



**Report Title:** Site C Environmental Impact Statement

**Issuer:** BC Hydro and Power Authority, System Engineering Division

**Date:** July 1980

**NOTE TO READER:**

**THE FOLLOWING REPORT IS MORE THAN TWO DECADES OLD. INFORMATION  
CONTAINED IN THIS REPORT MAY BE OUT OF DATE AND BC HYDRO MAKES NO  
STATEMENT ABOUT ITS ACCURACY OR COMPLETENESS. USE OF THIS REPORT AND/OR  
ITS CONTENTS IS AT THE USER'S OWN RISK.**

**During Stage 2 of the Site C Project, studies are underway to update many of the historical studies and information known about the project.**

**The potential Site C project, as originally conceived, will be updated to reflect current information and to incorporate new ideas brought forward by communities, First Nations, regulatory agencies and stakeholders. Today's approach to Site C will consider environmental concerns, impacts to land, and opportunities for community benefits, and will update design, financial and technical work.**

# **PEACE SITE C PROJECT**

# **ENVIRONMENTAL IMPACT STATEMENT**

## **Appendix A**

**Revelstoke Project**  
**Environmental Guidelines**

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

REVELSTOKE PROJECT

ENVIRONMENTAL GUIDELINES

CONSTRUCTION DIVISION

April 1977

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Note: Changes made to the original draft dated February 1977 are identified by an \* against the line where the change occurs.

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1. INTRODUCTION

Pursuant to the issuance of the Conditional Water Licence on 1 December 1976 for the Revelstoke Project and in compliance with item (r) thereof, the environmental guidelines for all construction activities are herewith submitted.

The environmental guidelines identify the principal activities that will occur throughout the construction of the Revelstoke Project and establish the basis on which these will be controlled to minimize their influence on the environment not only from the physical aspects but with due consideration for the preservation of all forms of flora and fauna. Special attention will be given to aquatic life and their habitat. All such aspects will be considered to preserve and where possible enhance the natural environment to the benefit of the local residents and others using the area.

The requirement of the Conditional Water Licence item (q) is that the British Columbia Hydro and Power Authority employ one fisheries biologist and one wildlife biologist who are to assist in the drafting of environmental guidelines for construction. In compliance with these principles, the Authority's staff biologists participated in the preparation of these guidelines while the resident biologists were being sought.

The Authority will ensure that contractors engaged on this Project will preserve the environment with due consideration to the natural features and the protection of fish and wildlife.

2. ENVIRONMENTAL CONCERNs

In opening up work areas within the Revelstoke Project, B.C. Hydro will make provision in any work assignments or contracts that natural terrain, existing tree cover, and natural vegetation are preserved to the maximum extent. It is intended that construction activities be carried out in a manner that has the minimal effect on the

2. ENVIRONMENTAL CONCERNs - (Cont'd)

natural streams and watercourses. Areas which are unavoidably disturbed by construction will be reinstated by grading and landscaping to as natural appearance as possible following completion of construction.

The development of construction areas cannot be totally prevented from influencing wildlife habitats in the vicinity of the project. The Authority will, in consultation with the biologists, identify problems arising from construction and incorporate in the planning of construction operations provisions for protection of areas that are important for the preservation of wildlife. Wherever possible every effort will be made to conserve the natural surroundings. Wildlife trails which are cut as a result of construction will be restored where the biologists consider such trails are necessary to maintain wildlife movement. \*

Construction activities will also cause an impact on the fish habitat in rivers and streams in the construction area. The various permanent structures on the Revelstoke Project will be designed to facilitate construction such that it can be accomplished with the minimum of disturbance to the natural watercourses.

The two full time site biologists will participate in all decisions affecting the environment on the Project and will contribute much to ensure that construction practices are followed which cause the least environmental impact. They will also liaise with the local representatives of the Provincial Fish and Wildlife Branch on such matters. \* \* \*

3. CONTRACTUAL REQUIREMENTS

Requirements for the protection of wildlife and the environment will be specified in the contracts for the Revelstoke Project. Contract CR-1, Revelstoke Project Diversion Tunnel, is the first

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

contract to be awarded and is typical of the Revelstoke construction contracts. It contains the following clauses which are quoted verbatim from that contract.

It should be noted that the Engineer referred to in these clauses is B.C. Hydro's Chief Engineer who is represented on the site by the Construction Manager.

"4.27 COMPLIANCE WITH LAWS

*The Contractor and his employees in carrying out the Contract shall comply with all laws, statutes, by-laws, ordinances and regulations of all Federal, Provincial, Municipal or other governmental authorities, any of which are applicable to the Contract or the performance of the Work, and the Contractor shall indemnify the Authority against any cost, loss, liability or obligation which may arise as a consequence of the failure of the Contractor and/or his employees to comply fully with the said laws and regulations.*

*Without restricting the foregoing, the Contractor shall conform to the provisions of the "Workers' Compensation Act", "Pollution Control Act", and all other statutes, by-laws or regulations in force from time to time in respect of or affecting in any manner performance of the Contract, the Work or the Site, and shall give all notices required by the said statutes, by-laws or regulations and pay all fees, assessments and other sums payable thereunder or in respect thereof.*

*The Public Construction Fair Wages Act applies to this contract and to every subcontract and to any work done by any other person under this contract.*

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

*Except as otherwise specified in writing by the Engineer or in the Tender Documents, the Contractor shall be responsible for obtaining at his own expense all necessary authorizations, licenses and permits in connection with or required for the Work."*

"4.50 FIRE

*The Contractor shall take every precaution to prevent fire occurring on or about the Site and to minimize any damage which might thereby be caused. He shall provide suitable and adequate fire fighting equipment, as approved by the Engineer, for ready use in all structures, buildings, or on work in progress including the Authority's buildings occupied by the Contractor, if any, and shall have at all times at the Site at least two men who are experienced and competent in the use of such equipment.*

*The Contractor shall maintain such equipment, and such additional fire fighting equipment as may elsewhere in the Tender Documents be required, in efficient condition until construction is completed and the Work accepted by the Authority. He shall comply with laws and regulations respecting fires and with instructions of the Engineer with respect to the prevention of fires. No fires shall be lit in the fire season without permission in writing, obtained from the Engineer.*

*The Contractor shall fight diligently any fire which occurs on or about the Site unless specifically directed by the Engineer not to do so. He shall employ all requisite equipment and manpower up to the limit of his equipment and manpower employed at the Site, including the equipment and manpower of his Sub-contractors. If the fire results from the actions or the negligence of the Contractor all his fire fighting costs shall be for his own account. If the fire is caused by an Act of God or the negligence or actions*

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

of persons for whom the Contractor is not responsible the Authority will reimburse his fire fighting costs in accordance with Clause 4.46 except that if the Contractor is required to fight forest fires for which he is not responsible, by and under the direction of the British Columbia Forest Service in accordance with the British Columbia "Forest Act" and amendments thereto, the Authority will not be responsible for the payments of any amounts expended by the Contractor in fighting such forest fires.

If the Engineer directs persons other than employees or Sub-contractors of the Contractor to assist the Contractor in fighting a fire, the costs of such assistance shall be borne by the Authority, but if the fire originates from or spreads or threatens to spread due to the negligence of the Contractor, or to his neglect to fight the same diligently, the Contractor shall reimburse the Authority for the cost of such assistance.

4.51 EXPLOSIVES

The supply, transportation, storage and use of explosives for the Work shall conform to law at all times and be subject to any requirements of the Engineer.

The methods of blasting and the times during which blasting operations may be carried out by the Contractor shall be subject to the approval of the Engineer to whom adequate notice of any blasting operation shall be given."

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

"4.54 PRESERVATION OF FLORA AND FAUNA

The Contractor shall:

1. Refrain from destroying, removing or clearing trees, timber and shrubs to an extent greater than is necessary for the execution of the Contract.
2. Take such measures as may be necessary to prevent his employees from illegally hunting, disturbing, capturing or destroying animals and birds or illegally taking fish from any waters.
3. Prevent unnecessary disfigurement of the countryside.

4.55 FOSSILS

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall be as between the Authority and the Contractor, the absolute property of the Authority, and the Contractor shall take all reasonable precautions and any precautions required by the Engineer to prevent his workers or any other persons from removing or damaging any such article or thing and shall immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out at the expense of the Authority the Engineer's orders as to the preservation and disposal of the same."

"7.07 AVAILABILITY AND USE OF THE SITE

(f) Landscape Preservation

The Contractor shall preserve the natural landscape except where clearing is required for permanent works or permitted by the Engineer in writing, and shall so conduct his

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

operations and operate his equipment that the destruction, scarring or defacing of trees, the native shrubbery and the natural surroundings is kept to a minimum.

On completion of the Work, all working areas shall be smoothed and graded to conform to the natural appearances of the landscape. Where the Contractor's operations have resulted in destruction, scarring, damage, or defacing to trees, shrubbery, or landscape outside the limits of the Contractor's working areas, the same shall be corrected to the satisfaction of the Engineer at the Contractor's expense.

(g) Prevention of Water Pollution

The Contractor shall comply with the regulations of the Pollution Control Branch of the Government of British Columbia with respect to disposal of pollutants and all additional requirements specified herein or directed by the Engineer.

The Contractor's construction activities shall be performed in such a manner that will prevent, to the satisfaction of the Engineer, solid matter, contaminants, debris and other objectionable pollutants and wastes, as determined by the Engineer, from entering into rivers, streams, flowing or dry watercourses, lakes, and underground water sources. Such pollutants and wastes include, but are not limited to, refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products, aggregate processing tailings and mineral salts. Sanitary wastes shall be disposed of on land by burial at approved sites or by other methods approved by the Engineer.

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

Where necessary, in the opinion of the Engineer, the Contractor shall construct intercepting ditches, sumps, bypass channels, barriers, settling ponds, or other means approved by the Engineer to prevent muddy water and eroded materials from entering rivers, streams or watercourses or damaging permanent installations. Such means will not be required in association with excavation in the Columbia River for the diversion tunnel approach and outlet channels and for construction of the Deadman Creek diversion as specified in the Detail Specifications. Except as otherwise specified, excavated materials shall not be deposited or stored in, or alongside of, watercourses where, in the opinion of the Engineer, they could be washed away by high water or storm runoff.

Waste waters from aggregate processing, concrete batching, or other construction operations shall not be discharged directly into rivers, streams, watercourses, or other surface drainage features. The Contractor shall use turbidity control methods such as settling ponds, gravel filter entrapment dikes, approved flocculating processes that are not harmful to fish, recirculation systems or other methods meeting the approval of the Engineer. Any waste waters discharged into surface water shall be essentially free of material in suspension. For the purpose of this Sub-clause, material in suspension is defined as that material which will settle from the water by gravity during a 1 hour quiescent detention period.

(h) Dust Abatement

During the performance of the Work the Contractor shall, to the satisfaction of the Engineer, furnish all labour, equipment and materials required to reduce dust nuisance and to prevent dust which has originated from his

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

operations from becoming a nuisance in any work areas including those occupied by Others. The Contractor will not be permitted to use oil for such purpose in locations where there is any possibility that oil could enter or contaminate water courses."

"7.09 STORAGE AREAS

The Contractor shall construct and maintain to the satisfaction of the Engineer all storage areas and facilities, including warehousing and platforms, required for storage and proper protection of the equipment and materials required for the Work. Storage facilities shall be constructed only in work areas assigned to the Contractor and shall be subject to the approval of the Engineer.

The Contractor's supplies of explosives, gasoline, petroleum products and fuels shall be stored in accordance with applicable statutory regulations.

The Contractor will not be permitted to store materials and equipment supplied by the Contractor for the Work in the Authority's storage area and warehouse.

7.10 BORROW AREAS

Except as otherwise specified, embankment and fill materials and concrete aggregates required for the Work shall be obtained by the Contractor from the necessary excavations, from potential borrow areas shown on the Drawings and/or from any other sources approved by the Engineer.

The Contractor shall submit to the Engineer for approval representative samples of the construction materials he proposes to supply for the Work well in advance of the time of their actual use

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

or as otherwise specified in the Detail Specifications or required by the Engineer in order that the Engineer can test and determine the suitability of such materials for the Work.

The Engineer's designation or approval of potential borrow areas, or of any other areas proposed by the Contractor as borrow areas, shall not be construed as constituting approval of all materials taken therefrom.

The Contractor's borrow pit operations shall be subject to the approval of the Engineer and shall be such as to avoid waste of any suitable construction material therein. Except as otherwise specified, borrow areas shall be excavated in relatively horizontal layers and in such a manner that water will not collect and stand therein. Before being abandoned, the sides of borrow areas shall be brought to stable slopes with slope intersections rounded and shaped to provide a natural appearance. All rubbish, Contractor's equipment and structures shall be removed from these areas. Waste piles shall be levelled, trimmed and shaped to regular lines to prevent the occurrence of ponding or of concentrations of surface runoff and to provide a neat appearance.

If the Contractor proposes to obtain fill materials from any potential borrow area or quarry area not shown on the Tender Drawings, he shall carry out such sub-surface investigation and obtain and submit such samples as are required by the Engineer to enable the Engineer to assess the suitability of the materials in the area for use as fill.

The Contractor shall keep accurate records of a type approved by the Engineer of any test pit, trench or drill hole which he makes for the purpose of investigating fill materials, and a copy of such record shall be submitted to the Engineer within

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

2 weeks of the completion of the test pit, trench or drill hole. Samples recovered from test pits, test trenches and drill holes and submitted to the Engineer for approval will be tested by the Engineer.

The Contractor shall give the Engineer not less than 60 days notice of his intention to develop any potential borrow pit or quarry not shown on the Tender Drawings.

Borrow materials may be obtained free of charge on land owned or controlled by the Authority, subject to prior approval of the location by the Engineer as provided herein and provided the Contractor does not interfere with the work of Others. The Contractor shall be responsible for any royalties or other charges required to be paid for materials obtained from borrow areas or other sources not owned or controlled by the Authority.

7.11 SPOIL DISPOSAL AND ROCKFILL STOCKPILE AREAS

Except as otherwise specified, the Contractor shall dispose of unsuitable and surplus materials from the excavations in spoil area No. 58 and rockfill stockpile area Nos. 59, 61 and 63 shown on the Drawings or as otherwise directed by the Engineer. Prior to commencing any excavation, the Contractor shall submit to the Engineer for approval his proposal for disposal of such materials outlining his proposed methods for developing and stabilizing the spoil fill and/or rockfill stockpile, dealing with drainage and other surface conditions in the area, grading the spoil fill and/or rockfill stockpile prior to completion of the Work, and providing any other information required by the Engineer.

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

Each spoil fill and/or rockfill stockpile shall be developed in an orderly manner and in such a way that it does not interfere harmfully with the natural drainage in the area. The Engineer reserves the right to limit the amount of material which can be placed in any spoil disposal area and/or rockfill stockpile and to control the height and slopes to which the material can be placed. Spoil fills and/or rockfill stockpiles shall be stable within themselves, shall not cause instability of adjacent natural slopes or any parts of the Work and, except as otherwise approved by the Engineer, shall be graded to the satisfaction of the Engineer, to provide free draining surfaces which do not detract from the general appearance of the area.

Materials may be disposed of in spoil disposal areas and/or rockfill stockpiles under winter conditions provided that no more than 6 inches of snow exists on the surface on which the material is to be placed.

7.12 WATER SUPPLY

The Contractor shall be completely responsible for the provision, operation and maintenance of such supplies of water as are required for the complete and satisfactory execution of the Work including the provision of any wells, reservoirs, pumps, piping and ancillary equipment required for such purpose.

Potable water shall be safe, clean, disinfected and correctively treated to the satisfaction of the Engineer and the Provincial Department of Health. All outlets dispensing non-potable water shall be conspicuously posted as dispensing water unfit for drinking.

### 3. CONTRACTUAL REQUIREMENTS - (Cont'd)

All necessary precautions shall be taken to avoid contamination of potable water, including supplies of the Authority and of Others.

#### 7.13 DEWATERING AND DRAINAGE

Except as otherwise required by the Engineer and provided for by the Tender Documents, the Contractor shall investigate, design, construct, operate, maintain and subsequently remove all cofferdams, rock plugs and such temporary surface and subsurface dewatering and drainage systems as are necessary for the orderly and proper execution of the Work. The cofferdams, rock plugs and dewatering and drainage facilities provided by the Contractor shall be subject to approval by the Engineer and shall not damage or interfere with the proper execution of the Work or the work or property of the Authority or Others. Water removed from the excavations shall be disposed of in such a manner as will not endanger public health or the environment.

The Contractor will not be permitted to drain water into foundations or other excavations or use the permanent drainage facilities installed for the Work without the prior approval of the Engineer.

The Contractor shall obtain written approval from the Engineer before discontinuing the operation of any dewatering system.

#### 7.14 SEWAGE DISPOSAL AND WASTE WATER

The Contractor shall be completely responsible for the provision, operation and maintenance of all facilities required for the disposal of sewage and waste water resulting from his operations.

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

On no account shall the Contractor discharge raw sewage or polluted water into natural watercourses, lakes, ponds, future reservoir sites or any area near camps, worksites, or buildings nor shall the Contractor make use of any permanent facilities installed for the Work or for the Authority by Others for disposal of sewage or waste water without the prior written consent of the Engineer. The Engineer may in his absolute discretion refuse to give such consent and the Authority will not be responsible for any effect such refusal may have on the Work.

The Contractor shall ensure that all drainage and sewage disposal installations constructed by him, including temporary outside toilets, shall conform to the requirements of the Provincial Department of Health or any other governmental requirements and are maintained and operated to the satisfaction of the Engineer.

On completion of the Work, the Contractor shall terminate or dispose of his drainage and sewage disposal installations, to the satisfaction of the Engineer.

7.15 REFUSE DISPOSAL

Except as otherwise specifically provided for in the Tender Documents, the Contractor shall collect and dispose of refuse from all premises and work centres provided for the Work by the Contractor. The refuse shall be collected in metal, covered, fly-proof cans and shall be removed at least twice per week. Disposal shall be either by an incinerator and/or to a pit which can be completely covered over to a depth of not less than 3 feet with rock or earth backfill. The incinerator and/or pit shall be located in an area approved by the Engineer. All such pits shall be periodically backfilled in order to maintain sanitation and to minimize the attraction of wildlife to the satisfaction of the

3. CONTRACTUAL REQUIREMENTS - (Cont'd)

Engineer. The methods of refuse disposal shall be acceptable to the Provincial Health Inspector and local Municipal requirements.

*Refuse shall not be disposed of for any reason whatsoever outside the areas designated or approved by the Engineer."*

4. ENVIRONMENTAL GUIDELINES

The conditions which B.C. Hydro require their contractors to follow for protection of the environment are covered by the clauses quoted in the previous section. The following guidelines clarify the intent of these clauses and how they will be administered.

4.01 General Construction

All construction activities and all construction plant and facilities at the Revelstoke Project must comply with all laws, statutes, bylaws, ordinances and regulations of all Federal, Provincial, Municipal or other regulatory bodies having legal jurisdiction. Without restricting the foregoing, the Contractor shall pay particular attention to the applicable provisions of the following Provincial Acts:

Workers' Compensation Act	Forest Act
Pollution Control Act	Mines Act
Water Act	Land Act
Fisheries Act	Highway Act
Wildlife Act	Health Act
Archaeological and Historic	Fire Marshal Act
Sites Protection Act	Litter Act

4. ENVIRONMENTAL GUIDELINES - (Cont'd)

In addition, construction activities are subject to the approval and direction of the Engineer as administrator of all contracts, and the Construction Manager will ensure that all contractual requirements with regard to the preservation of the environment are implemented.

4.02 Clearing of Areas required for Construction Activities

Much of the area at Revelstoke which will be used for camps, site offices, borrow areas, haul roads, work areas, etc., has already been logged and rough cleared. When additional clearing is necessary for construction facilities, contractors will be permitted by the Construction Manager to clear only specified areas and fringes or stands of trees and vegetation will be preserved wherever possible to screen construction activities from sight or to provide stream protection. Scarred or defaced trees will be removed as soon as possible to prevent disease outbreaks.

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4.03 Grading and Surfacing of Construction Areas

All surfaced areas will be shaped to control surface run-off to prevent erosion of the surface material and adjacent terrain.

When these areas are no longer required all buildings will be removed and the area reinstated. Topsoil will be replaced and native trees, shrubs and grasses will then be planted.

4.04 Topsoil

Where possible topsoil will be removed from all areas where it is likely to be spoiled. It will be stockpiled for use in the re-establishment of the work areas.

4. ENVIRONMENTAL GUIDELINES - (Cont'd)

4.05 Borrow Areas

All salvageable topsoil will be stockpiled. Borrow areas will then be developed with due consideration for drainage and run-off from the excavated surfaces so as not to cause erosion of the adjacent terrain.

When borrow areas are no longer required, the sides will be graded to stable slopes so that water will drain fully. Topsoil will then be replaced, ground cover of shrubs and grasses will be planted together with native trees to blend the areas with the original terrain.

4.06 Roads

All cut slopes and embankments will be made to minimize erosion on either permanent access roads or temporary construction roads. Banks will be seeded with native grasses. Buffer strips of vegetation will be left between roads and streams where possible.

Most of the construction roads will be gravel surfaced and the dust nuisance will be kept to a minimum by the use of water sprinkling. The use of oil and calcium chloride for dust control will only be permitted when the biologists are satisfied that their use will not be harmful to the environment. Use of such materials will not be permitted where there is any possibility of contamination of a watercourse.

All temporary roads will be restored to as natural condition as possible, prior to abandonment, to minimize erosion and negative visual impact.

4. ENVIRONMENTAL GUIDELINES - (Cont'd)

4.07 Prevention of Water Pollution

Item (g) of Clause 7.07 of Contract CR-1, gives particular attention to waste and other products from construction that are likely to cause pollution of watercourses and indicates several methods for prevention of those waste products from causing environmental damage. Waste water from construction operations will of necessity be discharged in the construction area and will infiltrate into streams and the Columbia River. However, such discharges whether direct or indirect will be kept as free of pollutants as practicable and will be monitored constantly by the biologists to ensure that they satisfy the requirements of regulatory agencies, operating under various statutes such as the Pollution Control Act, Mines Act, Fisheries Act, Health Act, etc.

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4.08 Sewage Disposal

Sewage and waste water from camps, offices and all construction work areas will be disposed of in accordance with the requirements of the Provincial Department of Health and other governmental agencies.

Sewage treatment plants will be provided for the single labour camps and septic systems will be used for offices and semi-permanent work sites all of which will be in accordance with the requirements of the Pollution Control Act. Elsewhere, portable chemical toilets will be utilized and disposal of waste made in accordance with the Department of Health recommendations.

4.09 Refuse Disposal

Disposal of garbage will be accomplished by a sanitary fill garbage pit properly located and maintained. Careful attention will be paid to drainage into and from the pit. However, it has been appreciated that such disposal sometimes attracts wildlife which is not desirable and therefore on the Revelstoke Project

4. ENVIRONMENTAL GUIDELINES - (Cont'd)

incineration of garbage is suggested in Clause 7.15 as an alternative and would be implemented should the circumstances arise. If nuisance bear problems arise as a result of improper siting, Hydro will fund the removal of such nuisance animals at the request of the Fish and Wildlife Branch.

4.10 Water Supply

Water for domestic consumption during construction will be provided in accordance with the requirements of the Provincial Department of Health. B.C. Hydro's present intention is to draw from a diversion reservoir which will be constructed on a local stream. The water has been tested and conforms to the requirements of the Department of Health for domestic use.

4.11 Dewatering and Drainage

Any dewatering and drainage systems will be constructed in such a way that no pollutants are discharged into existing watercourses and any erosion is controlled within acceptable limits.

4.12 Spoil Disposal Areas

Surplus excavated material that is not used for construction of the Project will be disposed of in designated spoil areas which will be developed to blend in with the natural topography. These spoil areas will be so located as not to interfere with the natural drainage. They will be finally graded to minimize erosion, topsoil will be spread over the areas as necessary, and natural ground cover planted to conform to the adjacent landscape.

4. ENVIRONMENTAL GUIDELINES - (Cont'd)

4.13 Fires

Fire break strips will be cleared around camps, offices and work areas at the Revelstoke Project to provide protection to the various facilities and the adjoining areas. The contractors will be required by their contracts to employ whatever equipment and manpower is at their disposal to fight any fire occurring on or about the site. The contractor must maintain fire fighting equipment and have trained personnel available at all times. Contractors are also required to fight fires when directed to do so by the British Columbia Forest Service.

4.14 Explosives

Transportation, storage and handling of explosives are controlled by law. Storage of explosives at the Revelstoke Project will be in isolated buildings. They will be clearly marked to identify their use and will be located clear of the camp and other work areas.

4.15 Petroleum Products

Petroleum products will be stored in a special location where spillage can be safely contained without contamination of the surrounding area. Storage of petroleum products will not be permitted in the vicinity of watercourses.

4.16 Noise Control

Contractors will be required to keep the noise from construction operations down to an acceptable level at all times.

5. REINSTATEMENT OF REVELSTOKE PROJECT CONSTRUCTION SITE

The overall landscaping program for the Revelstoke Project will be developed by a consulting landscape architect. This will be an ongoing program commencing as construction in the various work areas is

5. REINSTATEMENT OF REVELSTOKE PROJECT CONSTRUCTION SITE - (Cont'd)

completed. During the preparation of this program the biologists for Revelstoke will ensure that every possible consideration is given to the environment both in regard to its present and future preservation.

6. PROTECTION OF FISH AND WILDLIFE

The two site biologists will monitor the effectiveness and implementation of the guidelines as agreed to by the Comptroller of Water Rights to ensure the proper protection of fish and wildlife in the Revelstoke Project area. B.C. Hydro will cooperate fully at all times with all reasonable requests made by local authorized representatives of the Fish and Wildlife Branch of the Provincial Government.

The following principles will be implemented wherever possible.

6.01 Preservation of Watercourses

Construction activities near watercourses will be kept to a minimum. Construction equipment will not be "walked" through streams - culverts or log crossings will be utilized. All temporary culverts and log crossings will be removed upon completion of work in order that the natural drainage systems may prevail unencumbered.

6.02 Consideration of Spawning Cycles

Construction of cofferdams and other structures in rivers or streams will be scheduled when possible to avoid conflict with fish spawning cycles.

6.03 Control of Recreational Fishing

All site personnel will be informed that fishing in local rivers and streams must be in accordance with Provincial Regulations.

6. PROTECTION OF FISH AND WILDLIFE - (Cont'd)

6.04 Preservation of Wildlife Trails

When considered necessary by the resident wildlife biologist wildlife trails cut by construction operations will be restored to maintain traditional movement patterns. \*

6.05 Prohibition of Shooting

No shooting or hunting will be permitted in the immediate vicinity of the Project.

6.06 Protection from Hazardous Areas

If the resident wildlife biologist considers it necessary, fences will be provided to keep wildlife out of hazardous construction areas.

6.07 Continuing Environmental Concern

The resident biologists will carry out field studies of the fish and wildlife in the Project and reservoir area. They will assist in establishing the basis for environmental management programs to be implemented at the discretion of the Fish and Wildlife Branch as construction work is concluded and the Project becomes operational. \*

6.08 Provision of Wildlife Crossings

As considered necessary by the resident or Fish and Wildlife Branch biologists, log booms will be provided to facilitate wildlife crossing in the reservoir area. \*

7. COMMUNICATION WITH RESIDENTS IN THE AREA AND LOCAL INTEREST GROUPS

B.C. Hydro will provide information on the general construction program and its progress. It will use its offices to keep all residents and local interest groups informed. Local trappers will be advised of clearing and flooding schedules.

As soon as practical B.C. Hydro will arrange for public tours of the Project in order that the effectiveness of the practices being followed in construction of the Revelstoke Project may be observed.

**PEACE SITE C PROJECT  
ENVIRONMENTAL IMPACT STATEMENT**

**Appendix B**

**Site C Land Acquisition**

APPENDIX B  
SITE C LAND ACQUISITION

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ANNEXES

Annex No.

- 1      3 June 1977 Letter to Property Owners
- 2      Land Acquisition - Notes for Property Owners

APPENDIX B  
SITE C LAND ACQUISITION

\*  
The purpose of this Appendix is to indicate B.C. Hydro's approach to purchase of land and relocation of residents.

B.1 INTRODUCTION

Following discussions both locally and within Hydro management, a letter was sent out to all property owners likely to be affected by the project indicating that Hydro would consider proposals for sale. A copy is attached as Annex 1.

A number of responses were received as a result of which properties were purchased and leased either to the former owner or to a new tenant. Twenty-two dwellings exist on this land, of which nine are mobile homes.

The land remaining in private ownership as of 1 June 1979 which would have to be acquired for the project comprises approximately 6400 acres with some 26 dwellings.

B.2 LAND MANAGEMENT PROGRAM (see Section 17.3 of the Environmental Impact Statement - Recommendation LU-21)

B.C. Hydro's policy is to ensure a high standard of land management during the period of Hydro ownership, especially for farm and ranch properties, so as to ensure that proper farm methods are practiced. Stringent control is maintained through choice of tenant, terms of the lease agreement, and strict supervision of cropping, fertilization, weed/pest control and grazing capacities.

### B.3 LAND ACQUISITION PROGRAM

Annex 2 contains the text of a pamphlet on Land Acquisition prepared for the use of owners by Hydro's Properties Division. It relates to acquisition for transmission lines and other projects as well as to projects such as Site C.

So far as Site C is concerned, the main features of an acquisition program would be:

1. Review and listing of all properties and owners affected.
2. Early contact with each owner to explain the program and listen to his concerns.
3. Professional appraisal of each property.
4. Offer based on appraisal and reflecting any relocation needs made known by the owner.
5. Discussion with the owner of all matters arising on the offer and appraisal, leading eventually to settlement.

### B.4 PRINCIPLES OF COMPENSATION

The legal basis of compensation is laid down in the legislation and case law applicable at the time of taking. Several Canadian jurisdictions have in recent years passed new legislation on expropriation, notably the Federal and Ontario Acts. The possibility of new legislation in B.C. has been discussed for a number of years.

Market value is the concept which is the basis of compensation. This has been defined as "...the value of the land shall ...be taken to be the amount which the land if sold in the open market might

B.4 PRINCIPLES OF COMPENSATION - (Cont'd)

be expected to realize...."\*. However, most jurisdictions recognize that an owner may need additional recompense, because of the special relationship which he has with the particular property. In B.C. at the present time, this is recognized in the principle of "value to the owner" which has been defined as "...the owner at the moment of expropriation is to be deemed as without title, but all else remaining the same, and the question is what would he, as a prudent man, at that moment, pay for the property rather than be ejected from it."\*\*

B.5 THE RELOCATION PROBLEM

Section 14.2 of the Environmental Impact Statement states:

"14.2 RELOCATION AND RURAL IMPACTS

The project would require the forced relocation of at least 41 existing resident families (comprising about 157 individuals) and would cause certain other forms of disruption in the Peace River Valley. Of all the social changes associated with the Site C project, the phenomenon of forced relocation has to rank as the most serious. Past relocation studies consistently support the basic proposition that involuntary displacement is a stressful and disruptive experience for most individuals and that it creates apprehension and a sense of powerlessness among them. The findings of this study support that general finding.

Some Valley residents might not find the move stressful or difficult. However, most residents would be adversely affected by the project. The project planning process has already created uncertainty and apprehension among most families. During the construction phase, when well-known structures are removed or torn down, most people would experience an acute sense of loss as well as major physical disruptions and serious inconveniences.

It should be noted that, in comparison to some other projects in British Columbia and the United States, the numbers of people who would be seriously affected by the project are relatively small. It is

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\* See report on Expropriation, Law Reform Commission of British Columbia, 1971, p. 125.

\*\* Ibid. p. 124.

B.5 THE RELOCATION PROBLEM - (Cont'd)

unlikely that these relocations would have any major regional implications in terms of shifting centres of population. That the relocations would have no major regional population impacts and that they are relatively few in number would not, however, diminish the extent and level of impact experienced by the individuals and families directly involved. Mitigation and compensation measures could be applied to help families deal with the financial implications of forced relocation. However, it is difficult to suppose that the social disruptions accompanying forced relocation could be mitigated or compensated for in any significant way."

Present knowledge indicates that the main features of the relocation problem would be:

1. Two farms completely lost or destroyed as viable economic units; of these two, the former owners requested purchase by Hydro. This enabled early relocation and re-establishment at the former owner's convenience.
2. Seven farms capable of readjustment to enable viable and efficient operation on reduced or adjusted acreage.
3. Thirty-five homes with small acreage.
4. Miscellaneous small parcels unimproved.

It should be noted that about half of the homes on small acreages are presently occupied by employees at Hydro's Peace Canyon Project.

The first task is to make contact with the people affected, to verify the general nature of the problem as outlined above and to establish in detail what is needed in each case to enable the owner to adjust successfully to the new conditions. This would include a study not merely of financial needs, but also where necessary of need for help in finding other accommodation or in determining the best solution for the adjustment problem.

B.5 THE RELOCATION PROBLEM - (Cont'd)

The objective of this study would be to arrive at a program which would not only meet legislative requirements but also assure owners of a level of compensation which would be adequate to enable them to retain a standard as good as that which they now enjoy and to assure them of assistance in making their decision, if they need it.

B.6 EXPROPRIATION

Disruption of an owner's life is a serious matter; the experience of the adversary procedure of expropriation does nothing to improve it. It is, therefore, to be used only when all other reasonable attempts to achieve a settlement have failed.

Experience indicates that in most cases, agreement can be reached upon the market value of land without a great deal of difficulty, provided valuations are realistic and the parties are negotiating in good faith. Compensation for disturbance and similar items can be more difficult. Also, discrepancies in treatment as between one owner and another, whether real or perceived, can give rise to difficulty.

In order to ensure that cases involving expropriation are avoided or kept to a minimum, these principles will be followed:

1. All offers are to be based upon a professional appraisal.
2. The basis of the offer and the appraisal will be fully discussed with the owner.
3. The first offer will be the full amount reflecting all compensable aspects of value taken into account by Hydro, i.e. Hydro will not offer low and bargain up although it will be open to the owner to raise other compensable aspects if he feels they exist.

B.6 EXPROPRIATION - (Cont'd)

4. The program of disturbance payments, where appropriate, will be arrived at after discussion of each case with the owner.
5. Consistency will be sought by:
  - a. Use of professional appraisals.
  - b. Terms of the program of disturbance payments.
  - c. Rigorous internal scrutiny.
6. Hydro would not be at liberty to discuss one owner's case with another, for obvious reasons.

B.7 TRAPPERS

Traplines affected by hydroelectric projects present difficult problems of compensation. The effect of flooding on part of a line may be very significant, but the normal approach to compensation based on market value is usually unsatisfactory in that one of the main value aspects of a trapline often lies in the way of life it represents; this basically cannot be reduced to monetary terms.

Properties Division has responded to the problem evolving a scheme which will be presented to the Fish and Wildlife Branch and the Trappers' Association for discussion and hopefully implementation.

The scheme would provide, as an alternative to lump sum compensation, a program designed to:

1. Encourage better management of the trapline.

B.7 TRAPPERS - (Cont'd)

2. Encourage utilization of the unaffected portion of the trapline.
3. Maintain and/or increase productivity.
4. Maintain or improve economic return of the affected trapline.

The payments to be made would be:

1. Annual payment each fall for 5 years consisting of a percentage of the value of the best catches over the previous 10 years, the percentage to be based upon the proportion of line lost to the total line.
2. Annual payments over a period of 5 years matching the value of catches in each year. The initial payments would be full payments, the remainder graduated, e.g.: the first and second year payments would be 100 percent, the third 75 percent, fourth 50 percent and fifth 25 percent.
3. Compensation for cabins lost.
4. Payment for cutting new trails and providing additional cabins.

The program would be administered by an Inspection Committee on which Hydro, Fish and Wildlife Branch and the Trappers' Association would be represented.

The details of this program have still to be worked out with the Fish and Wildlife Branch and the Trappers' Association. Initial discussions have indicated a favourable response. The program would be flexible so as to allow some provision for special cases. It offers the promise of dealing with traplines in a constructive and helpful way.



**BRITISH COLUMBIA HYDRO AND POWER AUTHORITY**

PROPERTIES DIVISION, 900-1045 HOWE STREET, VANCOUVER, B.C. V6Z 2B1  
FOR PERSONAL CONTACT

DIAL \_\_\_\_\_

Telex 04-54395

Our File: 1016-1501.0(1) Part I.

3rd June 1977

Dear :

Re: Possible Site "C" Project

At the "Open House" and on subsequent occasions property owners in the area of the Project expressed concern that the possibility of the Site "C" Project is having an unsettling effect, particularly in the planning of personal affairs.

Hydro has no authority, either by way of Water Licence or otherwise, to carry out the Site "C" Project. Indeed, pending further progress in the environmental studies, Hydro has yet made no decision to seek such authority and is therefore not actively seeking to acquire land for the Project at this time.

However, in response to the concerns expressed, I write to confirm that Hydro is prepared to consider proposals to sell at market value from any landowner whose land would be subject to flooding in the event that the Project does proceed.

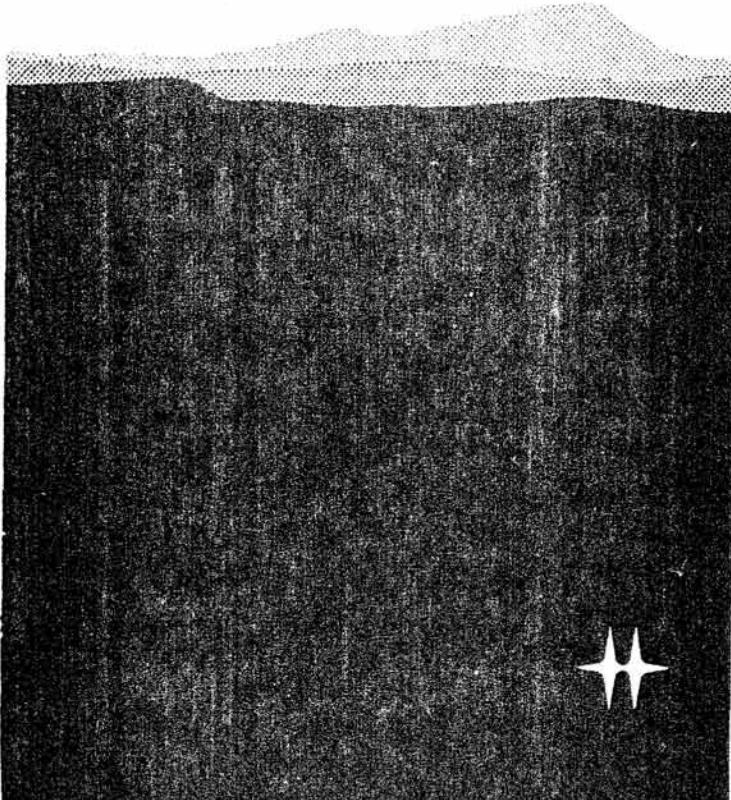
Mr. W. A. Power, Land Supervisor, and others will be at Attachie School on Wednesday, 15th June 1977 from 5 p.m. to 10 p.m. to meet with owners to give further information on this matter and to discuss their problems if so requested. Discussion can, of course, only be in general terms at this point but we would appreciate the opportunity to hear owners' concerns and endeavour to answer their queries.

Yours very truly,

E. S. Collins  
Manager, Properties Division

ESC:rb

# Land Acquisition



Annex 2

## CONTENTS

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- 3 - LOCATION OF FACILITIES
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### B.C. HYDRO PROPERTY ACQUISITION PRACTICES

#### Notes for the Property Owner

As energy demand increases, the responsibility of Hydro to meet these requirements necessitates the construction of new transmission lines, substations and generating facilities. While it is generally desirable to avoid the use of privately owned land to accommodate these works, this can not be totally avoided. Whatever land is ultimately required, Hydro endeavours to develop its facilities with proper consideration for the environment and social concerns generally, for the best use of land and to the technical and economic constraints involved. In some cases, Hydro will require ownership of land as with substation sites but more often a form of easement will be sufficient.

This booklet is designed to explain how major Hydro facilities are located, how Hydro proposes to negotiate for property rights, including the steps taken to ensure fair payment for those rights, and to explain our operations as they will affect the community and individual land owners. The procedures outlined will not apply to situations involving low voltage distribution lines which are normally installed on road allowances and handled within the local district.

#### LOCATION OF FACILITIES

In determining the location of facilities, procedures have been developed to give consideration to environmental, social and economic considerations and to take into account the views of local authorities, government resource agencies and local opinion.

Major projects normally involve feasibility and environmental studies and incorporate consideration of the comments of regional boards and other governmental agencies, together with Hydro's system planning, design, construction and property requirements.

On major projects direct public participation and consultation is often solicited in determining the general location of a transmission line.

The procedure being followed in respect of a particular project will be explained by public announcement or by a land representative when he calls on owners (see below).

Once the general location is determined the specific right of way or other site must be defined by an engineering survey. This may be the first occasion on which entry on private land is necessary.

By the time it is necessary to enter property all efforts will have been made to contact each owner and tenant involved. In most cases, this contact will be made by a land representative who will explain Hydro's requirements and the steps involved in establishing the location of Hydro facilities.

## DISCUSSION OF PROBLEMS WITH HYDRO

A land representative will contact owners prior to entry for survey or any other purpose. It is his responsibility to ensure that landowners understand all steps involved in site selection or route location. He must also explain Hydro's procedures involving land acquisition and those persons the owner can expect to be visiting his property. He should also indicate the scheduled dates for acquisition, clearing and construction.

The land representative will answer any general questions and provide specific information as requested. He will advise the owners as to where he can be contacted should any problems arise.

Should the land representative not be able to provide the required assistance, the owner can contact the Manager, Properties Division, 1045 Howe Street, Vancouver, B.C. V6Z 2B1.

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## FORESTRY

In most cases, land must be cleared prior to construction. Forest consultants will need to enter upon the land to determine and flag the areas required to be cleared. At the same time, a calculation of the timber volumes affected is made which will be taken into account during negotiations for the land or right of way.

The standard of clearing to be carried out is often of considerable importance to a landowner. In general, Hydro prefers to "machine-clear" land where the risk of erosion does not exist. Machine-clearing involves the use of tractors which grub all but the largest stumps, after which the area is often seeded to grass. In some cases, it is preferable to "hand-clear" land, leaving stumps and roots to prevent erosion. In some cases, selective clearing may be prescribed to reduce the visibility of the Hydro facilities to be built.

## SURVEY

The engineering survey will entail the location of the centreline of one or more proposed transmission lines and the boundaries of the right of way or site. This work will involve certain cutting of trees or bushes. It will be the responsibility of the land representative to ensure that the survey crew are aware of and adhere to any special conditions agreed between him and the owner.

While Hydro surveyors are instructed to take all reasonable precautions to avoid damage to crops, fences or any other property, some damage may occur. Claims should be promptly referred to the land representative who will review the situation and arrange for the payment of fair compensation.

## APPRAISALS

In order to ensure fair payment for land and rights of way, a determination of value is made by professional appraisers either employed on staff or engaged independently.

The appraisers carry out investigations of the real estate market and gather whatever other relevant data is available. This material is then used as the basis for their calculation of the value of the property. Normally this value will represent the market value of the interest required. In some cases, the property may have a unique or special value to a particular owner when the value to him may exceed the market value. This should also be reflected in the appraisal.

The appraisal will form the basis for Hydro's offer for the property and will be discussed in detail with an owner if requested.

## NEGOTIATIONS

Hydro utilizes many different approaches to the acquisition of property. The objective is to find the most suitable form of agreement from the point of view of both parties.

Normally, an owner is asked to grant permission for Hydro to enter upon his property to survey, clear and construct a transmission line or to conduct other tests. If ownership of a site is required, purchase terms can be discussed as soon as our requirements can be determined. Where an easement is required, some owners prefer to await the construction before entering into an agreement. Hydro is prepared to proceed on this basis if the owner will permit clearing and construction to proceed on the understanding that negotiation for the easement will take place later.

Other owners prefer to negotiate immediately and Hydro will normally enter into agreement suitable to the stage of development. Some agreements provide for legal survey to take place later or the legal survey can be carried out in advance to define the area involved precisely.

In any event, the Hydro land representative will submit an offer for the property and will discuss the appraisal with the owner if so requested in order to ensure that no elements of value have been overlooked. In appropriate cases procurement of moving costs or the advance of money prior to the final

resolution of the compensation payable may be in order.

When the offer is made to the owner for an easement, a copy of the proposed easement agreement will be left with the owner for consideration.

## EXPROPRIATION

It is Hydro's policy to endeavour to purchase land or rights of way by agreement, if at all possible, without resorting to expropriation.

In the event that no agreement between the owner and Hydro can be reached and further negotiation would not likely be productive Hydro may, with the approval of the Lieutenant-Governor in Council, proceed to acquire the necessary property interest by expropriation. Under the terms of the British Columbia Hydro and Power Authority Act, 1964, expropriation becomes effective upon the filing of a plan with a description of the property interest in the appropriate Land Registry Office.

It should be noted by property owners that the expropriation procedure provides a method of determining property compensation. The first step would be the appointment of an independent valuator by Order-In-Council. This valuator would be chosen by the Lieutenant Governor in Council. He is directed to make his own inquiries and to notify the parties of the amount of compensation he has fixed. Each party then would have a right of appeal within a specified time to the local county court and if necessary, to the British Columbia Court of Appeal.

Hydro would be prepared to continue negotiations at any stage of this process before final determination. However, it should be understood that while Hydro has a responsibility to pay fair compensation it will not meet demands which appear unreasonable.

## CONSTRUCTION

The land representative will advise landowners of the schedule for land clearing and construction. While weather conditions play a significant part in determining when this work can best be done, Hydro will attempt to take into account the use and condition of any land and attempt to minimize inconvenience and disturbance so far as practicable.

Any special conditions that an owner feels should be met can be discussed with the land representative who will ensure that any agreed conditions are met, normally by the insertion of a special requirement in the clearing or construction contract. Requirements for access roads are usually left as a matter which must be arranged by the contractor directly with the landowner. Complaints in respect of such direct agreements should be made as quickly as possible to the land representative.

## DAMAGES

After completion of any work either the contractor or the land representative will check with the owner to ensure that the owner is satisfied with the condition of his land after our work. Hydro will endeavour to repair or mitigate any damage to fences, gates, tiles, crops, livestock or other property or will arrange for payment to compensate the owner for his loss.

## MAINTENANCE

After facilities have been constructed, it is necessary to inspect, repair and maintain the works and the land on which they are situated. Except in emergency situations, a Hydro representative will attempt to contact an owner before entry to describe the work to be done. Arrangements can then be made for any access required and any special conditions the owner wishes to have met.

In connection with the necessary task of keeping trees from interfering with transmission lines, it is the present practice by Hydro to utilize herbicides when appropriate. Should a landowner object to the method of maintenance proposed, he should make his views known to Hydro's representative.

It should be noted that arrangements for maintenance must ultimately be made with the operating division of Hydro in each area. However, the land representative can provide appropriate advice in each case.

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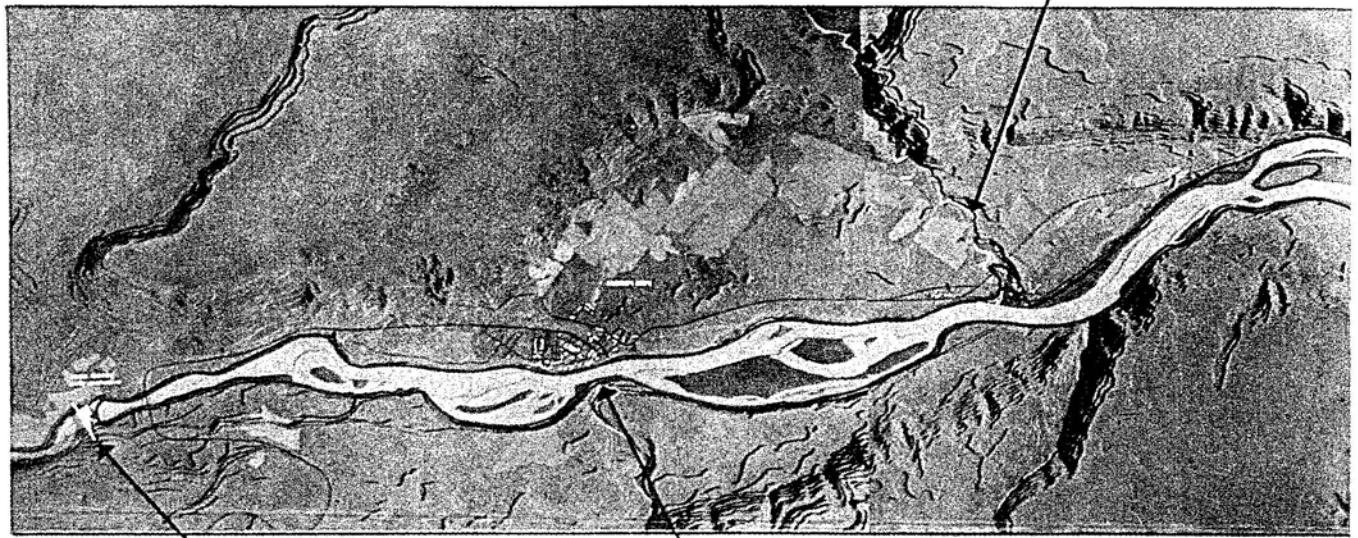
## PROPERTY MANAGEMENT

Hydro purchases interests in land which from time to time become surplus to our needs or which can be leased for certain purposes consistent with Hydro operations.

Hydro is always prepared to consider any proposal for the safe and efficient use of its properties and inquiries should be directed to the Manager of Land Management and Development, 1045 Howe Street, Vancouver, B.C. V6Z 2B1.

## NOTES

You may wish to use the space below for your own notes, or to list the matters which you wish to discuss with the Land Representative.

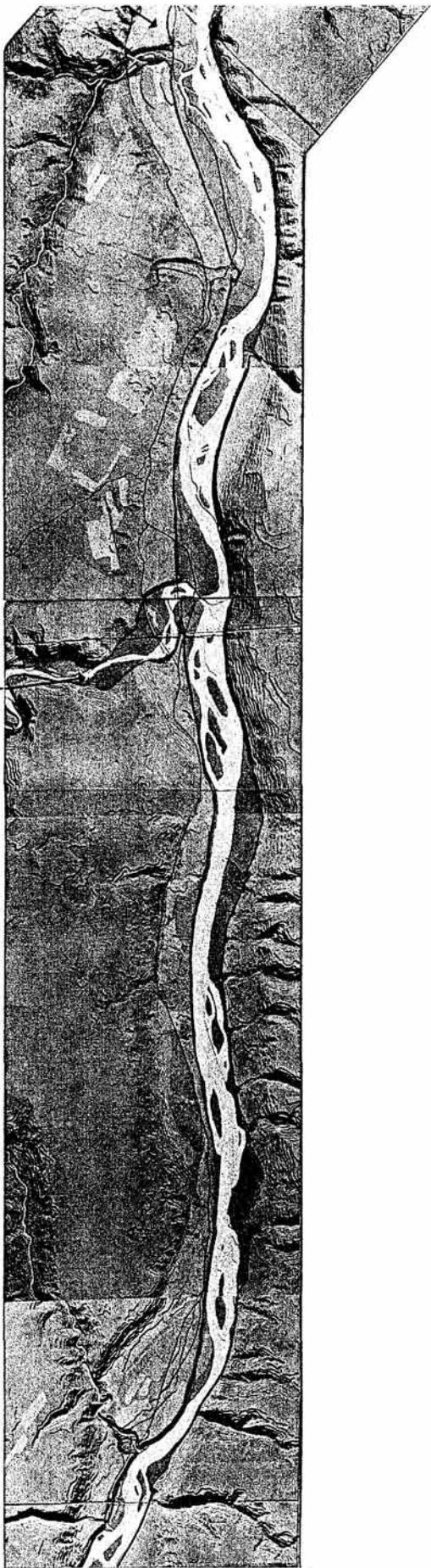


**PEACE CANYON (SITE ONE)**

**HUDSON'S HOPE**



HALFWAY RIVER



### PROPOSED PEACE RIVER SITE C DEVELOPMENT

