

970 BURRARD STREET

VANCOUVER 1, B. C.

16 June 1971

The Honourable W.A.C. Bennett, P.C., LL.D., D.Pol.Sc., K.St.J.,  
Prime Minister of British Columbia,  
Parliament Buildings,  
Victoria, British Columbia.

Dear Sir:

Presented herewith is the Annual Report of British Columbia Hydro and Power Authority for the year ended 31 March 1971. B.C. Hydro is proud to participate in the celebrations marking British Columbia's 100th anniversary in Canadian Confederation, in the knowledge that this Utility and its predecessors have made an important contribution to the progress of Canada's most western region throughout the past one hundred years.

Demand for electricity continued to increase during the year under review, although the rate of increase was the lowest in seven years, primarily because of a series of labour-management disputes in key industries and a general slowdown in the North American economy. The decline in the rate of growth in sales of electricity is considered to be temporary, as indicators point to an early resumption of the annual rate of growth experienced during the past decade.

To meet requirements for energy in the Seventies, present electric generating capacity must be doubled, and related transmission and distribution facilities greatly expanded. B.C. Hydro believes this challenge can be met without adversely affecting the natural environment of our Province. As British Columbia enters its second hundred years in Canadian Confederation, the efforts of management and staff of B.C. Hydro will be directed towards this objective.

Submitted on behalf of the Board of Directors.



CHAIRMAN

BRITISH COLUMBIA

1871



1971

CANADA CONFEDERATION CENTENNIAL

## CENTENARY OF BRITISH COLUMBIA'S ENTRY INTO CANADIAN CONFEDERATION

British Columbia is commemorating the Centenary of its entry into Canadian Confederation with a program of celebrations marking the progress achieved by the Province since the historic event on 20 July 1871 when British Columbia became part of Canada.

British Columbia Hydro and Power Authority is participating in these Centennial celebrations. B.C. Hydro buildings throughout the Province are being decorated in a Centennial theme featuring the official Centennial emblem, with two of the largest emblems in the Province mounted on the roof of the Head Office building in Vancouver. The Centennial emblem also appears on stationery, printed matter and vehicles; and articles recounting British Columbia's 100 years of progress are featured in B.C. Hydro publications. The cover and centre section of this Report recognize the occasion by depicting some of the early history of electric, gas and transportation services in British Columbia.

## THE YEAR IN BRIEF

- The second 500 kv transmission line to the Lower Mainland from Gordon M. Shrum Generating Station on the Peace River was completed in December 1970.
- Construction of Mica Dam, the last of three Columbia River Treaty storage projects in British Columbia, was more than half completed at year-end as work proceeded on schedule.
- Net income for the year was \$16,084,686.
- Kilowatt-hours of electricity sold in British Columbia were 7.6% higher than last year, and peak one-hour demand was up 10.8%.
- Therms of gas sold were 14.2% higher than last year.
- Number of gas customers passed the 200,000 mark during the year.
- Number of passengers carried on the urban transportation services decreased from last year.
- Expenditures on new plant amounted to \$215,985,420 compared with \$189,629,998 for the previous year.



# ANNUAL REPORT OF BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

for the year ended 31 March 1971

## RESULTS OF OPERATIONS

Net income after providing for all expenses was \$16,084,686 compared with a loss of \$408,118 for the previous year. The increases in electric rates and transit fares introduced in the early part of 1970 were primarily responsible for restoring B.C. Hydro's operations to a sound financial basis; it is not expected, however, that this level of income can be maintained in the face of steadily rising costs. The net income for the year was added to earnings employed in the business, and the corresponding funds have been used for plant renewals and expansion to meet load growth. Gross revenues for the year under review amounted to \$276,944,700, an increase of \$37,044,420 or 15.4% over the previous year.

The following table shows the principal sources of revenue and how this revenue was used in the operations of B.C. Hydro:

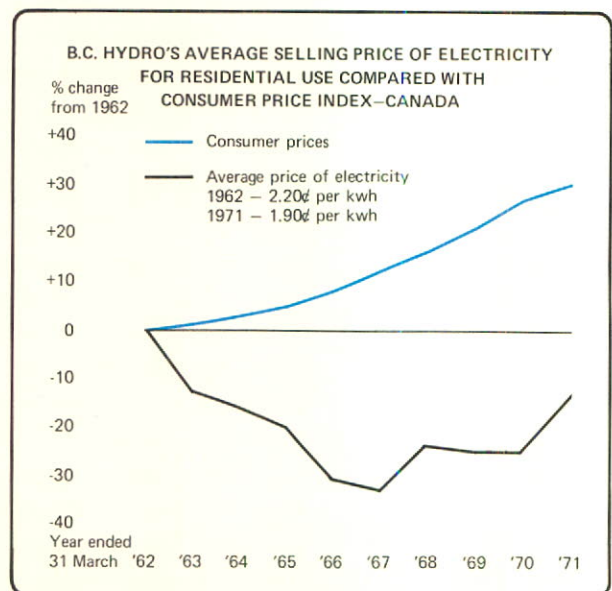
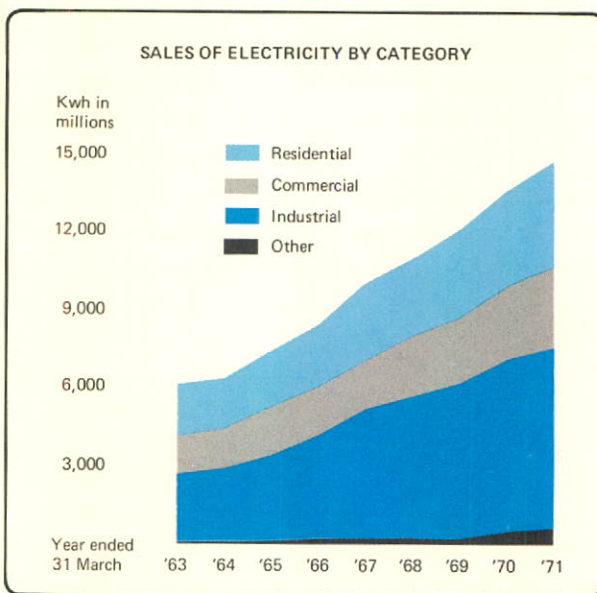
	Year Ended 31 March 1971	Year Ended 31 March 1970
<b>Where the revenue came from:</b>		
Sale of electricity to residential customers . . . . .	\$ 78,296,177	\$ 60,660,409
Sale of electricity to other customers . . . . .	114,677,428	102,087,136
Sale of gas . . . . .	47,513,551	40,965,694
Transportation of urban and interurban passengers . . . . .	21,307,358	20,739,317
Rail freight operations . . . . .	8,001,617	8,441,237
Interest on temporary investments . . . . .	3,100,842	3,854,459
Miscellaneous . . . . .	4,047,727	3,152,028
	<u>\$276,944,700</u>	<u>\$239,900,280</u>
<b>How the revenue was used:</b>		
Salaries, wages and employee benefits . . . . .	\$ 57,948,278	\$ 55,085,900
Materials and services . . . . .	45,214,693	40,409,194
Grants, school taxes, etc. . . . .	18,594,109	17,041,965
Interest on debt, less interest charged to construction . . . . .	88,901,465	83,042,438
Depreciation of plant . . . . .	50,201,469	44,728,901
Employed in the business (withdrawal) . . . . .	16,084,686	(408,118)
	<u>\$276,944,700</u>	<u>\$239,900,280</u>

## ELECTRIC SERVICE

### Sales of Electricity

The rapid growth that British Columbia has experienced in recent years was curbed somewhat during 1970 by a series of labour-management disputes in key industries and by anti-inflation measures that affected the North American economy generally. This slowdown in the economy was reflected in B.C. Hydro's sales of kilowatt-hours of electricity in British Columbia, which increased 7.6% during the year ended 31 March 1971—the lowest rate of growth in the past seven years. Gross revenues from the electric service were \$192,973,605, an increase of 18.6% over the previous year. The percentage increase in gross revenues compared with the relatively smaller increase in kilowatt-hours sold resulted principally from the adjustment in electric rates that became effective with billings in May 1970.

Residential sales of kilowatt-hours recorded a significant increase of 12.7% over the previous year, as 34,153 new residential customers were added to B.C. Hydro's system,



*Fluorescent lamps hidden in cornice provide soft background lighting.*



*New ranges feature automatic controls.*

and average annual consumption per customer rose from 6,651 kwh to 6,949 kwh. Commercial sales increased 10.7% compared with the 9.4% increase recorded a year ago. Part of the increase in this category can be attributed to the growing demand for electricity for heating; during the year, electric heating systems were installed in approximately 450 new office buildings, schools, churches, stores, hotels and motels. Industrial and bulk sales showed a gain of 4.4% compared with the increase of 11.6% recorded during the previous year; labour disputes were the major cause of the sharp decline in the rate of growth in this category.

At 31 March 1971, there were 689,526 customers served with electricity by B.C. Hydro.

## Regional Development

Despite adverse factors affecting the economy in 1970, consumption of electricity continued to increase in all regions of the Province, with the exception of Vancouver Island. Contributing to the lower rate of economic growth in British Columbia during the year was a decline in construction activity. Housing starts for the year were 14% less than for the previous year, the decrease being mainly in construction of apartment suites. Commercial and industrial construction activity experienced a similar trend.

British Columbia's continuing rapid growth in population—up 3.4% during the year ended 31 March 1971 compared with 1.3% for the rest of Canada—and pent-up demand for living accommodation, together with lower interest rates on mortgages, are expected to stimulate residential construction in 1971. As a consequence of improvement in residential construction in the Province and higher demand for housing elsewhere in North America, prospects for increased production of lumber and plywood from British Columbia's mills are encouraging. The pulp and paper industry is also expected to show gains in 1971. At Kitimat, the pulp mill complex of Eurocan Pulp and Paper Co. Ltd., which began production in 1970, is providing a stimulus to employment in that area. At Houston, a sawmill of Bulkley Valley Forest Industries Ltd. commenced operation; and a new pulp mill of Finlay Forest Industries Ltd. on Williston Lake reservoir went into production in the latter part of 1970. A major expansion of Kamloops Pulp and Paper Co. Ltd. and a new sawmill being built by Crown Zellerbach Canada Limited are contributing significantly to growth in the southern interior. As a consequence of expansion in British Columbia's forest industries, requirements for electricity from B.C. Hydro are expected to rise markedly during the coming year.

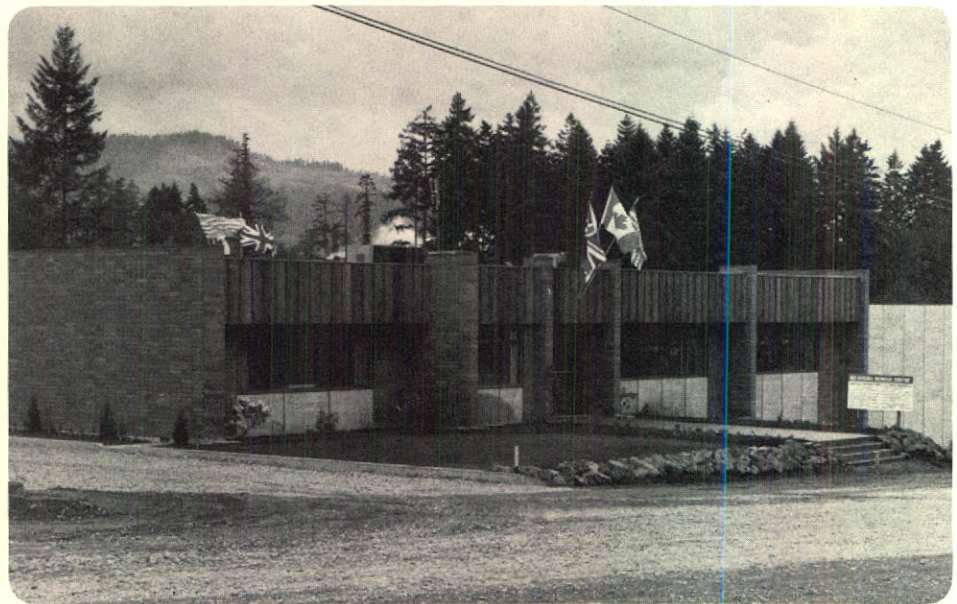
The mineral industry continued to make important gains during the year. Total value of production in the Province established a new record in 1970 for the twelfth successive year, as production of copper, molybdenum and coal increased significantly. Development of new mines also continued at a good pace during the year. On northern Vancouver Island, development of the large open-pit copper mine of Utah Construction and Mining Company was well advanced by year-end. In the Highland Valley, development by Lornex Mining Company Ltd. of a large copper-molybdenum mine progressed during the year, with production scheduled for 1972; and a copper mine of Similkameen Mining Co. Ltd., near Princeton, is also scheduled for operation in 1972. Another large copper-molybdenum mine is being developed farther north, near McLeese Lake, by Gibraltar Mines Ltd. In the East Kootenay region, shipments of coal from the Natal operations of Kaiser Resources Ltd. were commenced in April 1970; and good progress was made in developing the Fording River property of Fording Coal Limited, with deliveries scheduled to begin in 1972. Development of major new mines in British Columbia is expected to add approximately 130,000 kw to B.C. Hydro's electric load by the summer of 1972.

In the northern part of the Province, Fort Nelson is growing rapidly, primarily because of a 250-mile extension of the Pacific Great Eastern Railway to that community from Fort St. John and expansion of natural gas facilities of Westcoast Transmission Company Limited.

In the Lower Mainland area, construction is under way on a number of major commercial developments, including Pacific Centre, Project 200 and Royal Centre—all in downtown Vancouver. In Delta, Roberts Bank Superport commenced handling deliveries of coal from the East Kootenays in April 1970, and the official opening of the port by Prime Minister Pierre Elliott Trudeau of Canada was celebrated on 15 June 1970. The economy of the Lower Mainland and British Columbia generally will benefit greatly as the port at Roberts Bank is further developed to handle larger quantities of coal for shipment to Japan as well as other bulk cargoes to countries on the rim of the Pacific Ocean.

On 1 July 1970, B.C. Hydro assumed responsibility for operation of the electric distribution systems of the East Kootenay cities of Cranbrook, Fernie and Kimberley. These cities had previously purchased electricity from B.C. Hydro to serve approximately 8,200 residential and commercial customers. Improvements in the three electric systems are planned by B.C. Hydro to meet load growth and to improve reliability of service.

Other communities added to B.C. Hydro's system during the year included Bella Bella and McLeod Lake.



*B.C. Hydro building opened in Port Alberni in 1970 includes district office, distribution line crew headquarters, storage and warehouse facilities and terminal for vehicles.*

## **Rural Electrification**

During the year, the Government of British Columbia made a grant of \$2,000,000 to B.C. Hydro to provide financial assistance for the electrification of rural areas. Among the new areas served by this program was the Kispiox Valley, north of Hazelton, where a unique self-help project was completed in 1970 by residents of the community. Installation of 36 miles of distribution line, initially to serve 47 customers, was achieved through the initiative and determination of the residents, who provided the necessary power poles and cleared a right-of-way for the line. Throughout B.C. Hydro's service area, commitments were made during the year to extend financial assistance to 113 rural electrification projects serving 442 customers along 231 miles of distribution lines.

## Generation and Supply of Electricity

Demand for electricity during the year ended 31 March 1971 totalled 16,564 million kwh compared with 15,196 million kwh during the previous year. The following table shows requirements for energy and sources of supply for the year under review:

	Kwh in Millions	% of Total
Requirements for Energy:		
Sales to customers . . . . .	14,401	86.9
Export of surplus . . . . .	432	2.6
Line loss and system usage . . . . .	1,731	10.5
	<u>16,564</u>	<u>100.0</u>
Sources of Supply:		
Hydro generation—		
Peace River Project . . . . .	8,502	51.3
Other . . . . .	5,763	34.8
Thermal generation . . . . .	1,536	9.3
Purchases, etc. . . . .	763	4.6
	<u>16,564</u>	<u>100.0</u>

As shown above, more than 50% of the energy was supplied from Gordon M. Shrum Generating Station on the Peace River, where five units of an ultimate ten were operational during the year. Because water inflow to reservoirs during most of 1970 was below normal, it was necessary to increase production at Burrard Thermal Generating Plant. Some excess thermal energy was also available at Burrard for export to the United States; the energy exported was delivered at off-peak periods so as not to add to B.C. Hydro's peak load requirements.

Installed nameplate generating capacity of B.C. Hydro's system at 31 March 1971 totalled 3,513,868 kw. The highest one-hour demand ever recorded on the integrated system, 2,769,000 kw, occurred on 11 January 1971. This record demand represented an increase of 10.8% over the previous year's one-hour peak.

B.C. Hydro's concern for recreational and aesthetic values in British Columbia was demonstrated by an undertaking to clear Stave Lake, 35 miles east of Vancouver, of unsightly trees and debris, and ultimately to create a public recreation area for fishing, boating and picnicking. Clearing of the 18-mile-long lake will be done by selected personnel from the Haney Correctional Institution. The program will be coordinated by the Provincial Department of Recreation and Conservation and carried out progressively over several years.

A noise abatement program has been undertaken at Burrard Thermal Generating Plant. A contract for \$200,000 was awarded to a Vancouver firm in January 1971 to supply and install acoustical barriers to trap noise created during operation of four of the plant's generating units. The fifth unit was modified with sound dampening devices in 1970, and tests have proven the installation to be effective. Noise silencers and sound barriers were also installed at a number of substations to ensure quieter operation of equipment.

## Future Requirements for Electricity and the Environment

Hydroelectric energy is the cleanest power available to man. Its production leaves the air clean and the water pure. British Columbia, blessed with ample rainfall, high mountains with large snowfields and great rivers, is fortunate to have abundant hydroelectric potential. These great natural resources have enabled B.C. Hydro and its predecessors to employ hydroelectric developments instead of thermal plants for generating electric energy, with the result that B.C. Hydro is one of the most pollution-free electric utilities in North America. Approximately 90% of the energy generated by B.C. Hydro is from hydroelectric installations; the remainder is provided by thermal plants fired primarily by natural gas, the cleanest fossil fuel available today.

The following statistics summarize growth in the electric service during the past ten years and estimated growth during the next ten years:

	Actual Years Ended 31 March		% Increase 1971 over 1961	Forecast Year Ending 31 March 1981	% Increase 1981 over 1971
	1961	1971			
Requirements for energy (kwh in millions)	5,828	16,564	184	39,102	136
Number of customers (thousands)	432	690	60	1,056	53
Peak one-hour demand integrated system (kw in thousands)	1,083	2,769	156	7,142	158
Average annual use per residential customer (kwh)	4,723	6,949	47	10,800	55

As indicated in the above table, demand for electricity increased 184% during the ten-year period ended 31 March 1971, requiring generating facilities capable of supplying nearly 11 billion kilowatt-hours of additional load. During the ten years ending 31 March 1981, requirements for electricity are forecast to increase 136%, necessitating generating facilities capable of supplying more than 22 billion kilowatt-hours of additional load. The compounding effect of increases in electric load means that generating facilities must be developed at an increasingly rapid rate. Present generating capacity must be doubled before the decade of the Seventies is ended. If this rate of increase continues, capacity will have to be increased approximately 14 times by the end of the century.

Future requirements for energy will place a tremendous burden on B.C. Hydro. The challenge is to develop new sources of power that least detract from the natural environment of the Province.



*British Columbia's ample snowfields—measured each year to determine runoffs—provide sources of hydroelectric power which leave the air clean and the water pure.*



*Preservation of the environment is becoming an increasingly important consideration as attitudes and values are changing. The growing use of natural gas in homes, commercial buildings and industrial plants contributes greatly to the preservation of clear air and clean surroundings.*

## GAS SERVICE

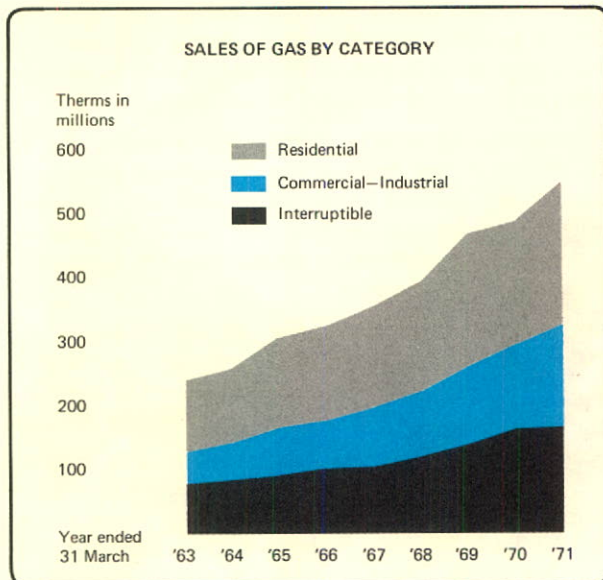
Gross revenues from the sale of gas to the public were \$47,513,551, up 16.0% from the previous year, while therms of gas sold rose 14.2%. The weather, which has a marked influence on sales of gas for heating, was considerably cooler during the year ended 31 March 1971; the number of degree days recorded at Vancouver International Airport was 13.0% more than during the previous year.

The peak one-day output of gas in the Lower Mainland during the year, excluding interruptible loads and gas delivered to Burrard Thermal Generating Plant, was 2.8 million therms on 11 January 1971, up significantly from the peak in the previous year but below the record peak of 2.9 million therms established during an extremely cold period in December 1968.

In the Lower Mainland, gains were recorded during the year in sales of therms of gas for all categories of customers. Sales to residential consumers increased 21.2%, as 5,747 new houses had gas heating installed, and 2,053 existing houses were converted to use natural gas. At year-end, there were 175,114 residential gas customers on line. Consumption by commercial customers increased 19.6% during the year, with natural gas the fuel chosen to heat 7,715 new apartment suites and many other new office buildings and retail stores; in addition, 2,236 existing apartment suites were converted to use this fuel. Natural gas continues to dominate the space heating market, as 94% of the residential and commercial heating load added during the year in B.C. Hydro's natural gas service area was supplied with this fuel. Interruptible gas represented 29.8% of total therms sold during the year in the Lower Mainland.

In Greater Victoria, therms of liquefied petroleum gas-air sold during the year increased 7.7% over the previous year, primarily reflecting growth in sales to commercial customers. Plant capacity was increased during the year from 45,000 to 53,000 therms per day to ensure adequate supply to meet the increasing load.

In September 1970, the number of gas customers served by B.C. Hydro reached 200,000, and the occasion was marked by a special ceremony to commemorate this milestone.



*Gold-plated meter was presented at special ceremony marking service to B.C. Hydro's 200,000th gas customer.*



Although the gas industry in British Columbia had its start in Victoria in 1860, with the formation of Victoria Gas Company Limited, growth in the industry was relatively slow until the advent of natural gas in the Lower Mainland in November 1956. At that time, there were 61,554 customers being served with manufactured gas from 964 miles of distribution mains, and of these customers, 7,529 used gas for space heating. At 31 March 1971, there were 3,686 miles of mains serving 205,176 customers, of whom 178,037 used gas for space heating.

Westcoast Transmission Company Limited supplies natural gas to B.C. Hydro in the Lower Mainland. In accordance with terms of the purchase agreement with Westcoast, the daily billing demand for firm gas was increased from 218.3 million cubic feet to 227.6 million cubic feet in November 1970 and to 236.9 million cubic feet in January 1971.

Construction of a liquefied natural gas plant on Tilbury Island in Delta was completed in 1970. The plant has a storage tank capable of holding 175,000 barrels of liquid natural gas, equivalent to 625 million cubic feet of gas when vapourized. In January 1971, liquefied natural gas was stored in the new facility for the first time, and 97 million cubic feet of natural gas had been accumulated before the plant was utilized to supply gas to B.C. Hydro's distribution system in the Lower Mainland. The availability of this plant will reduce the demand for gas from the transmission pipeline during periods of peak load and thereby minimize the cost of gas to B.C. Hydro. With the placing in service of the new liquefied natural gas plant, the liquid petroleum peak-shaving plant located at "city gate" in Surrey was withdrawn from service.

Plans are under way to convert up to four B.C. Hydro service vehicles to operate on liquefied natural gas. It is known that costs of maintaining vehicles using liquefied natural gas are considerably lower and exhaust pollution is significantly less than that from standard automotive fuels. The performance of these vehicles will be thoroughly tested, and the information gained will be used to determine whether other B.C. Hydro vehicles should be converted to use this fuel.

## TRANSPORTATION SERVICES

### Urban Transportation

Gross revenues from urban transportation services, excluding the grant of \$2,000,000 received from the Government of British Columbia, amounted to \$15,385,168. Revenues reflected the fare increase introduced 1 April 1970. Passengers carried on the Greater Vancouver and Greater Victoria systems totalled 65.9 million, a decrease of 16.2% from the previous year. The decrease in passengers carried reflects normal resistance to a fare increase, the impact of generally unsettled economic conditions and the suspension of urban transit services caused by a strike by members of the Amalgamated Transit Union. The combination of the strike, which occurred from 4 January to 5 February 1971, and extremely adverse weather conditions forced transit patrons to form "car pools" or travel by private automobile. These alternative transportation arrangements are continuing to have an unfavourable effect on usage of B.C. Hydro transit services.

Operating losses on B.C. Hydro's urban transit services continue to be heavy, and an agreement negotiated in February 1971 with the Amalgamated Transit Union will add further to these already high transit losses. Because of increasing costs and decreased patronage, B.C. Hydro introduced a number of changes in service during the year; all were carefully considered, with the objective of maintaining the best possible standard of service at the lowest cost for the greatest number of people.

A study of transit operations was undertaken jointly by the City of Vancouver and B.C. Hydro with a view to expediting service in the downtown area of Vancouver. A report was completed in the latter part of 1970, and some of the recommendations have been adopted, with a consequent improvement in the movement of transit vehicles.

A study of the role of "rapid transit" in the future of Greater Vancouver was completed in 1970 by a firm of consultants. The study was carried out at the request of a Joint Transportation Committee, of which Dr. G.M. Shrum was Chairman. B.C. Hydro shared the cost of the study jointly with the Greater Vancouver Regional District and supplied substantial data and staff assistance. The resulting report, which was well received, could

provide the groundwork for development of a "rapid transit" system in the Lower Mainland.

In the transit services, B.C. Hydro operates electric trolley coaches, diesel buses and gasoline buses. Gasoline buses are gradually being phased out of service in Greater Vancouver and Greater Victoria. Diesel buses cause less pollution of the atmosphere than the average automobile. To further reduce pollution, diesel buses are now operated with a top grade of fuel, and modifications are being made to the engines of these buses to provide even more complete combustion and thereby minimize exhaust smoke and odour.

Ten new diesel buses were purchased during the year for use in the Greater Vancouver and Greater Victoria areas. Delivery of these new buses, together with changes in service, enabled older equipment to be withdrawn from service.

### Interurban Transportation (Pacific Stage Lines)

Gross revenues from interurban transportation services rose 13.2% to \$3,922,190 during the year. An increase in fares effective 1 April 1970, on the Greater Vancouver and Fraser Valley routes, contributed to the increase in revenues, although the number of passengers carried on these routes declined from the previous year. Revenues from the services operated between Vancouver and Victoria and between Vancouver and Nanaimo (via ships of the British Columbia Ferry Authority) showed an increase over last year, as B.C. Hydro expanded these cross-water services effective 30 November 1970, when Vancouver Island Coach Lines withdrew from a joint operating arrangement that commenced in 1960. To meet the requirements for equipment to provide the additional service, B.C. Hydro acquired nine buses from Vancouver Island Coach Lines; and twenty-one former employees of that company were hired by B.C. Hydro.

In addition to the buses acquired from Vancouver Island Coach Lines, six new diesel buses were purchased in April 1970; five older gasoline buses were retired from service.



*B.C. Hydro expanded its bus services between Vancouver and Vancouver Island in 1970.*

### Rail Freight

Gross revenues from rail freight operations amounted to \$8,001,617 for the year, a decline of 5.2% from the previous year, while volume of freight hauled totalled 2,200,066 tons, down 10.8% from a year ago. The decline in rail freight traffic was caused by a number of factors, including a strike by members of the Amalgamated Transit Union that curtailed railway operations for approximately one month early in 1971, other labour strikes in British Columbia and elsewhere, generally unsettled economic conditions

and increased competition from other carriers. Increases during the year in some Canadian and American rail freight rates partially offset the effect on revenues of the general decline in business.

Major decreases in B.C. Hydro's rail freight traffic were recorded for forest products, building materials, industrial machinery, household appliances, electrical equipment and shipments of motor vehicles from eastern Canada. Notable increases in commodities handled included vehicles imported from Japan for routing to eastern points and more than 600 carloads of gas pipe from eastern Canada and from Japan for destinations in British Columbia. As a result of the active solicitation of new business, prospects for growth in volume of freight handled are encouraging.

The establishment of industries on lands adjacent to B.C. Hydro's railway continued at a satisfactory rate. One of the more significant developments, emphasizing the growing trend to locate rail-oriented industries in suburban areas, was the sale of a large site in Newton Industrial Centre to a major international food company. Another major project that will benefit B.C. Hydro's rail freight service is the redevelopment of land on Carrall Street in Vancouver as a downtown distributing centre.

Construction of a large warehouse on Annacis Island was completed during the year by McGregor Warehouses (1945) Ltd. The Annacis Island industrial centre is served exclusively by B.C. Hydro's freight railway with connections to five other railways.

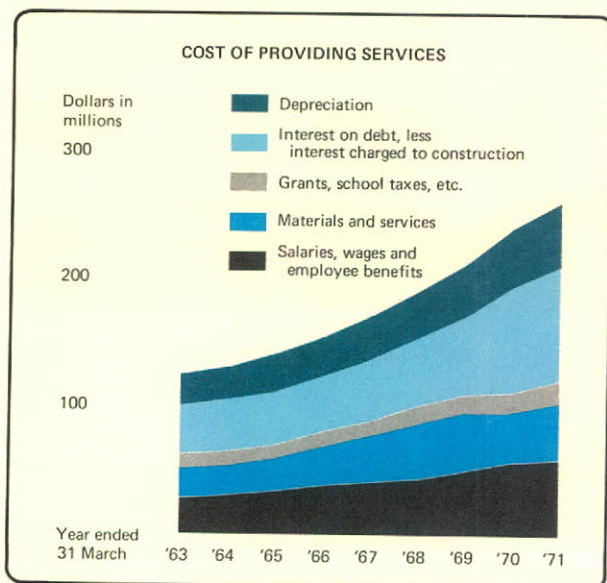
The rail access from a point near Cloverdale to the port at Roberts Bank, which had been completed during the previous year, has been transferred to the British Columbia Harbours Board. B.C. Hydro was reimbursed by the Harbours Board for expenditures on this rail access.

## COST OF PROVIDING SERVICES

The total cost of providing all services during the year was \$260,860,014, an increase of \$20,551,616 or 8.6% over the previous year.

Interest and other costs on debt charged to operations during the year were \$88,901,465, up \$5,859,027 or 7.1% over the previous year. Provision for depreciation of plant was \$50,201,469 compared with \$44,728,901 last year, an increase of \$5,472,568 or 12.2%. Increases in interest charges and provision for depreciation are related to the completion and transfer to active service of new plant and to property acquisitions.

Grants, school taxes and water rentals charged to operating expenses totalled \$18,594,109, an increase of \$1,552,144 or 9.1% over the previous year. The increase was



*Acoustical barriers to dampen noise from boiler fans are being installed at Burrard Thermal Generating Plant.*

caused mainly by additions to B.C. Hydro's assessable property, higher mill rates and generally higher assessments on property.

Salaries, wages and employee benefits charged to operations amounted to \$57,948,278, an increase of \$2,862,378 or 5.2% over last year. The increase was caused by higher rates of pay and an increase in the number of regular employees, partially offset by a decrease in labour costs resulting from suspension of urban transit services and curtailment of rail freight operations during the strike early in 1971 by members of the Amalgamated Transit Union.

Purchases of natural gas from Westcoast Transmission Company Limited totalled \$21,803,836, of which \$19,248,095 was for gas sold to the public—an increase of 2.2% over the previous year. The remainder of the gas purchased was used principally at Burrard Thermal Generating Plant. The relatively small increase in cost of gas purchased from the pipeline company for sale to the public reflects a reduction in demand charges from the previous year that partially offset the effect of continuing growth in consumption of gas.

Total cost of fuel for generation at Burrard Thermal Generating Plant increased \$1,795,209 over the year ended 31 March 1970. Production of energy at the Burrard plant during the year showed an overall increase, primarily because water conditions during most of 1970 were below normal and hydroelectric generation was thereby reduced at some stations; in addition, power was generated at the Burrard plant in off-peak periods for export to the United States.

## FINANCING

The following 25-year sinking fund bonds were sold in Canada during the year ended 31 March 1971:

Issue	Principal Amount	Effective Rate
8% Series CC	\$ 2,420,000	8.14%
8% Series CD	480,000	8.14
8% Series CE	10,000,000	8.08
7.54% Series CF	15,000,000	7.54
6.90% Series CH	10,000,000	6.90
6.90% Series CJ	20,000,000	6.90

In addition, sinking fund bonds totalling \$110,949,000 were sold to the Canada Pension Plan Investment Fund, at an average interest cost of 7.77%.

The average effective annual interest cost of all long-term bonds sold by B.C. Hydro during the year was 7.62% compared with an average of 7.69% for the previous year.

On 1 September 1970, \$50,505,000 7% Parity Development Bonds Series CG, due 1 September 1975, were sold. The net proceeds of this issue were applied to the repayment of \$50,505,000 6½% Parity Development Bonds Series R, which matured 1 September 1970. At the same time, the interest rate of the other three issues of parity development bonds of B.C. Hydro was increased from 6½% to 7%.

During the year, \$20,806,619 was paid to Trustees to meet sinking fund requirements of B.C. Hydro's long-term debt. All sinking fund obligations have been met.

Bonds and other securities issued by B.C. Hydro and its predecessors are unconditionally guaranteed as to principal and interest by the Province of British Columbia.

Two of B.C. Hydro's major projects have received recognition for Utility Design in competition with publicly owned utilities in North America. The awards were recently granted by the American Public Power Association.

The Arrow project, which includes Hugh Keenleyside Dam, received an Honor Award, the second highest award in the competition. Gordon M. Shrum Generating Station won an Award of Merit, the third highest award in the contest.

The judges commented as follows on the Arrow project: The engineering of the dam and lock and other facilities are of high order. Not only is this a handsome engineering and sound functional solution, but it has contributed greatly to the entire region surrounding the artificial lake. It has created a regional recreation facility and brought life back to small communities along the lake.

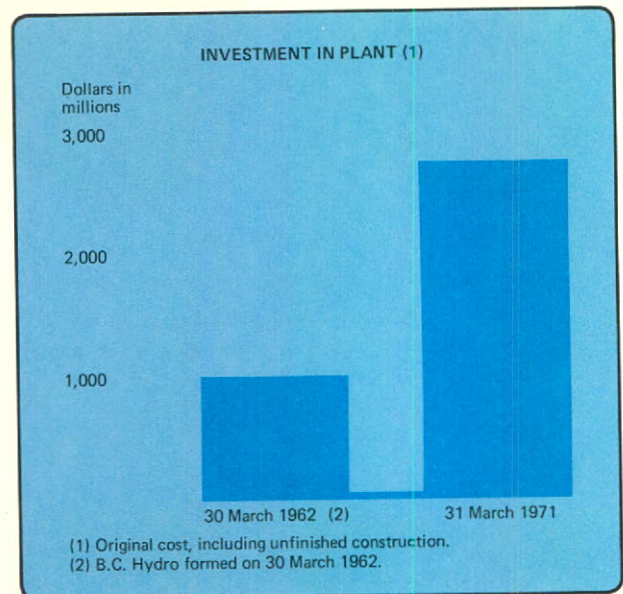
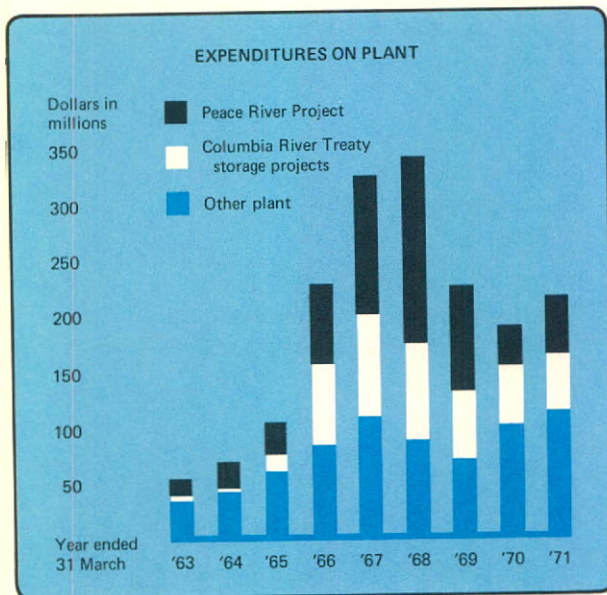
About the Gordon M. Shrum Generating Station, the judges stated: The concept of the whole project and the way it fits into the landscape is superior. It illustrates recognition of the macrolandscape and the determination to leave it, to the extent possible, unaffected by man-made disturbances. This facility was designed to bring visitors closely in contact with really exciting, dramatic parts of the operation.

## CONSTRUCTION PROGRAM

Expenditures on plant additions, land and improvements totalled \$215,985,420 compared with \$189,629,998 for the previous year. Net property additions amounted to \$208,204,151, after deducting plant retirements of \$7,781,269. The amount of \$6,037,681 was also added to property account, representing the gross book value of the electric distribution systems of Cranbrook, Fernie and Kimberley. Major expenditures for the year by projects or broad classifications included the following:

Peace River Project, including transmission lines . . . . .	\$52,485,244
Columbia River Treaty storage projects . . . . .	51,678,629
Jordan River redevelopment . . . . .	16,731,944
Mica generating plant . . . . .	5,401,772
Fort Nelson diesel generating station . . . . .	2,312,423
Whatshan redevelopment . . . . .	1,726,489
Major electric transmission line construction—	
Gold River to Quatsino to Jeune Landing—230 kv and 138 kv . . . . .	5,926,036
Nelway to Cranbrook to Natal—230 kv. . . . .	4,540,779
Sechelt to Forest View—230 kv . . . . .	2,984,488
Cypress to Cheekye to Walters—230 kv. . . . .	1,328,726
Other . . . . .	7,976,012
Substations, associated distribution facilities and local trans- mission systems . . . . .	32,244,039
Electric extensions to serve new customers . . . . .	14,916,223
Gas extensions to serve new customers . . . . .	4,333,459
Gas system renewals and alterations . . . . .	2,315,727
Liquefied natural gas plant . . . . .	3,936,220
Buses for urban and interurban transit systems . . . . .	1,334,321

Design engineering and construction inspection on most B.C. Hydro construction projects are carried out by International Power and Engineering Consultants Limited, a wholly owned subsidiary of B.C. Hydro.



## Peace River Project

To deliver electricity from the expanding Peace River generating facilities at Gordon M. Shrum Generating Station to the Lower Mainland, the second 500 kv transmission line was completed in December 1970 from Kelly Lake Substation, near Clinton, to Ingledow Substation, in Surrey. The section of the line between the Peace River and Kelly Lake Substation became operational in 1969. Completion of the second line, which extends a distance of 548 miles, strengthens transmission facilities from the Peace River plant, allows economies in system operation and improves security of supply.

A vital step in completing the second 500 kv line to the Lower Mainland was installation of 3-inch-diameter conductors—believed to be the largest overhead conductors in the world—along a 4¼-mile section of line traversing Mission Ridge, in the Coast Range of British Columbia. The extremely heavy conductor and towers were specially designed to withstand winds of hurricane velocity and severe icing conditions that are prevalent in the area, where elevations range from 4,000 to 6,500 feet. Because of the mountainous terrain and bad weather, construction of the Mission Ridge section of line presented a tremendous challenge to engineers and workmen.

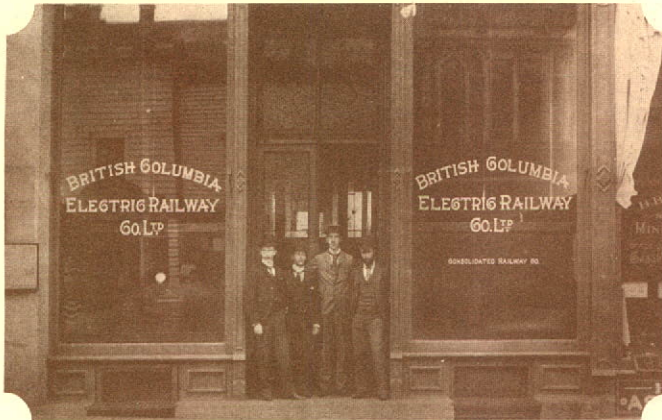
Capacity of Gordon M. Shrum Generating Station will be increased in the autumn of 1971 with the addition of a sixth 227,000 kw generating unit, bringing total generating capacity of the underground power plant to 1,362,000 kw, or 60% of its ultimate capacity. Manufacture of the seventh and eighth generating units progressed during the year, with these units scheduled for operation in the autumn of 1972. A ninth unit is planned for service in 1974 and a tenth unit later, as needed. Studies are under way to assess the need for a third 500 kv transmission line from Gordon M. Shrum Generating Station to Williston Substation, near Prince George.

Trial of the lawsuit initiated on 17 July 1967 by Northern Powerplant Builders against B.C. Hydro for additional remuneration, damages and declarations as to the contractor's rights with respect to the contract for construction of the underground powerhouse and associated works commenced on 14 September 1970.

## EVENTS IN THE HISTORY OF B.C. HYDRO AND ITS PREDECESSORS



Centennial medallion shows official emblem of the 100th anniversary of British Columbia's entry into Canadian Confederation: a stylized grouping of three "C"s representing Canada, Confederation and Centennial, with Provincial floral emblem, the flowering dogwood, in centre. Reverse side of medallion shows a map of Canada as at 20 July 1871, when British Columbia joined Nova Scotia, New Brunswick, Quebec, Ontario and Manitoba to make Canada a transcontinental nation.



Vancouver office of one of B.C. Hydro's predecessors in 1897, at 163 Cordova Street; and B.C. Hydro's present attractive Head Office building at 970 Burrard Street in Vancouver.



- 1860 Victoria Gas Company Limited, B.C. Hydro's first predecessor, was formed. First gas was manufactured and distributed in 1862.
- 1871 British Columbia joined Canadian Confederation.
- 1883 First street lighting system became operative in Victoria, utilizing electricity generated from a 25 horsepower steam engine.
- 1887 Electricity became available in Vancouver from steam plant built at corner of Pender and Abbott Streets. Also, first gas was manufactured and distributed in Vancouver.
- 1890 Electric streetcars began operating in Victoria and Vancouver. Nanaimo received first electricity from steam generating plant.
- 1891 Vancouver to New Westminster interurban rail passenger service was inaugurated.
- 1897 British Columbia Electric Railway Company Limited was formed.
- 1898 First hydroelectric generating plant on the west coast of Canada was built at Goldstream to serve Victoria.
- 1899 Electric service in Vancouver—20 cents a kilowatt-hour.
- 1902 Passengers were carried on first steam train from Steveston to Vancouver for Dominion Day celebrations. Service with electric trams commenced on this route in 1905.
- 1903 First hydroelectric generating plant in Lower Mainland was built at Lake Buntzen to serve Greater Vancouver area.
- 1904 Gas companies in Vancouver and Victoria were acquired by B.C. Electric. Electric service in Vancouver—13 cents a kilowatt-hour.

1907 Construction began on interurban rail line to provide passenger and freight service to lower Fraser Valley.

1909 Supply of power from steam generating plant became available in Fernie.

1911 Stave Lake power plant was placed in service to serve lower Fraser Valley.

1912 Power from Jordan River hydroelectric generating plant was transmitted to Victoria. On north coast of Province, steam generating plant provided first electric energy to Prince Rupert, and in southern interior, Kamloops received first electricity from steam plant.

1913 Alberni area received electricity from diesel generating plant.

1915 "Jitneys" appeared on streets of Vancouver and Victoria.

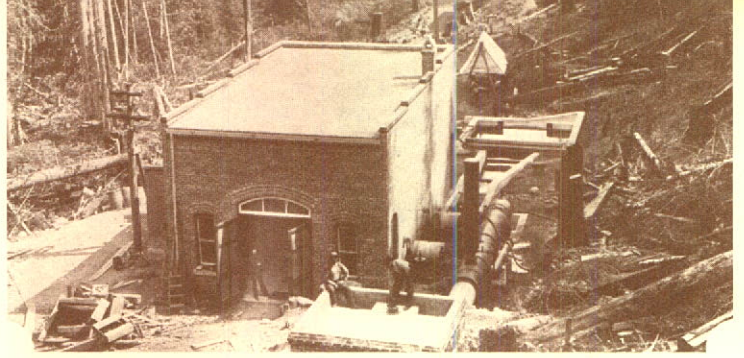
1917 Diesel generating plant supplied electricity to Prince George. Electric service in Vancouver—11 cents a kilowatt-hour gross and 8.8 cents net.

1922 Rule of the road was changed from left to right.

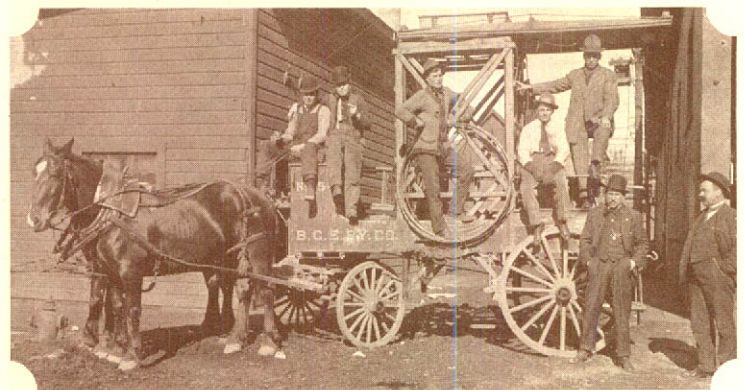
1923 First buses in Vancouver commenced operating along Grandview Highway. Electric service in Vancouver—5 cents a kilowatt-hour.

1928 British Columbia Power Corporation, Limited was incorporated for the purpose of acquiring B.C. Electric operations.

1933 In Vancouver, Carrall Street manufactured gas plant went into operation.



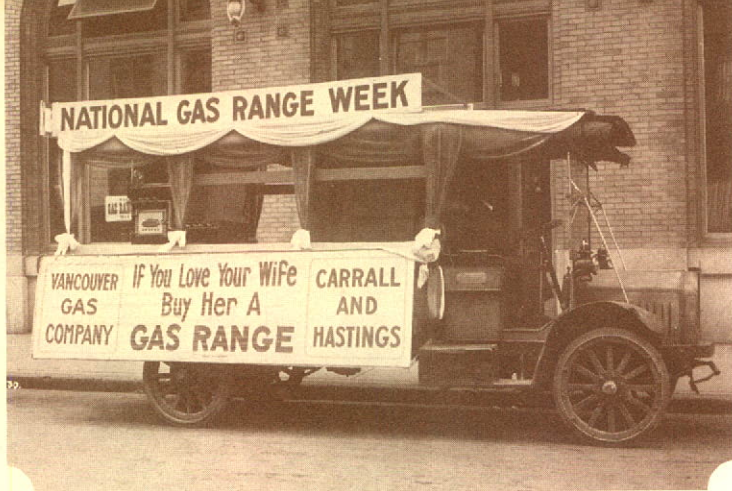
*First hydroelectric generating plant on Canadian west coast, at Goldstream near Victoria in 1898; and B.C. Hydro's present major source of power, Gordon M. Shrum Generating Station on the Peace River.*



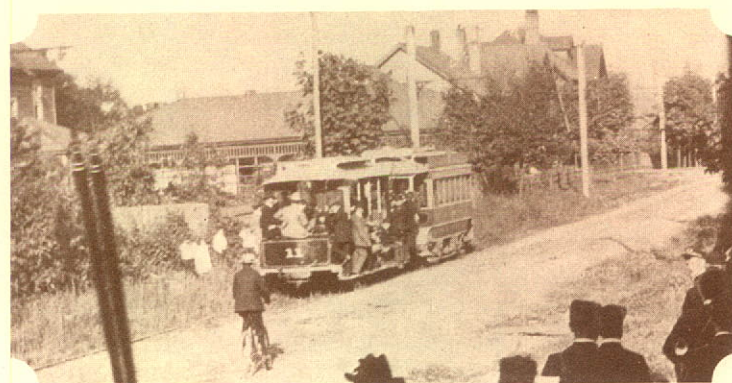
*Horse-drawn turn-of-century vehicle for servicing streetcar overhead wires; and one of today's efficient, specially-designed line trucks for maintaining trolley coach wires.*







*A truck decorated for gas range advertising in 1916 by one of B.C. Hydro's predecessors; and a modern, two-oven appliance for today's clean natural gas, with automatic controls including a thermostatically controlled surface burner.*



*One of the early streetcars, first introduced to Victoria and Vancouver in 1890; and one of B.C. Hydro's present fleet of efficient, comfortable buses.*



- 1935 Electric transmission line from Victoria to Duncan was completed.
- 1939 Electric residential service in Vancouver—2.6 cents a kilowatt-hour.
- 1945 British Columbia Power Commission was formed to consolidate generation and distribution of electricity in a number of centres throughout the Province, and to provide for progressive extension of service to potential markets in other areas of British Columbia.
- 1947 First power was generated at John Hart Generating Station, near Campbell River.
- 1948 Power was received from Bridge River Generating Station.
- 1950 132 kv transmission line between Victoria and Nanaimo was placed in service. Passenger service on interurban rail line between New Westminster and Chilliwack was discontinued. Pacific Stage Lines replaced interurban rail service in Fraser Valley.
- 1955 Conversion of urban transit system in Vancouver from streetcars to buses was completed.
- 1956 Natural gas became available in Lower Mainland. First submarine cable between Lower Mainland and Vancouver Island was placed in service. New transmission line from Cheekye to Powell River was completed, thereby connecting Powell River and adjacent areas to integrated system.
- 1957 B.C. Electric Head Office building at 970 Burrard Street, Vancouver was opened.
- 1961 British Columbia Electric Company Limited became Crown corporation. Peace River Project was assigned to B.C. Electric. Power was delivered from Burrard Thermal Generating Plant.

1962 British Columbia Hydro and Power Authority was formed, amalgamating British Columbia Electric Company Limited and British Columbia Power Commission. Average electric residential service in B.C. Hydro's service area—2.2 cents a kilowatt-hour.

1964 Columbia River Treaty was ratified by Canada and United States, and B.C. Hydro was designated as Canadian Entity under terms of Treaty. B.C. Hydro acquired Northern British Columbia Power Company Limited, serving Prince Rupert, Stewart and neighbouring areas.

1966 Electric operations of East Kootenay Power Company, Limited were acquired.

1967 W.A.C. Bennett Dam on Peace River was completed. Duncan Dam, first of three Columbia River Treaty storage projects in British Columbia, was completed. 287 kv transmission line from Kitimat to Prince Rupert was placed in service.

1968 First power from Peace River Project flowed into B.C. Hydro's integrated system, as three generating units at Gordon M. Shrum Generating Station and first 500 kv transmission line to Lower Mainland were completed. Arrow Dam (renamed Hugh Keenleyside Dam in 1969) became second Columbia River Treaty storage project to be completed.

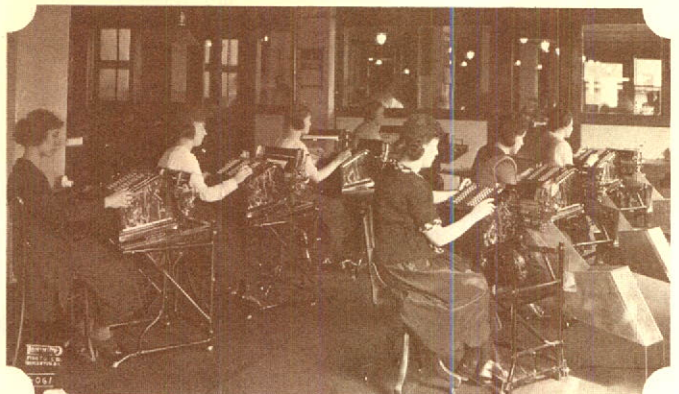
1969 Fourth and fifth units at Gordon M. Shrum Generating Station were placed in service.

1970 Second 500 kv transmission line was completed from Peace River to Lower Mainland. Responsibility for operation of electric distribution systems of Cranbrook, Fernie and Kimberley was assumed by B.C. Hydro. Average electric residential service in B.C. Hydro's service area—1.9 cents a kilowatt-hour.

1971 British Columbia celebrates 100 years in Canadian Confederation.



*The Lower Mainland's first electric interurban freight locomotive ahead of milk-train car in the early 1920s; and one of B.C. Hydro's current freight locomotives hauling shipment of motor vehicles.*



*Bookkeeping machines in the office of a B.C. Hydro predecessor in 1928 each printed about 1,000 electricity and gas bills a day; and today's high-speed computer, which can print out more than 30,000 bills in five hours.*



Major contracts awarded during the year included:

Oy Nokia Ab <i>Installation of 500 kv series capacitors . . . . .</i>	\$2,664,680
Trans Power Construction Ltd. and Chapman-Long Construction Ltd. <i>Installation of foundations, erection of towers and installation of conductor for "Mission Ridge" section of transmission line . . . . .</i>	1,433,026



*Rough terrain and weather at Mission Ridge posed stiff test for powerline builders.*



*Water cascaded down W.A.C. Bennett Dam spillway for first time during test in 1970.*

## Columbia River Treaty Storage Projects

The Columbia River Treaty between Canada and the United States called for construction of three storage projects in Canada—Duncan, Arrow and Mica—to regulate river flow for both hydroelectric generation and flood control purposes. B.C. Hydro completed the Duncan and Arrow storage projects well in advance of the scheduled dates, and work on the Mica project is proceeding satisfactorily.

Duncan and Arrow storage projects were operated throughout the year in accordance with power and flood control operating plans prepared and implemented by the Canadian and United States Entities under provisions of the Columbia River Treaty.

At the Duncan project, the rise in the water level in the reservoir behind Duncan Dam, at the north end of Kootenay Lake, caused large areas of marshland to be inundated. These marshes were a link in the annual migration of ducks, geese and other waterfowl. To compensate for this loss, B.C. Hydro designed and commenced development during the year of a nesting habitat and resting area for waterfowl at Duck Lake, near Creston. Dykes and pumping stations were completed and about sixty nesting islands were constructed. This development will be completed in 1971 and turned over to the Creston Valley Wildlife Management Area Authority of the Provincial Department of Recreation and Conservation.

Construction of Mica Dam, which is scheduled for completion by 1 April 1973, progressed satisfactorily during the year. By the end of the construction season in November 1970, the dam had reached a height of 440 feet of an ultimate 800 feet above bedrock; and of the 42,000,000 cubic yards of fill required to complete the dam, 24,000,000 cubic yards had been placed. Excavation was completed during the year for the spillway and outlet tunnel, and placement of concrete progressed favourably. Installation of mechanical equipment—including three large radial gates for the spillway—was under way at year-end.

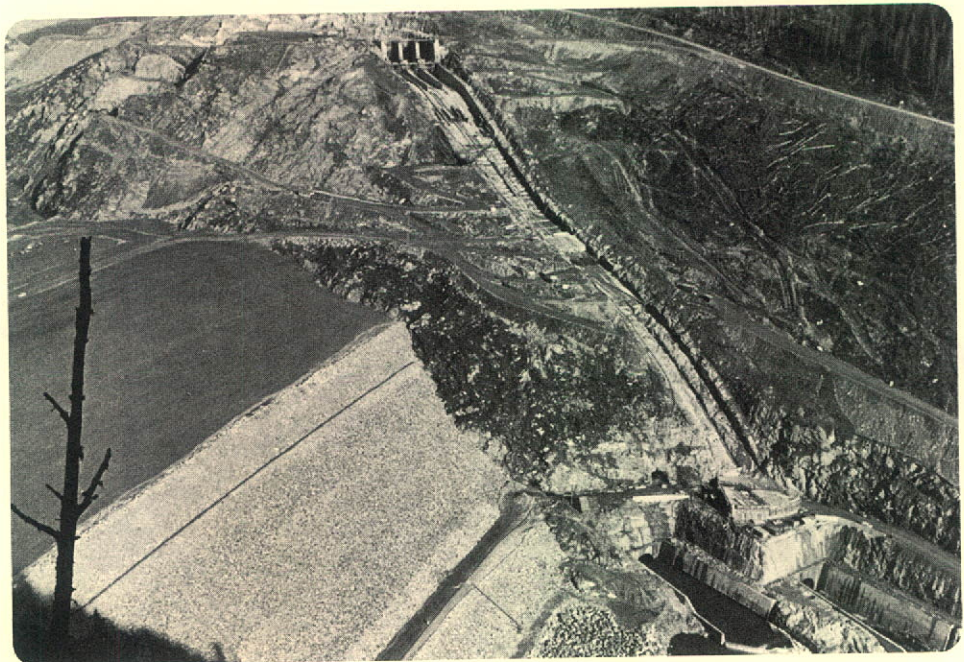
The peak labour force at the Mica project in 1970 was 1,450 men, slightly below that of 1969; a maximum labour force of 1,700 men is expected for 1971.



*Waterfowl refuge at Duck Lake will replace marshland inundated by Duncan reservoir.*



*Mica Dam reached a height of 440 feet before annual snows ended construction season.*



*Excavation for spillway and outlet tunnel at Mica project was completed in 1970.*

### **Other Major Electric Service Plant Additions**

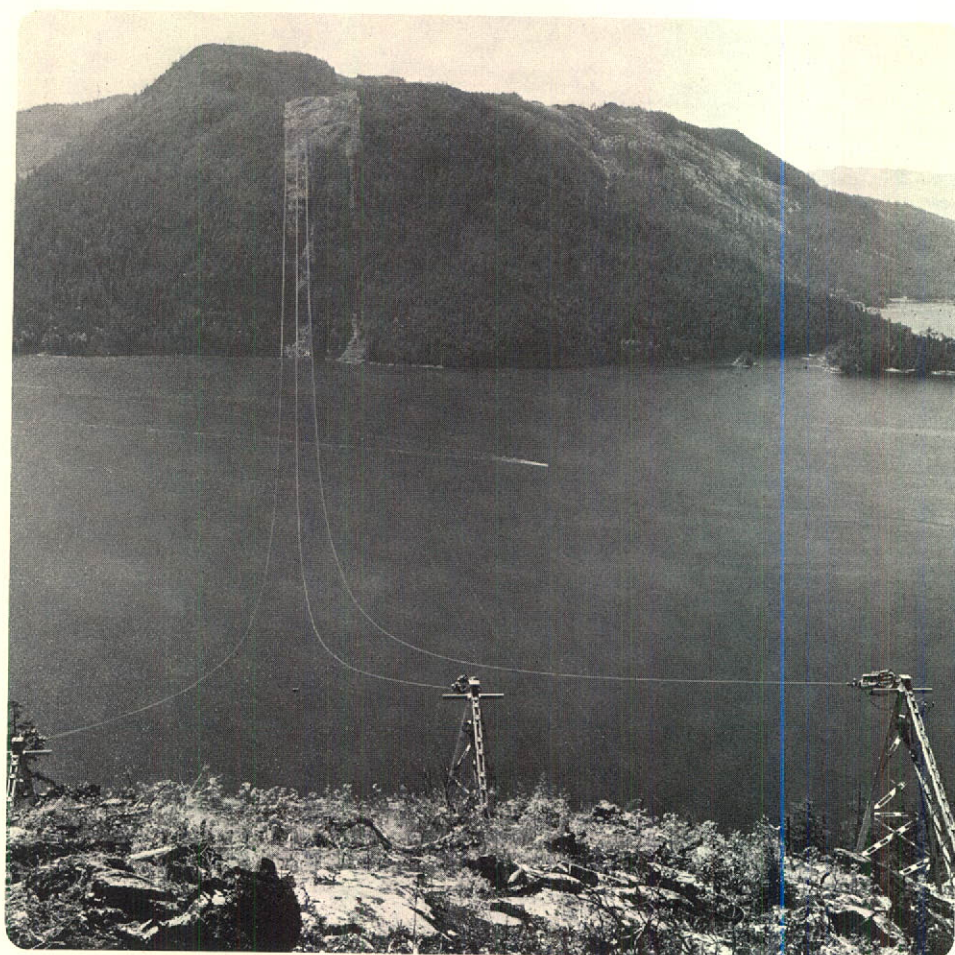
Redevelopment of the hydroelectric generating plant at Jordan River on southern Vancouver Island was continued during the year, with production of power scheduled for the autumn of 1971. Rehabilitation of the existing Diversion and Bear Creek dams and construction of the new 430-foot-long and 117-foot-high Elliott Dam, powerhouse, penstock, power tunnel and associated works all progressed satisfactorily. The new station will provide 150,000 kw of peaking capacity.

Redevelopment of Whatshan Generating Station in the southern interior of the Province is under way. On 9 October 1970, a contract was awarded for construction of a new

powerhouse for a 50,000 kw generating unit to replace the original station that had to be removed from service prior to the rise in water level in the reservoir behind Hugh Keenleyside Dam. Excavation for the powerhouse was completed ahead of schedule, and placement of concrete was commenced in February 1971. The generating station is scheduled to be in service by the autumn of 1972.

Engineering was commenced during the year on design of a 2,500,000 kw hydroelectric generating plant for Mica, with first power tentatively scheduled for 1976, and surveys were initiated for two 500 kv lines to transmit power from the site to the Lower Mainland. Engineering was also undertaken on additional hydroelectric developments on the Kootenay and Peace Rivers. At Burrard Thermal Generating Plant, a sixth 150,000 kw unit is scheduled for service in the autumn of 1974; present capacity of the Burrard plant is 750,000 kw. To provide increased peaking and standby capacity at Port Hardy and Prince Rupert, plans are under way for gas turbine units to be placed in service at these locations by 1973. Consideration is being given to the installation of additional peaking capacity in the Victoria area by 1974.

To provide electricity in areas where hydroelectric power is not available, diesel generating capacity had to be increased during the year. At Masset, construction of a new powerhouse and installation of five 500 kw generating units were completed. At Fort Nelson, a new powerhouse for two 3,000 kw units was constructed; one unit was placed in service in 1970, and the other unit is scheduled to be operational in 1971. Additions to existing diesel generating installations were made at Atlin, Hazelton and Stewart.



*Jervis Inlet span is one of longest over-water transmission line crossings in world.*

As generating capacity is increased to meet the continually growing demand for electric energy, transmission facilities must also be expanded in a manner that ensures reliability of supply to load centres. Advanced electrical engineering concepts have been applied in designing the voltage regulation and response characteristics of B.C. Hydro's 500 kv trunk transmission system. Unique features of the design include a stabilizing signal, high-ceiling static exciters and braking resistors. These provisions, along with high-speed, solid-state fault detection devices using microwave control channels, have extended the stability margin of long-distance, high-voltage transmission and have contributed to the reliable performance of B.C. Hydro's 500 kv system.

During the year, additions to the transmission system in the Lower Mainland included 11 miles of 230 kv line to supply power to the new Cypress Substation in West Vancouver. This transmission extension and the substation will increase security of supply to customers on the North Shore. To meet load growth in the Powell River area and on the Sechelt Peninsula, a second transmission line, involving a second overhead crossing of Jervis Inlet with a span of more than two miles, was constructed from Sechelt to Powell River. This 53-mile line, built to 230 kv standards, is to be operated initially at 138 kv.

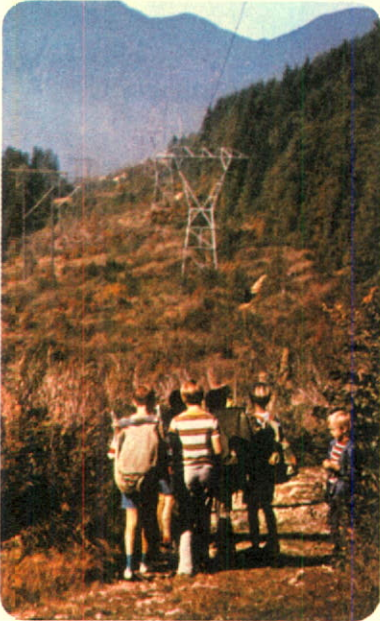
On Vancouver Island, a 230 kv line was completed from Gold River to a new substation at Quatsino (89 miles) to supply power for new loads on the northern part of the Island, including a new copper mine operation and the community of Jeune Landing. Clearing was started during the year on the 35-mile right-of-way for a 138 kv circuit to serve the community of Tahsis. In 1971, a new 138 kv line will be built to transmit power from the redeveloped Jordan River hydroelectric station to load centres in Victoria. The right-of-way for this line was acquired in 1970.

In the central interior of the Province, right-of-way was acquired during the year for construction in 1971 of a 230 kv line from Kelly Lake Substation to 100 Mile House (53 miles). North of Prince George, a 230 kv line was completed to meet loads of expanding pulp producing facilities; pending completion of the new Salmon Valley Substation, this 21-mile line is being operated at 138 kv.

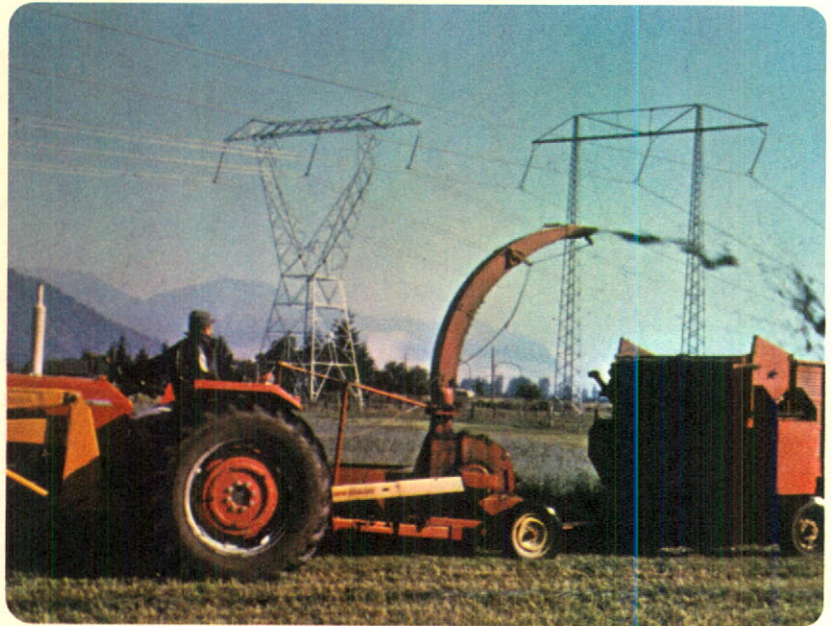
In the southern interior, work was continued during the year on construction of the 230 kv transmission line from Nelway, near the international boundary, to Cranbrook (104 miles) to be completed in 1971. This line, which utilizes aluminum towers, will transmit power to developing industry in the East Kootenay area by providing a link with a transmission network in the United States. It is planned to extend the transmission line from Cranbrook to Natal in 1972. To serve increased loads in the Westbank area and in the region south of Savona, a second 138 kv transmission line was completed between Savona and Highland Substations (26 miles).

In planning transmission lines, B.C. Hydro seeks, as far as practicable, to follow the least conspicuous routes, to minimize disturbance to owners of property and to preserve the natural environment. To achieve these objectives, B.C. Hydro consults with boards of regional districts, municipal councils and provincial and federal departments concerned with the environment. In planning the right-of-way for the transmission line extension to Cypress Substation in West Vancouver, a location was chosen on the north side of Hollyburn Mountain so that the view of the North Shore mountains from Vancouver would not be unduly affected. Clearing of the right-of-way for this extension was given special treatment because of its potential for recreational purposes. After being cleared thoroughly, 150 acres of the right-of-way were seeded with alpine-type grasses to prevent erosion and encourage the type of growth consistent with recreational use. A program for clearing logs and debris from the right-of-way for the transmission line from Needles to Nakusp was commenced during the year. When construction of the transmission line from Nelway to Cranbrook is completed, plans call for seeding the section of right-of-way

alongside the Salmo to Creston highway. B.C. Hydro encourages the multiple use of rights-of-way for a variety of purposes, including recreation, agriculture, Christmas tree farms, cattle grazing and parks.



*Hiking is one of many recreations enjoyed on powerline rights-of-way.*



*Farmer harvests crop under B.C. Hydro transmission lines. Many rights-of-way are used for ranch land, tree farms and various agricultural purposes.*

New and increased substation facilities were added during the year in various parts of the Province, including Heffley Creek, 100 Mile House, Powell River, the Prince George area, Sechelt, Terrace, Westbank, the Fraser Valley, Greater Vancouver and Vancouver Island.

To make substations less conspicuous and more aesthetically appealing, B.C. Hydro in recent years has developed an advanced substation design of low profile. This new design has been used in substations built at Armstrong, Enderby and Salmon Arm in the southern interior of the Province; Babine Lake, Smithers and Topley in the central interior; Campbell River, Esquimalt, Gold River, Northfield, Puntledge and Quatsino on Vancouver Island; and at locations in the Lower Mainland. Another important feature is that the basic pattern is modular and therefore adaptable to varying conditions, permitting a considerable degree of standardization in design and construction.

Major contracts awarded during the year included:

Cana Construction Co. Ltd.	
<i>Construction of power plant and associated works at Whatshan redevelopment. . . . .</i>	\$3,674,050
Canada Wire & Cable Company Limited	
<i>Supply of conductor for transmission lines. . . . .</i>	1,681,670
Northwest Electric Ltd.	
<i>Erection of towers and installation of conductor for Nelway-Cranbrook transmission line . . . . .</i>	1,120,629
Chapman-Long Construction Ltd.	
<i>Installation of foundations and erection of wood-pole structures for Nelway-Cranbrook transmission line . . . . .</i>	1,015,763





*New low-profile design of B.C. Hydro substations is functional and pleasing to the eye.*

## SENIOR MANAGEMENT

Mr. Robert C. McMordie, Principal Civil Engineer, died 13 August 1970. Mr. McMordie joined British Columbia Power Commission in 1956 as Chief Engineer, and on formation of B.C. Hydro, he became Associate Manager, Engineering Division. Mr. McMordie's special contribution came from his important responsibilities relating to development of the Columbia River Treaty projects.

Mr. Robert W. Gross, Manager, Corporate Services Division, was granted early retirement effective 31 July 1970. Mr. Gross had been Manager, Land Division since formation of B.C. Hydro until he assumed his most recent position in August 1968. His service began with British Columbia Electric Railway Company Limited in 1946.

Effective 1 August 1970, Mr. Charles W. Nash was appointed Manager, Corporate Services Division succeeding Mr. Gross. Prior to becoming Assistant Manager of the Division earlier in 1970, Mr. Nash held the position of Manager, Load Development Department. He commenced service with British Columbia Power Commission in 1945.

Mr. D. Wayne Minion resigned from the position of Manager, Corporate Planning Division on 17 July 1970 to accept a position with another organization.

Following the resignation of Mr. Minion, Mr. Thomas A. Nordstrom was appointed Manager, Computer and Management Systems Division on 18 July 1970. Mr. Nordstrom joined International Power and Engineering Consultants Limited in 1961, and directly prior to his present appointment was Manager of B.C. Hydro's Computer Sciences Department.

## EMPLOYEES

B.C. Hydro had a staff of 7,205 regular employees at 31 March 1971, an increase of 149 or 2.1% during the year.

A new collective labour agreement, providing for wage increases and other benefits, was concluded in February 1971 with the Amalgamated Transit Union following protracted negotiations and a strike by members of the Union. The settlement was for a 27-month period from 1 November 1970 to 31 January 1973; the main provisions called for a general wage increase of 7% effective 1 November 1970 and a 7% noncumulative increase effective 31 December 1971. General salary increases ranging up to 6% were granted supervisory and professional employees in December 1970.

Negotiations with the International Brotherhood of Electrical Workers and the Office and Technical Employees' Union began in December 1970 for contracts that expired 31 March 1971. Settlement had not been reached on either of these contracts by year-end.

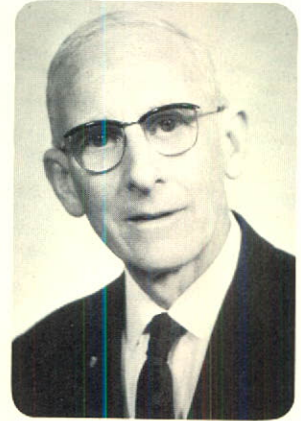
Continuing attention is given to employee training and development in managerial, supervisory and technical skills through programs designed to meet specific employee and organization needs. These programs are organized within B.C. Hydro or by employee participation in courses at universities, night schools and other institutes.

During the year ended 31 March 1971, approximately 100 employees participated in courses provided in co-operation with British Columbia Institute of Technology in the field of electronics for practical application within B.C. Hydro to the functions of electric generation, transformation, communication and protection. The need for education of employees in this field was recognized because of B.C. Hydro's increasing use of electronics in its electric operations. The courses involve formal instruction, laboratory work, home study and examinations, with successful students gaining credits toward a certificate from British Columbia Institute of Technology.

A total of 104 employees retired on pension during the year; of these, ten had service of 40 years or more. The following two employees had served for more than 45 years:

WILLIAM WILSON SMITH, Service Centre Supervisor – *51 years, 7 months*  
HAROLD LLOYD DUNCAN, Line Supervisor – *45 years, 7 months*

The operations of B.C. Hydro continued to grow in scope and complexity, and the Directors wish to record their appreciation of the effective work of the employees during the year.



WILLIAM WILSON SMITH

## FINANCIAL STATEMENTS

The financial statements of B.C. Hydro have been examined by Price Waterhouse & Co., the Auditors appointed by the Lieutenant-Governor in Council. The Report of the Auditors appears below, and the Statement of Income, Statement of Source and Application of Funds and Balance Sheet are included in the following pages.

### REPORT OF THE AUDITORS

The Lieutenant-Governor in Council,  
Province of British Columbia:

We have examined the balance sheet of British Columbia Hydro and Power Authority as at 31 March 1971 and the statements of income and source and application of funds for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of British Columbia Hydro and Power Authority as at 31 March 1971 and the results of its operations and the source and application of its funds for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Vancouver, British Columbia  
19 May 1971

PRICE WATERHOUSE & CO.,  
*Chartered Accountants.*

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

STATEMENT OF INCOME FOR THE YEAR ENDED 31 MARCH 1971

	1971	1970
Gross revenues . . . . .	<u>\$276,944,700</u>	<u>\$239,900,280</u>
Expenses:		
Salaries, wages and employee benefits . . . . .	57,948,278	55,085,900
Materials and services . . . . .	45,214,693	40,409,194
Grants, school taxes, etc. . . . .	18,594,109	17,041,965
Provision for depreciation . . . . .	50,201,469	44,728,901
Interest on debt (Note 5) . . . . .	\$104,950,100	\$97,732,311
Less—		
Interest charged to construction . . . . .	<u>16,048,635</u> <u>88,901,465</u>	<u>14,689,873</u> <u>83,042,438</u>
	<u>260,860,014</u>	<u>240,308,398</u>
Net income (loss), transferred to earnings employed in the business (Note 6) . . . . .	<u>\$ 16,084,686</u>	<u>\$ (408,118)</u>

STATEMENT OF SOURCE AND APPLICATION OF FUNDS  
FOR THE YEAR ENDED 31 MARCH 1971

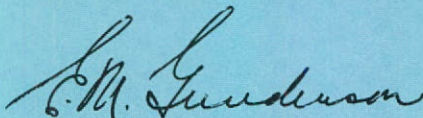
	1971	1970
<b>Funds provided:</b>		
Operations—		
Net income (loss) . . . . .	\$ 16,084,686	\$ (408,118)
Provision for depreciation . . . . .	50,201,469	44,728,901
Other . . . . .	1,766,544	1,738,620
	<u>68,052,699</u>	<u>46,059,403</u>
Contributions in aid of construction . . . . .	5,354,522	6,343,209
Proceeds from sales of bonds . . . . .	218,566,664	208,278,859
Columbia River Treaty—		
Benefits received during year (net) . . . . .	541,465	125,218
Interest . . . . .	14,015,489	13,328,363
	<u>\$306,530,839</u>	<u>\$274,135,052</u>
<b>Funds expended:</b>		
Plant additions—		
Peace River Project . . . . .	\$ 52,485,244	\$ 35,196,798
Columbia River Treaty storage projects . . . . .	51,678,629	51,258,956
Other . . . . .	111,821,547	103,174,244
	<u>215,985,420</u>	<u>189,629,998</u>
Sinking funds . . . . .	20,806,619	18,775,053
Bonds matured . . . . .	50,505,000	50,505,000
Increase in working capital exclusive of changes in current portion of long-term debt . . . . .	19,596,904	14,552,467
(Decrease) increase in other items . . . . .	(363,104)	672,534
	<u>\$306,530,839</u>	<u>\$274,135,052</u>

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

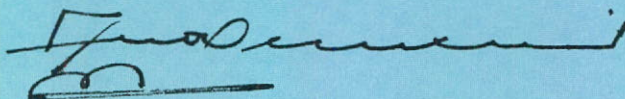
BALANCE SHEET AS AT 31 MARCH 1971

	1971	1970
<b>PROPERTY ACCOUNT:</b>		
Lands, franchises, water rights, storage dams, plants for the generation, transmission and distribution of electricity and gas, trolley coaches, motor buses, freight railway and rolling stock, etc., at cost . . . . .	\$2,242,143,023	\$2,131,097,845
<i>Less—</i>		
Accumulated depreciation . . . . .	<u>417,189,218</u>	<u>371,068,370</u>
	1,824,953,805	1,760,029,475
Deferred costs of dam, powerhouse and other common property (Note 1) . .	195,250,571	182,180,730
Unfinished construction—		
Peace River Project . . . . .	26,229,724	23,386,718
Columbia River Treaty storage projects . . . . .	211,848,782	160,764,975
Other . . . . .	<u>70,900,000</u>	<u>34,700,000</u>
	<u>2,329,182,882</u>	<u>2,161,061,898</u>
<b>CURRENT AND WORKING ASSETS:</b>		
Cash . . . . .	7,295,723	8,394,329
Temporary investments (Note 2) . . . . .	70,244,877	47,459,173
Accounts receivable and unbilled revenues . . . . .	41,721,183	36,735,463
Materials and supplies at average cost . . . . .	16,104,589	12,725,841
Prepaid expenses . . . . .	<u>598,437</u>	<u>486,608</u>
	<u>135,964,809</u>	<u>105,801,414</u>
MORTGAGES AND OTHER DEFERRED ACCOUNTS RECEIVABLE . . . . .	<u>5,792,689</u>	<u>5,454,686</u>
INSURANCE FUND . . . . .	<u>1,012,968</u>	<u>375,000</u>
UNAMORTIZED DISCOUNT AND EXPENSE ON LONG-TERM DEBT AND PARITY DEVELOPMENT BONDS . . . . .	<u>21,027,430</u>	<u>21,974,248</u>
	<u>\$2,492,980,778</u>	<u>\$2,294,667,246</u>

APPROVED ON BEHALF OF THE BOARD:



E. M. GUNDERSON, Director



JOHN DUNSMUIR, Director

	1971	1970
LONG-TERM DEBT (Notes 3 and 4) . . . . .	<u>\$1,588,300,954</u>	<u>\$1,443,772,629</u>
PARITY DEVELOPMENT BONDS, payable on demand (Notes 4 and 5): . . . .		
6½% Series R due 1 September 1970 . . . . .	—	50,505,000
7% Series AN due 15 August 1972 . . . . .	50,505,000	50,505,000
7% Series AT due 3 August 1973 . . . . .	50,505,000	50,505,000
7% Series AZ due 1 September 1974 . . . . .	50,505,000	50,505,000
7% Series CG due 1 September 1975 . . . . .	50,505,000	—
	<u>202,020,000</u>	<u>202,020,000</u>
CURRENT AND ACCRUED LIABILITIES:		
Accounts payable . . . . .	62,670,911	55,706,280
Interest accrued on long-term debt and parity development bonds . . . . .	29,658,050	26,056,190
Sinking fund instalments due within one year . . . . .	17,157,888	15,528,187
	<u>109,486,849</u>	<u>97,290,657</u>
DEFERRED LIABILITIES . . . . .	<u>16,134,450</u>	<u>10,255,160</u>
RESERVE FOR INSURANCE (Note 8) . . . . .	<u>1,012,968</u>	<u>389,245</u>
CONTRIBUTIONS ARISING FROM COLUMBIA RIVER TREATY (Note 9) . .	<u>446,732,702</u>	<u>432,175,748</u>
CONTRIBUTIONS IN AID OF CONSTRUCTION . . . . .	<u>27,994,704</u>	<u>23,550,342</u>
EARNINGS EMPLOYED IN THE BUSINESS (Note 6) . . . . .	<u>101,298,151</u>	<u>85,213,465</u>
	<u>\$2,492,980,778</u>	<u>\$2,294,667,246</u>

COMMITMENTS (Note 9)

*The accompanying notes are an integral part of the above balance sheet.*

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS AS AT 31 MARCH 1971

**Note 1 – Peace River Project:**

Consistent with the accounting practice adopted in 1968, the construction costs of the dam, powerhouse and other common property are being transferred to plant in service by instalments proportionate to the number of completed and operational generating units in relation to the ten units presently contemplated. The transfers are to be completed not later than 31 March 1976. By 31 March 1971, five generating units were in service and consequently 50% of the costs of the dam, powerhouse and other common property had been transferred to plant in service.

The costs of the dam, powerhouse and other common property not yet transferred to plant in service are shown separately as deferred costs under property account. These costs continue to attract interest charged to construction.

**Note 2 – Temporary investments:**

Short-term deposits and investment receipts—

Banks . . . . .	\$35,500,000
Financial institutions . . . . .	10,000,000
Province of British Columbia . . . . .	1,100,000
7% parity development bonds, payable on demand, guaranteed by Province of British Columbia—	
British Columbia Hydro and Power Authority . . . . .	17,575,300
Pacific Great Eastern Railway . . . . .	3,981,800
Bonds purchased and held for sinking fund requirements . . . . .	2,087,777
	<u>\$70,244,877</u>

The above investments are carried at cost which is not in excess of market value.

**Note 3 – Long-term debt:**

*Issued by British Columbia Hydro and Power Authority—*

Bonds:

5¼% Series A due 1 May 1982 . . . . .	\$ 32,496,300
3¼% Series B due 1 October 1979 . . . . .	10,000,000
5% Series C due 1 March 1993 . . . . .	15,000,000
5¼% Series D due 1 May 1993 . . . . .	25,000,000
5¼% Series F due 1 June 1993 . . . . .	10,000,000
5¼% Series G due 15 October 1993 . . . . .	15,000,000
5¼% Series H due 15 December 1993 . . . . .	10,000,000
5¼% Series J due 1 March 1994 . . . . .	10,000,000
5¼% Series L due 2 July 1994 . . . . .	10,000,000
5¼% Series M due 15 December 1994 . . . . .	20,000,000
5¼% Series N due 15 March 1995 . . . . .	10,000,000
5¾% Series S due 15 September 1995 . . . . .	10,000,000
5½% Series T due 29 December 1995 . . . . .	29,000,000
5¾% Series U due 18 April 1991 . . . . .	40,000,000
5¾% Series X due 1 July 1991 . . . . .	5,000,000
5% Series Y due 2 July 1991 . . . . .	50,000,000*
6¼% Series AG due 1 December 1991 . . . . .	20,000,000
5% Series AH due 2 January 1992 . . . . .	50,000,000*
5.46% Series W-A due 1 February 1987 . . . . .	80,396,000
6% Series AJ due 15 March 1992 . . . . .	25,000,000
6% Series BA due 29 May 1992 . . . . .	2,500,000
6¼% Series AK due 1 June 1992 . . . . .	50,000,000*
6.10% Series AL-A due 2 July 1992 . . . . .	10,000,000
6¼% Series AM due 4 July 1992 . . . . .	25,000,000
6¼% Series BB due 19 July 1992 . . . . .	4,000,000
Carried forward . . . . .	<u>\$ 568,392,300</u>

**Note 3 — Long-term debt (continued):**

Brought forward . . . . .	\$ 568,392,300
6½% Series AP due 1 November 1992 . . . . .	20,000,000
6¼% Series BC due 1 February 1993 . . . . .	10,200,000
6¼% Series Z-S due 15 February 1993 . . . . .	3,300,000
6¼% Series Z-T due 15 February 1993 . . . . .	4,200,000
6% Series AR due 29 March 1993 . . . . .	10,000,000
5.71% Series W-B due 1 February 1988 . . . . .	95,001,000
7¼% Series AS due 1 June 1993 . . . . .	10,000,000
7% Series AU due 5 August 1993 . . . . .	10,000,000
7% Series AV due 1 October 1993 . . . . .	10,000,000
7% Series Z-G due 15 December 1993 . . . . .	7,000,000
7½% Series AW due 31 March 1994 . . . . .	10,000,000
6.68% Series W-C due 3 February 1989 . . . . .	65,862,000
7¼% Series BD due 2 July 1993 . . . . .	5,500,000
7% Series BE due 1 December 1993 . . . . .	12,800,000
7½% Series AX due 2 June 1994 . . . . .	25,000,000
7% Series AY due 1 October 1994 . . . . .	30,000,000
8% Series CA due 1 December 1994 . . . . .	10,000,000
8% Series CB due 30 December 1994 . . . . .	15,000,000
8% Series CC due 31 March 1995 . . . . .	20,000,000
8% Series CD due 31 March 1995 . . . . .	5,000,000
7.32% Series WD due 2 September 1989 . . . . .	68,396,000
7.85% Series VW due 1 May 1990 . . . . .	4,000,000
7.85% Series VX due 4 May 1990 . . . . .	4,707,000
8.08% Series VY due 1 June 1990 . . . . .	10,000,000
8.08% Series VZ due 2 June 1990 . . . . .	3,840,000
8.12% Series VA due 2 July 1990 . . . . .	10,000,000
8.12% Series VB due 3 July 1990 . . . . .	842,000
8% Series CE due 1 August 1995 . . . . .	10,000,000
8.08% Series VC due 4 August 1990 . . . . .	10,000,000
8.08% Series VD due 5 August 1990 . . . . .	982,000
8% Series VE due 1 September 1990 . . . . .	5,629,000
8% Series VF due 1 September 1990 . . . . .	4,371,000
8% Series VG due 2 September 1990 . . . . .	653,000
7.98% Series VH due 1 October 1990 . . . . .	9,702,000
7.91% Series VJ due 2 November 1990 . . . . .	8,100,000
7.91% Series VK due 1 December 1990 . . . . .	10,000,000
7.91% Series VL due 2 December 1990 . . . . .	2,297,000
7.54% Series CF due 30 December 1995 . . . . .	15,000,000
7.54% Series VM due 4 January 1991 . . . . .	5,482,000
7.01% Series VN due 1 February 1991 . . . . .	5,342,000
6.79% Series VP due 1 March 1991 . . . . .	4,053,000
6.79% Series VR due 1 March 1991 . . . . .	5,947,000
6.79% Series VS due 2 March 1991 . . . . .	5,002,000
6.90% Series CH due 30 March 1996 . . . . .	10,000,000
6.90% Series CJ due 30 March 1996 . . . . .	20,000,000

*Issued by the former British Columbia Electric Company Limited—*

First Mortgage Bonds, after deducting bonds redeemed in accordance with sinking fund requirements:

3½% Series "E" due 1 March 1975 . . . . .	12,564,000
4% Series "F" due 1 July 1991 . . . . .	2,288,000
3¼% Series "G" due 1 December 1976 . . . . .	14,165,000*
4¼% Series "H" due 1 December 1977 . . . . .	10,326,000
4¼% Series "I" due 1 February 1979 . . . . .	10,627,000
3¾% Series "J" due 1 June 1980 . . . . .	11,089,000
4¼% Series "K" due 1 February 1981 . . . . .	22,206,000
Carried forward . . . . .	\$1,264,865,300

## BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS AS AT 31 MARCH 1971 (continued)

## Note 3 — Long-term debt (continued):

Brought forward . . . . .	\$1,264,865,300
5% Series "L" due 1 February 1982 . . . . .	30,682,000
5½% Series "M" due 2 January 1988 . . . . .	39,220,000
5½% Series "N" due 1 March 1989 . . . . .	24,274,000
6½% Series "O" due 1 April 1990 . . . . .	25,721,000
5¾% Series "P" due 1 May 1991 . . . . .	13,082,000
Perpetual Callable Bonds:	
4% . . . . .	267,500
4¼% . . . . .	103,800
4½% . . . . .	183,750
4¾% . . . . .	481,100
5% . . . . .	407,500
5½% . . . . .	268,450
25-year Callable Bonds due 1 August 1986:	
4% Series AA . . . . .	11,732,500
4¼% Series AB . . . . .	10,896,200
4½% Series AC . . . . .	14,816,250
4¾% Series AD . . . . .	25,932,300
5% Series AE . . . . .	24,592,500
5½% Series AF . . . . .	14,731,550
Sinking Fund Debentures:	
5¾% Series A due 1 April 1977, after deducting debentures redeemed in accordance with sinking fund requirements . . . . .	34,800,000
<i>Issued by the former British Columbia Power Commission—</i>	
Bonds:	
3¾% Series C due 15 September 1991 . . . . .	3,000,000
4% Series D due 21 May 1992 . . . . .	1,000,000
4% Series E due 15 June 1992 . . . . .	1,000,000
4% Series F due 15 September 1992 . . . . .	1,500,000
4% Series G due 1 November 1988 . . . . .	10,000,000*
3¼% Series H due 15 July 1989 . . . . .	6,300,000*
3¼% Series J due 4 July 1975 . . . . .	10,000,000
5% Series MC due 15 September 1982 . . . . .	5,149,000
5% Series MD due 15 September 1992 . . . . .	18,724,000
5% Series N due 15 September 1992 . . . . .	10,000,000
3% Series S due 1 April 1976 . . . . .	17,738,000
3% Series T due 1 April 1977 (payable in Canadian or United States funds at option of holder) . . . . .	9,285,000
Debentures:	
3¾% Series K due 15 June 1986 . . . . .	20,000,000*
4¾% Series L due 15 April 1987 . . . . .	25,000,000*
3¾% Series P due 1 February 1988 . . . . .	20,000,000*
	1,695,753,700
Exchange premium at date of issue on long-term debt payable in United States funds . . . . .	9,156,162
	1,704,909,862
Less—	
Sinking funds on deposit with Trustee, Minister of Finance for the Province of British Columbia. . . . .	99,451,020
	<u>\$1,605,458,842</u>
<i>*Payable in United States funds and carried at par of exchange.</i>	
<i>Classification on balance sheet—</i>	
Long-term debt . . . . .	\$1,588,300,954
Sinking fund instalments due within one year, included in current and accrued liabilities . . . . .	17,157,888
	<u>\$1,605,458,842</u>



#### Note 4 – Guarantee by Province of British Columbia:

The Government of the Province of British Columbia has unconditionally guaranteed the principal and interest of the long-term debt and parity development bonds.

#### Note 5 – Interest:

Included in interest on debt for the year ended 31 March 1971 is \$1,766,544 for amortization of discount and expense on long-term debt and parity development bonds, and there has been deducted \$5,352,081 for income from sinking fund investments.

The interest rate on Series AN, AT and AZ Parity Development Bonds was increased from 6½% to 7% effective 1 September 1970.

#### Note 6 – Earnings employed in the business:

Balance as at 31 March 1970 . . . . .	\$ 85,213,465
Net income for the year ended 31 March 1971 . . . . .	<u>16,084,686</u>
Balance as at 31 March 1971 . . . . .	<u>\$101,298,151</u>

#### Note 7 – Pension plans:

Employees of B.C. Hydro are covered under contributory pension plans, and provisions are being made for current services according to the requirements of the various plans. Provision has been made for all past service costs under these plans with the exception of those relating to a contributory plan introduced effective 1 January 1965. B.C. Hydro is funding the estimated past service costs of this plan by annual payments of \$393,800 over a fifteen-year period which commenced 1 April 1967.

#### Note 8 – Self-insurance:

In 1969, B.C. Hydro adopted a policy of self-insurance on plant and equipment and for general liability. An insurance reserve is being accumulated by annual charges to operations commensurate with the current cost of insurance.

Fire insurance coverage has been retained with insurance companies on certain plant and equipment to comply with trust deed requirements. Insurance coverage is also maintained on major plant under construction.

#### Note 9 – Commitments:

B.C. Hydro, being the Canadian Entity required to construct three storage dams under the Columbia River Treaty, is liable to compensate the Columbia Storage Power Exchange if Mica, the only dam still under construction, is not operational by the agreed date of 1 April 1973. B.C. Hydro also has obligations relating to the operation and maintenance of the three storage dams.

Purchase commitments and contracts of B.C. Hydro for capital projects and inventories of materials and supplies aggregated approximately \$126,000,000 as at 31 March 1971, which includes contracts awarded in respect of the general commitment of B.C. Hydro to construct Mica dam as referred to in the preceding paragraph.

# FINANCIAL STATISTICS

(in millions of dollars)

YEAR ENDED 31 MARCH	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962
<b>SOURCES OF REVENUE</b>										
Electric—residential . . . . .	78.3	60.7	57.7	51.5	41.6	38.1	40.6	38.5	37.4	40.0
—other . . . . .	114.7	102.1	91.7	86.2	76.8	66.8	60.4	54.8	55.1	50.3
Gas . . . . .	47.5	41.0	40.6	34.4	32.1	31.2	30.0	25.7	24.6	22.5
Passenger transportation . . . . .	21.3*	20.7*	19.5*	18.1	17.6	16.9	14.5	13.8	13.9	13.4
Rail freight . . . . .	8.0	8.4	7.4	7.0	6.4	6.2	5.9	5.6	5.3	5.0
Miscellaneous . . . . .	7.1	7.0	4.2	4.3	3.6	1.6	1.9	1.2	1.4	2.1
Total . . . . .	276.9	239.9	221.1	201.5	178.1	160.8	153.3	139.6	137.7	133.3
<i>* Includes metropolitan transit subsidy received from Provincial Government.</i>										
<b>DISPOSITION OF REVENUE</b>										
Employment costs, materials and services . . . . .	103.1	95.5	94.5	87.4	76.8	69.2	59.9	54.5	51.7	47.9
Grants, school taxes, etc. . . . .	18.6	17.0	15.0	13.3	11.3	10.6	9.9	9.1	8.4	7.1
Provision for depreciation . . . . .	50.2	44.7	38.6	34.7	31.7	28.8	27.1	25.3	22.8	21.8
Taxes on income . . . . .	—	—	—	—	—	—	—	—	—	2.8
Interest on debt, less interest charged to construction . . . . .	88.9	83.1	63.7	53.2	49.0	44.7	43.2	41.9	40.8	32.5
Dividends on preferred shares . . . . .	—	—	—	—	—	—	—	—	—	1.7
Dividends on common shares . . . . .	—	—	—	—	—	—	—	—	—	1.9
Employed in the business (withdrawal) . . . . .	16.1	(.4)	9.3	12.9	9.3	7.5	13.2	8.8	14.0	17.6
Total . . . . .	276.9	239.9	221.1	201.5	178.1	160.8	153.3	139.6	137.7	133.3
<b>EXPENDITURES ON PLANT . . . . .</b>	<b>216.0</b>	<b>189.6</b>	<b>227.3</b>	<b>341.2</b>	<b>324.1</b>	<b>227.5</b>	<b>105.3</b>	<b>70.6</b>	<b>54.2</b>	<b>57.1</b>

NOTE: FOR 1962, statistics of the former British Columbia Electric Company Limited and the former British Columbia Power Commission have been combined.

## OPERATING STATISTICS

YEAR ENDED 31 MARCH	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962
<b>ELECTRIC</b>										
Generating capacity at year-end (rated kw in thousands)*										
Hydro . . . . .	2,455	2,455	2,001	1,320	1,320	1,306	1,306	1,295	1,295	1,295
Thermal . . . . .	1,059	1,056	1,055	906	752	738	588	571	570	268
Total . . . . .	3,514	3,511	3,056	2,226	2,072	2,044	1,894	1,866	1,865	1,563
Peak one-hour demand, integrated system (kw in thousands) . . . . .	2,769	2,499	2,357	2,152	1,860	1,686	1,490	1,244	1,169	1,154
Customers at year-end (in thousands) . . . . .	690	652	605	583	555	529	503	478	459	443
Electricity sold to public (kwh)										
Total (in millions) . . . . .	14,833	13,656	12,237	11,084	10,000	8,506	7,345	6,431	6,059	5,540
Increase over previous year (%) . . . . .	8.6	11.6	10.4	10.8	17.6	15.8	14.2	6.1	9.4	7.6
By class of customer (%)										
Residential . . . . .	28	27	28	28	28	30	31	32	32	33
Commercial . . . . .	21	21	21	21	20	21	22	23	22	22
Industrial . . . . .	47	48	49	49	50	48	45	43	44	44
Other systems . . . . .	1	2	2	2	2	1	2	2	2	1
Export** . . . . .	3	2	—	—	—	—	—	—	—	—
Residential service										
Average annual kwh use per customer . . . . .	6,949	6,651	6,674	6,222	6,016	5,650	5,486	5,200	5,029	4,829
Average revenue per kwh (cents) . . . . .	1.9	1.7	1.7	1.7	1.5	1.5	1.8	1.8	1.9	2.2
* Excludes electricity available from other systems. Rated capacity has been exceeded on occasion.										
** Less than 1/2 of 1% 1962 through 1969.										
<b>GAS</b>										
One-day capacity at year-end (therms in thousands)										
Mainland—firm pipeline contracts*	2,460	2,360	2,529	2,260	2,140	2,020	1,900	1,780	1,780	1,780
—plant . . . . .	1,000	250	250	250	250	250	250	250	250	250
Greater Victoria—plant . . . . .	53	45	45	36	36	36	36	36	36	36
Peak one-day demand (therms in thousands)										
Mainland system—including interruptible . . . . .	2,939	2,770	3,108	2,537	2,634	2,593	2,341	1,359	1,580	1,287
—excluding interruptible . . . . .	2,762	1,962	2,889	1,905	1,474	1,493	1,849	1,060	1,342	1,081
Greater Victoria system . . . . .	22	19	24	19	16	17	23	16	18	21
Customers at year-end (in thousands) . . . . .	205	197	186	178	169	161	153	145	137	129
Gas sold to public (therms)										
Total (in millions) . . . . .	554	485	470	391	357	322	306	260	240	217
Increase over previous year (%) . . . . .	14.2	3.1	20.2	9.6	10.7	5.3	17.7	8.6	10.3	16.8
Average revenue per therm (cents) . . . . .	8.6	8.4	8.6	8.8	9.0	9.7	9.8	9.9	10.3	10.2
* On basis of 100 cu. ft. to one therm.										
<b>PASSENGER TRANSPORTATION</b>										
Vehicles at year-end										
Urban—buses . . . . .	353	340	339	340	321	325	336	339	334	332
—trolley coaches . . . . .	298	296	296	296	296	296	296	312	317	327
—total . . . . .	651	636	635	636	617	621	632	651	651	659
Interurban buses . . . . .	85	66	71	70	56	61	70	80	81	75
Passengers carried (in millions)										
Urban . . . . .	65.9	78.7	77.4	74.6	72.7	70.7	73.1	75.8	77.3	78.3
Interurban . . . . .	2.2	2.3	2.2	2.1	2.1	2.0	2.0	2.3	2.5	2.5
Revenue miles run—urban (in millions) . . . . .	19.3	21.2	20.9	20.8	20.5	20.4	20.5	20.5	20.5	20.6
Passenger revenue per mile—urban (cents) . . . . .	78.9	71.6	72.1	71.2	70.2	68.4	57.7	52.8	54.0	54.2
<b>RAIL FREIGHT (tons in thousands) . . . . .</b>	<b>2,200</b>	<b>2,466</b>	<b>2,265</b>	<b>2,057</b>	<b>2,011</b>	<b>1,971</b>	<b>1,832</b>	<b>1,663</b>	<b>1,567</b>	<b>1,527</b>
<b>EMPLOYEES AT YEAR-END</b>										
Regular . . . . .	7,205	7,056	6,905	6,737	6,452	6,250	6,006	5,761	5,641	5,804
Temporary . . . . .	481	810	717	614	687	647	418	451	328	292
Total . . . . .	7,686	7,866	7,622	7,351	7,139	6,897	6,424	6,212	5,969	6,096

NOTE: For 1962, statistics of the former British Columbia Electric Company Limited and the former British Columbia Power Commission have been combined.

## DIVISIONAL ORGANIZATION

### Office of the Chairman

H.A. ELLIOTT  
*Coordinator of Administration*  
W.D. KENNEDY  
*Manager, Canadian Entity Services*  
G.G. WOODWARD  
*Corporate Secretary*

### Office of Chief Engineer

H.K. PRATT  
*Chief Engineer*

### Engineering Division

H.M. ELLIS  
*Division Manager*  
J.S. DAVIDSON  
*Manager, Commissioning and Acceptance*  
W.F. GEIST  
*Manager, Quality Control and Expediting*  
W.D. GILL  
*Manager, System Projects and Design*  
H.J. GOLDIE  
*Manager, System Planning and Development*  
J.F. MILES  
*Manager, Generation Planning*  
E.W. NEWBURY  
*Manager, Engineering Services*  
W.M. WALKER  
*Executive Assistant, Engineering Division*

### Construction Division

J.P. OTTESEN  
*Division Manager*  
R.B. JACKSON  
*Construction Manager, Mica Dam Project*  
E.H. MARTIN  
*Manager, Construction*  
E.T. QUIRK  
*Construction Manager, Whatshan Redevelopment*  
R.H. SPINNEY  
*Construction Manager, Gordon M. Shrum Generating Station*  
W.J. TREMBATH  
*Construction Manager, Transmission Lines*  
W.S. WALKER  
*Construction Manager, Jordan River Redevelopment*

### Production Division

G.F. GREEN  
*Division Manager*  
W.A. BATEMAN  
*Manager, Maintenance Control*  
T.M. BERGER  
*Area Manager, Southern Interior*  
M.A. FAVELL  
*Area Manager, Central Interior*  
S.C. IRVING  
*Manager, Burrard Thermal Generating Plant*  
W.E. KENNY  
*Manager, Operations Control*  
N.S. KENT  
*Area Manager, Lower Mainland*  
E. MARZOCCO  
*Area Manager, Vancouver Island*

### Distribution Division

G. GRIFFITHS  
*Division Manager*  
W.A. BEST  
*Regional Manager, Central Interior*  
S.C. BURNELL  
*Regional Manager, Metropolitan*  
T.V. FARMER  
*Regional Manager, Southern Interior*  
W.B. GALE  
*Manager, Distribution Services*  
D.J. McLENNAN  
*Regional Manager, North Coast*  
A.J. MACDONALD  
*Regional Manager, Vancouver Island*  
G.J. ROPER  
*Regional Manager, Fraser Valley*  
R.G. SCOTT  
*Marketing Services Manager*  
H.E. SLADEN  
*Senior Distribution Engineer*

### Gas Division

R.K. KIDD  
*Division Manager*  
J.L. GEMMELL  
*Manager, Metropolitan Distribution*  
K.S. HENDERSON  
*Manager, Fraser Valley Distribution*  
N.M. KING  
*Manager, Staff Services*  
A.H. MacPHERSON  
*Manager, Engineering*  
G.A. THOMSON  
*Supply Superintendent*

### Transportation Division

P.W. BARCHARD  
*General Manager of Transportation*  
H.C. GIVINS  
*Manager, Transportation Maintenance*  
H.R. HALLS  
*Manager, Victoria Transportation*  
W.W. McAULAY  
*Operations Manager, Metropolitan Transit Lines*  
D.J. MARTIN  
*Manager, Railway Operations*  
A.S. MURIE  
*Manager, Transportation Staff Services*  
T.A. ROSS  
*Manager, Pacific Stage Lines Operations*

### Financial Division

T. CHAMBERS  
*Comptroller and Chief Financial Officer*  
L.E. BEARD  
*Assistant Comptroller*  
G.F. BLYTH  
*Cashier Manager*  
D. DAVIS  
*Manager, Customers' Accounts*  
G. EWING  
*Assistant to Chief Financial Officer*  
D.R. HUNDLEBY  
*Pay Manager*  
S.H. JAGGER  
*Stores Manager*  
C.G. KILLAM  
*Research and Laboratory Superintendent*

I.R.A. MILLS  
*Assistant Treasurer and Registrar*  
S.B. PEACH  
*Manager, Purchasing and Supply*  
A.L. ROLLINS  
*Manager, Plant Accounting*  
G.A. WOODBURY  
*Manager, General Accounting*

### Legal Division

W.D. MITCHELL  
*Division Manager and General Solicitor*  
J.C. BLEWETT  
*Senior Solicitor*  
W.M. PHILIP  
*Senior Solicitor*  
D.W. PRATT  
*Senior Solicitor*

### Computer and Management Systems Division

T.A. NORDSTROM  
*Division Manager*  
B.A. ANGEL  
*Manager, Computer Sciences*  
E.S. GARDINER  
*Manager, Data Processing*  
J.A. POLSON  
*Manager, Economic Analysis*  
J.A.D. SIMPSON  
*Manager, Commercial Management Systems*

### Administration Division

J.N. OLSEN  
*Division Manager*  
R.H. DOWNEY  
*Manager, Manpower and Organization Planning*  
M.H. FOX  
*Manager, Personnel Administration*  
B.A. HAWRYSH  
*Manager, General Services*  
A.R. KLUCKNER  
*Manager, Manpower Development*  
R.H. LUND  
*Manager, Personnel Services*  
D.G. McKILLOP  
*Manager, Productivity Services*  
J.V. MILBURN  
*Manager, Safety Engineering*  
E.R. PECK  
*Manager, Labour Relations*

### Corporate Services Division

C.W. NASH  
*Division Manager*  
G. BARNETT  
*Manager, Rates and Costs*  
G.E. BOWES  
*Manager, Industrial Development*  
J.R. BRASSINGTON  
*Manager, Load Development*  
E.S. COLLINS  
*Manager, Land*  
J.A. MacCARTHY  
*Manager, Information Services*

### Internal Audit Department

J.S. LANG  
*Internal Auditor*

FOLD OUT MAP OF ELECTRIC TRANSMISSION SYSTEM









# BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

## ELECTRIC TRANSMISSION SYSTEM

### AT 31 MARCH 1971

### WITH PLANNED ADDITIONS

#### LEGEND

-  HYDROELECTRIC GENERATING STATIONS
-  DIESEL-ELECTRIC GENERATING STATIONS
-  GAS-TURBINE-ELECTRIC GENERATING STATIONS
-  SUBSTATIONS
-  TRANSMISSION LINES 60 KV-360 KV (EXISTING AND UNDER CONSTRUCTION)
-  TRANSMISSION LINES 500 KV (EXISTING AND UNDER CONSTRUCTION)
-  TRANSMISSION LINES 60 KV-360 KV (PLANNED)
-  TRANSMISSION LINES 500 KV (PLANNED)

#### VANCOUVER AREA

##### MAJOR GENERATING PLANTS

- |   |                            |
|---|----------------------------|
| Alouette: Hydroelectric                   | Port Mann: Gas-Turbine     |
| Burrard: Steam-Turbine                    | Ruskin: Hydroelectric      |
| Lake Buntzen, Nos. 1 and 2: Hydroelectric | Stave Falls: Hydroelectric |

##### MAJOR SUBSTATIONS

- |             |                    |
|-------------|--------------------|
| Arnott      | Kidd, Nos. 1 and 2 |
| Comosun     | Mainwaring         |
| Cypress     | Murrin             |
| Dal Grauer  | Newell             |
| Horne-Payne | Walters            |
| Ingledow    |                    |

#### VICTORIA AREA

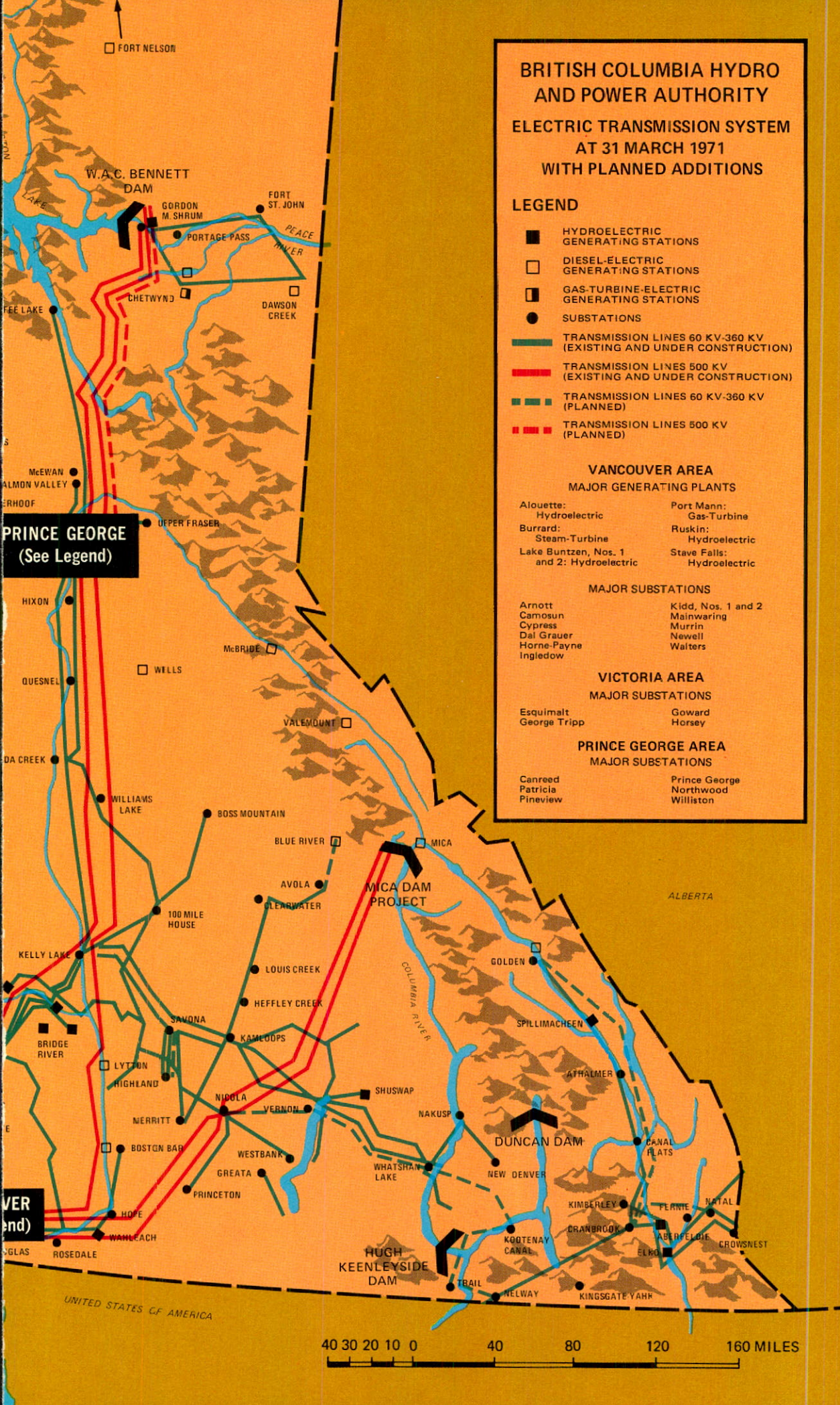
##### MAJOR SUBSTATIONS

- |              |         |
|--------------|---------|
| Esquimalt    | Goward  |
| George Tripp | Horsley |

#### PRINCE GEORGE AREA

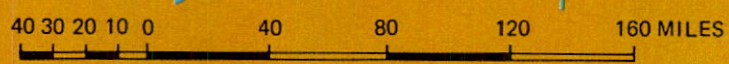
##### MAJOR SUBSTATIONS

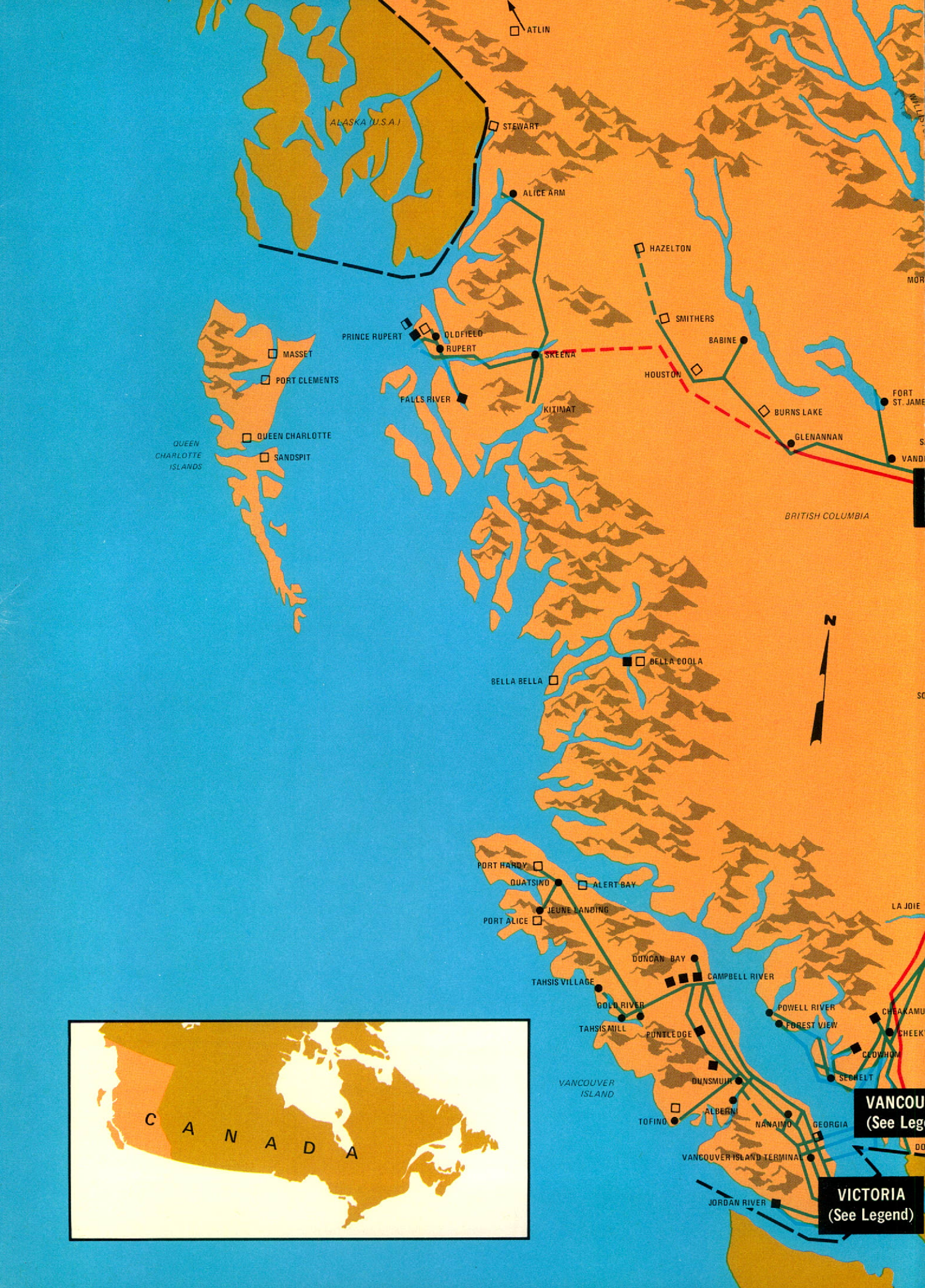
- |          |               |
|----------|---------------|
| Canreed  | Prince George |
| Patricia | Northwood     |
| Pineview | Williston     |



**PRINCE GEORGE**  
(See Legend)

**VER end)**





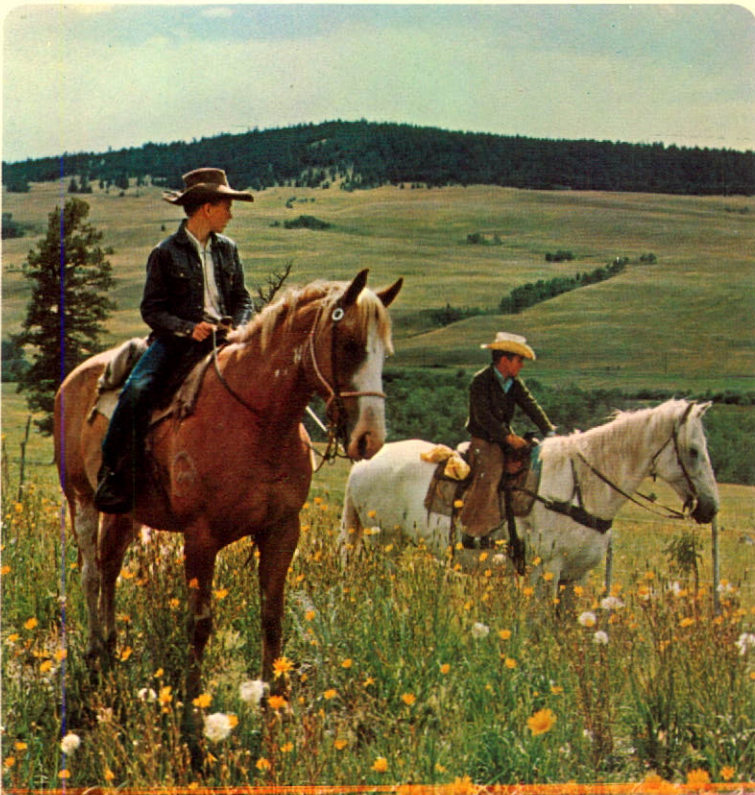
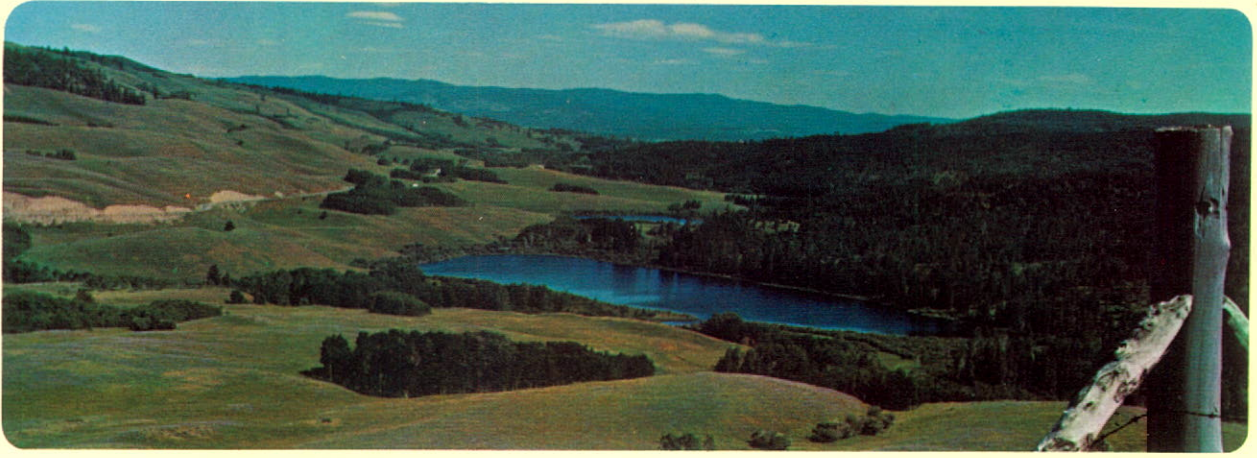
VANCOUVER  
(See Legend)

VICTORIA  
(See Legend)

We are fortunate in British Columbia to have an abundance of unspoiled recreational areas. The beauties of nature in this Province, pictured here, serve as a reminder that preservation of the natural environment should be of prime concern to each and every one of us.









FLOWERING DOGWOOD, THE FLORAL EMBLEM OF BRITISH COLUMBIA.