

ANNUAL REPORT
TO
DECEMBER 31, 1989
Technical Report A.6

Prepared for:

CANADA-SASKATCHEWAN SOUTH SASKATCHEWAN RIVER BASIN STUDY

Prepared by:

CANADA-SASKATCHEWAN SOUTH SASKATCHEWAN RIVER BASIN STUDY
Moose Jaw, Saskatchewan



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TO

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CANADA - SASKATCHEWAN

SOUTH SASKATCHEWAN RIVER BASIN STUDY

SOUTH SASKATCHEWAN RIVER BASIN STUDY

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Our File S15-6-4-2

April 6, 1990

The Honourable Lucien Bouchard
Minister of the Environment
Government of Canada
Room 533
Confederation Building
Ottawa, Ontario
K1A 0A6

The Honourable Harold Martens
Minister Responsible for the
Saskatchewan Water Corporation
Room 302
Legislative Building
Regina, Saskatchewan
S4S 0B3

Dear Mr. Bouchard and Mr. Martens:

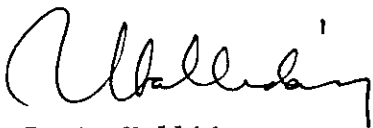
RE: 1989 Annual Report

We are pleased to present the fourth annual report of the Study Board for the Canada-Saskatchewan South Saskatchewan River Basin Study. This report describes the progress made and the expenses incurred during 1989.

In 1989, the Study completed the information gathering phase and began the process of formulating and evaluating alternate basin management strategies. The strategies represent a major component of the the final product of the study -- the Framework Plan.

Expenditures from the start of the Study to the end of 1989, totalled approximately \$1 210 000. Of the total Study Budget of \$1.6 million, approximately \$390 000 remains.

Yours truly,



R. A. Halliday
Study Board Co-Chairman
Environment Canada



W. L. Dybvig
Study Board Co-Chairman
Saskatchewan Water Corporation

RAH/WLD/sdm
Enclosure

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I INTRODUCTION

The South Saskatchewan River, shared by the provinces of Alberta and Saskatchewan, has its headwaters in the Rocky Mountains of southwestern Alberta. The easterly course of the river takes it through southern Alberta and southwestern Saskatchewan, one of Canada's most arid regions. The river then follows a northeasterly course to join the North Saskatchewan River near Prince Albert to form the Saskatchewan River which then flows into Manitoba (Figure 1).

The South Saskatchewan River is vitally important to all three prairie provinces. The water resources of the basin support economic growth in each of the provinces. Recognizing the importance of the South Saskatchewan River, Alberta Environment completed a major basin study in 1984. The study evaluated future water management options which would meet the growing water uses within the province, while meeting downstream commitments to Saskatchewan as a first priority. The study concluded that after the year 2000, if maximum development occurs, 57 percent of the natural flow, on average, would be passed on to Saskatchewan.

Given the conclusions of the Alberta basin study, as well as the occurrence of three severe drought years during the previous ten years, the Saskatchewan Water Corporation and Environment Canada developed a proposal to conduct a water management study for the basin in Saskatchewan. In May, 1986, the Canada-Saskatchewan South Saskatchewan River Basin Study Agreement (Appendix 21) was signed. Under the \$1.6 million cost-shared agreement, the two parties undertook to:

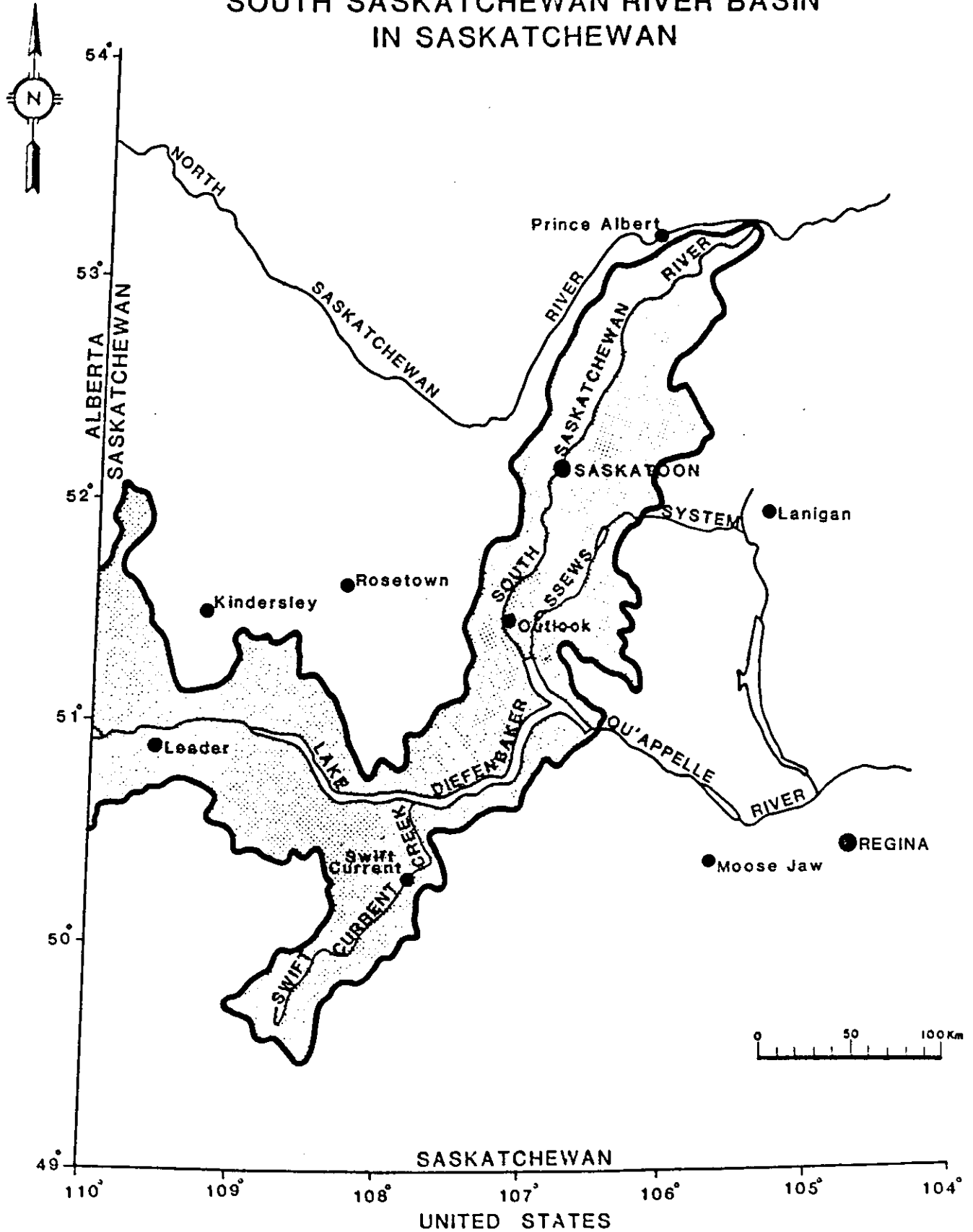
- document current and emerging water management issues;
- assess the water and related resources of the basin; and,
- develop a framework plan for the future management of the water resources of the basin.

The South Saskatchewan River Basin Study is intended to provide essential information to guide water management and development decisions in the interests of all water users dependent upon the water resources of the basin.

The Study was originally scheduled for completion by December 31, 1989. However, to ensure that adequate attention is paid to all aspects of the planning process, the Study Board is seeking a time-only extension to the Study Agreement, with the proposed completion date being March 31, 1991.

Figure 1

SOUTH SASKATCHEWAN RIVER BASIN IN SASKATCHEWAN



II ORGANIZATION

The Study Board, which was established under the terms of the Study Agreement, is responsible for the administration of the Study. The Board is structured with two members and two alternates. The alternates attend all meetings and provide input as desired. The Study Board members in 1989 were R. A. Halliday for Environment Canada, and W. L. Dybvig for the Saskatchewan Water Corporation (Figure 2). The alternates were R. D. Bjonback for Environment Canada, and, until July, D. Fast of Saskatchewan Environment and Public Safety.

The Study Board has overall responsibility for the conduct of the Study. Although the day to day administration is handled by the Study Office, the Board regularly reviews Study progress and finances, and provides general direction on all the Study components to ensure that the activities are directed towards the achievement of the study goals as outlined in the Agreement. At the conclusion of the Study, the Board is responsible for presenting a final report to the Ministers.

During the year, the Board met 13 times. It also met with the Management Strategies Technical Committee and attended all meetings of the Advisory Committee.

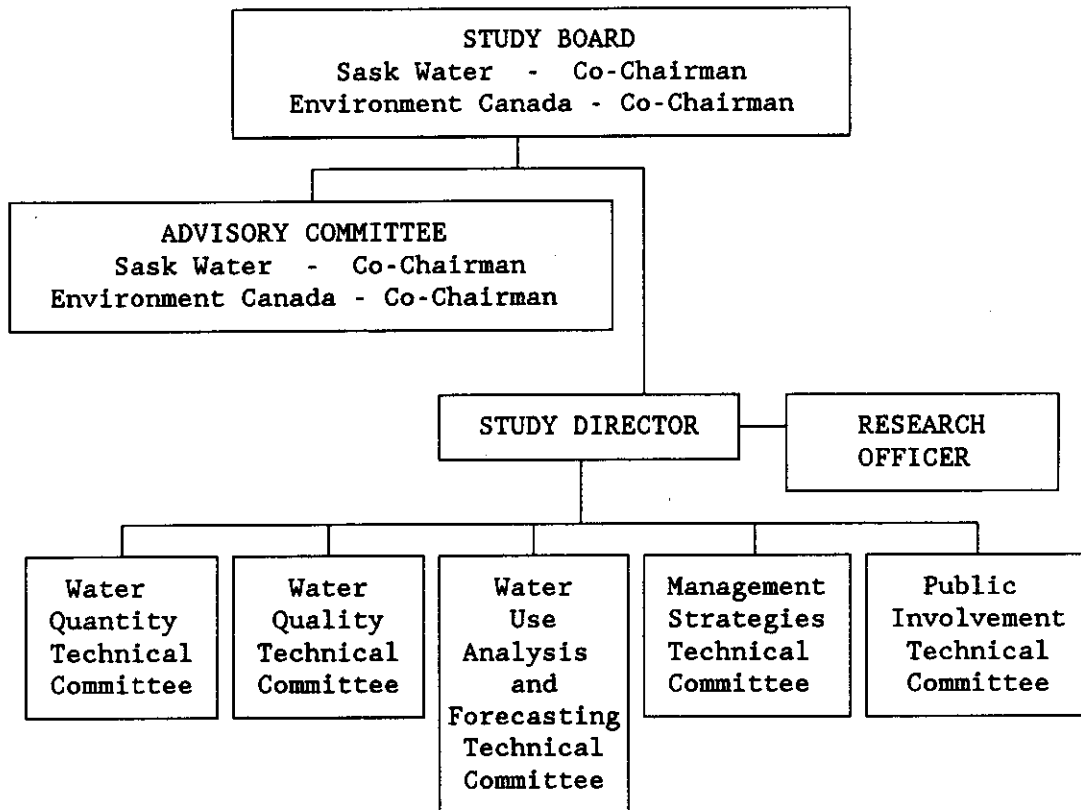
The Study Director, reporting directly to the Study Board, is responsible for overseeing planning, scheduling, co-ordinating, budget control communications, and other day-to-day matters associated with the Study. The Study Director also chairs the Technical Committees established for each of the Study components. He is assisted in his responsibilities by the Research Officer and the Study Office secretary.

An Advisory Committee, consisting of senior officials from provincial and federal departments, provides policy advice to the Board.

The Technical Committees assist the Study Office in defining the need for technical studies to be undertaken by consultants and in reviewing the results of these studies as they become available. As well, the Committees will be involved with defining and revising alternative management strategies for the Basin.

Members of the Technical and Advisory Committees for 1989 are listed in Appendix 2.

Figure 2: Study Organization Chart



III PROGRESS BY STUDY COMPONENT

A. STUDY OFFICE ADMINISTRATION

During 1989, the Study Office continued to produce monthly and quarterly progress reports for the Study Board. Expenditure forecasts to December 31, 1989 and to March 31, 1990 were provided for Sask Water and Environment Canada respectively.

Mr. Brad Fairley, formerly the Assistant Director, assumed the position of Study Director at the beginning of 1989. In order to better meet the changing needs of the Study Office, the Assistant Director position was replaced by a Research Officer position. Mr. Ron Blackwell was appointed to the Research Officer position in October 1989.

At the end of 1989, the staff complement for the Study Office was:

Director	Brad Fairley
Research Officer	Ron Blackwell
Office Administrator	Sharon Monkhouse

B. STUDY OFFICE PLANNING/COORDINATION/COMMUNICATION

Considerable efforts were expended on this component of the Study in 1989 as the planning for the completion of the Study was begun. This work involved the development of a detailed outline for reporting the results of the Study. The outline calls for a Public Report and a series of Technical Reports. These reports will ensure that the Study achieves the goals established in the Study Agreement.

Principles and Water Use Objectives, which will guide the planning process, were developed and refined through a series of Public Meetings held in June.

Nine contracts and project authorizations were initiated in 1989. Of these, six fell into the water use category, one dealt with water quality, one with water quantity and the last involved computer modelling for the Management Strategies Technical Committee. A total of 14 contracts and project authorizations were completed during the course of 1989.

C. WATER QUANTITY

The Water Quantity Technical Committee completed the development of the HYDSIM Model. This model determines the hydro-electric power production of the basin's facilities under different flow conditions. The model will assist the Management Strategies Technical Committee in assessing the impact of proposed management strategies on power production.

The Committee also initiated a study of erosion and sedimentation, important concerns in some parts of the basin. The conclusion of the Erosion and Sedimentation Study, in January of 1990, will mark the completion of the work planned for this component of the Study. The Water Quantity Technical Committee will remain available to the Management Strategies Technical Committee to provide specialized support as required.

D. WATER QUALITY

Through 1989, the Water Quality Technical Committee continued work on three major tasks: reviewing the existing water quality data; developing water quality models; and preparing basin specific water quality objectives. To this end, a total of seven reports were completed and received by the Study Office.

Consultants under contract to the Study completed a review of nutrient data, and a review of salinity conditions of twelve small reservoirs in the basin.

Saskatchewan Environment and Public Safety completed a refinement to the Lake Diefenbaker Trophic State Model by adding a sediment component. This model will assist in the evaluation of basin management strategies.

The Water Quality Technical Committee used all the information produced to date to develop basin specific water quality objectives. These objectives will assist in the evaluation of alternate management strategies. The Committee is currently working on a water quality monitoring strategy to support the implementation of these objectives. This report will be completed early in 1990.

The development of the water quality monitoring strategy is the last piece of independent work to be undertaken by the Water Quality Technical Committee. The Committee will remain in place to provide technical assistance to the Management Strategies Technical Committee on any water quality matters.

E. WATER USE ANALYSIS AND FORECASTING

As with the other components, work on water use analysis and forecasting in 1989 focused on completing the work initiated in 1988 and filling in any remaining information gaps. The work under this component has been divided into two major sections: economic and environment.

Under an economic studies contract a Short-term Water Use Forecast Report was prepared. A computer model which determines the financial impact of water shortages of varying severity and duration to irrigation farmers was also prepared. This model will help water managers develop an effective strategy for allocating water. A Recreation Demand Model was also

completed. The model can be used to analyze future recreational development in the basin.

A Flood Impact Study was completed late in 1989. The report identifies the impact of flooding in agricultural areas. This information will be used to help assess alternate management strategies.

A Demand Management Study was initiated in 1989. The report, which will be completed early in 1990, identifies ways of encouraging different water uses to conserve water.

Heritage Branch, Saskatchewan Culture, Multiculturalism and Recreation submitted a final version of the Heritage Resources Study in December. The report contains models for predicting the likelihood of finding heritage resources in different parts of the basin. This model will assist in guiding future development in the basin.

In order to address some additional environmental aspects of the basin, work on an environmental contract was started. Proposals have been received from consultants to prepare a report which inventories endangered species, wetlands, critical wildlife habitat, and environmentally sensitive areas.

F: PUBLIC INVOLVEMENT PROGRAM

The objective of this component is to facilitate public involvement in the Study. Such involvement is essential if the Framework Plan produced by the Basin Study is to be successfully implemented.

Efforts were undertaken in 1989 towards the development by the Public Involvement Technical Committee of a Public Information and Awareness Strategy. The purpose of this strategy is threefold:

- o to increase public awareness of the South Saskatchewan River and the importance of proper planning for its water resources;
- o to correct misconceptions among interest groups, key individuals, and the affected public concerning the scope and intent of the Basin Study; and,
- o to present and explain the Basin Study's Goals, Principles and Water Use Objectives, and encourage discussions of them as a precursor to acceptance of the Framework Plan.

The basis of the strategy was a series of six public meetings held throughout the Basin. The purpose of the meetings was to provide information on the purpose and scope of the Study, as well as update the public, on Study progress. In addition, the meetings gave the public (residents of the basin), another opportunity to review the proposed Study Principles and Water Use Objectives, which had originally been developed with significant public input.

The public meetings were held during the period June 12 to 20, at the following locations: Leader, Swift Current, Lucky Lake, Outlook, St. Louis, and Saskatoon.

The Public Information and Awareness Strategy was judged an overall success, as measured by the public response to the meetings and by the positive media coverage that resulted before, during, and immediately following the public meetings.

In order to keep those who have expressed an interest in the Study up to date, the Study Office continued to distribute newsletters to the approximately 1100 groups or individuals on the Study Office's mailing list. The newsletters included information on water resource management issues in the Basin and updates on Study progress.

The Public Involvement Program will intensify in 1990 as the Study nears completion.

G: MANAGEMENT STRATEGIES

The Management Strategies Component is intended to assemble the information produced under the other components together in the production of the Framework Plan. To that end, the Management Strategies Technical Committee continued the process of study familiarization begun in 1988. In the first part of 1989, the Committee became acquainted with the many computer models built to assist them in the process of developing and evaluating management strategies.

In the second half of the year, the Committee began work on the short-term management strategies. These strategies deal with current and emerging water management issues in the basin. The strategies developed by the Management Strategies Technical Committee will be completed early in 1990.

The Advisory Committee and the Study Board have developed a process for the development and evaluation of long-term scenarios. Information regarding long-term water use for the basin both in Alberta and Saskatchewan has been secured. Computer modelling of various development and water resource management scenarios will begin early in 1990.

IV. FINANCIAL REPORT

Expenditures from January 1, 1989 to December 31, 1989

The 1989 budget was confirmed in March as \$440 000. Allocations were approximately \$188 000 (42%) for Study Office Administration and \$252 000 (58%) for contractual services as shown in Table 1.

The year-end expenditure for Study Office support was \$141 500. This under-expenditure of \$46 500 was due mainly to the vacant Assistant Director position. Underspending by small amounts in each accounting component of Study expenses also contributed to completing the year under budget.

A total of nine contracts and project authorizations was undertaken during the year. The total expenditure for consulting services paid out by the end of December was approximately \$124 000, or approximately \$129 000 under budget. Work during the year in all study components was completed under budget. The expenses for the round of Public Meetings is shown under the Travel, Communications, Office Supplies and Consulting headings, but was still within the \$10 000 originally budgeted.

The net result was a year-end actual expenditure of \$141 500 (41%) for Study Office Administration and \$131 100 (59%) for contractual services for a total of \$272 600. Adding the 1986, 1987, 1988, and 1989 expenditures, the Study costs to date are \$1 210 400. Approximately \$389 600 of the \$1.6 million committed to the Study under the Agreement remained at the end of the year.

TABLE 1
Summary of Expenditures to December 31, 1968

SOUTH SASKATCHEWAN RIVER BASIN STUDY
BUDGET VS. ACTUALS
By Major Study Component
December 31, 1968

DESCRIPTION	ADMINISTRATION		PLANNING/COORD		QUANTITY		QUALITY		WATER USE		P. I. PROGRAM		MGMT STRATEGY		TOTAL
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	
EMPLOYEE SALARIES AND BENEFITS	144,400	113,947													30,453
TRAVEL	8,000	6,167									1,216				1,816
CONSULTING SERVICES	252,000		45,000	31,725	10,000	8,000	5,000	4,244	120,000	68,243	10,000	550	62,000	12,324	252,000
COMMUNICATIONS	22,700	11,740										6,756			22,700
OFFICE SUPPLIES	3,600	2,134										69			2,800
RENTALS	10,300	6,697													10,300
REPAIRS & MAINTENANCE	0	0													0
CAPITAL EXPENDITURES	0	0													0
TOTAL EXPENDITURES	440,000	141,486	45,000	31,725	10,000	8,000	5,000	4,244	120,000	68,243	10,000	8,049	62,000	12,324	440,000
															272,470
															167,530

SOUTH SASKATCHEWAN RIVER BASIN STUDY AGREEMENT

THIS AGREEMENT made this 16th day of May, 1986

BETWEEN:

THE GOVERNMENT OF CANADA, represented herein by the Minister of the Environment (hereinafter referred to as "Canada")

AND

THE GOVERNMENT OF SASKATCHEWAN, represented herein by the Minister in charge of the Saskatchewan Water Corporation (hereinafter referred to as "Saskatchewan"),

WHEREAS the Canada Water Act encourages federal-provincial cooperation in the examination and resolution of water resource issues;

WHEREAS the Saskatchewan Water Corporation has among its powers pursuant to Section 16 of the Saskatchewan Water Corporation Act the responsibility to manage, administer, develop, control and protect the water and related land resources of Saskatchewan;

WHEREAS the South Saskatchewan River Basin is an interprovincial river basin, and is a primary source of reliable, high quality water for the plains region of Saskatchewan, a region of national significance;

WHEREAS the social and economic welfare of the people in the plains region of Saskatchewan depends to a considerable degree on the way in which the water and related resources of the South Saskatchewan River Basin are managed to serve diverse and often competing activities such as agriculture (livestock and irrigation), recreation, tourism development, fisheries, hydro-electric power generation, and domestic, municipal and industrial uses;

WHEREAS there is a need to protect and enhance the quality of the water resource in the South Saskatchewan River Basin;

WHEREAS the water resources of the South Saskatchewan Basin could be altered by future, major water resource development projects, including interbasin transfers which could have potential economic and environmental effects in Saskatchewan, as well as in Manitoba and the United States.

WHEREAS there is a need to develop a framework in which the social, economic and environmental effects of future projects and programs can be evaluated;

WHEREAS the Governments of Canada and Saskatchewan agree that a cooperative approach to planning and managing the water and related resources in the South Saskatchewan River Basin is necessary and desirable;

WHEREAS Her Excellency, the Governor in Council, by Order in Council P. C. 1986-2/512 dated February 27, 1986, has authorized the Minister of the Environment to execute this Agreement on behalf of Canada; and

WHEREAS His Honour, the Lieutenant Governor in Council, by Order in Council 1087/85 dated October 28, 1985, has authorized the Minister in charge of the Saskatchewan Water Corporation to execute this Agreement on behalf of Saskatchewan.

IT IS THEREFORE AGREED BETWEEN THE PARTIES HERETO AS FOLLOWS:

Section 1 - Definitions

1. In this Agreement, unless the context otherwise requires:
 - (a) "eligible costs" means directly related costs that have been approved and recorded by the Board as having been reasonably and properly incurred for the study;
 - (b) "Ministers" means the Minister of the Environment for Canada and the Minister in charge of the Saskatchewan Water Corporation;
 - (c) "study" means the South Saskatchewan River Basin Study as outlined in Schedule A;
 - (d) "Study Director" means the director appointed pursuant to Section 3.4; and
 - (e) "The Board" means the Canada-Saskatchewan South Saskatchewan River Basin Study Board established pursuant to Clause 3.1.

Section 2 - Purpose

- 2.1 The purpose of this Agreement is to provide for a study having the following objectives:
 - (a) document current and emerging water and related issues in the South Saskatchewan River Basin in Saskatchewan;
 - (b) carry out an assessment of the water and related resources of the South Saskatchewan Basin, and their current and future use;
 - (c) develop a framework plan for the conservation and management of the water in the South Saskatchewan Basin in Saskatchewan which allows for the evaluation of water resource projects.

Section 3 - Management and Coordination

- 3.1 This Agreement shall be administered by a Study Board consisting of one member appointed by the Minister of the Environment for Canada, and one appointed by the Minister in charge of the Saskatchewan Water Corporation.
- 3.2 Each Board member shall designate an alternate to assume responsibilities during periods of absence.
- 3.3 The Board shall:
 - (a) be responsible for the carrying out of the terms of reference of the study as set out in Schedule A, and be responsible for determining the manner in which the funds allocated to the study will be spent;
 - (b) keep minutes of its meetings and records of decisions taken at its meetings;
 - (c) report annually to the respective Ministers;
 - (d) provide a final report of the study with recommendations to the Ministers by December 31, 1989;
 - (e) carry out a program of public information;

- (f) determine eligible costs pursuant to this Agreement; and
 - (g) carry out such other related duties as the Ministers may direct.
- 3.4 Subject to the recommendation of the Board, the parties will establish:
- (a) a study office; and
 - (b) technical and advisory committees as required;
- and Saskatchewan will appoint a Study Director, and such other staff as may be required;
- 3.5 The parties to this Agreement may, on the recommendation of the Board, enter into contracts to carry out various aspects of the work associated with the study.

Section 4 - Financial Provisions

- 4.1 Total costs shall not exceed \$1,600,000, to be shared equally by Canada and Saskatchewan;
- 4.2 Canada and Saskatchewan shall bear the entire costs of the salary, travel, and related expenses of:
- (a) each of its members of the Board; and
 - (b) any other employee who, although engaged in an activity hereunder, does not have a specified portion of his workday, week, month or year assigned exclusively to the carrying out of this Agreement;
- and such costs shall not count against the limit stipulated under Clause 4.1.
- 4.3 Where Canada and Saskatchewan are supplying goods or services, such goods or services shall be supplied at cost.
- 4.4 The parties shall, with respect to the costs to which Clause 4.1 is applicable:
- (a) pay such costs as they come due; and
 - (b) submit, at least quarterly, progress claims to the other party for its share of the eligible costs incurred and paid for in the performance of work, as certified by a senior financial officer of that party, and in a mutually agreed manner.
- 4.5 The parties shall pay the progress claims submitted by the other party after the claims are certified by a senior officer of that latter party.
- 4.6 Payments to be made by Canada under this Agreement shall be paid by Canada to the Saskatchewan Water Corporation.
- 4.7 The provisions of this Agreement respecting the payment and reimbursement of eligible costs that are to be shared by Canada and Saskatchewan shall remain in effect until March 31, 1990.
- 4.8 Canada and Saskatchewan shall maintain adequate documentation and records of the costs that are to be shared by them and which are incurred pursuant to this Agreement and shall, upon request, make such records and documents available for examination by auditors of the other.

4.9 Any discrepancy in the documents and records of costs incurred under this Agreement disclosed by an audit under Section 4.8 shall be promptly adjusted between Canada and Saskatchewan.

Section 5 - Amendment

5.1 This Agreement may be amended by the Ministers with the exception of Clauses 4.1 and 7.1 which can only be amended with the approval of the Governor in Council for Canada and the Lieutenant Governor in Council for Saskatchewan.

Section 6 - Evaluation

6.1 Canada and Saskatchewan may undertake an evaluation of this Agreement. Where Canada or Saskatchewan undertake to make an evaluation of this Agreement, the other shall supply such information as may reasonably be necessary for such evaluation to be undertaken.

Section 7 - General

7.1 This Agreement shall take effect on the date of signing, and terminate on December 31, 1989.

7.2 Canada and Saskatchewan shall make available to the Board all reports and related available information from prior and current studies for use in the study.

7.3 Where Canada or Saskatchewan undertakes or is responsible for any portion of the study, it shall indemnify and save harmless the other, its officers, servants and agents, against all claims and demands of third parties in any way arising out of any work undertaken pursuant to this Agreement, except as such claims or demands relate to the act or negligence of any officer, employee or agent of the other.

7.4 No member of the Parliament of Canada or member of the Legislative Assembly of Saskatchewan shall hold, enjoy or be admitted to any share or part of any contract, agreement, commission or benefit arising out of this Agreement.

IN WITNESS WHEREOF, the Honourable Thomas McMillan, Minister of the Environment, has hereto set his hand on behalf of Canada; and the Honourable Eric Berntson, Minister in charge of the Saskatchewan Water Corporation, has hereto set his hand on behalf of Saskatchewan.

IN THE PRESENCE OF

GOVERNMENT OF CANADA

Marc Brulier
Witness

Don McMillan
Minister of the Environment

GOVERNMENT OF SASKATCHEWAN

Timothy Shaw
Witness

Eric Berntson
Minister in charge of the
Saskatchewan Water Corporation

STUDY COMPONENTS AND ANNUAL BUDGETS
South Saskatchewan River Basin Study

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
1. <u>Water Quantity</u>	<u>\$125,000</u>	0	65,000	45,000	15,000	0

This component focuses on the quantitative aspects of water management in the Saskatchewan portion of the South Saskatchewan River Basin, in particular:

- . analysis and modelling of present and future supplies (incl. reservoir operations, Alberta supply scenarios);
- . developing future supply scenarios, to complement the water demand scenarios in component 3 (including concepts and costs of development projects, reservoir operating plans); and
- . evaluating the quantitative effects on the South Saskatchewan Basin in Saskatchewan of water management alternatives, including currently proposed alternatives by Alberta and any major interbasin transfers which have already been identified.

The cost is relatively modest because of a good water quantity data base, and extensive earlier supply studies by both federal and provincial agencies, as well as the Prairie Provinces Water Board.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
2. <u>Water Quality</u>	<u>\$295,000</u>	0	135,000	105,000	55,000	0

This component deals with the qualitative aspects of water management in the basin, in particular:

- . basic data for identifying sources for, trends in, and causes of water quality change;
- . analysis of present water quality and future implications (e.g., of Alberta scenarios);
- . assessing future water quality, as part of the water supply and demand scenarios in components 1 and 3; and
- . evaluating quality implications of water management alternatives, both within and downstream of the basin (including management proposals, water quality objectives, project concepts and costs, to maintain or improve water quality).

The high cost of this component reflects the recentness of water quality management (hence, a limited data base and few basin-wide studies) and the increasing complexity and seriousness of water quality issues. Water quality is a special concern for Lake Diefenbaker, because of its critical location and role in the basin.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
3. <u>Water Use Analysis and Forecasting</u>	<u>\$300,000</u>	0	180,000	80,000	40,000	0

The approach, of taking a balanced look at both supply and demand management, is a distinct departure from the traditional supply-oriented approach. This is a central component of the study, the first step toward planning for a more water-efficient economy. The component includes:

- . analysis of current and future water use by major water use sectors (irrigation, power, manufacturing, service industry, municipal); and
- . analysis of economic trends and projections, changing technology, climatic change, and economic value/pricing of water, as they may affect water use (both short- and long-term);

- . parallel analysis for instream uses and related uses (fisheries, wildlife, recreation, tourism), especially water quantity/quality aspects, economic value, downstream issues; and
- . development of a regional water supply/demand model for the South Saskatchewan River Basin (Saskatchewan portion) for evaluating supply/demand balances for various scenarios (economic, pricing, water quality and instream needs) and for evaluating management options in component 5.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
4. <u>Public Involvement</u>	<u>\$170,000</u>	0	45,000	50,000	40,000	35,000

Public involvement is an essential input to the study. An understanding and enumeration of public views and concerns on water issues in the basin and adjacent basins is required for the development of alternative management strategies and formulation of recommendations.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
5. <u>Water Management Strategies</u>	<u>\$105,000</u>	0	5,000	25,000	25,000	50,000

This is the crucial stage of the study: how the ever-increasing competition for a finite water resource can be dealt with, with due consideration to the economic, social environmental, technological, and institutional realities and changes.

The intent here is to integrate the results of the first four study components in alternative management strategies, both short- and long-term for the basin. Specific guidance is being sought among others, on:

- . future operation plans for Lake Diefenbaker;
- . the range of future growth opportunities;
- . need for establishing water use priorities;
- . implications of interbasin transfers;
- . measures to protect water quality; and
- . social response to the long-term prospects.

The strategies are not "blueprints for the future". The strategies will, however, provide a series of carefully developed views of the region's water future. Demands for water in the basin will continue to grow. The study will provide information on the nature of the water management choices that are necessary now, and in the future, to meet the challenge of supporting a larger economic base with a diminishing supply of high quality water.

<u>Study Component</u>	<u>Total Cost</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>
6. <u>Study Management</u>						
- Study office, Director and support staff	\$ 530,000	10,000	140,000	140,000	140,000	100,000
- Final report production	75,000					75,000
<u>Sub-totals</u>	<u>\$ 605,000</u>	<u>10,000</u>	<u>140,000</u>	<u>140,000</u>	<u>140,000</u>	<u>175,000</u>
<u>Totals</u>	<u>1,600,000</u>	<u>10,000</u>	<u>570,000</u>	<u>445,000</u>	<u>315,000</u>	<u>260,000</u>

<u>All Components</u>							
<u>Cost sharing:</u>	Canada	\$ 800,000	5,000	285,000	222,500	157,500	130,000
	Saskatchewan	800,000	5,000	285,000	222,500	157,500	130,000

APPENDIX 2

SOUTH SASKATCHEWAN RIVER BASIN STUDY

TECHNICAL COMMITTEES MEMBERSHIP

December 31, 1989

PUBLIC INVOLVEMENT

Rod McLean	Sask Water	Moose Jaw
Meta Perry	Environment Canada	Regina

WATER QUALITY

Diane Blachford	Environment Canada	Regina
Barney Kenney	National Hydrology Research Inst.	Saskatoon
Randy Munch	City of Saskatoon	Saskatoon
Robert Ruggles	Sask. Environment & Public Safety	Regina
Bill Sawchyn	Sask. Parks & Renewable Resources	Saskatoon
Ken Weagle	Sask. Environment & Public Safety	Regina

WATER QUANTITY

Alex Banga	Sask Water	Moose Jaw
Fred Martin	Prairie Farm Rehabilitation Adm.	Regina
Vipin Prasad	Sask Power	Regina
Larry Wiens	Environment Canada	Regina

MANAGEMENT STRATEGIES

Brian Abrahamson	Prairie Farm Rehabilitation Adm.	Regina
Alex Banga	Sask Water	Moose Jaw
Bill Gummer	Environment Canada	Regina
Bryan Ireland	Sask Water	Outlook
Ray Pentland	Water Resources Consultants Ltd.	Regina

WATER USE

Jim Atcheson	Agriculture Canada	Regina
David Donald	Environment Canada	Regina
Glen Grismer	Meewasin Valley	Saskatoon
Murray Jones	Prairie Farm Rehabilitation Adm.	Regina
Hasu Naik	Environment Canada	Regina
Vipin Prasad	Sask Power	Regina
Larry Ward (Alternate)		
Jim Rogers	Environment Canada	Regina
Robert Smith	Public Works Canada	Edmonton
Larry Sukava	Sask. Parks & Renewable Resources	Saskatoon
Don Tate	Environment Canada	Ottawa

A P P E N D I X 2
(Continued)

ENVIRONMENTAL SUBCOMMITTEE

David Donald	Environment Canada	Regina
Henry Epp	Sask. Environment & Public Safety	Regina
Glen Grismer	Meewasin Valley Authority	Saskatoon
Wally Kost	Sask. Parks & Renewable Resources	Saskatoon
Bill Sawchyn	Sask. Parks & Renewable Resources	Saskatoon
Carlos Germann	Sask. Culture, Multiculturalism and Recreation	Regina

ECONOMIC SUBCOMMITTEE

Derek Bjonback	Environment Canada	Regina
Wayne Dybvig	Sask Water	Moose Jaw

ADVISORY COMMITTEE MEMBERSHIP

Brian Abrahamson	Prairie Farm Rehabilitation Adm.	Regina
Jim Atcheson	Agriculture Canada	Regina
Derek Bjonback	Environment Canada	Regina
Wayne Dybvig	Sask Water	Moose Jaw
Hans Foerstel	Environment Canada	Ottawa
Bill Gummer	Environment Canada	Regina
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Ken Panchuk	Sask. Agriculture	Regina
Wayne Pepper	Sask. Parks & Renewable Resources	Regina
Bob Ruggles	Sask. Environment & Public Safety	Regina
Lloyd Talbot	Saskatchewan Rural Development	Regina
Dave Richards	Sask Water	Moose Jaw
Randy Winnitow	Western Diversification	Saskatoon

STUDY BOARD

Bob Halliday	Environment Canada	Regina
Wayne Dybvig	Sask Water	Moose Jaw
Derek Bjonback	Environment Canada	Regina

APPENDIX 3

SOUTH SASKATCHEWAN RIVER BASIN STUDY
LIST OF COMPLETED REPORTS
December 31, 1989

These reports are available at the following government libraries in Saskatchewan:

Environment Canada, Regina
Saskatchewan Water Corporation, Moose Jaw
Saskatchewan Environment & Public Safety, Regina
National Hydrology Research Centre, Saskatoon
Prairie Provinces Water Board, Regina
Prairie Farm Rehabilitation Administration, Regina

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Annual Report to December 31, 1986	November 1, 1987
Annual Report to December 31, 1987	July 21, 1988
Annual Report to December 31, 1988	May 15, 1989
Compendium of Water Quality Objectives Development Methodologies	1988
Contaminant Organic Compounds in the Surface Waters of the South Saskatchewan River Basin	December 31, 1987
Data Collection and Data Base Development: South Saskatchewan River Basin Recreation Survey	November 30, 1986
Economic Profile and Trends 1951-86	June 1, 1988
Fisheries Survey of the South Saskatchewan River and Its Tributaries in Saskatchewan	November, 1988
Flood Frequencies in the South Saskatchewan River Basin	August 1988
Framework Plan Working Definition (Working Document - not complete)	September 3, 1987
Frequency Analysis of Meteorological Drought in the Saskatchewan Portion of the South Saskatchewan River Basin	July 1988
Ground Water and the South Saskatchewan River Basin: Recommendation to the Study Board	March 2, 1988

APPENDIX 3 (Continued)

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Ground Water Study South Saskatchewan River Basin	March 15, 1988
Hydraulic Study of the South Saskatchewan River, A	May, 1989
Hydro System Simulation (HYDSIM) Model Study Report	February, 1989
Hydrologic Drought Analysis of Simulated Flows - South Saskatchewan River Basin	November 1, 1988
Information Base: Surface Water Hydrology and Water Use	March 13, 1987
Instream Water Use South Saskatchewan River Basin	December 31, 1987
Irrigation Water Use Pilot Study	April 1, 1988
Irrigation Water Use Survey (South Saskatchewan River Basin Study)	December, 1988
Lake Diefenbaker Trophic State Model	January 31, 1988
Land Use in the Effective Drainage Area of the South Saskatchewan River Basin	October 31, 1987
Legal and Administrative Analysis Interim Report	March 31, 1988
Major Industrial Water Users in the South Saskatchewan River Basin	October 19, 1988
Mass Loading of Phosphorus to Lake Diefenbaker	September, 1989
Municipal and Residential Water Use Study	August 31, 1987
Municipal Water Use Survey	July 30, 1987
Phosphorous Loading from Non-point Sources Relevant to the Lake Diefenbaker Basin	September 30, 1987
Proposed Water Quality Objectives for the South Saskatchewan River Basin	August, 1988
Public Involvement Program Position Paper	October 30, 1986

APPENDIX 3 (Continued)

<u>TITLE OF REPORT</u>	<u>DATE COMPLETE</u>
Public Opinion Survey, 1988 Survey Design	March 7, 1988
Recreational Data Analysis Report South Saskatchewan River Basin	July 30, 1987
Reservoir Salinity Study Phase 1	October, 1988
Study Plan and Annual Work Plans - 1987	February 15, 1987
Study Proposal for the South Saskatchewan River Basin	April 30, 1986
Summary and Evaluation of the Public Information and Awareness Strategy	September 12, 1989
Water Intake and Outfall Survey South Saskatchewan River Basin	December 30, 1987
Water Management Model Study South Saskatchewan River Basin	January 1988
Water Quality Data Review	March, 1988
Water Quality Monitoring Review South Saskatchewan River Basin	June, 1989
Water Quality Trend Analysis and Data Base Summary	November 12, 1987