

MEMORANDUM OF AGREEMENT made this
10th day of October, 1985.

BETWEEN

THE GOVERNMENT OF CANADA, hereinafter called Canada, represented by the
Minister of the Environment,

OF THE FIRST PART,

AND

THE GOVERNMENT OF BRITISH COLUMBIA, hereinafter called British Columbia,
represented by the Minister of Environment,

OF THE SECOND PART,

WHEREAS CANADA is responsible for national assessments of water quality and for
the implementation of a comprehensive strategy for water quality monitoring; and

WHEREAS BRITISH COLUMBIA is responsible for managing water resources within
the province; and

WHEREAS CANADA and BRITISH COLUMBIA recognize the importance of
obtaining data and undertaking assessments on the quality of the aquatic environment;
and

WHEREAS some cooperative water quality monitoring has been conducted with British
Columbia for many years under informal federal-provincial arrangements with the
Water Quality Branch of the Department of the Environment for the purpose of securing
ambient baseline water quality data and providing joint assessments; and

WHEREAS it is desirable that the various informal arrangements be replaced by a formal
agreement between Canada and British Columbia so that water quality data and
information can be collected on a uniform, systematic, nonduplicative and cost-shared
basis; and

WHEREAS this information is required to advise both federal and provincial agencies in
support of water resource management programs, pollution control regulations,
environmental assessment studies, research undertakings, legislative formulations and
federal, provincial and international agreements and commitments; and

WHEREAS the Governor General-in-Council has by Order-in-Council P.C. 1985-3062,
dated 8th October, 1985, authorized the Minister of the Environment to execute this
Agreement on behalf of Canada; and

WHEREAS the Lieutenant Governor-in-Council has, by Order-in-Council 1816, dated 20th September, 1985, authorized the Minister of Environment to execute this Agreement on behalf of British Columbia,

WHEREAS the Treasury Board of British Columbia has given approval to the execution of this agreement,

NOW THEREFORE the parties agree as follows:

PURPOSE

The purpose of this Agreement is to provide for the coordination and integration of federal and provincial water quality monitoring activities to develop comprehensive assessments expressed above in a cost-shared or work-shared manner.

OBJECTIVES

The objectives of this Agreement are to:

- 1) achieve a continuing commitment by the parties to the acquisition of water quality data; and
- 2) obtain scientifically sound water quality information and achieve compatibility between respective water quality data bases for water resource management purposes.

DEFINITIONS

- a) **WATER QUALITY MONITORING STATIONS** – designated locations at which physical, chemical and/or biological sampling or measurements are performed using standard methods to determine the quality of the aquatic resource.
- b) **IMPLEMENTATION** – the planning, establishment and operation of a water quality monitoring station.
- c) **OPERATING PARTY** – either party to this Agreement which operates a water quality monitoring station.
- d) **OPERATION** – the collection and analysis of samples and the performance of in situ measurements, including the provision of equipment and resources to obtain and manage water quality data obtained under this agreement.
- e) **FEDERAL WATER QUALITY MONITORING STATIONS** – stations implemented to meet federal requirements or mandates, and paid for by Canada.

- f) **PROVINCIAL WATER QUALITY MONITORING STATIONS** – stations implemented to meet provincial requirements or mandates, and paid for by British Columbia.
- g) **FEDERAL-PROVINCIAL WATER QUALITY MONITORING STATIONS** - stations where implementation would be in the common interest of both parties, and the costs are shared equally.
- h) **ANNUAL ESTIMATED COST OF IMPLEMENTATION** – an estimated cost for the annual implementation of water quality activities and determined in accordance with Schedule C.
- i) **ACTUAL COST OF IMPLEMENTATION** – the actual costs for the annual implementation of water quality activities as incurred by both parties and determined in accordance with Schedule C.
- j) **PERSONNEL** – includes federal and provincial water quality supervisors, field and laboratory staff on full-time duty and staff on temporary assignment.
- k) **NAQUADAT** – the computerized National Water Quality data bank for storing and retrieving chemical, physical, biological and hydrometric data relevant to water quality for surface waters, groundwaters, precipitation, wastewaters and sediments.
- l) **SEAM** – the computerized British Columbia System for Environmental Assessment and Management for storing and retrieving physical and chemical data related to sediments; biological tissues, discharges to air, land and water, surface waters, ground waters, and precipitation.
- m) **DATA SUMMARY** – a tabulation of measurements and results collected as a part of this agreement.
- n) **ADMINISTRATORS** – persons appointed by the Ministers to be responsible for the general implementation and management of this agreement.

OPERATIONAL MATTERS

ARTICLE I

Each water quality monitoring station under this Agreement will be identified according to the designation “federal”, “federal-provincial” or “provincial”, based on the division of responsibility. The initial designation is given in SCHEDULE B, hereto attached. SCHEDULE B may be revised to include a change in the designation of a station, the addition of new stations or the deletion of stations as agreed by the Coordinating Committee (Article X).

ARTICLE II

Canada will be responsible for the annual costs associated with implementing water quality monitoring stations which have been designated as federal. Where Canada deems it desirable in the interest of efficiency of operation, British Columbia may be requested to implement, in whole or in part, some federal water quality monitoring stations. If British Columbia agrees to such arrangements, Canada will in such cases compensate British Columbia for the appropriate proportion of the annual cost in accordance with Articles VI, VII, and IX.

ARTICLE III

Where Canada implements water quality monitoring stations designated as federal-provincial, British Columbia will compensate Canada for 50% of the annual cost. Where British Columbia implements such stations, Canada will compensate British Columbia for 50% of the annual cost. Compensation by either party will be in accordance with Articles VI, VII, VIII and IX.

ARTICLE IV

British Columbia will be responsible for the annual costs associated with the implementation of water quality monitoring stations which have been designated as provincial. Where British Columbia deems it desirable in the interest of efficiency of operation, Canada may be requested to implement in whole or in part, some provincial water quality monitoring stations. If Canada agrees to such arrangements, British Columbia will in such cases compensate Canada for the appropriate proportion of the annual cost in accordance with Articles VI, VII, and IX.

ARTICLE V

- a) The operating party shall provide the personnel and resources to meet its responsibilities under this Agreement.
- b) The parties agree to cooperate in a quality assurance program as defined in SCHEDULE E.
- c) The parties shall jointly own all data collected under the Agreement and have equal access to them. The parties will exchange data collected at stations as agreed to be equitable by the Coordinating Committee as designated in SCHEDULE A. These data will be stored in appropriate data bases such as NAQUADAT and SEAM.
- d) Canada and British Columbia may publish data summaries and may jointly or individually produce water quality interpretive reports in areas of their respective

jurisdictions from information obtained for any station(s) designated in SCHEDULE B.

FINANCIAL SECTION

ARTICLE VI

- a) Each party's obligation under this Agreement is subject to sufficient funds being appropriated by the Parliament of Canada or by the legislature of British Columbia.
- b) Annual estimates and actual costs will be determined in accordance with SCHEDULE C. Costs will be estimated by August 1st of the preceding fiscal year for approval by the Administrators. Payment and/or compensation will be made according to Article VII.
- c) Annual estimated costs and the estimate for payment and/or compensation are to be provided annually in SCHEDULE D.

ARTICLE VII

- a) Canada or British Columbia shall submit a statement of claims for estimated cost imbalances based on the estimated annual cost as approved by the Administrators on a quarterly basis on July 1st, October 1st, January 1st and March 1st of each fiscal year in accordance with the annual payment computed in Schedule D. Payment is to be made as soon as possible after receipt of each quarterly claim, but in no case later than April 30th of the following fiscal year.
- b) The costs to be shared are the actual costs incurred as determined by Schedule C.
- c) Where there is a difference between the actual annual cost imbalance and the estimated annual cost imbalance, an adjustment, as agreed to by the Administrators will be made in the final quarterly payment (March 1st), or the first quarterly payment (July 1st) of the next fiscal year, to reflect more accurately the cost-sharing of the parties to this agreement.

ARTICLE VIII

The annual net change, excluding inflation, in the total cost of implementing federal-provincial water quality monitoring stations as set out in SCHEDULE B, is not to exceed 8% in any year, subject to funds being available, unless approved by the respective parties' Treasury Boards.

ARTICLE IX

Each party operating a water quality monitoring station or stations shall keep complete records of all shareable expenditures made pursuant to this Agreement and shall support such expenditures with proper documentation. Canada and British Columbia shall have suitable supporting records and documents (as outlined in SCHEDULE C) available in order that an audit may be conducted at the discretion of either party. Any discrepancy disclosed by audit between the amount paid and the amount payable by a party shall be promptly adjusted.

ADMINISTRATION

ARTICLE X

The administrators named in SCHEDULE A shall establish a Coordinating Committee with equal representation from the parties to this Agreement. Terms of reference for this Committee are described in SCHEDULE A. The Administrators shall ensure that the Coordinating Committee fulfills its responsibilities for:

- a) exchanging water quality data and related information obtained under this Agreement between Canada and British Columbia in a timely and equitable fashion;
- b) informing the Administrators about modifications of water quality monitoring activities within provincial boundaries as designated in SCHEDULE B
- c) assuring compatibility in field sampling and measurements, laboratory procedures, and data management as defined in SCHEDULE E;
- d) reviewing annual costs and advising the Administrators about the transfer of funds as per Articles VI and VII;
- e) modifying and updating the Schedules as required during the life of the agreement;
- f) preparing an annual report for the Administrator's approval on the implementation of and payment for water quality monitoring activities undertaken by this Agreement; and
- g) other duties as assigned by the administrators.

IMPLEMENTATION

ARTICLE XI

During the initial period of implementation of this Agreement, there shall be a start-up period specified in SCHEDULE C, during which there will be no transfer of money. The activities pertaining to federal-provincial stations will be apportioned on an equal basis between the parties. The provisions of the Articles, Schedules and procedures, and internal accounting systems will be implemented by the parties. This shall not preclude the contracting of work by one party for the other. The necessary records for audit purposes are specified in SCHEDULE C.

ARTICLE XII

The parties hereto agree that the water quality monitoring activities will be carried out as indicated from Articles I to XVII and as applicable under SCHEDULES A to E attached hereto which form an integral part of the Agreement. These activities will be managed and administered by the administrators named in SCHEDULE A.

NON-PARTICIPATION

ARTICLE XIII

No member of the House of Commons of Canada shall be admitted to any share or part of this Agreement or to any benefit to arise there from.

SETTLEMENTS AND INDEMNIFICATION

ARTICLE XIV

- a) Any dispute between the parties hereto on any question of law or fact arising from this Agreement will be settled by a Court of Competent Jurisdiction in British Columbia.
- b) The implementing party shall indemnify and save harmless the other party, its officers, servants and agents, against all claims and demands of third parties in any way arising out of its implementation, except to the extent to which such claims or demands relate to the act of negligence of any officer, employee, or agent of the other party. Where the responsibility for an implementation hereunder or any part thereof is to be vested in a third party, the contractual arrangements made between the implementing jurisdiction and said party shall provide a clause in order to save the parties harmless from any claims, demands, actions, and causes of action which may be made against them arising out of such implementation by the third party.

RENEGOTIATION AND AMENDMENT

ARTICLE XV

- a) This Agreement shall continue until it is renegotiated or terminated as outlined below. This Agreement may be renegotiated or terminated at the request of either of the parties if, prior to ~~the~~ ^{March} 31st of any year, the party wishing renegotiation or termination gives at least 18 months' notice in writing to the other party, or at the mutual consent of both parties.
- b) This Agreement, excluding the Schedules, may be revised by the consent of the Governor General-in-Council and the Lieutenant Governor-in-Council and is subject to any terms and conditions of the Treasury Boards of both parties.

GENERAL

ARTICLE XVI

This Agreement annuls all contracts or representatives, if any, made previously relating in whole or in part to the object hereof.

EFFECTIVE DATE

ARTICLE XVII

This Agreement will become effective and binding on the parties upon the signature of both of the Ministers.

IN WITNESS WHEREOF, the hand of the Minister of the Environment for Canada, has hereunto been set on behalf of Canada, and the hand of the Minister of Environment for British Columbia, has hereunto been set on behalf of British Columbia.

Signed on behalf of Canada by the Minister of the Environment for Canada

IN THE PRESENCE OF

Signed on behalf of British Columbia by the Minister of Environment for British Columbia.

IN THE PRESENCE OF

SCHEDULE A

Administration

On behalf of their respective parties the following officials are named to administer this Agreement:

Mr. E.M. Clark on behalf of Canada

Mr. P.M. Brady on behalf of British Columbia

These officials will be supported by a Coordinating Committee as described below:

Terms of Reference for the Coordinating Committee

Membership: An equal number of members from each party as referred to in Article X, and named by the Administrators.

- Duties:
- 1) To advise the Administrators on the implementation of water quality monitoring performed under the terms of the Agreement and subject to the administrators' approval.
 - 2) Review and modify SCHEDULE B to meet changing needs and to improve the overall implementation of water quality monitoring activities, including the selection and classification of stations.
 - 3) Develop and implement annual technical plans respecting stations listed in SCHEDULE B, including the variables to be measured, timing and other technical details of the monitoring program outlined in SCHEDULES B AND E.
 - 4) Review and recommend an equitable data exchange to ensure that the station classifications will be consistent with each party's interest in the stations.
 - 5) Review and recommend modifications to SCHEDULES C and D for approval by the Administrators.
 - 6) Determine station costs, activity costs and annual payments in accordance with SCHEDULES C and D
 - 7) Prepare an annual report on the activities and developments related to the Agreement for approval by the Administrators.
 - 8) Carry out other duties as assigned by the administrators.

SCHEDULE B MONITORING
ACTIVITIES

Part 1.1 Federal-Provincial Monitoring Stations

<u>Major Rivers and Lakes</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Frequency</u>	<u>Purpose</u>	<u>Operator</u>	<u>Cost</u>
Fraser River at Hansard	54 04 35	121 50 52\	26	Trend Assessment	Fed/Prov	\$9,330.00
Fraser River at Marguerite	52 31 48	122 26 30	26	Trend Assessment	Fed/Prov	\$9,460.00
Fraser River at Hope	49 23 12	121 26 58	26	Trend Assessment	Fed/Prov	\$9,330.00
Nechako River at Prince George	53 55 38	123 13 59	26	Trend Assessment	Fed/Prov	\$8,700.00
Thompson River at Spences Bridge	50 21 16	121 23 335	26	Trend Assessment	Fed/Prov	\$5,280.00
Peace River above Alces River	56 07 41	120 03 20	26	Trend Assessment	Fed/Prov	\$11,620.00
Skeena River at Usk	54 37 49	128 25 40	26	Trend Assessment	Fed/Prov	\$8,620.00
Quinsam River near the mouth	50 02 39	125 18 39	26	Trend Assessment	Fed/Prov	\$8,740.00
Columbia River at Revelstoke	50 51 11	118 06 18	13	Trend Assessment	Fed/Prov	\$3,180.00
Columbia River at Birchbank	49 10 40	117 42 59	26	Trend Assessment	Fed/Prov	\$9,560.00
Columbia River at Waneta	49 01 39	117 36 11	52	Trend Assessment	Fed/Prov	\$19,120.00
Flathead River at U.S. Border	49 00 15	114 28 45	52	Trend Assessment	Fed/Prov	\$11,080.00
Kootenay River at Canal Flats	50 09 38	115 48 10	26	Trend Assessment	Fed/Prov	\$6,580.00
Kootenay River at Fenwick Station	49 31 41	115 32 54	26	Trend Assessment	Fed/Prov	\$6,920.00
Koocanusa Lake at U.S. Border	48 59 55	115 10 48	7	Trend Assessment	Fed/Prov	\$9,050.00
Kootenay River at Creston	49 07 00	116 34 45	26	Trend Assessment	Fed/Prov	\$6,580.00
Elk River at Phillips Bridge	49 10 47	115 09 53	26	Trend Assessment	Fed/Prov	\$6,920.00
Okanagan River at Oliver	49 22 45	119 33 20	26	Trend Assessment	Fed/Prov	\$5,470.00
Similkameen River near U.S. Border	49 04 45	119 40 00	26	Trend Assessment	Fed/Prov	\$8,420.00
<u>Headwater Lakes for Airborne Contaminants</u>						
Old Wolf Lake (Victoria)	48 30 00	123 40 05	12	Trend Assessment	Province	\$7,080.00
Lizard lake near Port Renfrew	48 36 20	124 13 20	12	Trend Assessment	Province	\$7,130.00
Spectacle Lake near Malahat Summit	48 34 41	123 34 07	12	Trend Assessment	Province	\$7,090.00
Maxwell Lake (Saltspring Island)	48 49 15	123 32 12	12	Trend Assessment	Province	\$7,110.00

Part 1.2 Federal-Provincial Monitoring Activities

<u>Activity</u>	<u>Cost</u>
Quality assurance program	\$29,500.00
Evaluations	\$25,100.00
Interpretation of Columbia River metallothionein and mercury data	\$20,000.00
Coastal stream sampling strategies	\$5,100.00
Network optimization and data transfer	\$28,000.00

Part 1.3 Variables Sampled at Federal-Province Monitoring Stations

<u>Major River and Lakes</u>	<u>Temp.</u>	<u>Diss. O2</u>	<u>pH</u>	<u>Turbidity</u>	<u>Extinction Depth</u>	<u>Residue (non-fil.)</u>	<u>Residue (fil.)</u>	<u>Colour (Ta</u>
Fraser River at Hansard	X		X	X		X	X	X
Fraser River at Marguerite	X	X	X	X		X	X	X
Fraser River at Hope	X		X	X		X	X	X
Nechako River at Prince George	X		X	X		X	X	X
Thompson River at Spences Bridge	X		X	X		X	X	X
Peace River above Alces River	X		X	X		X		X
Skeena River at Usk	X		X	X		X		X
Quinsam River near the mouth	X		X	X		X		
Columbia River at Revelstoke	X		X	X		X	X	
Columbia River at Birchbank	X		X	X		X		X
Columbia River at Waneta	X		X	X		X		X
Flathead River at U.S. Border	X		X	X		X	X	
Kootenay River at Canal Flats	X		X	X		X	X	X
Kootenay River at Fenwick Station	X		X	X		X	X	X
Koocanusa Lake at U.S. Border	X	X	X	X	X	X	X	
Kootenay River at Creston	X		X	X		X	X	X
Elk River at Phillips Bridge	X		X	X		X	X	X
Okanagan River at Oliver	X		X	X		X		
Similkameen River near U.S. Border	X		X	X		X		
<u>Headwater Lakes for Airborne</u>								
<u>Contaminants</u>								
Old Wolf Lake (Victoria)	X		X	X		X	X	X
Lizard lake near Port Renfrew	X		X	X		X	X	X
Spectacle Lake near Malahat Summit	X		X	X		X	X	X
Maxwell Lake, Saltspring Island	X		X	X		X	X	X

<u>Major River and Lakes</u>	<u>Colour (SWL)</u>	<u>Spec. Con.</u>	<u>Alk. Phenol</u>	<u>Alk. Total</u>	<u>Alk. (titration curve)</u>	<u>Hardness</u>	<u>Ca</u>	<u>Mg</u>
Fraser River at Hansard		X	X	X		X	X	X
Fraser River at Marguerite		X	X	X		X	X	X
Fraser River at Hope		X	X	X		X	X	X
Nechako River at Prince George		X	X	X		X	X	X
Thompson River at Spences Bridge		X	X	X		X	X	X
Peace River above Alces River		X	X	X		X	X	X
Skeena River at Usk		X	X	X		X	X	X
Quinsam River near the mouth		X	X	X		X	X	X
Columbia River at Revelstoke		X	X	X		X	X	X
Columbia River at Birchbank	X	X	X	X		X	X	X
Columbia River at Waneta	X	X	X	X		X	X	X
Flathead River at U.S. Border		X	X	X		X	X	X
Kootenay River at Canal Flats	X	X	X	X		X	X	X
Kootenay River at Fenwick Station	X	X	X	X		X	X	X
Koocanusa Lake at U.S. Border	X	X				X		
Kootenay River at Creston		X	X	X		X	X	X
Elk River at Phillips Bridge	X	X	X	X		X	X	X
Okanagan River at Oliver		X	X	X		X	X	X
Similkameen River near U.S. Border		X	X	X		X	X	X
<u>Headwater Lakes for Airborne Contaminants</u>								
Old Wolf Lake (Victoria)		X		X	X	X	X	X
Lizard lake near Port Renfrew		X		X	X	X	X	X
Spectacle Lake near Malahat Summit		X		X	X	X	X	X
Maxwell Lake, Saltspring Island		X		X	X	X	X	X

<u>Major River and Lakes</u>	<u>K</u>	<u>Na</u>	<u>Cl (dis.)</u>	<u>F (total)</u>	<u>F (dis.)</u>	<u>SO4</u>	<u>SiO2 reactive</u>	<u>N (org.)</u>
Fraser River at Hansard	X	X	X		X	X	X	
Fraser River at Marguerite	X	X	X		X	X	X	
Fraser River at Hope	X	X	X		X	X	X	
Nechako River at Prince George	X	X	X		X	X	X	
Thompson River at Spences Bridge	X	X	X		X	X	X	
Peace River above Alces River	X	X	X		X	X	X	
Skeena River at Usk	X	X	X		X	X	X	
Quinsam River near the mouth	X	X	X		X	X	X	
Columbia River at Revelstoke	X	X	X		X	X	X	
Columbia River at Birchbank	X	X	X	X	X	X	X	
Columbia River at Waneta	X	X	X	X	X	X	X	
Flathead River at U.S. Border	X	X	X		X	X	X	
Kootenay River at Canal Flats	X	X	X		X	X	X	
Kootenay River at Fenwick Station	X	X	X		X	X	X	
Koocanusa Lake at U.S. Border					X			X
Kootenay River at Creston	X	X	X		X	X	X	X
Elk River at Phillips Bridge	X	X	X		X	X	X	
Okanagan River at Oliver	X	X	X		X	X	X	
Similkameen River near U.S. Border	X	X	X		X	X	X	
<u>Headwater Lakes for Airborne Contaminants</u>								
Old Wolf Lake (Victoria)		X	X		X	X		X
Lizard lake near Port Renfrew		X	X		X	X		X
Spectacle Lake near Malahat Summit		X	X		X	X		X
Maxwell Lake, Saltspring Island		X	X		X	X		X

<u>Major River and Lakes</u>	<u>N (total dis.)</u>	<u>N (kjeldahl)</u>	<u>NO2 + NO3</u>	<u>NH4</u>	<u>NO2 (dis.)</u>	<u>P (total dis.)</u>	<u>P (dis. ortho)</u>
Fraser River at Hansard	X		X	X		X	X
Fraser River at Marguerite	X		X	X		X	X
Fraser River at Hope	X		X	X		X	X
Nechako River at Prince George	X		X	X		X	
Thompson River at Spences Bridge	X		X	X		X	
Peace River above Alces River	X		X	X		X	
Skeena River at Usk	X		X	X		X	
Quinsam River near the mouth	X		X	X		X	
Columbia River at Revelstoke	X		X	X		X	X
Columbia River at Birchbank	X		X	X		X	X
Columbia River at Waneta	X		X	X		X	X
Flathead River at U.S. Border	X		X	X	X	X	X
Kootenay River at Canal Flats	X		X	X		X	X
Kootenay River at Fenwick Station	X		X	X		X	X
Koocanusa Lake at U.S. Border		X	X	X		X	
Kootenay River at Creston	X		X	X		X	X
Elk River at Phillips Bridge	X		X	X		X	X
Okanagan River at Oliver	X		X	X		X	X
Similkameen River near U.S. Border	X		X	X		X	
<u>Headwater Lakes for Airborne Contaminants</u>							
Old Wolf Lake (Victoria)		X	X	X		X	X
Lizard lake near Port Renfrew		X	X	X		X	X
Spectacle Lake near Malahat Summit		X	X	X		X	X
Maxwell Lake, Saltspring Island		X	X	X		X	X

<u>Major River and Lakes</u>	<u>P (dis. ortho low level)</u>	<u>P (total)</u>	<u>As (total)</u>	<u>As (dis.)</u>	<u>Al (total)</u>	<u>Al (dis.)</u>	<u>Ba (total)</u>	<u>Ba (dis.)</u>
Fraser River at Hansard		X			X	X		
Fraser River at Marguerite		X			X	X		
Fraser River at Hope		X			X	X		
Nechako River at Prince George		X			X	X		
Thompson River at Spences Bridge	X	X						
Peace River above Alces River		X			X	X		
Skeena River at Usk		X	X	X	X	X		
Quinsam River near the mouth		X			X	X		
Columbia River at Revelstoke		X						
Columbia River at Birchbank		X	X	X				
Columbia River at Waneta		X	X	X				
Flathead River at U.S. Border		X					X	X
Kootenay River at Canal Flats		X						
Kootenay River at Fenwick Station		X						
Koocanusa Lake at U.S. Border	X	X						
Kootenay River at Creston		X						
Elk River at Phillips Bridge	X	X						
Okanagan River at Oliver		X						
Similkameen River near U.S. Border		X						
<u>Headwater Lakes for Airborne Contaminants</u>								
Old Wolf Lake (Victoria)		X			X			
Lizard lake near Port Renfrew		X			X			
Spectacle Lake near Malahat Summit		X			X			
Maxwell Lake, Saltspring Island		X			X			

<u>Major River and Lakes</u>	<u>Cd (dis.)</u>	<u>Cd (total ultra low level, ug/L)</u>	<u>Cd (total)</u>	<u>Cr (dis.)</u>	<u>Cr (total)</u>	<u>Cu (total)</u>	<u>Cu (dis.)</u>	<u>Fe (total)</u>
Fraser River at Hansard	X		X	X	X	X	X	X
Fraser River at Marguerite	X		X	X	X	X	X	X
Fraser River at Hope	X		X	X	X	X	X	X
Nechako River at Prince George	X		X			X	X	X
Thompson River at Spences Bridge			X			X		X
Peace River above Alces River	X		X			X	X	X
Skeena River at Usk	X		X	X	X	X	X	X
Quinsam River near the mouth	X	X				X	X	X
Columbia River at Revelstoke			X			X		X
Columbia River at Birchbank		X		X	X	X	X	X
Columbia River at Waneta		X		X	X	X	X	X
Flathead River at U.S. Border			X			X		X
Kootenay River at Canal Flats			X			X	X	X
Kootenay River at Fenwick Station			X			X	X	X
Koocanusa Lake at U.S. Border						X		X
Kootenay River at Creston			X			X		X
Elk River at Phillips Bridge			X			X	X	X
Okanagan River at Oliver			X			X		X
Similkameen River near U.S. Border	X		X			X	X	X
<u>Headwater Lakes for Airborne Contaminants</u>								
Old Wolf Lake (Victoria)			X		X	X		X
Lizard lake near Port Renfrew			X		X	X		X
Spectacle Lake near Malahat Summit			X		X	X		X

Maxwell Lake, Saltspring Island

X

X

X

Major River and Lakes

Fe (dis.)

Mg (total)

Mn (total)

Mn (dis.)

Mo (dis.)

Mo (total)

Ni (total)

Ni (dis.)

Fraser River at

X

X

X

X

Hansard

Fraser River at Marguerite

X

X

X

X

Fraser River at Hope

X

X

X

X

Nechako River at Prince George

X

X

X

X

Thompson River at Spences Bridge

X

Peace River above Alces River

X

X

X

X

Skeena River at Usk

X

X

X

X

Quinsam River near the mouth

X

X

X

X

X

Columbia River at Revelstoke

X

X

Columbia River at Birchbank

X

X

X

X

Columbia River at

X

X

X

X

Waneta

Flathead River at U.S. Border

X

Kootenay River at Canal Flats

X

X

X

Kootenay River at Fenwick Station

X

X

X

Koocanusa Lake at U.S. Border

X

Kootenay River at Creston

X

Elk River at Phillips

X

X

X

Bridge

Okanagan River at

X

Oliver

Similkameen River near U.S. Border

X

X

X

X

X

X

Headwater Lakes for Airborne Contaminants

Old Wolf Lake (Victoria)

X

X

Lizard lake near Port Renfrew

X

X

Spectacle Lake near Malahat

X

X

Summit

Maxwell Lake, Saltspring Island

X

X

<u>Major River and Lakes</u>	<u>Pb (total)</u>	<u>Pb (dis)</u>	<u>V (total)</u>	<u>Zn (total)</u>	<u>Zn (dis)</u>	<u>TOC</u>	<u>Phenol</u>	<u>Cyanide (total)</u>
Fraser River at Hansard	X	X		X	X		X	
Fraser River at Marguerite	X	X		X	X		X	
Fraser River at Hope	X	X		X	X		X	
Nechako River at Prince George	X	X		X	X		X	
Thompson River at Spences Bridge	X			X				
Peace River above Alces River	X	X		X	X		X	
Skeena River at Usk	X	X		X	X			
Quinsam River near the mouth	X	X		X	X			
Columbia River at Revelstoke	X			X				
Columbia River at Birchbank	X	X		X	X			
Columbia River at Waneta	X	X		X	X			
Flathead River at U.S. Border	X			X				
Kootenay River at Canal Flats	X			X	X	X		
Kootenay River at Fenwick Station	X			X	X	X		
Koocanusa Lake at U.S. Border	X			X	X	X		
Kootenay River at Creston	X			X				
Elk River at Phillips Bridge	X			X		X		
Okanagan River at Oliver	X			X				
Similkameen River near U.S. Border	X	X		X	X			X
<u>Headwater Lakes for Airborne Contaminants</u>								
Old Wolf Lake (Victoria)	X		X	X				
Lizard lake near Port Renfrew	X		X	X				
Spectacle Lake near Malahat	X		X	X				

Summit

Maxwell Lake, Saltspring Island

X X X

Major River and Lakes

Hydrocarbon
s

Coliform (fecal)

Chlorophyll

Phytoplankton

Zooplankton

Fraser River at
Hansard

X

Fraser River at Marguerite

X

Fraser River at Hope

X

Nechako River at Prince George

X

Thompson River at Spences Bridge

Peace River above Alces River

X

X

Skeena River at Usk

Quinsam River near the mouth

Columbia River at Revelstoke

Columbia River at Birchbank

X

Columbia River at
Waneta

X

Flathead River at U.S. Border

Kootenay River at Canal Flats

Kootenay River at Fenwick Station

Koocanusa Lake at U.S. Border

X

X

X

Kootenay River at Creston

X

Elk River at Phillips
Bridge

Okanagan River at
Oliver

X

Similkameen River near U.S. Border

X

Headwater Lakes for Airborne Contaminants

Old Wolf Lake (Victoria)

X

X

X

Lizard lake near Port Renfrew
Spectacle Lake near Malahat
Summit
Maxwell Lake, Saltspring Island

X	X	X
X	X	X
X	X	X

Part 2 Provincial Monitoring Stations

	<u>Latitude</u>	<u>Longitude</u>	<u>Frequenc</u> <u>y</u>	<u>Purpose</u>	<u>Operator</u>
Mesachie lake near Lake Cowichan	48 48 48	124 06 30	12	Trend Assessment	Province
Westwood lake near Nanaimo	49 09 40	124 00 00	12	Trend Assessment	Province
Stocking Lake near Ladysmith	48 57 30	123 49 07	12	Trend Assessment	Province
Jacobs Lake (Marion) Maple Ridge	49 18 40	122 32 46	12	Trend Assessment	Province
Rolley Lake near Whonnock	49 14 40	122 23 15	12	Trend Assessment	Province
Buttle Lake at Gold River Hwy Bridge	49 50 33	125 37 15	12	Trend Assessment	Province
Cowichan River at outlet of Cowichan Lake	48 49 25	124 03 30	12	Trend Assessment	Province
Cowichan River at Hwy 1	48 46 22	123 41 48	12	Trend Assessment	Province
Cowichan River 1km d/s Somenos Ck	48 46 32	123 39 55	12	Trend Assessment	Province
Bessette Creek u/s Lumby STP	50 15 05	118 57 28	12	Effects of Waste	Province
Shuswap u/s Enderby STP	50 33 52	119 08 01	12	Effects of Waste	Province
Vernon Creek u/s Vernon STP	50 22 00	119 17 00	15	Effects of Waste	Province
Deep Creek u/s Dutch Dairies	50 26 46	119 12 17	12	Effects of Waste	Province
Deep Creek at mouth, Armstrong	50 20 49	119 17 39	12	Effects of Waste	Province
Bailey Creek, Vernon	50 10 50	119 20 25	9	Effects of Waste	Province
Brandt's Creek, Kelowna	49 54 00	119 29 02	12	Effects of Waste	Province
Westbank Creek u/s Westbank STP	49 49 25	119 37 02	12	Effects of Waste	Province
Westbank Creek u/s Spray Irrigation	49 49 24	119 37 05	12	Effects of Waste	Province
Okanagan River at Hwy 97 Penticton	49 29 46	119 36 58	12	Effects of Waste	Province
Shingle Creek near Penticton	49 28 46	119 35 56	27	Nutrient Loading	Province
Ellis Creek u/s Okanagan River	49 28 36	119 35 43	27	Nutrient Loading	Province
Similkameen River u/s Princeton STP	49 27 39	120 28 55	6	Effects of Waste	Province
Similkameen River u/s Keremeos	49 12 01	119 50 29	6	Effects of Waste	Province
Similkameen River 3600m d/s Keremeos	49 11 45	119 47 10	6	Effects of Waste	Province
Boundary Creek u/s Greenwood	49 05 44	118 40 39	6	Effects of Waste	Province
Boundary Creek 3km south Greenwood	49 03 31	118 41 36	6	Effects of Waste	Province
Kettle River u/s Grand Forks STP	49 01 46	118 25 45	6	Effects of Waste	Province
Lewis Creek near Marguerite	52 31 52	122 18 26	4	Effects of Waste	Province
Willow River at Hwy 26 near Wells	53 06 08	121 34 08	4	Effects of Waste	Province
Little Horsefly River at road	52 22 30	121 19 08	4	Surveillance	Province
Little Horsefly River at Niquidit	52 22 00	121 22 00	4	Surveillance	Province
Little Horsefly River Gardner Road	52 21 38	121 23 35	4	Surveillance	Province
Dragon Lake near Quesnel	52 57 25	122 24 37	14	Trend Assessment	Province
San Jose River near Lac la Hache	51 52 24	121 40 00	21	Nutrient Loading	Province
Williams Lake River at lake Outlet	52 07 19	122 07 50	21	Nutrient Loading	Province
Williams lake River near mouth	52 09 52	122 16 08	4	Surveillance	Province
Elk River near headquarters	50 26 30	114 56 43	9	Trend Assessment	Province
Elk River u/s Elkford STP	50 01 08	114 54 43	9	Trend Assessment	Province
Elk River u/s Grave Creek	49 51 60	114 52 02	9	Trend Assessment	Province
Elk River Michel Creek	49 44 48	114 53 10	9	Trend Assessment	Province
Elk River at Sparwood	49 43 51	114 54 00	9	Trend Assessment	Province
Elk River d/s Sparwood	49 40 08	114 54 08	9	Trend Assessment	Province
Elk River at Hosmer Bridge	49 35 08	114 58 04	9	Trend Assessment	Province

Line Creek near mouth	49 53 34	114 49 32	9	Trend Assessment	Province
Fording River at mouth	49 53 09	114 52 23	9	Trend Assessment	Province
Summit Creek u/s of Alexander Creek	49 39 00	114 43 00	9	Trend Assessment	Province
Alexander Creek u/s Summit Creek	49 39 00	114 43 00	9	Trend Assessment	Province
Alexander Creek u/s Michel Creek	49 50 00	114 46 00	9	Trend Assessment	Province
Michel Creek u/s Alexander Creek	49 40 00	114 46 00	9	Trend Assessment	Province
Michel Creek at Metal Bridge	49 43 45	114 51 22	9	Trend Assessment	Province
Elk River d/s Lizard Creek	49 27 11	115 04 01	9	Trend Assessment	Province
Kootenay Lake, Cape Horn	49 35 58	116 50 49	9	Trend Assessment	Province
Kootenay Lake, Fraser Rapids	49 37 03	116 59 34	9	Trend Assessment	Province
Yakoun River, Queen Charlotte Island	53 36 40	132 12 45	12	Trend Assessment	Province
Tiell River, Queen Charlotte Island	53 32 40	131 58 00	12	Trend Assessment	Province
Lakelse River above Skeena River	54 26 32	128 45 42	13	Trend Assessment	Province
Kitimat River at Kitimat	54 03 24	128 40 53	13	Trend Assessment	Province
Kispiox River above Babine River	55 20 50	127 41 49	13	Trend Assessment	Province
Bulkley River near Houston	55 23 48	126 42 33	13	Trend Assessment	Province
Bulkley River at Quick	54 37 05	126 53 55	13	Trend Assessment	Province
Telkwa River at Telkwa	54 41 42	127 03 12	13	Trend Assessment	Province
Morice River above Bulkley River	54 22 32	126 44 55	13	Trend Assessment	Province

Part 3.1 Federal Monitoring Stations

	<u>Latitude</u>	<u>Longitude</u>	<u>Frequenc</u> <u>y</u>	<u>Purpose</u>	<u>Operator</u>
Fraser River at Red Pass	52 59 17	119 00 33	26	Trend Assessment	Federal
Columbia River at Donald Station	51 29 03	117 10 48	26	Trend Assessment	Federal
Kettle River at Midway	49 00 16	118 46 28	26	Trend Assessment	Federal
Kettle River at Carson	49 00 00	118 29 48	26	Trend Assessment	Federal
Kettle River at Gilpin	49 00 29	118 18 11	5	Surveillance	Federal
Sage Creek at road bridge	49 04 13	114 27 55	13	Trend Assessment	Federal
Moyle River at Kingsgate	49 00 16	116 57 46	5	Surveillance	Federal
Pend D'Oreille River at Waneta	49 00 11	117 37 00	13	Trend Assessment	Federal
Boundary Creek at Midway	49 00 06	118 45 38	5	Surveillance	Federal
Sumas River at Huntington	49 00 10	122 13 50	13	Trend Assessment	Federal
Swift River at B.C. Yukon Border	59 55 54	131 45 43	5	Surveillance	Federal
Bear River at Stewart	55 57 15	129 58 23	5	Surveillance	Federal

Part 3.2 Other Federal Monitoring Activities

Kettle River Station Evaluation

Evaluation of sites at Midway, Carson and Gilpin as monitoring sites.

Similkameen River Objectives Project

Adaptation of objectives and intensive regional survey to provide background for water quality objectives.

Columbia River Studies

Evaluation of Columbia River data.

Fraser River Estuary Study

Proposal for integrated survey on toxic chemicals in the lower Fraser River.
Sampling to collect sediment and fish tissue for analyses of organic contaminants.
Evaluation of the high volume organic sampler for use in the estuarine environment.

Acid Ampoule Quality Assurance Study

Testing of various methods for holding preservatives for sample preservation.

Metal Speciation

Further development of the method for the measurement of free and labile heavy metals; testing in the lower Fraser River.

Compliance with Objectives Strategy

Evaluation of sampling strategies for determining whether or not a stream is in compliance and the required sampling effort.

Okanagan River

Report on nutrient concentrations and loads in the Okanagan River.

Kanaka Creek Data Acquisition Project

Evaluation of electronic data gathering techniques and the gathering of data from a coastal stream at very high frequency.

Stikine River Survey

Interpretation of Stikine River data from surveys conducted between 1981 and 1983.

Flathead River Objectives Project

Assessment of eutrophication potential, adaptation of objectives, fish criteria for sedimentation and toxic materials, and intensive regional survey to provide background for water quality objectives.

SCHEDULE C

Shareable Expenditures

According to Articles V, VI, VII, and IX of this Agreement, the parties agree to estimate annual costs, keep records of shareable expenditures, calculate actual annual costs and submit a statement of claim for imbalances.

Unless covered by separate agreement or contract, cost imbalances referred to above and in Article VII are the sole amounts of funds to be transferred between the parties under this agreement. These imbalances shall be the net amount to be transferred after all costs for a given period are summed for work done in accordance with Articles I, II, III and IV.

The initial start-up period will be twelve months. During this period, internal accounting systems will be implemented by the parties to enable the following to be maintained for accounting purposes:

Shareable expenditures for the purpose of estimating and calculating costs under this Agreement are:

- 1) laboratory analyses and analytical methods development in accordance with the price list of each party;
- 2) shipping of samples and sampling equipment;
- 3) contracts and personnel such as lay samplers, consultants and data compilers;
- 4) travel expenses including per diem as applicable to each party, accommodation, vehicle kilometres as applicable to each party, public and government transportation and fuel for boats and rented vehicles;
- 5) capital cost of equipment such as samplers and meters;
- 6) expendable field supplies such as ice, rope, tape, forms and containers;
- 7) rentals of vehicles, aircraft, equipment and boats;
- 8) computer costs including data transfer charges, development work to enable data storage and transfer, and computer time for data evaluation, but not storage charges;
- 9) eligible salaries and overtime for working level operational staff.

Expenses which are not shareable are:

- 1) salaries, overtime, and travel expenses of Administrators, the Coordinating Committee, the technical committee(s) and operational supervisors
- 2) data evaluation or report preparation not directly related to the operation of the monitoring activities and specified in SCHEDULE B.

SCHEDULE D

Estimated Annual Costs 1985/1986

	Environment Canada	B.C. Ministry of Environment
Routine Water Quality Monitoring (\$192,400)		
Analytical Service	\$62,500	\$75,900
Lab or Regional Sampling	\$12,700	\$10,900
Mailing/Shipping	\$3,000	\$0
Computer Costs	\$5,000	\$5,100
Contract Services	\$0	\$17,300
Quality Assurance Program (\$29,500)		
Analytical Services	\$5,400	\$17,100
Staff and Travel	\$3,500	\$3,500
Capital Equipment Replacement (\$5,000)	\$2,500	\$2,500
Evaluations (\$25,100)		
Analytical Services	\$0	\$0
Staff and Travel	\$25,100	\$0
Network Evaluation and Data Exchange (\$28,000)		
Staff and Travel	\$20,300	\$7,700
Totals	\$140,000	\$140,000
Grand Total	\$280,000	

