

*1976-1977
ANNUAL
REPORT
PRAIRIE
FARM
REHABILITATION
ADMINISTRATION*

PFRA



Government
of Canada

Regional
Economic
Expansion

Gouvernement
du Canada

Expansion
Économique
Régionale

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INTRODUCTION

Weather conditions during most of the 1976-77 fiscal year were very dry, reminiscent of 1935 when the Prairie Farm Rehabilitation Act was passed by Parliament. The original legislation was designed to assist in the reclamation of agricultural lands seriously affected by drought and soil drifting in Manitoba, Saskatchewan and Alberta. Subsequent amendments to the act widened the scope of Prairie Farm Rehabilitation Administration (PFRA) activities, and extended indefinitely the life of the original legislation.

Early in the 1976-77 fiscal year, moisture conditions were favourable in most areas and farmers harvested a bumper crop under dry fall conditions. But those same conditions which assisted farmers in the fall, remained to haunt them in the winter and spring. There were no fall rains and winter brought little snow. For almost all this time, temperatures were above normal. As a result, soil moisture reserves were dissipated, and spring winds lifted topsoil into swirling clouds reminiscent of the 'Dirty Thirties'.

The situation was serious even though farmers today are better equipped to withstand drought conditions. As the year closed it was obvious there would be little runoff from snowmelt to replenish dams and dugouts, and many shallow wells were failing or providing water in volumes much below their normal capacity. The agricultural outlook for the 1977 crop year was gloomy. It appeared that moisture sufficient for crop production might be forthcoming, but it would not be enough to fill dugouts and reservoirs. A start on plans to alleviate these problems was underway at year end. The Department of Regional Economic Expansion (DREE), through PFRA, was preparing to initiate a federal-provincial deep-well drilling program while PFRA was laying plans to broaden assistance to farmers under its water development program. On the drawing board were plans for a Task Force on Drought to be established in Regina by the federal government early in the new fiscal year, an operation in which PFRA expects to be involved.

Throughout the year, PFRA continued its long-standing programs of water conservation and development at the farm and community levels, including assistance to community irrigation projects. Its involvement in land use activities continued through the operation of its extensive community pastures program.

PFRA has also been engaged in activities under Agricultural Service Centres Agreements (ASCA) with the three prairie provinces. Projects involve the improvement or extension of waste disposal and water supply facilities in Manitoba and Saskatchewan. In Alberta only water supply projects are undertaken. Fifty-four communities have been selected because of their importance as service centres for the agricultural industry in their respective areas. Helping them to remain viable is the main purpose of the program. The cost of projects under the ASCA program is being shared with the three provinces. Canada is contributing half the cost in the form of grants and providing the balance, in most cases, as loans to the provinces. PFRA is responsible for administration, implementation and supervision of construction.

Under the terms of the Canada-Alberta Irrigation Rehabilitation Agreement signed in 1973, PFRA continued construction work on major irrigation works in that province although activity was not at as high a level as it was the year before.

On the following pages is a summary of the activities undertaken by the Prairie Farm Rehabilitation Administration for the year ending March 31, 1977. Expenditures from 1935 to 1977 are outlined in Appendix I.

LAND USE SERVICE

An amendment to the Prairie Farm Rehabilitation Act in 1937 provided for the establishment of the Land Use Service. The objective of this unit was to remove submarginal land from cereal crop production and to convert it to pasture through regrassing and other development. Many of the farmers who left unproductive land were relocated by PFRA on irrigated land in Alberta. When the land was reclaimed, it was made available to farmers in the surrounding area for grazing livestock.

For a summary of the development and operation of community pastures from 1938 through 1977, see Appendix II.

PASTURE OPERATIONS

PFRA operated 96 community pastures, the same number as it did the previous year. The large pasture at Suffield, Alberta was not operated in 1976, and the Louis Bull-Ermineskin Pasture on Indian Reserve land was transferred to Indian Band jurisdiction. The new Libau Pasture in Manitoba was put into operation for the first time, and another Manitoba pasture, McCreary, was divided into two pastures, the new one being named Alonsa.

The non-operation of the 138 280-acre grazing area at Suffield reduced the operating acreage to 2 265 593 from over 2 400 000 acres. The reduced grazing area resulted in a corresponding decrease in livestock numbers by 9 467 to 240 809. Livestock consisted of 147 579 adult cattle and 93 230 calves. These animals were owned by 5 515 patrons.

Livestock losses from all causes amounted to 0.72 of one per cent, a slight decrease compared with the previous year.

Grazing Fees

There was no change in grazing fees, which were as follows:

Cattle — 9¢ per head per day (including 1¢ tax levy)
 Horses — 10¢ per head per day (including 1¢ tax levy)
 Sheep — 2¢ per head per day (including 0.3¢ tax levy)
 Calves — \$5 per head per season
 Colts — \$6.50 per head (of current season)
 Breeding Service — \$10 per cow
 Minimum grazing fees per head per season: cattle \$8,
 horses \$9

The tax levies indicated above represent the return on each animal which is collected by PFRA and distributed to the municipalities involved in lieu of taxes. In the year under review, this amounted to \$200 662.

From PFRA pastures operated on Indian Reserve lands, one-third of the gross revenue is returned to the Indian Bands concerned. In the 1976 grazing season, this amounted to \$58 093 which was disbursed to 12 Bands.

Breeding Service

In the past year, 100 989 animals were bred naturally with bulls provided by PFRA. For this, 3 816 bulls were used, of which 3 303 were owned by PFRA and 513 rented from patrons. Close to one-half of the bulls were Herefords, and almost as many were Charolais. One hundred and ten Angus and six Shorthorns were also used. Breeds provided are in accordance with patron preference.

During the year, PFRA purchased 533 bulls, 263 of which were yearlings and 270 two-year olds. During and following the grazing season, PFRA sold 720 bulls. An additional 75 either died or were missing, leaving an inventory of 3 195 bulls at the close of the fiscal year.

Haying Operations

Breeding bulls are kept over winter at the pastures, while young, developing bulls are cared for at two bull stations. Hay for these animals is obtained from various sources. These include five irrigation projects, the PFRA Tree Nursery, Gardiner and Qu'Appelle River dams, the RCMP division in Regina, the Canada Agriculture Research Station at Indian Head, and PFRA pastures. This year 10 100 tons of hay were used.

PASTURE IMPROVEMENT AND DEVELOPMENT

The work of the Pasture Improvement and Development Division can be divided into three categories: land improvement, water development, and buildings and facilities.

Approximately 1 000 acres of land were cleared and brush piled or repiled, 24 700 acres of land were broken, and 21 200 acres of newly broken land were seeded. Additional forage seeding involved 16 200 acres. Other reseeding was accomplished on 1 395 acres of hayfields, while 2 388 acres of new hayfields were developed. It was necessary to fertilize 1 600 acres. Spraying to retard brush or brush regrowth was carried out on 30 100 acres. Crews also had to construct 9.5 miles of access trails and roads. The Land Improvement Division installed 108 irrigation structures and 3 000 feet of canal lining to prevent seepage.

In addition to the installation of 1 300 feet of water lines in various locations and land drainage for 400 acres, there were 136 projects involving water development activity. The division constructed 50 dugouts and cleaned 29 others. Four new wells were developed, three were re-drilled, pump equipment was installed at 10 wells, two others were repaired, and two windmills were erected at wells. Dam repairs were completed at 19 sites. Eleven sewer and water installations were undertaken and six stock-waterers were put into operation.

With respect to buildings and other physical facilities, the division either provided or renovated 11 pasture managers' houses, five riders' cabins, seven barns, eight garages, one bull shed and one granary. Four sets of headquarters buildings were painted, and landscaping was carried out at three pastures. Thirteen corrals received attention, and five Texas gates were built and installed. Some 51.5 miles of new fence were built and 135 miles rebuilt. As well, 500 feet of protective slotted board fence (porosity fence), were erected.

Expenditures incurred by the Pasture Improvement and Development Division totalled \$1 963 000 in the 1976-77 fiscal year.

WATER DEVELOPMENT SERVICE

The Water Development Service consists of four divisions which provide technical and financial assistance for the development of water and land resources for agricultural purposes; operate irrigation projects in southwest Saskatchewan and an irrigation demonstration facility at Outlook, Saskatchewan; produce and distribute tree seedlings and cuttings to farmers and government agencies for shelterbelt, reclamation and environmental purposes; and provide equipment repair and maintenance, truck transport and project construction services.

WATER DEVELOPMENT DIVISION

The Water Development Division conducts a program which provides for technical and financial assistance to farmers, ranchers and rural community groups in the prairie provinces in order to make the most efficient use of available water for livestock, irrigation and domestic requirements.

Technical assistance is provided at no charge to locate, survey, design and construct water storage and irrigation projects. Financial assistance is provided by means of grants based on specific construction items related to surface and groundwater development and irrigation projects.

To carry out this program, the division operates 20 district offices administered by three regional offices. These 23 offices are staffed with 93 professional, technical and clerical personnel. During the field season, this establishment is increased by 30 to 35 casual employees who are engaged as rodmen or draftsmen to accommodate surveying and planning requirements.

The key to the success of most water development projects is spring runoff. Runoff across the prairies in 1976 ranged from below normal in Alberta to normal in most of Saskatchewan, and excessive in most Manitoba watersheds.

Construction of farm projects increased slightly over the previous year, with 7 387 applications. The majority of projects developed were wells, with 5 807 applications.

The number of farm dugouts excavated decreased by four per cent, while stockwatering dams constructed declined by 57 per cent. There was a four per cent increase in irrigation projects.

Following a trend of recent years, more projects were constructed in Alberta than in Saskatchewan or Manitoba. The average grant paid was \$404.

Two small community projects were constructed during the year to provide water for both stockwatering and domestic use. Investigations were conducted for 20 other projects following requests for small community developments. Maintenance was carried out on several projects for which PFRA continues to be responsible.

Agencies outside PFRA were provided with 745 technical services. These agencies included other federal departments, provincial government offices, municipalities and farm groups. Services to provincial water licensing agencies involved resurveying and updating plans of older projects for the purpose of reviewing present water allotments. Services were also provided to the federal Department of Indian Affairs and Northern Development and to Indian Bands, in connection with establishing the feasibility of water development proposals. Thirteen surveys and plans were undertaken for the Saskatchewan Family Farm Improvement Branch relative to intensive livestock production on feedlots. A number of surveys were also performed for the Saskatchewan Conservation and Land Improvement Branch. Technical services were provided to PFRA's Engineering Services to assist in projects at Rosetown, Biggar, Shaunavon, Weyburn and Melville under the Agricultural Service Centres program.

Appendix III indicates the services provided by the Water Development Division during the year under review. Appendix IV shows projects and financial assistance.

IRRIGATION PROJECTS DEVELOPED, OPERATED AND MAINTAINED BY PFRA

Since the late 1930s, PFRA has continued to operate six irrigation projects in southwest Saskatchewan. In conjunction with these projects, other acreages operated

by the province and a number of private schemes also receive water supplies. All these operations are served by 26 reservoirs constructed by PFRA, some of which are on international streams. The latter also serve as control structures for the division of flows between Canada and the United States under the terms of the Boundary Waters Treaty. Domestic and commercial water for the communities of Swift Current, Gravelbourg, Laffèche and Eastend are supplied from these reservoirs.

Irrigation operations in this region are an important factor in the continuation of a viable livestock industry. There are millions of acres of shortgrass grazing land in the area, but few sources of winter feed apart from that grown under irrigation conditions. The total irrigated area served by the 26 PFRA reservoirs is 34 775 acres. Of this number, 23 227 acres fall within the six PFRA projects worked by 453 farmers and ranchers, with 8 653 acres under provincial control operated by 141 farmers, and 2 895 acres under private water licenses held by 38 farmers.

In the past fiscal year, production was slightly below the levels of previous years, with 48 266 tons of hay and 9 150 bushels of feed grains being produced on PFRA projects. Livestock numbers increased only slightly to 51 532 cattle, 1 425 sheep and 3 280 hogs.

One of the key activities in successful gravity flow irrigation lies in adequate land preparation. Recognizing this fact, farmers, with PFRA assistance, levelled 1 067 acres during the past year.

CONSTRUCTION, EQUIPMENT AND SERVICES DIVISION

This division provides operational and related technical and administrative services to all sections of PFRA, and to authorized outside agencies. Services include construction and maintenance of buildings, engineering works and associated utilities, together with maintenance, fabrication and storage of equipment and supplies. Technical and administrative services provided relate to the selection, cost estimating, availability, purchase and use of equipment and materials.

Total activity for the year under review involved 2 875 assignments with a value of \$2 020 103.

Field Construction Section

This section completed 136 construction jobs with a total value of \$826 076. Major activity included replacement of the Gouverneur Dam spillway chute slab and repairs to the drainage system and outlet channel; repair of the Laffèche Dam spillway slab and drainage system; renovation of irrigation works on the Maple Creek Irrigation Project; reconstruction of a portion of the West Val Marie Irrigation Project, and levelling 420 acres on the Rush Lake Irrigation Project. Work on PFRA community pastures included regrading 853 miles of pasture access roads; riverbank stabilization at the Souris River and Coalfields pastures; and construction of head ditches, drains, dikes and land levelling at the Maple Creek Bull Station. The section also harvested 1 444 tons of hay, painted nine sets of pasture headquarters buildings, and performed tree removal and land breaking operations at the PFRA Tree Nursery.

Two of the main users of the Field Construction Section services were irrigation projects operated by PFRA in southwest Saskatchewan, which accounted for 45 per cent of output, and the community pastures, which were responsible for 28 per cent of the section's workload.

Service Depot

The Service Depot, located in Moose Jaw, consists of a large complex of workshops, material and equipment stores, equipment storage, marshalling areas and related office facilities. It is also the operating base for personnel of the Field Construction Section.

During the year, the depot provided services valued at \$1 194 027. The repair of equipment accounted for 45 per cent of the value of services and 1 256 work orders. A total of 1 054 trucking jobs were completed, requiring the logging of 297 872 miles.

DEMONSTRATION FARM

The Demonstration Farm was established in 1949 when it became known that construction of the South Saskatchewan River Project would proceed. The farm exhibits methods and techniques for the production of a variety of crops under diverse irrigation conditions.

As well as demonstrating which grass varieties and water applications are most successful in forage production, the farm has been concerned with the growing of speciality crops. During the past year, confection sunflowers and dry field beans were featured. The plots of these products gave clear indication that these crops can be brought to maturity in the area, with the result that it is anticipated that about 200 acres of confection sunflowers and 150 acres of beans will be grown by farmers next year. Other vegetable crops, apart from potatoes, are increasing in popularity with 75 acres planted on the project in 1976 for a considerable increase over the previous year. Additional acreage is expected to be planted in 1977.

Corn silage still holds the speculative interest of farmers and research personnel. Information on yields, varieties, management and feeding techniques is frequently sought. The queries on corn silage are in line with the increased interest in other aspects of livestock production, such as the results obtained by the Demonstration Farm with irrigated pasture and the intensive grazing trials conducted each year. In 1976, the farm obtained outstanding results in the production of finished beef on a low-cost ration consisting mainly of cull potatoes.

The farm continues to work closely with the Saskatchewan Department of Agriculture in horticultural and fruit crop demonstrations. Farmers and tourists from all over the world visit the farm to view and discuss methods, techniques, crops, structures and equipment employed.

TREE NURSERY

Distribution

In the spring of 1976, approximately 6 000 000 trees and shrubs were distributed to 7 946 applicants. Included were stock transfers of 219 800 plants to the Alberta Tree Nursery at Oliver, and 156 000 to the Saskatchewan Forest Nursery at Prince Albert. The supply of plants for each of eight species fell short of demand with the result that shortages for this group totalled 651 000. Some 774 000 plants of six species broke bud prior to spring packing and had to be discarded.

More than 73 per cent of the tree material was used for farm shelterbelt plantings, while 22 per cent went to provincial agencies, and minor amounts to municipal and federal agencies. By province, 57.5 per cent of the seedlings and cuttings were planted in Saskatchewan, 37 per cent in Manitoba, and 5.5 per cent in Alberta.

Distribution totalled 34 873 bales of trees during the year, with close to 74 per cent going to 79 agricultural representatives in Manitoba and Saskatchewan for pick-up by farmers. The remainder were either picked up at the Tree Nursery or shipped individually to applicants.

Technical Services

Tree Nursery personnel provided 1 086 technical services, including 543 site appraisals, 419 planting plans, four instances of development assistance, and 120 survival surveys. With the assistance of the Information Division, the nursery developed two displays, gave 43 slide talks, issued 14 newsletters, and arranged 38 radio spots, television announcements and programs as part of its public information program.

Production

Spring activities were favoured with warm dry weather. More than 2 000 000 poplar and willow cuttings were planted, and 1 000 000 conifer seedlings were transplanted. Excessive rain from late May to early July delayed the sowing of 39 acres of caragana and elm. This heavy rain reduced the need for irrigation during that

period, but later in the year heavy irrigation was required for 67 acres of deciduous plants to bring them to the proper stage for fall harvesting. In the fall 7 000 000 plants of 16 deciduous tree and shrub species were lifted, counted, bundled, and heeled-in for the winter, ready for spring delivery. Late in the calendar year, 2.2 million poplar and willow cuttings were harvested and stored.

Drought conditions reduced seedcrop harvestings to only 223 pounds of eight species, necessitating tapping of reserve seed stocks for later sowings.

Investigations

Success in the rooting of hardwood cuttings increased from 63 to 95 per cent when shoots were made into cuttings and stored within eight hours of collection at -2°C . Planting survival of six shrub species increased from 64 per cent following outdoor heeling-in storage, to 98 per cent with indoor storage at -2°C .

An efficient non-toxic chemical for fall defoliation of Siberian elm was identified. This permits mechanical harvesting and prevents mould development during winter storage.

Herbicidal weed controls were developed for nursery production of an additional six shrub species, and seed storage techniques were improved for three species.

A new sex attractant proved effective for trapping root borers and may provide a biological method of preventing infestations of beds of poplar cuttings.

ENGINEERING SERVICE

The PFRA Engineering Service investigates, plans, designs, and is responsible for construction and maintenance of various works pertaining to water development, irrigation and community infrastructure programs in Manitoba, Saskatchewan and Alberta. It provides technical assistance to the various PFRA offices including those responsible for the operation and maintenance of projects in which the federal government retains an interest. Several outside agencies, such as the International Joint Commission and the Prairies Provinces Water Board which are engaged in planning major works in large river basin developments of interprovincial or international scope, are also assisted.

Specialized engineering units supply extensive services in investigation, planning, hydrology, design, geology, air surveys, soil and materials evaluations and construction.

One special project office is located at Lethbridge to administer the Alberta Irrigation Rehabilitation Program, and another at Cutbank to maintain the South Saskatchewan River Project. The Geotechnical Division is located on the University of Saskatchewan campus at Saskatoon, while all other specialized divisions are headquartered in Regina.

PFRA's major irrigation, reclamation, water storage and municipal works projects are summarized in Appendix V.

MAJOR PROJECTS

Alberta Irrigation Rehabilitation Agreement

Only minor construction activity took place on the Brooks Aqueduct replacement program. However, the largest contract required to complete the structure was awarded, with work to begin on embankment construction early in the new fiscal year.

South Saskatchewan River Project

Staff of the PFRA Geotechnical Division carried out the on-going testing and maintenance program at the Gardiner and Qu'Appelle River dams. This work will be undertaken by PFRA until the end of the 1978-79 fiscal year when responsibility for this activity will be assumed by Saskatchewan as specified in the original agreement for construction and maintenance of the project.

Water in the reservoir created by the two dams peaked in September. Water control was provided by releases through the power generating facility at Gardiner Dam, smaller releases through the Qu'Appelle River Dam to maintain lake levels in the Qu'Appelle Valley and via the irrigation pumping facility on the east side of the reservoir. The spillway was not used during the year.

Painting of the spillway gates was begun. A deep well was drilled and a new sewer and water system was installed at the headquarters complex. Normal instrumentation observations were carried out and one slope hole and four piezometers were installed. The townsite at the dam was returned to PFRA jurisdiction from the Province of Saskatchewan. By agreement, some of the buildings will be retained by the province and Canada will be compensated for them. Some of the houses will be utilized by PFRA in its community pastures program. The balance of the buildings which are not required for the operation of the project will be turned over to the Department of Public Works for disposal.

REGIONAL OFFICES

The regional offices of the Engineering Service are located at Winnipeg, Regina and Calgary, with a sub-office of the Saskatchewan Regional Division at Swift Current. These offices perform a wide variety of services including field surveys and investigations, cost and design studies, construction supervision and report preparation related to these activities. In addition, regional offices provide a planning service and supervision of repairs, renovations, and maintenance of existing structures. They render services to other PFRA offices, assist in DREE programs such as the Agricultural Service Centres program, and are involved in other federal and provincial activities.

Manitoba Region

In April 1976, floods, with peak flows of more than twice those previously recorded, occurred on the Souris and Assiniboine rivers and extensive flooding resulted along the Souris River. Along the Assiniboine, however, the Shellmouth Dam and Portage floodway, together with the diking system, handled the 48 000-cubic-feet-per-second flow with only minor flooding taking place. Additional field surveys were made to update the topographic information on the dikes. The report: "The Status of Physical Works and Land Control, Assiniboine River Diking System" was revised to reflect these changes.

An engineering investigation for a proposed water supply source for the village of Plum Coulee was completed. Most of the work consisted of revisions to the text of the report and the preparation of report drawings.

During the year under review, the regional office obtained additional topographical data needed to finalize design of the Grandview Dam and prepared detailed land acquisition plans. Treasury Board authority for construction of this dam, as well as the Gilbert Plains Dam, was received.

The Swan River Dam project involved a study of the feasibility of constructing a dam near the town of Swan River to reduce unfavourable icing conditions in the river channel and to increase the recreational potential of the river. The engineering investigations were completed and a draft report submitted.

The Vermilion damsite, located on the Vermilion River about 14 miles southwest of Dauphin, was recommended as the most feasible of several alternatives investigated by PFRA as a municipal water supply source. Construction started in February 1977 when a contract was awarded for reservoir clearing. Clearing was largely completed by the end of the fiscal year. A contract of more than \$2 000 000 for the main works was also awarded, with work to begin in April 1977. The rolled earthfill dam will have a maximum height of 56 feet and a length of 2 000 feet. It will have a reinforced concrete spillway and riparian outlet works with concrete inlet and gateway structures. Construction is scheduled for completion in 1978.

In response to a request from the Department of Northern Saskatchewan, PFRA agreed to investigate the engineering feasibility of regulating the levels of Cumberland Lake in Saskatchewan. The Manitoba regional office carried out a reconnaissance survey of the area, obtained horizontal and vertical field control for photogrammetric mapping of the study area, tied in drill hole locations, and

obtained cross sections of the Saskatchewan River at the proposed dam location.

A 50-acre-foot reservoir on Edwards Creek, about eight miles south of Dauphin, serves as this town's water supply. During an exceptional storm in September 1975, the dam was impaired and the reservoir was almost filled with sediment. This damage was repaired and the reservoir restored to short-term service while the division prepared a draft report indicating improvements required to restore it to long-term service. These included a flood flow frequency analysis, a sedimentation evaluation, hydraulic structures design and preparation of cost estimates.

PFRA was requested by the Manitoba Department of Mines, Resources and Environmental Management to review and update its 1956 report which described several alternatives for alleviating flooding in the agricultural lands northeast of Riding Mountain. A report of the investigations and results was subsequently submitted to the Province of Manitoba.

Acting on another request from Manitoba, PFRA obtained topographic information in addition to what was already available from previous engineering studies of the Whitewater Lake area. Office studies of five diversion routes under three different operating conditions were carried out and a report submitted to the province. Their objective was to determine the most feasible method of draining excess water from the lake, which was at an unprecedented high level and was flooding surrounding agricultural land. A report was submitted.

The Wilson Creek experimental watershed was again evaluated in 1976. It was first studied in 1957 to determine the causes of frequent flooding and sediment deposition on agricultural lands along the Manitoba escarpment. Torrential rains in September 1975, which deposited 12 inches of moisture on the watershed, provided an unusual opportunity to further study the transport of sediment in the creek. Topographic surveys, made shortly after the storm, were plotted cross-sectionally to determine erosion and deposition volumes. The findings were summarized in a report submitted to the Wilson Creek Headwater Flood and Erosion Control Committee.

Under the Agricultural Service Centres program, PFRA administers consulting and construction contracts, and provides resident engineering and inspection services during construction. The Manitoba portion of the program has now reached the midpoint in terms of time and expenditure of funds. Eleven of the 16 eligible centres have entered into agreements for the design and construction of water and waste disposal works.

At Altona, a contract for water and sewer extension was completed, and at Beausejour an addition to the water treatment plant was built. A water booster station was completed this year at Dauphin and a contract was awarded for construction of a pumphouse at the site of the Vermilion Dam. The contract for a water treatment plant at Portage la Prairie was also awarded, while at Selkirk contracts for a sewage pumping station and treatment plant were retendered and awarded. A contract to build a forcemain between the pumping station and treatment plant, as well as trunk collector sewers, was also awarded. Although the water supply system was completed it was not in operation at year end. At Steinbach, water and sewer extension contracts were awarded, while the sewage treatment works at Swan River were completed and put into operation. Contracts for sewer and water mains and sanitary trunk sewers were also awarded and completed. At Swan River, where a supply contract for storm sewers was awarded, some of the pipe was delivered and stockpiled.

The regional office checked and revised plans for several small water projects submitted by the PFRA Water Development Service. It also erected signs for several DREE incentive and infrastructure projects, and for other work.

Saskatchewan Region

Spring runoff in 1976 was unusually heavy in some areas of the southwest and throughout the southeast part of Saskatchewan. Record flows were recorded in parts of the Souris River basin. Monitoring the operation of a number of projects and areas was undertaken by the regional office during the flooding period.

Operations associated with the control and distribution of water in the Qu'Appelle Valley continued. The Qu'Appelle River operation involved the release of 28 630 acre-feet of water from Diefenbaker Lake into the river system, a slight increase from the previous year. At the close of the fiscal year, the lakes in the Qu'Appelle system were generally near or slightly below normal operating levels.

A substantial part of the Saskatchewan regional office's work was related to administration and the provision of engineering services to the Agricultural Service Centres program.

There are 26 designated centres in Saskatchewan under the ASCA for upgrading municipal water and waste disposal facilities. During the last fiscal year,

supply and construction activities were under way at 18 of these centres. The work of the regional office involved engineering investigation and preparation of reports; planning, preparation and processing of subsidiary agreements; arranging for and administering engineering consultant service contracts; and administering and supervising supply and construction contracts for each centre.

The fiscal year under review saw the completion of improvement programs at two centres, Assiniboia and Wynyard, which included the completion of a large water supply reservoir at Assiniboia. Water supply reports were completed and submitted for Weyburn, Melville and Melfort, while water supply studies continued for Humboldt and Canora. Studies were also undertaken on a drainage problem related to sewage facilities at Unity and the renovation of a dam at Kindersley.

Surveys and preliminary engineering studies were undertaken for several community water projects, a number of which were requested by the Province of Saskatchewan relating to water supply and demand problems at Grenfell, Ceylon and Kerrobert. An engineering report was submitted to the province on Kerrobert, and studies on Grenfell and Ceylon continued. Special reports were prepared on sedimentation in the Weyburn reservoir and on proposed rights-of-way revisions around the Highfield reservoir. Studies were being undertaken on flood and drainage problems in the area of the West Osage Ditch at the end of the year.

Regional office personnel worked on 12 projects for the PFRA Tree Nursery at Indian Head. These covered surveys for drainage ditches, irrigation piping layout and other miscellaneous problems.

The Swift Current district regional office provided engineering supervision for the operation and maintenance of six PFRA irrigation projects in southwest Saskatchewan. During the year, surveys were undertaken on 1 700 acres to evaluate the feasibility of land levelling operations. About 1 000 acres were levelled, and an additional 1 000 acres regraded. Border dike systems were staked for 780 acres. Office work continued on all six projects and on the monitoring of supply reservoirs. A five-year land levelling program on the Rush Lake project was completed. An upgrading of the Maple Creek Supply "B" and laterals was completed as well as the rehabilitation program on the Val Marie project. About 30 miles of supply ditches and more than five miles of drains were surveyed and 60 small control structures placed throughout the irrigation projects. In addition, 530 linear feet of culvert were installed. The Bitter Lake Bull Station and

the Demonstration Farm at Outlook received engineering assistance on irrigation works.

The regional office also supervised repair work on the concrete spillway chutes and drainage systems at both the Laffèche and Gouverneur dams.

At the request of the Saskatchewan DREE office, regional staff evaluated and prepared progress reports on the construction of the Weyburn inland terminal grain-handling complex which has now been completed.

Alberta Region

In support of the PFRA Water Development Service, the Alberta regional office reviewed 265 plans, made revisions as required, and prepared them for submission to provincial licensing authorities. In four instances it was necessary to conduct field inspections of completed projects. Detailed designs also were provided for a concrete chute spillway associated with a project for the Hutterite colony at Veteran and a drop inlet spillway for a private dam near Pincher Creek.

Throughout the year, activity continued on works at several communities under the Canada-Alberta Agricultural Service Centres Agreement. The Alberta office is responsible for administration and supervision of construction and was assisted by the Alberta special projects office. At Barrhead, a 900 000-gallon clear water reservoir was constructed, and a contract for a river intake supply line, pumphouse and pressure reducing station was awarded. Meanwhile, at Hanna, all work has been completed on the Fox Lake storage reservoir and the Bullpound Creek diversion. At Leduc, a contract for a supply line was completed except for minor cleanup, while another supply line contract at Redcliff was also completed. A second contract for construction of a river intake and pumphouse has been reviewed and recommended for approval. A water treatability study of the Big Lake supply source was undertaken for the town of St. Albert. Five contracts were completed at Taber related to the construction of a 2 000 000-gallon raw water reservoir, a supply line, extension of a treatment plant, a clear water reservoir and slope protection. A contract for a building to house controls was close to completion.

A report dealing with construction on the Peace-Athabasca delta project was prepared and submitted. This concerned work by PFRA on the installation of a walkway and winch at a boat tramway. For another special project, a construction report was prepared and submitted on the Western Irrigation District Headworks at

Calgary under the Canada-Alberta Irrigation Rehabilitation Agreement.

A study to examine alternative water supply sources for the Stoney Wilderness Centre on the Stoney Indian Reserve west of Calgary was undertaken and a report was prepared and submitted to the Department of Indian Affairs and Northern Development. Another study, to determine the feasibility of a number of alternatives for replacement of the West Arrowwood siphon on the Bow River irrigation project is underway.

At the site of the proposed Eyremore reservoir on the Bow River near Bassano, a study was conducted on land use and reservoir costs. Regional office staff also carried out field surveys for vertical and horizontal ties for test drill holes.

At the request of Alberta Environment, the Lethbridge northern irrigation canal was surveyed.

Snow and water content surveys were continued in various parts of the province.

Late in the fiscal year, the Alberta special projects office at Lethbridge was amalgamated with the regional office.

TECHNICAL DIVISIONS

Design Division

Under the Alberta Irrigation Rehabilitation Program, a contract was awarded for the construction of a canal embankment crossing to replace the existing Brooks Aqueduct. Work continued on final designs for the concrete structures associated with the replacement works. All work concerned with the design and construction of Carseland Dam and the Western Irrigation District Headworks was completed, as was the preparation of operation and maintenance manuals which were forwarded to the Province of Alberta. With the exception of a review of replacement alternatives and cost estimates, little work was performed on Bassano Dam.

The division was involved in a number of engineering studies during the year, the most extensive of which were the Coronach area water supply study and the Eyremore damsite study. Other studies involved

Cumberland Lake, Double Bar L Ranch, Eastern Irrigation District storages, Frenchman River, Grenfell community water supply, Kerrobert water supply, Souris River basin, Riding Mountain watershed and Whitewater Lake.

Under the Agricultural Service Centres program, designs, drawings and specifications for 38 contracts were reviewed and tendered. Seven others were reviewed but not tendered.

A wide variety of engineering activities ranging from preliminary investigations to detailed designs were carried out for Gouverneur Dam, Coronach Dam, Vermilion Dam, Gardiner Dam, St. Mary spillway, Grandview Dam, Melville Dam, Oxbow — Carnduff, Roughbark Dam, Dauphin water supply, Bow River project, Indian Head Tree Nursery and the Moose Jaw service depot.

The Drafting Section produced all the working drawings, charts and illustrations required to support the work of the division, and provided similar assistance to other services within PFRA and other federal government departments.

Geology and Air Surveys Division

Geological studies, photogrammetric mapping and air photo interpretation studies were completed during the fiscal year to support water resource investigations, Agricultural Service Centres programs, and community pasture improvement programs.

In Saskatchewan, studies supporting an engineering investigation to determine the feasibility and means of controlling the level of Cumberland Lake were undertaken. These involved an examination of the subsurface geology and distribution of surface materials in the vicinity of possible sites for control structures along the river channels draining the lake. Existing topographical data were compiled and reviewed and the area-capacity relationship for the lake and adjacent low-lying areas was developed.

Site selection studies and related geologic mapping and photogrammetric mapping of sites and reservoir areas were carried out on the Middlefork and on Beaver Creek of the Poplar River system as part of the first stage of an engineering investigation of major water supplies in the Coronach area. During the second stage of this investigation, geologic mapping and photogrammetric mapping of sites and reservoir areas were completed as part of site selection studies along the Wood River. In addition, air photo interpretation of near-surface geology and related hazards was completed for several pipeline and canal routes under consideration in this investigation.

In Alberta, detailed stratigraphic studies, involving a test hole investigation and mapping of the surficial geology, were undertaken as part of an overall investigation of the Eyremore site on the Bow River to determine the technical feasibility and cost of a high dam at that location.

A study of the factors controlling the rate and amount of shoreline erosion on reservoirs in the prairies was begun to assist in the assessment of this hazard as part of site-selection studies.

Geological reconnaissance and terrain analysis of community pastures in Saskatchewan were continued, with preparation of the soils, geology and drainage series of pasture maps.

Large-scale air photo mosaics and enlargements were prepared for the Water Development Service to assist in the planning and investigation of small projects.

Geotechnical Division

The Geotechnical Division of the PFRA Engineering Service is located in the Peterson Soil Mechanics Building on the University of Saskatchewan campus at Saskatoon. As a specialist division, it is responsible for engineering studies of soils, concrete and other materials used in the construction of water development projects.

During the fiscal year, the division worked on 84 engineering studies involving 48 project studies and 36 research, testing and evaluation studies. The project studies ranged from development of water wells to geotechnical studies for provincial departments. In this respect, the Saskatchewan Department of the Environment requested PFRA to investigate four reservoir sites in the Coronach area and the Alberta Department of the Environment requested geotechnical studies of a site on the Bow River at Eyremore. Investigation, design and construction control work was also performed under the Agricultural Service Centres Agreements.

Research studies varied from a short-term study of filter fabrics to the continuing study of the residual shear strength of clay-shales.

Of the total 84 engineering studies, 45 were completed and 39 were in progress. One hundred and fifty plans were prepared in connection with these studies. An additional 64 charts, drawings and maps were prepared for DREE Western Region headquarters in Saskatoon.

A total of 12 827 linear feet of test hole drilling was carried out at 32 sites, and 3 395 soil samples were recovered. In the laboratory, 18 454 tests were per-

formed on samples of soil, bedrock, concrete, cement, aggregates and construction materials.

Hydrology Division

The Hydrology Division performs studies for other operational divisions of PFRA. In the past year it has also done similar studies for other federal and provincial departments and private agencies. Three such studies were completed in the current year.

The Frenchman River study evaluated the ability of three existing Frenchman River reservoirs and seven additional reservoir sites on the Frenchman River to provide sufficient water to meet present and future basin needs.

The second important study determined the ability of the Bow River below Calgary to meet present and future irrigation requirements of the Western Irrigation District, Bow River Irrigation District and the Eastern Irrigation District.

The third study analyzed local water supply potential and feasible importation alternatives for the Coronach area.

Initial studies for the Souris River Basin Study Board, involving determination of monthly natural flow at 40 key sites, have been completed, as have the flood hydrology and water supply hydrology portions of the study. Current work is centred on an evaluation of the various water supply projects and flood damage reduction proposals.

Considerable time was also spent working on the Cumberland Lake study. The work, initiated in answer to a request from the Department of Northern Saskatchewan, will determine ways to raise seasonally low levels of Cumberland Lake while minimizing additional flooding.

Memoranda reports were prepared on two ongoing programs of the Hydrology Division. The first, spring runoff measurements at 16 small dams, provided additional information on how lesser reservoirs on small watersheds react to spring runoff. The second, the measurement of ice thickness in dugouts, will improve the ability of field officers and designers to forecast thickness and variability of ice formation.

The division answered 90 minor study requests dealing with water supply and flood problems in such communities as Kindersley, Esterhazy, Grandview, Mayfair and Stephenfield. Although these studies take a limited time to complete, they are an important part of the service furnished to urban and rural water users.

From 80 to 90 per cent of all work done in the Hydrology Division of PFRA is now based on computerized techniques and data. Effective use of computers by the staff forms the key to a continuing ability to process large volumes of work and to provide accurate estimates for hydrologic studies in the prairie region of Canada.

Legal Surveys Division

All surveys, except for one contract on the Brooks Aqueduct, were performed by division personnel. Field surveys completed consisted of rights-of-way, re-subdivisions, road diversions, retracements, re-establishments or horizontal and vertical control surveys in connection with the Coronach water supply study; towns of Nipawin and Unity; city of Regina; Ituna Bon Accord, Kahkewistahaw and Montrose community pastures; McDougald, Weyburn, Highfield, Tenaille Lake and Cadillac reservoirs; and the Eastend, Maple Creek and West Osage irrigation projects.

Office activities included plotting, drafting, calculating and processing all plans for registration in the provincial land registration system. Other tasks involved the preparation of land control requirements and related procedures as well as performing vertical, horizontal and complex computerized computations and related work concerning control surveys for photogrammetric mapping. The division approved or prepared 301 descriptions, related sketch plans and computations for easements, sale agreements, assignments and submissions.

ADMINISTRATION AND PROGRAM SERVICE

The Administration and Program Service supports the program activities of PFRA through internal management and special program-related services. These services are administered through five divisions: Finance, Information, Land Administration, Accident Prevention, and General Administration.

FINANCE DIVISION

In exercising financial control and reporting of all PFRA expenditures and revenue, this division is concerned with commitment control, pre-audit, classification and payment of all accounts, and the processing of pay for approximately 1 200 casual employees.

The co-ordination and preparation of program forecasts and main estimates is another responsibility of the division, as well as input of budget data into the Department of Supply and Services computer system together with continual monitoring.

In order to provide more effective and current information, and to reduce the number of small accounting systems throughout PFRA, emphasis during the past year has been on attempting to change the concept of the division from one strictly of control, to one of control and financial information services.

INFORMATION DIVISION

The Information Division continued to provide a full range of technical support services and was also involved in several functions of a less usual nature. Chief

among these were the preparations for celebrating the 75th Anniversary of the PFRA Tree Nursery, later in 1977. Special stickers, lapel buttons and a bronze plaque were being designed and a prestige brochure was being prepared for the occasion. The division participated in the development of special displays and arrangements for dedication ceremonies at the nursery.

In addition to the preparation of news releases, the production of short films and scripts, and the routine accumulation of photographic material, assistance was given to other government agencies ranging from the provision of pictorial material to the editing and narration of sound-slide presentations. An informative calendar was produced for community pasture managers.

The audio-visual component procured and utilized stills and movies for information and documentary purposes, and continued to provide technical services in support of PFRA programs using specialized photographic techniques.

LAND ADMINISTRATION DIVISION

In continuing its responsibility for the acquisition and disposition of lands associated with the operation of the PFRA program, the Land Administration Division completed a number of transactions. The most significant transfer involved about 6 845 acres of land in 45 parcels which have been leased, and otherwise utilized, by PFRA since the 1940s. The land was acquired at the time that farmers were resettled from submarginal land, mainly in Saskatchewan, to the Bow River irrigation project in Alberta. Much of the land abandoned when farmers were moved to the irrigation development was turned into community pastures and is still operated for that purpose by PFRA. The 45 parcels of land which, because of unit size or location, could not be efficiently developed for pasture use were declared surplus to PFRA requirements and were turned over to the federal Department of Public Works for disposition.

The division continued its functions of appraisals, negotiations and the preparation of Treasury Board and Privy Council submissions, together with completing easements, administering all lands, completing

exchanges and maintaining land and real property inventories for PFRA.

A summary of the PFRA land inventory as of March 31, 1977, is shown in Appendix VI.

ACCIDENT PREVENTION DIVISION

A new long-range accident prevention concept was tested throughout the year under review with good results. The key to the new program is employee interest and involvement on a voluntary basis in the preventive aspect of safety. Outstanding co-operation from all sectors has created a much improved situation throughout PFRA. Although the total number of injuries was up two per cent, the success of the program is perhaps best reflected in the production-days-lost category which decreased by 32 per cent. Despite the increased cost of accident insurance and medical and hospital care, the net total insured costs dropped 12 per cent.

The success of the new program has indicated that it should be continued and expanded. It has demonstrated that its participatory aspect is of major importance in helping to overcome the problems created by the geographic dispersion of PFRA and the diverse occupational requirements of the organization.

GENERAL ADMINISTRATION DIVISION

The General Administration Division provides a wide variety of administrative services to the organization through four sections.

General Services Section

Major renovation of PFRA headquarters in the Motherwell Building has required a sustained effort by the General Services Section in co-ordinating the orderly movement of personnel and equipment to facilitate the one-floor-at-a-time renovation process. Thus far, the program has proceeded smoothly with no loss in services.

The section has also continued to provide support though the operation of a typing and transcribing unit, records management facility, office and technical stores, and duplication, telecommunication and data services.

Materiel Management Section

This section provides a central service for the direct requisition and purchase of materials and equipment through the Department of Supply and Services. It operates a construction materials supply depot, and provides related services such as the preparation of purchase specifications, cataloguing, vehicle and equipment inventory control and the disposal of movable property.

The value of materials purchased during the year exceeded \$3 million. An average inventory of \$122 000 was maintained in the construction materials supply depot. Total stock issues were valued at \$383 000. At the end of the year, equipment inventory records listed 10 974 items with a total book value of \$6 588 958, in addition to 380 motor vehicles with a book value of \$1 882 886.

During the year, the section completed the conversion of all equipment distribution records to an improved electronic data processing control system, and developed improved procedures covering the disposal and write-off of material. Vehicle accident reporting procedures were also amended.

Management Services Section

This section continued to provide advisory services to, and recommendations for improvement of PFRA management through the study of management and operational problems. Organization analysis, systems and procedures studies, feasibility studies for data processing applications, forms design and control, and the efficiency evaluation of office equipment continued to be main areas of activity.

A study of PFRA Tree Nursery operations was completed and some procedure recommendations were implemented.

Considerable emphasis is currently being placed on the development and maintenance of a policy and procedures program and a forms management program.

Library Section

The continual upgrading of library materials and methods was evident during the year as more than 900 titles were catalogued, bringing to approximately 7 000 the number of titles now under catalogue control. The use of automated search systems continued to increase and shared library services were again made available to PFRA and other federal agencies. The periodicals routing system experienced an increased demand to the point where the system is now overloaded, with 27 000 transactions completed. During the year under review, the library disposed of 625 reference questions, made 210 inter-library loans and 469 loans from the PFRA library.

APPENDIX I

PFRA EXPENDITURES BY ACTIVITIES

Includes Operation, Maintenance and Capital Funds
1935 — March 31, 1977

	1976-1977	1935-1977
ADMINISTRATION		
Regina, Administration	\$ 1 602 010	\$ 16 030 147
LAND USE SERVICE		
Cultural Work — Soil Drifting, etc. (Exp. Farm Service)	—	4 966 394
Community Pastures — Construction, Operation and Maintenance	7 806 563	82 776 103
Movement of Settlers	—	227 841
WATER DEVELOPMENT SERVICE		
Supervision, Individual Dugouts, Wells, Community Large Water Storage and Irrigation Projects	4 924 579	90 397 189
Equipment — Purchase and Repairs, Service Depot	1 766 687	25 293 790
Tree Nursery Station	1 134 380	9 735 235
Bow River Irrigation Project	—	47 353 798
ENGINEERING SERVICE		
Surveys, Design, Geotechnics, Drainage Studies, Legal Surveys, Supervision of Construction	4 650 472	62 631 597
St. Mary Irrigation Project	—	33 928 864
South Saskatchewan River Project	215 343	138 442 683
Assiniboine River Diking	—	1 743 773
Shellmouth Dam and Portage Diversion	16 975	14 773 535
B.C. Reclamation and Development, including Lillooet Project	—	3 310 182
Land Protection and Reclamation, Manitoba and Eastern Canada	—	4 136 021
Alberta Irrigation Rehabilitation	58 824	18 476 442
Agricultural Service Centres	3 960 720	12 658 523*
Vermilion Dam and Reservoir	40 231	40 231
Miscellaneous Projects — Construction	—	5 472 771
	<u>\$26 176 784</u>	<u>\$572 395 119</u>

PFRA REVENUES BY ACTIVITIES, 1935 — 1977

Community Pasture Operations	\$ 3 584 175	\$ 37 989 004
Irrigation Project Operation and General Revenue	1 252 337	24 065 862
	<u>\$ 4 836 512</u>	<u>\$ 62 054 866</u>

*This figure does not include loans which were included in 1975-76 report.

APPENDIX II
DEVELOPMENT AND OPERATION OF PFRA COMMUNITY PASTURES
1938 — 1977

<i>Fiscal Year</i>	<i>Operating Pastures</i>	<i>Total Acreage in Pastures</i>	<i>Total Construction Costs \$</i>	<i>Livestock Units Pastured</i>	<i>Acres Per Livestock Unit</i>	<i>Revenue \$</i>	<i>Operating Costs* \$</i>	<i>Stock Unit Operating Cost \$</i>	<i>Unit Cost To Patron \$</i>	<i>Municipal Tax Levy Paid**</i>
1938 - 39	14	189 800	165 995	3 231	58.7	6 340	10 186	3.15	1.96	—
1948 - 49	54	1 436 480	2 486 277	71 393	20.1	204 012	175 666	2.46	2.86	—
1958 - 59	62	1 815 265	5 509 958	117 032	15.5	542 607	686 449	5.87	4.64	—
1968 - 69	88	2 382 456	11 543 616	172 629	13.8	1 570 652	1 554 688	9.01	9.10	170 000
1969 - 70	88	2 386 799	12 465 226	172 624	13.8	1 652 165	1 666 223	9.65	9.57	160 959
1970 - 71	90	2 431 784	13 469 740	182 689	13.3	1 754 194	1 900 158	10.40	9.60	162 974
1971 - 72	93	2 430 940	14 227 399	205 611	11.8	1 954 604	2 002 379	9.74	9.51	176 435
1972 - 73	94	2 431 420	14 878 288	216 708	11.2	1 912 347	2 368 818	10.93	8.82	182 373
1973 - 74	95	2 419 100	15 798 792	234 488	10.3	3 217 128	3 014 999	12.86	13.72	182 680
1974 - 75	95	2 409 220	19 110 434	242 176	9.9	3 116 880	3 549 388	14.66	12.87	188 854
1975 - 76	96	2 405 392	21 549 400	250 532	9.6	3 712 383	4 238 348	16.92	14.82	191 755
1976 - 77	96	2 240 447	23 809 123	241 135	9.4	3 584 175	4 337 671	17.99	14.86	200 662
Totals 1938 - 77						37 989 004	38 989 154			

* Includes direct operating costs only. Does not include supervision, capital and overhead.

** 1963-64 was the first year the tax was levied.

N.B. Detailed annual figures for years 1938 through 1968 are available in the 1975-76 PFRA Annual Report.

APPENDIX III
 SERVICES PROVIDED BY WATER DEVELOPMENT DIVISION
 1976 — 1977

Agency	Dugout		S.W.D.			Irrigation				Drainage			Community Projects					Wells		Other		
	Technical Investigation	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Report	Final Inspection	Technical Investigation	Final Inspection	Other Services	Total Services			
PFRA Program	683	1 365	594	184	148	103	1 140	388	322	111	144	70	—	252	11	9	2	7	403	5 807	628	12 371
Federal Request	3	—	—	—	—	—	1	—	—	—	1	1	—	—	—	—	—	—	1	—	23	30
Provincial Request	18	—	108	57	52	—	171	30	30	1	40	6	4	9	8	6	—	9	—	—	73	622
Municipal Rural-Urban	—	—	1	—	—	—	2	1	—	—	10	2	—	6	1	1	—	—	1	—	13	38
Other Groups or Individuals	—	—	—	—	—	—	—	1	—	—	32	6	1	1	—	—	—	—	—	—	14	55
TOTAL	704	1 365	703	241	200	103	1 314	420	352	112	227	85	5	268	20	16	2	16	405	5 807	751	13 116

Total capital expenditure on individual projects — \$2 603 059.19

Total capital expenditure on small community projects — \$27 901.79

APPENDIX IV
 WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID
 1935 — 1977

	<i>Dugouts</i>		<i>Stockwatering Dams</i>		<i>Irrigation Schemes</i>		<i>Wells</i>		<i>Total</i>	
	<i>Number Completed</i>	<i>Assistance \$</i>	<i>Number Completed</i>	<i>Assistance \$</i>	<i>Number Completed</i>	<i>Assistance \$</i>	<i>Number Completed</i>	<i>Assistance \$</i>	<i>Number Completed</i>	<i>Assistance \$</i>
MANITOBA										
Individual	19 469	2 964 661	362	35 810	361	154 596	5 123	1 430 857	25 315	4 585 924
Neighbour	77	21 852	18	6 445	24	15 408	—	—	119	43 705
Small Community	44	135 585	25	134 402	2	30 583	—	—	71	300 570
TOTAL	19 590	3 122 098	405	176 657	387	200 587	5 123	1 430 857	25 505	4 930 199
SASKATCHEWAN										
Individual	56 769	9 386 355	6 232	763 157	3 680	1 106 296	6 947	2 476 654	73 628	13 732 462
Neighbour	433	137 580	65	15 041	207	128 357	—	—	705	280 978
Small Community	593	1 150 653	225	1 169 530	74	697 439	—	—	892	3 017 622
TOTAL	57 795	10 674 588	6 522	1 947 728	3 961	1 932 092	6 947	2 476 654	75 225	17 031 062
ALBERTA										
Individual	20 763	4 127 667	4 407	665 895	1 782	568 261	9 026	3 071 887	35 978	8 433 710
Neighbour	68	26 956	18	7 108	34	20 110	—	—	120	54 174
Small Community	231	634 860	131	839 371	68	752 421	—	—	430	2 226 652
TOTAL	21 062	4 789 483	4 556	1 512 374	1 884	1 340 792	9 026	3 071 887	36 528	10 714 536
GRAND TOTAL	98 447	18 586 169	11 483	3 636 759	6 232	3 473 471	21 096	6 979 398	137 258	32 675 797

APPENDIX V
 MAJOR PROJECTS — IRRIGATION, RECLAMATION, WATER STORAGE AND MUNICIPAL WORKS¹
 1935 To March 31, 1977

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs \$</i>
MANITOBA						
Assiniboine River Diking and Cut Offs	Brandon and Portage la Prairie to Baie St. Paul	Flood Control	Not Yet Complete	—	—	1 743 773
Northwest Escarpment Reclamation Project — Riding Mt. Area	Dauphin Area	Flood Control	1966	—	—	1 313 103
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287 751
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	1960	—	—	2 256 388
Shellmouth Dam and Portage Diversion	Shellmouth and Portage la Prairie	River Control	1970	—	390 000	14 773 535 ²
Agricultural Service Centres	16 Communities	Water and Sewer	Not Yet Complete	—	—	4 288 362 ³
The Pas Indian Reserve	The Pas	Water, Sewer and Roads	1975	—	—	1 099 744
Vermilion Dam and Reservoir	Dauphin	Water Supply	Not Yet Complete	—	—	40 231 ²
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-Purpose	1969	350 000 (potential)	7 600 000	120 126 759 ⁴
Buffalo Pound Project	Qu'Appelle Valley	Water Supply	1960	—	42 000	2 293 145
Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	—	—	98 376
Agricultural Service Centres	26 Communities	Water and Sewer	Not Yet Complete	—	—	6 117 601 ³

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs \$</i>
ALBERTA						
Bow River	Vauxhall	Irrigation	—	235 000	408 862	—
(a) Purchase of Canada Land & Irrigation Company	—	—	—	—	—	2 353 517
(b) Development and Construction	—	—	1974	—	—	24 941 316
St. Mary	Lethbridge	Irrigation		300 000	460 000	25 160 993
Sawridge Creek	Slave Lake	Flood Control	1973	—	—	248 377
Alberta Irrigation Rehabilitation	3 Projects	Irrigation	Not Yet Complete	—	—	18 465 663 ⁵
Agricultural Service Centres	13 Communities	Water	Not Yet Complete	—	—	2 192 765 ³
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation	1951	629	2 000	185 491
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98 243
Lillooet — Pemberton	Pemberton	River Control	1953	—	—	1 056 539
Westbank Project	Kelowna	Irrigation	1950	1 200	2 500	537 450
Penticton West Bench	Penticton	Irrigation	1953	800	—	66 362
B.C. Fruitlands	Kamloops	Irrigation	1966	2 000	—	200 000
Figures do not include operation and maintenance expenditures.						

¹ Funds for certain of these projects were provided by special votes of Parliament.

² Canada's share only.

³ Grants only — does not include loans of equal amounts.

⁴ Includes \$25 000 000 Province of Saskatchewan contribution.

⁵ Includes grants to Province of Alberta of \$3 500 000 for secondary works and \$6 200 000 associated with the turnover of Canada's interest in the Bow and St. Mary Rivers.

APPENDIX VI

SUMMARY OF LAND INVENTORY TO MARCH 31, 1977

	Title	Reservation, Order-in-Council, Lease, Easement (acres)	Total
I. WATER DEVELOPMENT SERVICE			
A. <i>Water Conservation</i>			
	Manitoba	1.3	—
	Saskatchewan	10 440.9	821.0
	Alberta	107.6	563.4
B. <i>Irrigation Projects</i>			
	Southwest Saskatchewan	48 483.3	425.1
C. <i>Tree Nursery</i>			
	160.0	480.0	640.0
D. <i>Demonstration Farm</i>			
	169.5	—	169.5
	<u>59 362.6</u>	<u>2 289.5</u>	<u>61 652.1</u>
II. LAND USE SERVICE			
A. <i>Community Pastures</i>			
	Manitoba	4 744.4	409 809.8
	Saskatchewan	1 236 714.5	576 036.0
	Alberta	—	13 142.0
	<u>1 241 458.9</u>	<u>998 987.8</u>	<u>2 240 446.7</u>
III. ENGINEERING SERVICE			
A. <i>Assiniboine River Diking</i>			
	1 121.6	55.2	1 176.8
	<u>1 121.6</u>	<u>55.2</u>	<u>1 176.8</u>
IV. MISCELLANEOUS			
A. <i>Hydrometric Site</i>			
	10.0	—	10.0
B. <i>Service Depots</i>			
	24.5	0.5	25.0
C. <i>Bow River Exchange Lands</i>			
	723.0	—	723.0
	<u>757.5</u>	<u>0.5</u>	<u>758.0</u>
SUMMARY			
I.	Water Development Service	59 362.6	2 289.5
II.	Land Use Service	1 241 458.9	998 987.8
III.	Engineering Service	1 121.6	55.2
IV.	Miscellaneous	757.5	0.5
	<u>1 302 700.6</u>	<u>1 001 333.0</u>	<u>2 304 033.6</u>

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