REPORT OF THE

INTERNATIONAL JOINT COMMISSION

CANADA AND UNITED STATES

ON THE

SAGE CREEK REFERENCE

OCTOBER 1967

REPORT

to the

Governments of the United States and Canada

On The SAGE CREEK REFERENCE

The Government of the United States of America and the Government of Canada, on 8 April 1946, submitted the following Reference to the International Joint Commission:

> "The Governments of the United States and Canada have been informed of a complaint made by Mr J.W. Cox, of Havre, Montana, United States of America, with reference to the alleged appropriation in Alberta, Canada, of waters of Sage Creek, an intermittent stream arising in Township 5 North, Range 4 East Province of Alberta, which would otherwise flow across the international boundary into Montana and there be available for the irrigation of Mr Cox's land. Mr Cox complains that the diversion has gone on for some years and that he has in consequence suffered a considerable financial loss.
>
> "Sage Creek is a small stream rising in Southern Alberta near the Saskatchewan boundary and flowing south into Wild Horse Lake located immediately south of the International Boundary with an arm extending into Canada. Wild Horse Lake has no outlet and in recent years has been dry. It is not tributary to the St Mary and Milk Rivers system and accordingly is not subject to apportionment between the two countries under Article VI of the Boundary Waters Treaty.
>
> "Sage Creek is also normally dry except for that short period of spring run-off from melting snow during the months of March and April. The creek is higher than the adjacent land and it is reported that in some years when the channel is filled with hard snow or ice a large portion of the flow spreads out in various directions over the flat areas adjoining the creek in Canada, thus preventing the water from crossing the Boundary.

"In Canada the Province of Alberta has granted seven water rights for irrigation purposes, totaling 1,769 acre-feet at high and flood stages. These rights were granted during the period 1907 to 1921 but no record is available of the amounts of water used by the licensees. It is known that in dry years there is not sufficient run-off to satisfy Canadian requirements.

"In the United States Mr Cox claims to have a water right on Sage Creek from the State of Montana, dating from 1901 for the flood irrigation of 1,000 acres. In 1932 he complained to the Province of Alberta that no water was allowed to cross the International Boundary. This matter was investigated in the field in 1933 and the report indicated that Mr Cox had constructed a dam and ditch capable of irrigating about 100 acres of the dried-up bed of Wild Horse Lake and that the works were in a bad state of repair.

"In 1937 Mr Cox registered a further complaint, copies of which were forwarded to the International Joint Commission and to the Director of Water Resources for the Province of Alberta. As a result of a further field investigation the Province of Alberta arranged in the years 1939 and 1940 to have a Water Master on Sage Creek during the run-off period with a view to regulating the diversions in accordance with the water licenses in existence. No records are available of the amounts of water which in fact crossed the Boundary as a result of this procedure. In any event, owing to the expense involved the province discontinued the practice of having a Water Master on the grounds in the years following 1940.

"Having in mind the provisions of Article 9 of the Boundary Waters Treaty signed at Washington January 11, 1909, that questions or matters of difference arising between the Governments of the United States and of Canada involving the rights, obligations or interests of either in relation to the other or to the inhabitants of the other along the common frontier between the United States and the Dominion of Canada shall be referred from time to time to the International Joint Commission for examination and report whenever the Government of the United States or the Government of the Dominion of Canada shall request that such questions or matters of difference

be so referred, the two Governments have agreed upon a joint reference of the matter to the International Joint Commission pursuant to the provisions of the said article of the said Treaty.

"The Commission is requested to examine and report upon the facts and circumstances of the complaint made by Mr Cox and to use its good offices to bring about a mutually satisfactory agreement.

"For the purpose of assisting the Commission in making the investigation and recommendations provided for in this Reference, the two Governments will, upon request, make available to the Commission the services of engineers and other specially qualified personnel of their governmental agencies, and such information and technical data as may have been acquired by such agencies or as may be acquired by them during the course of the investigation.

"The Commission should submit its report and recommendations to the two Governments as soon as practicable."

The Commission has examined the facts and circumstances of the complaint made by Mr Cox. It held public hearings in the area at which all interested parties had convenient opportunity to be heard and a number of briefs and statements were received. It arranged for the appointment of a Water Master by the Government of Alberta to supervise operations during the run-off period in an effort to make as fair and equitable an apportionment of the waters of Sage Creek between the ranchers in Alberta and those in Montana as was physically possible in the circumstances, pending final settlement of the matter. Engineering and land use studies were undertaken by international boards established for the purpose and the status of water rights in the Alberta and

Montana portions of the Sage Creek basin was investigated. As a result of these studies an agreement was drafted which was satisfactory to all of the ranchers in the basin but the very substantial expenditure of public funds that would be required in Canada for construction of the key works, a storage reservoir and canal, was not considered justifiable by the Canadian authorities. More modest proposals for channel improvements and construction of new diversion works were also considered but the authorites involved were not convinced that their effectiveness would justify the necessary expenditures.

The manner in which the Commission has conducted its investigation of the facts and circumstances of the complaint made by Mr Cox and has used its good offices in an effort to bring about a mutually satisfactory agreement is set forth in greater detail in Appendix I of this report.

Conclusions of the Commission

1. The problem investigated by the Commission is of a nature that does not admit of a final and comprehensive solution, "mutually satisfactory" to the parties in interest, at this time. Nevertheless,the Commission through its "good offices" has been instrumental in achieving improved understanding among the parties and in creating and maintaining an atmosphere conducive to the working out of reasonable arrangements on the ground to meet situations as they may arise from time to time.

2. The plan for impoundment and apportionment of the waters as described in Section 10 of Appendix I would be mutually satisfactory to the ranchers owning lands in the Alberta and Montana portions of the Sage Creek Basin and would result in a fair and equitable division of the waters between Alberta and Montana.

3. The capital cost of providing the reservoir and canal required to implement such mutually satisfactory arrangements was estimated in 1957 to be in excess of $400,000.

4. Having regard to this fact and to the small number of individuals in each country who would benefit from the arrangement, it is concluded that the costs would be disproportionate to the resulting benefits and construction of the required works by the Prairie Farm Rehabilitation Administration or other agency of the Government of Canada is not recommended.

5. In the absence of a storage reservoir in the Alberta portion of the Basin to impound the spring run-off and regulate its release for irrigation later in the season, it is physically impossible to measure or control the waters in a manner that would permit the implementation of the specific plan of apportionment between the countries outlined in Appendix I, Section 10, or any other apportionment plan that might be recommended by the Commission.

6. In view of the provisions of Article II of the Boundary Waters Treaty of 1909 concerning the rights and remedies of parties injured as a result of any interference with or diversion from their natural channels of waters which in their natural channels would flow across the boundary, it would be desirable for the appropriate agencies of the two Governments to continue to collect run-off data from the existing gauges in the Basin and to keep such data available for the information of interested parties.

7. Under existing conditions it would be desirable to have the Province of Alberta continue the services of a Water Master who would be available in the area during the spring run-off period and,to the extent practicable, during any other significant run-off periods to supervise operations and ensure as fair and equitable an apportionment of the waters between the ranchers in Alberta and those in Montana as is physically possible in the circumstances.

8. The "good offices" of the Commission should continue to be available to bring about mutually satisfactory arrangements at any time they are requested by the appropriate authorities in the United States or Canada.

Recommendations

The Commission recommends:

1. That the appropriate agencies of the Governments of Canada and the United States continue to collect run-off data

from the existing gauges in the Sage Creek Basin, to keep such data available for the information of interested parties and to submit reports thereon to the Commission when requested to do so and at other times in their discretion;

2. That the Government of Alberta designate a Water Master to be available in the Sage Creek Basin during the spring run-off period each year and, to the extent practicable, at other times of substantial run-off to supervise operations and ensure as fair and equitable an apportionment of the waters between the ranchers in Alberta and those in Montana, as is physically possible in the circumstances; the Water Master to submit to the Commission such reports as the Commission may require or as he in his discretion may see fit to file;

3. That the State of Montana designate a representative to establish and maintain an informal liaison with Alberta's Water Master and to assist him in any way necessary or appropriate to promote the realization of the objectives of Recommendation No 2;

4. That, with a view to permitting a fair and equitable distribution of water among all authorized users, the appropriate authorities in Alberta and Montana be asked to urge all users of the waters of Sage Creek to maintain the existing creek channel in as unobstructed a condition as

is practicable, having regard to the irrigation methods practiced in the Basin, and in particular but without limiting the generality of the foregoing, to avoid unnecessary obstruction of the channel by deterioration of bridges, culverts and fences; and

5. That the acceptance by the parties in interest of the foregoing Recommendations, and/or the recourse by appropriate authorities of Canada and the United States to the continuing "good offices" of the Commission, shall be without prejudice to the rights of any party under Article II or other pertinent provisions of the Boundary Waters Treaty signed at Washington on January 11, 1909.

SIGNED this 24th day of October, 1967.

A.D.P. Heeney

D.M. Stephens

Matthew E. Welsh

René Dupuis

Eugene W. Weber

Charles R. Ross

APPENDIX I

1. Description of Sage Creek Basin

The area of the Sage Creek watershed is approximately 263 square miles of which 188 square miles are in Canada and the remainder in the United States.

Sage Creek is a small intermittent stream which rises in southeastern Alberta and flows southerly across the international boundary into Montana, terminating in a large glacial depression known as "Wild Horse Lake", just south of the boundary. Both the creek bed and the lake bed are dry the greater part of the time. Wild Horse Lake has no surface outlet leading to any other stream or body of water and the Commission has no knowledge of any subterranean outlet.

The creek flows in a well-defined coulee to a point about five miles north of the boundary, and thence continues southerly in a very sinuous channel through a wide flat valley. Silt deposited by overflow has built up the banks appreciably. Due to the fact that the banks of the creek are higher than the adjacent lands on either side, the ground slopes downward away from the creek in the manner typical of alluvial streams. As the capacity of the channel in the lower reaches is not sufficient to carry the spring floods, the waters spread out over the valley at such times. This process is aggravated by the willows, debris, snow and ice

which clog the channel and by diversion structures and crossings. Roughly paralleling the lower reaches of the creek in Alberta are the Lone Tree Coulee to the east and the Geddis Flat Coulee to the west, which collect water overflowing from Sage Creek. The southerly flow in both of these coulees is interrupted by cross dykes built by Alberta irrigators; and a large part of the flow in the Sage Creek channel is diverted in Alberta for flood irrigation purposes.

A map of part of Sage Creek Basin is attached hereto.

2. Public Hearing

The Commission held a public hearing at Havre, Montana, 10-12 November 1947, when opportunity was afforded to all interested parties to appear and be heard. The United States, the State of Montana, the Province of Alberta, and certain landowners directly concerned in both Montana and Alberta were represented by counsel. Evidence was adduced during the first two days and on the third day the Commission heard argument of counsel. At the conclusion of the hearing the Commission granted permission to all interested parties to file briefs by 1 February 1948.

An important item of information presented at the hearing was a "Joint Report on Physical Conditions" in the Sage Creek basin, prepared under date of 15 October 1947 by

the Dominion Water and Power Bureau(now the Inland Waters Branch, Department of Energy, Mines and Resources) and the United States Geological Survey. Also, a joint report prepared by the State Engineer of Montana and the Director of Water Resources for the Province of Alberta under date of 11 November 1947 was filed with the Commission and special reference was made therein to a proposed reservoir on Elbow Coulee, a tributary of Sage Creek in Canada.

Briefs were filed with the Commission on behalf of the United States, Montana, Alberta, and Gilchrist Brothers Limited, owner, at that time, of the Q-Ranch which is situated in the Alberta portion of Sage Creek Basin. Copies were transmitted to the Department of State and the Department of External Affairs. The several briefs were reviewed briefly in the Commission's Interim Report dated 4 October 1951.

3. Appointment of Water Master

At the request of the Commission following the public hearing the Government of Alberta appointed a Water Master to make an annual inspection of the channel of Sage Creek before freeze-up and to supervise operations during the run-off period, in an effort to make as fair and equitable an apportionment of the waters of Sage Creek between the ranchers in Alberta and those in Montana as may be physically possible in the circumstances, pending final settlement of

the matter. In its Interim Report of 4 October 1951 the Commission recommended that the services of the Alberta Watermaster be continued, and that the State of Montana appoint an officer to supervise operations in the United States portion of the basin, to accompany the Alberta water master on his annual inspection and to confer with him regarding the steps being taken during the run-off period. The cooperation of the Government of Alberta and the State of Montana in continuing to provide the services of these officers has been most helpful to the Commission and to the parties directly concerned.

4. Appointment of Engineering Board

It became apparent in 1948 that the Commission did not have sufficient engineering data regarding the Sage Creek basin on which to base sound conclusions. Consequently, at an exectuve session in Washington on 26 January 1949, the Commission established the International Sage Creek Engineering Board to review the engineering data and submit a report thereon to the Commission. The Board was comprised of six members -- three from the United States and three from Canada. The United States members were Mr C.S. Heidel of the U.S. Geological Survey, Mr H.W. Genger of the U.S. Bureau of Reclamation, and Mr Fred E. Buck, State Engineer of Montana. The Canadian members were Mr Gordon MacKenzie of the Department of Agriculture, Mr O.H. Hoover of the Department of Mines and Resources (now the Department of Energy, Mines and

Resources), and Mr Ben Russel, Director of Water Resources, Province of Alberta.

The Engineering Board's Final Report to the Commission, dated 18 August 1950, sets forth certain conclusions, the more important of which are in substance as follows:

> The only portion of the runoff of the Sage Creek watershed which can be measured satisfactorily is that which flows past the gauging station on the creek above the Q-Ranch.
>
> It is not possible under prevailing conditions to apportion the water equitably either to the respective users agreeable to their water rights or to the respective countries.
>
> Storage facilities to control and regulate these waters so as to prevent overflow of the creek banks would greatly facilitate apportionment thereof and provide an opportunity for better utilization of the waters, but such facilities alone will not solve the problem because the amount of water to be impounded would be inadequate and present irrigation methods and practices in the basin are unsatisfactory.
>
> The proper agencies of the United States and Canada should make an investigation to determine the possibility of improving irrigation practices and the economical and beneficial use of the water, as well as the works required, if any, to properly distribute the water.
>
> It would be ineffective to recommend a basis for division of the water between the United States and Canada until conditions are such that the mechanics of said division are physically practicable.

5. Water Rights in Montana and Alberta

The Commission's International Sage Creek Engineering Board investigated the status of water rights in the Alberta and Montana portions of the Sage Creek basin and in its report of 18 August 1950 advised the Commission as follows:

"The methods of acquiring water rights are quite different in Alberta from those in Montana. In Alberta an application is made to the Director of Water Resources. A study is then made of the available supply and if found adequate a license is issued. The procedure in Montana is to file an appropriation with the County Clerk, and then proceed to use the water. There is no restriction placed upon the amount of a filing which may be made. The right, however, is limited to the amount of water beneficially used. The user in Montana may also acquire the right by beneficial use without ever making a recorded filing.

"At the time of the Havre hearing testimony showed that rights had been filed in Montana for a total 74 c.f.s. covering 1963.3 acres of irrigated land. Licenses and authorizations for the use of 1763 acre-feet covering 1651.5 acres had been issued in Canada."

Evidence presented at the Havre hearing indicates that the 1963.3 acres on which filings had been made in Montana and the 1651.5 acres covered by licenses in Alberta had been irrigated at times in the past. It is known, however, that the available water supply has not been sufficient for irrigation of that much acreage every year.

Sometime after the International Joint Commission's hearing at Havre, the Prescott Company filed suit in the District Court, Havre, Montana, against J.W. Cox and George L. Smith, for the adjudication of all the Sage Creek water rights in Montana. The judge found that the Prescott Company, who owned some 519 acres susceptible to irrigation, had made no valid appropriation of the waters of Sage Creek and that J.W. Cox and George L. Smith whose lands included approximately 1300 acres susceptible to irrigation, had made valid appropriations.

Under date of 28 February, 1950, the court issued the following decreed rights:

J.W. Cox, fifty-three cubic feet per second of time as of the following dates:-

April 28, 1901	3 cubic feet;
November 9, 1901	20 cubic feet;
November 9, 1901	20 cubic feet;
June 18, 1903	10 cubic feet.

George L. Smith, eighteen cubic feet per second of time as of the following dates:-

April 2, 1904	8 cubic feet;
May 22, 1948	10 cubic feet.

The Department of Water Resources of the Province of Alberta informed the Commission that, as of 4 October, 1960, the following water rights, granted in the period 1907 to 1930, were in good standing for irrigation in the Sage Creek drainage basin in Alberta:

Priority Number in D.B.	Applicant	Stream	Irr. Area in Acres	Quantity Acre-feet	Present Standing ('60)
1.	Q Ranches Ltd	Sage Creek	240.0	240	License
2.	Q Ranches Ltd	Sage Creek	310.0	465	License
4.	Q Ranches Ltd	Sage Creek	273.5	410	License
7.	Q Ranches Ltd	Sage Creek	174.0	116	License
10.	Q Ranches Ltd	Sage Creek	286.0	286	License
11.	Butts,A.L.transfer to George Griffiths pending	Sage Creek	268.0	179	License
13.	Q Ranches Ltd	Sage Creek	100.0	67	Authorized
Total for irrigation			1651.5 acres	1763 acre feet	

6. Streamflow

The intermittent and widely varying streamflow, which comes principally from melting snow, occurs during the months of March, April and May, with occasional brief, but sometimes significant, flows later in the season. More frequently the entire runoff for the year occurs late in March and early in April when the ground is still frozen and when the creek channel is still filled with ice and snow or is otherwise obstructed so that the water leaves the channel and flows over the adjacent lands. Table I shows the mean monthly discharge of Sage Creek at the "Q" Ranch gauge from 1935 to 1966. Table II shows the mean monthly discharge of Sage Creek at the gauge at the International Boundary, from 1946 to 1966. It should be noted that the "Q" Ranch gauge is in a well defined coulee some twenty feet deep. The gauge at the International Boundary, on the other hand, is in an elevated channel about five feet deep. The substantial quantity of water that escapes from Sage Creek below the coulee and flows into Montana over a flat plain two miles wide, by-passes the gauging station at the International Boundary.

7. Soil Surveys

In 1948, the United States Soil Conservation Service made soil surveys of the two ranches then in operation in the Montana portion of the basin, and in 1952 the Soil Survey, Department of Agriculture, Canada, made a soil survey of a large area in Alberta, including the five ranches then in operation in the Alberta portion of the basin.

8. Irrigation Methods

The land along the creek in Alberta is irrigated by direct diversion from the Sage Creek channel. Check dams are placed in the stream and the water is diverted largely by overflowing the banks or through cuts in the banks. The Commission's International Sage Creek Engineering Board, in its report of 18 August 1950, stated:

> "Earthern dikes have been constructed across various depressions on the Canadian side of the boundary, which heretofore have been operated without the necessary facilities to release the impounded waters. It is reported, however, that these dikes are now being provided with such facilities. Prior to the construction of these dikes the flow from these depressions would ordinarily cross the boundary into the United States. While the lands in the drainage basin are generally flat, local depressions cause excessive pondage in some locations resulting in detrimental effects to the land and crop production in these locations. Somewhat the same system of irrigation is used on the lands in the United States. Irrigation of the lower reaches is accomplished by the release of water from one dike to another lower in elevation. (It is known as "flood irrigation".)
>
> "Usually the runoff of Sage Creek comes early in the season before the frost is out of the lands being irrigated. This fact and the methods of flood irrigation results in a wasteful and inefficient use of water.
>
> "To make a fuller use of the land and water available, a study of the area by the proper agencies would be necessary to determine the type of works that should be constructed, what areas should be irrigated and what irrigation practices should be adopted. One feature which should be considered in this study is the possibility of a canal leading from Sage Creek below the Q-Ranch gauging station to the international boundary".

9. Land-Use Board

The Commission concurred in the conclusions of its engineering board with respect to a further investigation by

the appropriate agencies of the United States and Canada. In its Interim Report of 4 October 1951, the Commission advised the two Governments that it was contemplating the establishment of an "International Sage Creek Board on Land Use", and that:

> "This Board will be required to make the necessary surveys in the Sage Creek basin to determine the methods that should be employed and the works necessary for utilization of the water supplies of the area. This investigation is also expected to disclose whether storage on Sage Creek or any of its tributaries could be considered sound and economically feasible in the circumstances.
>
> "The Land Use Board will also be asked to investigate the desirability or otherwise of a canal leading from Sage Creek below the Q-Ranch gauging station to the international boundary. Reference is made to this project in the engineering board's report and also in the report prepared jointly by the Director of Water Resources of Alberta and the State Engineer of Montana of 11 November 1947 ....."

The Commission duly established the International Sage Creek Board on Land Use, comprised of two members, one from Canada and one from the United States. The Canadian member of this board was Mr J.B. Campbell, Officer-in-Charge, Pasture Division, Experimental Station, Swift Current, Saskatchewan; and the United States member was Professor O.W. Monson, Irrigation Engineer, Montana State College, Bozeman, Montana. The Land-Use Board's report to the Commission dated 2 March 1953, contains much valuable information.

The Land-Use Board emphasized the fact that the economy of the Sage Creek basin is a range livestock economy which utilized the "flats" as a winter feed production base and the

adjoining uplands for summer pasturage; and that the relatively small acreage of irrigated flats land is the key to successful use of a vastly larger area (approximately 130,000 acres) of adjacent range land.

The Board recognized that the flood irrigation method is the most suitable method for use in the Sage Creek basin, thus concurring in the views of all ranchers on both sides of the boundary. The Board recommended, however, that the irrigation systems should be improved by constructing additional dikes and contour ditches, so located as to make more efficient use of water.

The soil survey methods followed in Alberta and Montana were coordinated by the Land-Use Board so that the land classifications on either side of the boundary would be comparable. The lands were classified as follows:

"Class I. Very good soils, high permeability; good drainage; no salts and with favorable and uniform slope conditions. Suitable for production of a wide range of crops.

"Class II. Good soils; lower permeability; satisfactory drainage; little or no salt; surface may be uneven. Suitable for grain and forage crops.

"Class III. Good soil; permeability good to fair; salts, few or absent; topography, generally uneven; slopes 3 to 5 per cent. Suitable for pasture and forage crops.

"Class IV. Heavy soils; permeability poor; salts present; topography flat; crops, native hay and pasture.

"Class V. Heavy soils, poor drainage; low permeability; salts present; topography flat; crops, native pasture (poor quality)".

The Board reported that of the lands surveyed in Canada, 20% were in Class I; 43% in Class II; 12% in Class IV; 19% in Class V; and the remaining 6% "unsuitable". In Montana the breakdown of soil classes was not so complete, but the Board estimated 21% to be in Classes I and II; 44% in Class III; and the remaining 35% in Class IV.

The Board reported further that it found 4680 acres of good quality irrigable lands in the several Alberta ranches and 1060 acres of irrigable lands in the two Montana ranches, although water licences issued in Alberta and Montana cover only about 3000 acres. In addition, the Board found 1175 acres of Crown Land in Alberta and 519 acres of the Prescott ranch in Montana to be suitable for irrigation if water were available.

The Board noted that in the Court Decree of February 28, 1950, which adjudicated the Montana water rights in the Sage Creek Basin, some 1300 acres in the two Montana ranches are shown as susceptible to irrigation; and that while the plan for those ranches developed by the U.S. Soil Conservation Service shows only 1060 acres as being irrigable by flood methods, "it is recognized that the larger estimate may be closer to the exact figure because the ranch work plans do not clearly distinguish irrigated from non-irrigated crop land".

The Board recommended that, since there is a surplus of water above the needs of the presently irrigated area during

more than half the years of record, secondary water rights should be issued to provide an orderly distribution and use of the surplus water.

All of the engineering experts who have submitted reports to the Commission have favoured the construction of a reservoir on Elbow Coulee in the Sage Creek basin in Alberta for storage of the spring runoff in order that the water might be held back in the early spring and used more economically and with greater efficiency somewhat later in the season. The Land-Use Board specifically recommended that the proposed Elbow Coulee Reservoir be constructed in accordance with plans prepared by the Prairie Farm Rehabilitation Administration of the Canadian Department of Agriculture. The Board pointed out that a reservoir at the chosen site, with usable capacity of about 7,000 acre-feet, would provide 1.25 acre feet of water to all lands to which water rights have been granted, as well as one acre foot of water to an additional 2,000 or more acres during years when the reservoir fills.

The Land-Use Board recommended against the construction of a canal leading from Sage Creek below the Q-Ranch gauging station to the international boundary. It suggested that Sage Creek channel is the logical main canal for the irrigation system and the possibility of enlarging and straightening the channel should be thoroughly investigated.

10. Agreement Satisfactory to Land Owners

In accordance with the request of the two Governments that the Commission use its good offices to bring about a mutually satisfactory agreement, representatives of the Commission met on several occasions with the land owners and ranchers in both the Alberta and Montana portions of the Sage Creek Basin. All of these land owners and ranchers expressed themselves as agreeable to construction of the Elbow Coulee reservoir by an agency of the Government of Canada and to apportionment of the water to be impounded therein in accordance with the following understanding:

"1. Construction, by the Prairie Farm Rehabilitation Administration or other agency of the Government of Canada, of a reservoir in Canada at Elbow Coulee to provide capacity for approximately 7,500 acre feet of live storage.

"2. Construction, by the same agency of a "Supply Canal to the United States" on the west side of Sage Creek to carry all of the stored water apportioned to the Montana ranchers from a point in Sage Creek below the reservoir to the point where Sage Creek crosses the international boundary. Final location of this canal will be recommended by the Canadian authorities concerned, after completion of a survey by the Prairie Farm Rehabilitation Administration.

"3. Formation of a water storage society or other organization of the Canadian ranchers appropriate under Alberta laws, which will be responsible for:

(a) maintenance and operation of the reservoir and of the diversion works at the head of the Supply Canal to the United States;

(b) apportionment of the impounded water as between the Alberta ranchers and the Montana ranchers in accordance with the formula outlined hereunder;

(c) diversion of the United States share of the impounded water to the Supply Canal to the United States referred to in para. 2 above;

(d) provision of suitable storage apportionment and diversion records to the representative of the Montana ranchers and to the Board referred to in para. 5 below;

(e) maintenance of Sage Creek channel between the reservoir and the point of diversion to the Supply Canal to the United States, in a condition satisfactory to the Board referred to in para. 5 below.

"4. The water storage society or other organization mentioned in para 3 to cooperate with the Montana ranchers and, as and when requested by a representative of the Montana ranchers, to release and divert to the Supply Canal to the United States all or part of the Montana ranchers' share of the water then impounded in the reservoir.

"5. Inspection of the reservoir, channel and diversion

works and the records of the storage society by an international board created by the International Joint Commission, to verify compliance with the terms of the agreement for apportionment of the stored water; said board to recommend subsequently any adjustment which may be appropriate.

"6. Maintenance of the Supply Canal to the United States in a condition satisfactory to the Board referred to in para. 5 above, to be the responsibility of the Montana ranchers, who will be permitted appropriate access to the canal for this purpose at all reasonable times.

"7. Apportionment of water shall apply to water remaining in the reservoir at the commencement of the water year, together with the season runoff impounded in the reservoir, regardless of whether the runoff occurs during only one period of days or weeks or during two or more such periods. Such water shall be apportioned to the Alberta ranchers and the Montana ranchers in the following manner:

(a) If the amount of water thus available in the reservoir for apportionment during the water year is 3,750 acre-feet or less, one-third thereof shall be apportioned to the Montana ranchers and two-thirds to the Alberta ranchers.

(b) If the amount is more than 3,750 acre-feet but not more than 5,000 acre-feet, 1,250 acre-feet thereof shall be apportioned to the Montana ranchers and the remainder to the Alberta ranchers.

(c) If the amount is more than 5,000 acre-feet, one fourth thereof shall be apportioned to the Montana ranchers and three-fourths to the Alberta ranchers; Provided, that if in any year the amount is more than 7,500 acre-feet, the water in excess of 7,500 acre-feet shall be made available to the Alberta ranchers if they can use it.

If the capacity of the reservoir for live storage should prove to be less than 7,500 acre-feet, the amounts of water stated above will be reduced proportionately.

"8. Measurement of diversions to be made at the point of diversion from Sage Creek to the Supply Canal to the United States.

"9. Reservoir losses, defined as 'changes in reservoir storage which are unexplained by inflows and deliveries', and physical losses in Sage Creek channel between the reservoir and the point of diversion to the Supply Canal to the United States, to be shared in the same proportions as the water impounded in the reservoir.

"10. All waters in Sage Creek Basin in Alberta, other than the Montana ranchers' share of water impounded in

the reservoir, calculated in accordance with the formula outlined in para. 7 above, to be available for use in Alberta.

"11. The flow of water across the international boundary in the Sage Creek Basin not to be obstructed in Montana in a manner which causes or is likely to cause damage in Alberta.

"12. In consideration of the apportionments of water to be made pursuant to the aforementioned arrangements, the State of Montana and the Montana ranchers to waive any and all rights they might otherwise assert, under Article II of the Boundary Waters Treaty of 1909, respecting the waters of the Sage Creek Basin."

11. Views of Canadian Department of Agriculture

Having ascertained that the above arrangements for storage and apportionment of Sage Creek waters would be acceptable to the ranchers owning the affected lands in each country, the Commission then consulted the Canadian Department of Agriculture as to the probable costs of the proposed facilities. In a letter addressed to the Chairman of the Canadian Section of the Commission under date of 19 September 1957, the Deputy Minister of Agriculture stated in part:

> "...you will recall that the original rough estimate of the cost of this project was some amount between $200,000 and $250,000.
>
> "Our most recent surveys and calculations indicate that the cost will exceed $400,000. We

have also given some attention to land ownership and possible benefits which might follow the construction of the proposed storage.

"Taking all factors into consideration we are now firmly of the opinion that the construction of this project by P.F.R.A. cannot be justified. The individuals who would benefit are few in number on both sides of the international boundary and we can see no public interest to be served that would in any way justify the expenditure involved."

12. Proposed Improvement of Channel and Strucutres

Following their annual Fall inspections of the Sage Creek channel in 1960 and in 1961, the Water Master appointed by the Government of Alberta and an officer representing the State Engineer of Montana recommended certain channel improvements, replacement of diversion structures and installation of culverts and additional dykes in the Canadian portion of the basin. They estimated the cost of carrying out their recommendations to be between $20,000 and $25,000, in addition to the cost of work to be performed by Q Ranches Ltd.

The Canadian Government studied these proposals to determine if the recommendations would be effective to meet the problem and if Canadian Government financial assistance might be provided. The Commission was informed by the Canadian Government that it was of the view that the improvements recommended would not be effective and that the greater expense involved in carrying out effective improvements in the area would not be warranted under the circumstances.

TABLE I

Monthly Mean Discharges, in cubic feet per second. Sage Creek at "Q" Ranch near Wild Horse

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Ac. Ft
1935		Nil	37.4	55	Nil	Nil	2.1	Nil	Nil	Nil			5,717
1936			Nil	41.7	0.05	Nil	Nil	Nil	Nil	Nil			2,486
1937			Nil	76.8	0.9	Nil	Nil	Nil	Nil	Nil			4,630
1938			57.2	33.2	4.1	3.7	13.2	Nil	20.7	Nil			8,003
1939			110	4.2	Nil	12.5	0.6	Nil	Nil	Nil			7,786
1940			2.3	201	10.7	2.3	1.7	Nil	Nil	Nil			13,031
1941			88	1.2	Nil	3.4	7.7	Nil	Nil	Nil			6,139
1942			4.8	21.3	Nil	58.1	4.8	Nil	Nil	Nil			5,322
1943			240	20.0	Nil	Nil	Nil	Nil	Nil	Nil			15,971
1944			0.18	2.66	Nil	0.54	11.4	Nil	Nil	Nil			899
1945			26.0	0.75	Nil	Nil	Nil	Nil	Nil	Nil			1,647
1946			57.7	1.8	Nil	2.0	Nil	Nil	Nil	Nil			3,772
1947			82.9	75.4	0.62	Nil	Nil	8.27	1.9	Nil			10,250
1948			11.6	126	14.5	Nil	Nil	Nil	Nil	Nil			9,128
1949			2.25	9.21	Nil	Nil	Nil	Nil	Nil	Nil			686
1950			Nil	79.6	0.01	2.01	0.02	Nil	Nil	Nil			4,859
1951			Nil	158	47.9	3.75	0.05	21.1	11.5	Nil			14,551
1952			Nil	388	10.8	0.05	Nil	Nil	Nil	Nil			23,771
1953			7.69	24.5	27.6	33.4	0.08	Nil	Nil	Nil			5,620
1954			Nil	28.2	Nil	5.93	0.24	5.68	3.5	0.99			2,666
1955			16.0	226	65.6	1.36	65.1	0.38	Nil	Nil			22,597
1956			8.42	44.7	0.50	4.89	27.6	0.73	Nil	Nil			5,240
1957			21.0	82.9	1.53	0.68	Nil	Nil	Nil	Nil			6,363
1958			21.1	239	0.15	Nil	Nil	Nil	Nil	Nil			15,525
1959			84.9	23.2	0.02	Nil	Nil	Nil	Nil	Nil			6,600
1960			120	6.49	24.3	0.13	Nil	Nil	Nil	Nil			9,270
1961			4.96	Nil	Nil	Nil	Nil	Nil	Nil	Nil			305
1962			29.9	10.3	Nil	6.77	Nil	Nil	Nil	Nil			2,856*
1963		34.8	25.2	5.3	Nil	Nil	28.5	Nil	Nil	Nil			3,615
1964		Nil	9.47	29.5	4.93	Nil	Nil	Nil	Nil	Nil			2,643
1965			Nil	169.	14.7	127.	24.4	0.03	6.43	Nil			20,379
1966			74.8	10.6	0.1	5.9	2.4	Nil	Nil	Nil			5,731

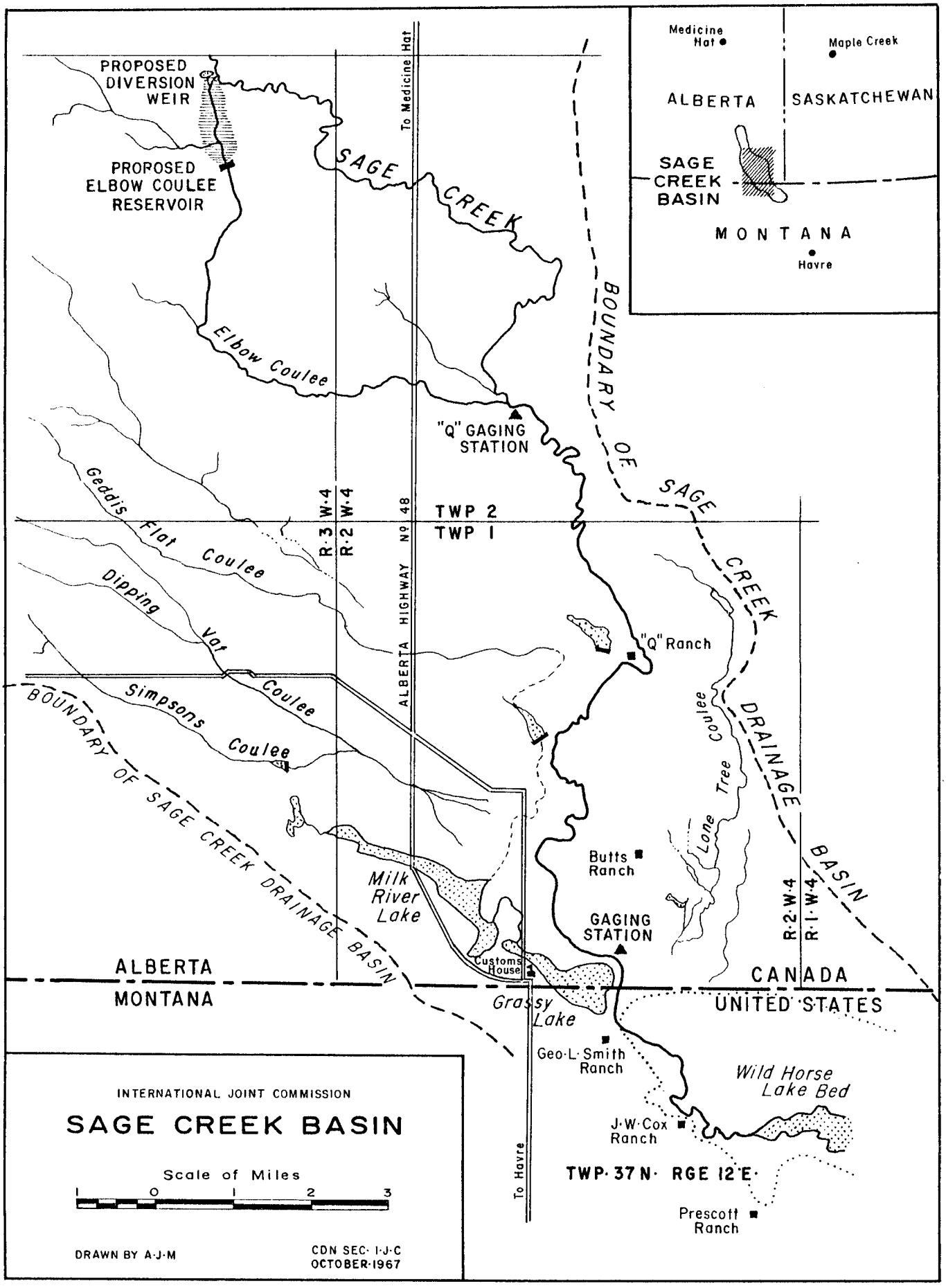
* March to October

TABLE II

Monthly Mean Discharges, in cubic feet per second. Sage Creek at International Boundary

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Ac. Ft
1946		Nil	6.47	1.17	Nil	Nil	Nil	Nil	Nil	Nil			467
1947			Nil	3.54	0.62	Nil	Nil	0.34	0.48	0.02			300
1948			1.11	12.7	11.5	Nil	Nil	Nil	Nil	Nil			1,534
1949			Nil	1.88	Nil	Nil	Nil	Nil	Nil	Nil			112
1950			Nil	4.54	Nil	Nil	0.19	Nil	Nil	Nil			282
1951			Nil	4.20	5.22	3.54	0.49	Nil	15.7	Nil			1,749
1952			Nil	5.00	5.68	0.08	Nil	Nil	Nil	Nil			652
1953			1.21	3.96	12.2	14.0	0.03	0.06	Nil	Nil			1,900
1954			Nil	5.86	Nil	2.63	0.52	1.39	4.08	1.67			968
1955			Nil	6.67	20.4	4.04	13.2	0.36	Nil	Nil			2,723
1956			Nil	9.54	0.19	0.84	9.51	0.25	Nil	Nil			1,230
1957			5.19	14.9	1.79	0.43	Nil	Nil	Nil	Nil			1,343
1958			1.27	21.3	0.19	0.33	Nil	Nil	Nil	Nil			1,376
1959			2.74	9.66	0.06	Nil	Nil	Nil	Nil	Nil			748
1960			4.00	0.75	6.00	0.49	Nil	Nil	Nil	Nil			689
1961			5.07	Nil	Nil	Nil	Nil	Nil	Nil	Nil			312
1962			Nil	5.85	0.05	1.67	0.01	Nil	Nil	Nil			450*
1963		7.69	2.40	1.33	0.01	Nil	6.66	Nil	Nil	Nil			637
1964		Nil	3.58	9.55	0.15	Nil	Nil	Nil	Nil	Nil			797
1965			Nil	4.77	7.06	13.4	21.4	0.52	4.57	0.15			3,137
1966			12.3	11.4	0.48	3.66	1.63	Nil	Nil	Nil			1,757

* March to October


Medicine Hat
Maple Creek
ALBERTA
SASKATCHEWAN
SAGE CREEK BASIN
MONTANA
Havre
PROPOSED DIVERSION WEIR
PROPOSED ELBOW COULEE RESERVOIR
To Medicine Hat
SAGE CREEK
Elbow Coulee
"Q" GAGING STATION
BOUNDARY OF SAGE CREEK DRAINAGE BASIN
Geddis Flat Coulee
Dipping Vat Coulee
Simpsons Coulee
R·3 W·4
R·2 W·4
ALBERTA HIGHWAY Nº 48
TWP 2
TWP 1
"Q" Ranch
Lone Tree Coulee
Milk River Lake
Butts Ranch
GAGING STATION
Customs House
R·2 W·4
R·1 W·4
ALBERTA
MONTANA
CANADA
UNITED STATES
Grassy Lake
Geo·L·Smith Ranch
Wild Horse Lake Bed
J·W·Cox Ranch
TWP·37 N· RGE 12 E·
To Havre
Prescott Ranch
INTERNATIONAL JOINT COMMISSION
SAGE CREEK BASIN
Scale of Miles
0 1 2 3
DRAWN BY A·J·M
CDN SEC· I·J·C
OCTOBER·1967