

# MAIN REPORT

of the  
CONSULTATIVE BOARD



"to everything there is a season  
and a time for every purpose"

including

**THE COMPREHENSIVE FRAMEWORK PLAN**

prepared under the

**CANADA-BRITISH COLUMBIA  
OKANAGAN BASIN AGREEMENT**

**MARCH 1974**

FINAL PUBLICATIONS IN THIS SERIES

1. SUMMARY REPORT OF THE CONSULTATIVE BOARD
2. THE MAIN REPORT OF THE CONSULTATIVE BOARD
3. TECHNICAL SUPPLEMENTS TO THE MAIN REPORT
  - I Water Quantity in the Okanagan Basin
  - II Water Quantity Computer Models
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  - IV Water Quality and Waste Loadings in the Okanagan Basin
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  - X Economic Growth Projections
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  - XII Planning, Administration and Institutional Considerations

Cover Photo by Tom W. Hall -

'Summer Scene on Okanagan Lake'

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Parliament Buildings,  
VICTORIA, B.C.

CANADA - BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT

THE  
MAIN REPORT  
OF THE  
CONSULTATIVE BOARD  
MARCH, 1974

PUBLISHED BY  
OFFICE OF THE STUDY DIRECTOR  
Box 458, PENTICTON, B.C.

CANADA-BRITISH COLUMBIA CONSULTATIVE BOARD

BRITISH COLUMBIA

(OKANAGAN BASIN AGREEMENT)

CANADA

B.E. MARR  
H.D. DEBECK  
W.N. VENABLES

A.T. PRINCE  
E.R. TINNEY  
R.L. MCLAREN

LETTER OF TRANSMITTAL

March 31, 1974

Honorable Robert Williams  
Minister  
Department of Lands, Forests  
and Water Resources  
Victoria, British Columbia

Honorable Jack Davis,  
Minister  
Department of the Environment  
Ottawa, Canada

SIRS:

The Consultative Board is pleased to present the main report containing the 'Comprehensive Framework Plan' resulting from the study undertaken in accordance with the Canada-British Columbia Okanagan Basin Agreement signed in October, 1969.

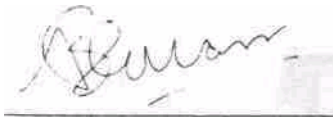
The comprehensive plan outlined has taken into account the consensus of public opinion as required in the terms of reference of the Agreement, including the views obtained following the release of a draft of this report in November, 1973. The Board is very appreciative of this public involvement in developing the framework plan, and in particular, the dedicated efforts of public involvement Task Force members.

In presenting these Findings and Recommendations the Board recognizes that they are based on the present state of the art using best judgement, and that the science involved in such areas as waste treatment is still imperfect. However, the framework plan developed is sufficiently flexible to encompass changes with time.

We would particularly draw your attention to Recommendations I and II, which concern the implementation of the plan. The deteriorating quality of water in the main valley lakes, and the water quantity problems that may arise should a prolonged drought period occur are continuing problems that require immediate consideration. Even assuming that a start is made on implementation of the plan in 1974, it will take two to three years to design, finance and construct appropriate works during which some further decline in water quality may be anticipated. This is the heart of the Board's conclusions; namely, that the future of the Valley rests primarily in the hands of local residents, with the support and assistance of senior governments.

The Board appreciates the continuing support given to it by the Ministers and their respective Departments along with the assistance rendered by other departments and organizations. The Board is particularly appreciative of the major contribution made by the Study Committee and the Study Director.

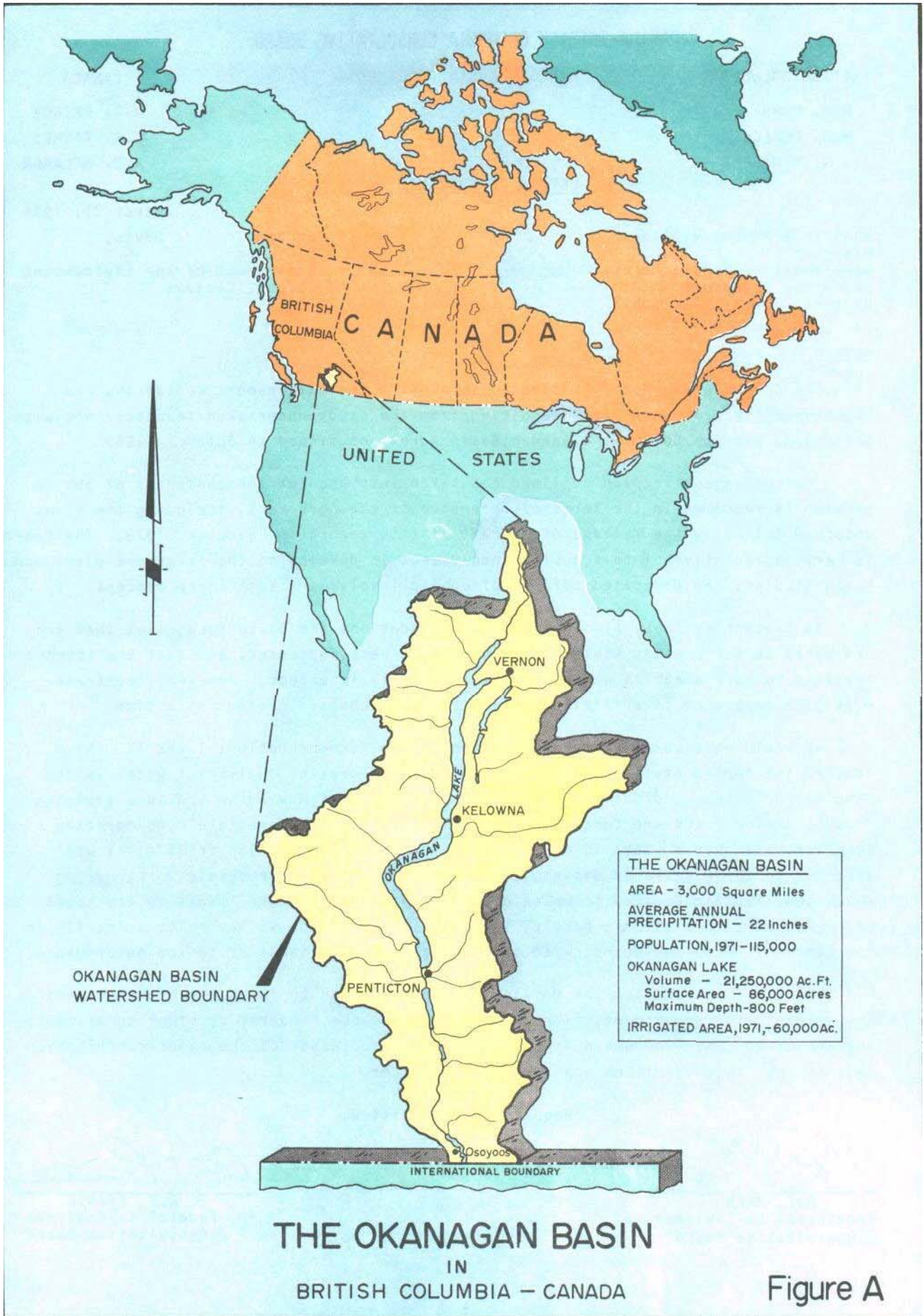
Respectively submitted,



B.E. MARR  
Provincial Co-Chairman  
Consultative Board



A.T. PRINCE  
Federal Co-Chairman  
Consultative Board



# FOREWORD

## Background

The Okanagan Valley is one of the most important river basins in the Southern Interior of British Columbia. Situated in the warm and dry interior of the Province, the region is both scenically attractive and climatically desirable, and has consequently experienced a rapidly expanding resident and tourist population growth. This influx of people has been accompanied by intensified, and sometimes conflicting, uses of the limited water and land resources of the basin.

Although Okanagan Lake provides the region with a large natural reservoir, replenishment of water is irregular owing to extreme variations in runoff from snow-melt and rainfall from year to year. As demands for the consumption of water for agricultural and municipal uses increase, particularly in tributary basins, the available supplies for non-consumptive uses in recreation, aesthetics and fisheries decrease. Added to the uncertainty concerning water supplies is the gradual deterioration of the quality of the valley's major lakes, indicated by an abundant growth of weeds around the shorelines and occasional algae blooms during the hot summer months.

These water resource problems have become a matter of increasing concern to the local residents. The complexities of the problems and the anticipation that pressure on the valley's water resources will continue to increase in the future, suggested the need for studies to develop suitable water management practices for the conservation of this resource. As a result the Canada British Columbia Okanagan Basin Agreement was enacted to carry out such studies, with recognition it would be of a pilot nature to develop and test new techniques for furthering comprehensive river basin planning in Canada.

## The Agreement

The Canada-British Columbia Okanagan Basin Agreement\* signed in October 1969, set out the purpose and terms of reference of the four-year preliminary study. The purpose of the Agreement was to develop a comprehensive framework plan for the development and management of water resources for the social betterment and economic growth of the Okanagan community. As the Agreement also made several references to maintaining a high level of environmental quality, the goals of the framework plan are as follows:

\*See Appendix A, page

1. Economic Development: To develop water and related resources as required to ensure a viable economic base in the Okanagan Basin,
2. Environmental Quality: To maintain and enhance the quality of the natural environment through management and protection of water and related resource systems such as fisheries, wildlife and recreational areas.
3. Social Betterment: To enhance social betterment in the Okanagan by creating a more equitable distribution of income, employment and opportunity between regions within the basin.

It should be recognized that these goals may conflict, for example a high rate of economic growth may not be compatible with maintenance of high levels of environmental quality. Therefore, the framework plan should attempt to achieve a desirable balance between these goals. Such a balance win only be struck after detailed consultation with a broad representation of public opinion based on discussions of water management alternatives.

Water resource management by itself, will not ensure the achievement of these multiple goals. Many other resources should also be integrated into a framework plan for the Okanagan, but because of the immediacy of some water resource problems in the Okanagan, the Agreement placed first priority on water management. Water related resources such as water-based recreation and sport fishery management which are also important components of the Okanagan life-style, are also brought into development of the framework plan.

The Agreement specifies that the planning horizon for the Okanagan Study will be to the year 2020. It is simply not possible - nor is it desirable - to base the framework plan on one projection of economic growth for the next fifty years. First, knowledge of the future - especially past 1980 - is extremely uncertain, and second, public values may change. Thus, it appears preferable to make the framework plan as flexible as possible so that it can suit a wide range of future growth options. This does not mean that nothing should be done, on the contrary, measures may have to be undertaken now to preserve future options for the next generation. Three future growth patterns for the basin were considered, each involving differing rates of economic growth and levels of environmental quality, so that the framework plan could be made as flexible as possible to cover a wide range of developments.

#### Scope of the Study

The Agreement sets out in some detail the scope of studies required to prepare the framework plan. First, social and economic studies are required to examine the existing relationships between water resources, economic growth

and aesthetic values. For each of the three different forecasts of economic activity in the Okanagan, projections of water requirements, waste loadings from industry and municipalities and recreational demands for fishing and shoreline activities were estimated. In addition, socio-economic studies were needed to evaluate water resource development and management alternatives. Because economic, environmental and social goals are explicitly stated, this evaluation must include both economic (dollars) and non-economic values.

Second, detailed hydrologic studies were to be undertaken to assess the water supply potential of both surface and groundwater resources, to evaluate means of regulating flows through storage and diversion to meet consumptive and non-consumptive water requirements and to analyze ways for augmenting existing water supplies within the Okanagan Basin itself.

Third, a similar broad range of studies was undertaken in the field of water quality analysis. The present quality of the lakes and streams was assessed and an inventory of all direct and indirect sources of wastes discharged into these waters was prepared. Analytical studies were undertaken to determine the capacity of surface waters to assimilate present and future waste materials without adversely affecting potential uses of these waters for drinking or recreational purposes.

In view of the immediacy of water quality problems in the Okanagan, the Agreement called for the development of pilot projects for advanced treatment of waste water including spray irrigation using treated municipal waste water and chemical means to remove nutrients and other pollutants. These projects were established in the three major municipalities in the Okanagan - Vernon, Kelowna and Penticton.

In keeping with this new approach to resource planning, the Agreement specified that a broad array of both structural and non-structural alternatives should be evaluated while developing the framework plan. Consequently, the adequacy of the existing institutional and legal framework to manage water and related resources was studied and recommendations made on changes in this framework that will be required to ensure more efficient water and waste management in the Okanagan over the next fifty years.

It was also recognized from the beginning of this study, that planning cannot be undertaken in a vacuum, insulated from the residents of the Okanagan Basin. Because the study involves such critical questions as the type of the life-style sought by the Okanagan community, the balance between environmental quality and economic growth and efficient ways of utilizing the water resource, the Okanagan public had to be involved directly in the planning process.



Consequently, public participation was an essential ingredient in developing the framework plan, and new techniques were devised and applied to obtain a broad representation of public opinion from informed citizens.

#### Administrative Arrangements

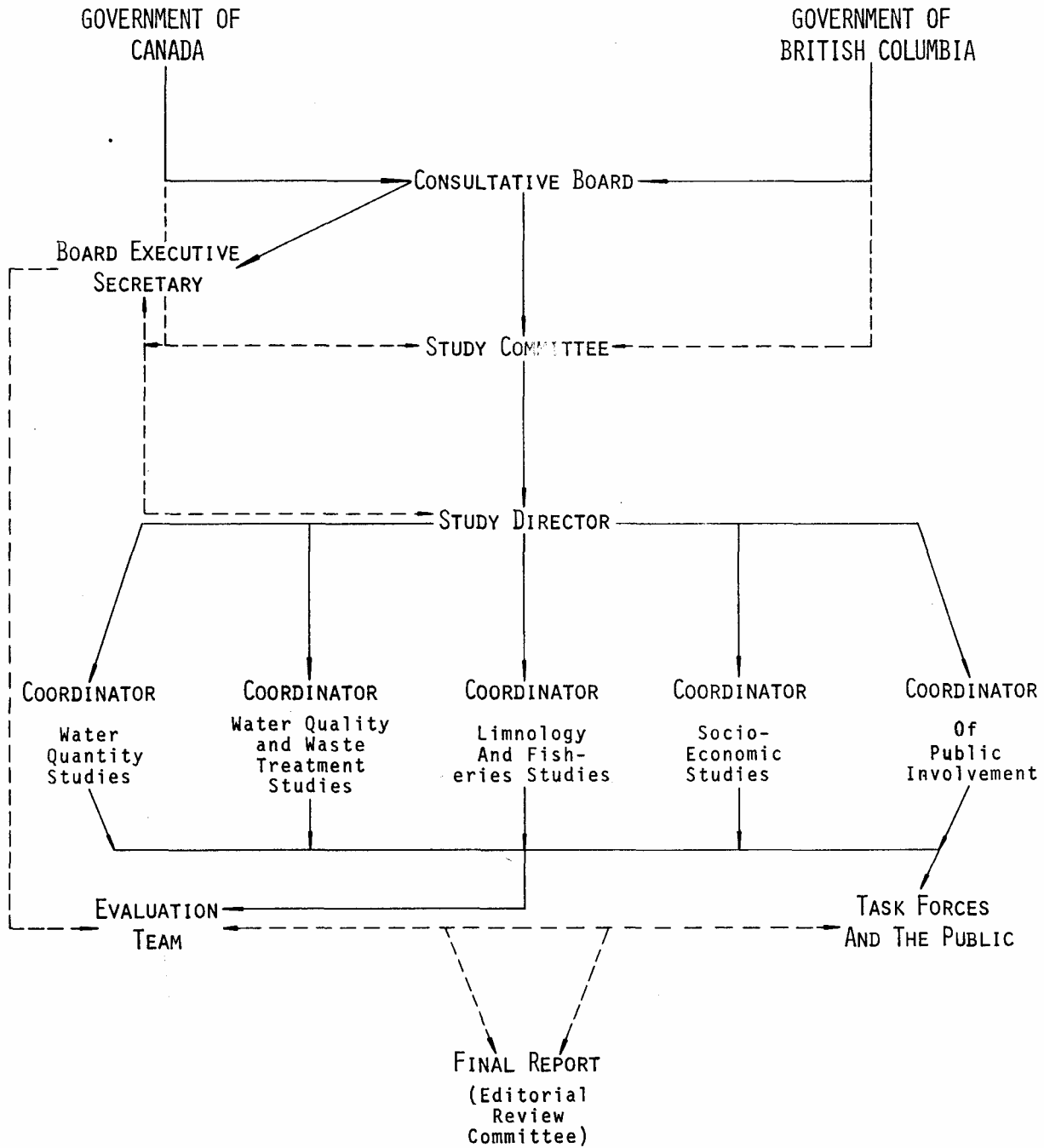
To facilitate joint federal-provincial participation in the planning process, a six-member Canada-British Columbia Consultative Board was established with three members each appointed by Canada and British Columbia. This Board was made responsible for the undertaking and overall supervision of the study program. The Board in turn appointed the Okanagan Study Committee with equal representation from both governments, to carry out the joint planning studies and pilot projects in accordance with the Terms of Reference of the Agreement. The functions of the Study Committee were coordinated by a Study Director appointed for this purpose by the Committee, and carried out by various government organizations who were assigned specific portions of the study program. These administrative arrangements and the personnel involved are shown in Figure 1 and Table 1 respectively.

The Agreement placed financial control of the study in the hands of the Consultative Board, with the provision that total study costs must not exceed \$2 million and that these costs would be shared equally by both governments. The Agreement called for a final report by October 29, 1973. Through mutual agreement by the two governments, the study was extended to March 31, 1974

A draft of the Findings and Recommendations and the Main Report were released to the public on November 28, 1973 followed by a public media discussion held at Kelowna, B.C. on December 3, 1973.

Final publications covering the work carried out under the Canada-British Columbia Okanagan Basin Agreement are listed on the inside front cover of this report.

CANADA-BRITISH COLUMBIA-OKANAGAN BASIN AGREEMENT



**ORGANIZATION STRUCTURE**

**Figure 1**

TABLE 1  
MEMBERS OF THE OKANAGAN BASIN STUDY  
Shown in Figure 1, Organizational Structure

NAME	POSITION	AFFILIATION AT TIME OF APPOINTMENT TO STUDY*
<b>1. CONSULTATIVE BOARD</b>		
<b>(a) FEDERAL</b>		
1. Dr. A.T. Prince	Co-Chairman	Director, Inland Waters Branch, Energy, Mines and Resources Canada
2. Dr. E.R. Tinney	Member	Director, Policy and Planning Branch, Energy, Mines and Resources Canada
3. Mr. K. Lucas	Member 1970-72	Director, Resource Development Service, Fisheries and Forestry Canada
(i) Replaced by Mr. R.L. McLaren	Member 1972-74	Regional Director, Environmental Protection Service, Environment Canada
<b>(b) PROVINCIAL</b>		
4. Mr. B.E. Marr	Co-Chairman	Chief Engineer, B.C.W.I.B. W.R.S. Dept. of Lands, Forests, and Water Resources
5. Mr. W.H. Venables	Member	Director B.C.P.C.B. W.R.S. Dept of Lands, Forests and Water Resources
6. Mr. H.D. Debeck	Member	Comptroller Water Rights Branch W.R.S. Dept. of Lands, Forests and Water Resources
Mr. J.C. Bunge	Board Secretary 1970-71	B.C.W.I.B. W.R.S. Dept. of Lands, Forests and Water Resources
(i) Replaced by Mr. J.G.A. Kidd	Board Secretary and Consultant 1971-73	Underwood, McLellan and Associates, Vancouver British Columbia
<b>2. STUDY COMMITTEE</b>		
<b>(a) FEDERAL</b>		
1. Mr. R.C. Hodges	Co-Chairman 1970-71	Chief, Planning Division, Energy, Mines and Resources
(i) Replaced by Dr. J. O'Riordan	Co-Chairman 1971-73	Policy and Planning Branch, Energy, Mines and Resources
2. Mr. L. Edgeworth	Member 1970-71	Chief, Resource Development Branch, Fisheries Service, Pacific Region
(i) Replaced by Mr. F.C. Boyd	Member 1971-74	Chief Environmental Quality Unit, Fisheries Service, Pacific Region
3. Dr. C.C. Strachan	Member 1970-71	Director, Summerland Research Station, Department of Agriculture, Canada
(i) Replaced by Dr. J.L. Mason	Member 1971-74	Head, Soil Service Section, Summerland Research Station Department of Agriculture, Canada
<b>(b) PROVINCIAL</b>		
1. Mr. T.A.J. Leach	Co-Chairman	Asst. Chief Engineer B.C.W.I.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
2. Mr. E.H. Vernon	Member	Chief, Fisheries Management, Fish and Wildlife Branch Dept. of Recreation and Conservation, Victoria, B.C.
3. Mr. M.W. Slezak	Member	Chief, Projects and Research Division, B.C. P.C.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
Dr. R.J. Buchanan	Interim Coordinator 1969-70	Water Resources Service Dept. of Lands, Forests and Water Resources, Victoria, B.C.
Mr. A.M. Thomson	Study Director 1970-74	Canada-British Columbia Okanagan Basin Agreement
<b>3. COORDINATORS</b>		
<b>FIELD OF STUDY</b>		
1. Mr. T.A.J. Leach	Water Quantity	Asst. Chief Engineer B.C.W.I.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
2. Mr. M.W. Slezak	Water Quantity and Waste Treatment 1970-72	Chief, Projects and Research Division, B.C. P.C.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
(i) Replaced by Mr. D. Corrigan	Water Quantity and Waste Treatment 1972	B.C.P.C.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
(ii) Replaced by Mr. E. Haughton	Water Quantity and Waste Treatment 1973-74	B.C.P.C.B. W.R.S. Dept of Lands, Forests and Water Resources, Victoria, B.C.
3. Dr J.G. Stockner	Limnology-Fisheries 1970-73	Freshwater Institute, Fisheries Research Board Environment Canada
(i) Replaced by Mr. G.D. Koshinsky	Limnology- Fisheries 1973	Freshwater Institute, Fisheries Research Board Environment Canada
(ii) Replaced by M. Pinsent	Limnology-Fisheries 1973-74	Fish and Wildlife Service, Dept of Recreation and Conservation, Victoria, B.C.
4. Dr. J. O'Riordan	Socio-Economics (Federal)	Policy and Planning Branch., Energy, Mines and Resources
5. Mr. C.H. Thomas	Socio-Economics (Provincial)	Water Resources Service, Department of Lands, Forests and Water Resources, Victoria, B.C.
6. Mr. G.W. Sinclair	Public Involvement 1972-74	G.W. Sinclair and Associates, Penticton, B.C.
<b>4. EDITORIAL REVIEW COMMITTEE</b>		
1. A.M. Thomson	Study Director	As Shown Above
2. Mr. T.A.J. Leach	Co-Chairman Study Committee	As Shown Above
3. Dr. J. O'Riordan	Co-Chairman Study Committee	As Shown Above
<b>5. SPECIAL AFFILIATIONS</b>		
1. Mr. H.B. Rosenberg	Federal Coordinator, Ottawa	Policy and Planning Branch, Energy, Mines and Resources, Canada
2. Dr. S.O. Russell	Water Quantity Consultant	University of British Columbia
3. Dr. W. Oldham	Waste Treatment Consultant	University of British Columbia

\* Federal members associated with the Department of Energy, Mines and Resources at the initiation of the Study, were transferred to the Department of the Environment, Canada, following its formation in June, 1971.