

Water Resources Survey

RECORDS
MANAGEMENT
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Part I:
HISTORY OF LAND AND WATER
USE ON IRRIGATED AREAS

and

Part II:
MAPS SHOWING IRRIGATED
AREAS IN COLORS DESIGNAT-
ING THE SOURCES OF SUPPLY

Pondera County. Montana

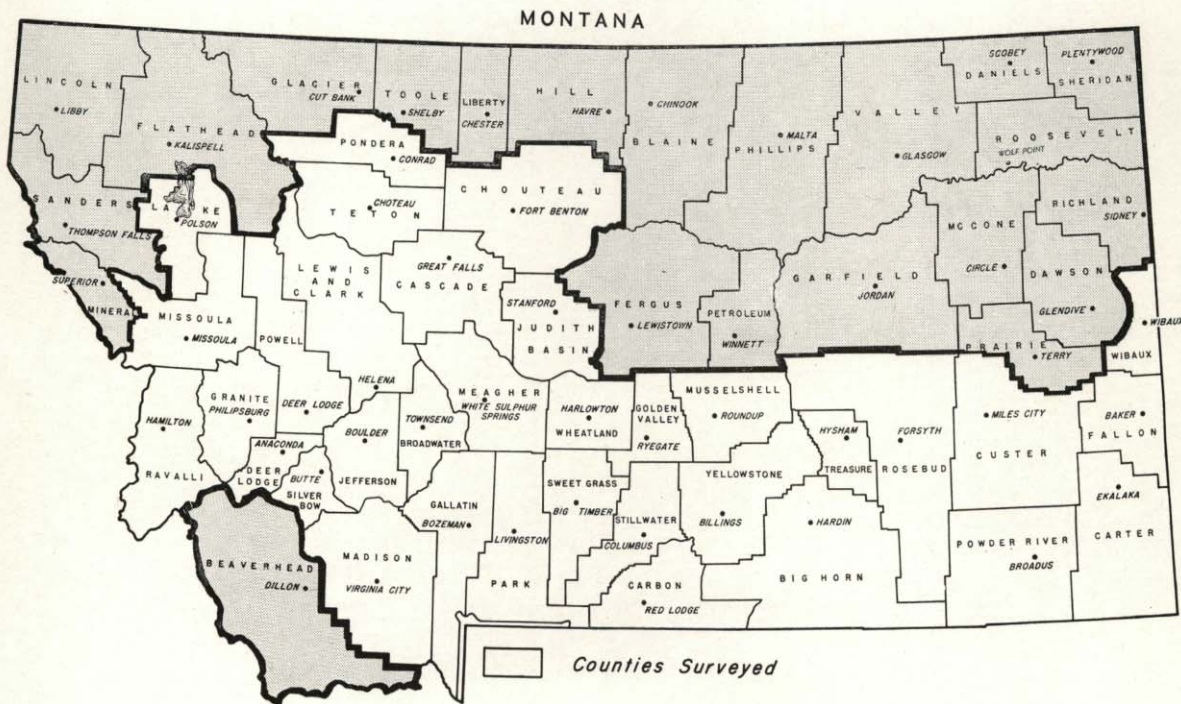
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Helena, Montana, June 1964

WATER RESOURCES SURVEY

PONDERA COUNTY MONTANA

Part I

History of Land and Water Use on Irrigated Areas



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June, 1964

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Water Resources Survey and Publication of County Reports

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Honorable Tim M. Babcock
Governor of Montana
Capitol Building
Helena, Montana

June, 1964

Dear Governor Babcock:

Submitted herewith is a consolidated report on the Water Resources Survey of Pondera County, Montana.

This work was accomplished with funds made available to the State Engineer by the 38th Legislative Session, 1963, and in co-operation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts: Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains the township maps in the County showing in colors the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Big Horn, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Deer Lodge, Fallon, Gallatin, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Madison, Meagher, Missoula, Musselshell, Park, **Pondera**, Powder River, Powell, Ravalli, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Wibaux, Wheatland and Yellowstone.

The office files contain minute descriptions and details of each individual water right and land use, which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data on water rights contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up-to-date.

Respectfully submitted,

EVERETT V. DARLINTON, State Engineer

ACKNOWLEDGMENTS

A survey and study of water resources involves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid co-operation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is hereby acknowledged.

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FOREWORD

SURFACE WATER

Our concern over surface water rights in Montana is nearly a century old. When the first Territorial Legislature, meeting in Bannack, adopted the common law of England on January 11, 1865, the Territory's legal profession assumed that it had adopted the Doctrine of Riparian Rights. This doctrine had evolved in England and in eastern United States where the annual rainfall is generally more than twenty inches. It gave the owners of land bordering a stream the right to have that stream flow past their land undiminished in quantity and unaltered in quality and to use it for household and livestock purposes. The law restricted the use of water to riparian owners and forbade them to reduce appreciably the stream flow, but the early miners and ranchers in Montana favored the Doctrine of Prior Appropriation which permitted diversion and diminution of the streams. Consequently, the next day the legislature enacted another law which permitted diversion by both riparian and non-riparian owners. Whether or not this action provided Montana with one or two definitions of water rights was not settled until 1921 when the Montana Supreme Court in the *Mettler vs. Ames Realty Co.* case declared the Doctrine of Prior Appropriation to be the valid Montana water right law. "Our conclusion," it said, "is that the common law doctrine of riparian rights has never prevailed in Montana since the enactment of the Bannack Statutes in 1865 and that it is unsuited to the conditions here. . ."

The appropriation right which originated in California was used by the forty-niners to divert water from the streams to placer mine gold. They applied to the water the same rules that they applied to their mining claims—first in time, first in right and limitation of the right by beneficial use. Those who came to the Montana gulches brought with them these rules, applying them to agriculture as well as to mining.

The main points of consideration under the Doctrine of Prior Appropriation are:

1. The use of water may be acquired by both riparian and non-riparian landowners.
2. It allows diversion of water regardless of the reduction of the water supply in the stream.
3. The value of the right is determined by the priority of the appropriation; i.e., first in time is first in right.
4. The right is limited to the use of the water. Stream waters in Montana are the property of the State and the appropriator acquires only a right to their use. Moreover, this use must be beneficial.
5. A right to the use of water is considered property only in the sense that it can be bought or sold; its owner may not be deprived of it except by due process of law.

The State Legislature has provided methods for the acquisition, determination of priority and administration of the right. No right may be acquired on a stream without diversion of water and its application to a beneficial use. On unadjudicated streams, the Statutes stipulate that the diversion must be preceded by posting a notice at a point of intended diversion and by

filing a copy of it within 20 days in the county clerk's office of the county in which the appropriation is being made. Construction of the means of diversion must begin within 40 days of the posting and continue with reasonable diligence to completion. However, the Montana Supreme Court has ruled that an appropriator who fails to comply with the Statutes may still acquire a right merely by digging a ditch and putting the water to beneficial use.

To obtain a water right on an adjudicated stream one must petition the District Court having jurisdiction over the stream for permission to make an appropriation. If the other appropriators do not object, the court gives its consent and issues a supplementary decree granting the right subject to the rights of the prior appropriators.

Inasmuch as the Montana laws do not require water users to file official records of the completion of their appropriations, it becomes advisable as soon as the demand for the waters of a stream becomes greater than its supply, to determine the rights and priorities of each user by means of an adjudication or water right suit. This action may be initiated by one or more of the appropriators who may make all the other claimants parties to the suit. Thereupon the Judge of the District Court examines the claims of all the claimants and issues a decree establishing priority of the right of each water user and the amount of water he is entitled to use. The court decree becomes in effect the deed of the appropriator to his water right.

Whenever scarcity of water in an adjudicated stream requires an allocation of the supply according to the priority of rights, the Judge, upon petition of the owners of at least 15 percent of the water rights affected, must appoint a water commissioner to distribute the water. Chapter No. 231, Montana Session Laws 1963, Senate Bill 55 amended Section 89-1001 R.C.M. 1947, to provide that a water commissioner be appointed to distribute decreed water rights by application of fifteen per cent (15%) of the owners of the water rights affected, or, under certain circumstances at the discretion of the judge of the district court—**“provided that when petitioners make proper showing they are not able to obtain the application of the owners of at least fifteen per cent (15%) of the water rights affected, and they are unable to obtain the water to which they are entitled, the judge of the district court having jurisdiction may, in his discretion, appoint a water commissioner.”** After the Commissioner has been appointed the Judge gives him full instructions on how the water is to be apportioned and distributed in accordance with the terms of the decree.

The recording of appropriations in local courthouses provides an incomplete record of the water rights on unadjudicated streams. In fact, the county records often bear little relation to the existing situation. Since the law places no restriction on the number or extent of the filings which may be made on an unadjudicated stream, the total amount of water claimed is frequently many times the available flow. There are numerous examples of streams becoming over appropriated. Once, six appropriators each claimed all of the water in Lyman Creek near Bozeman. Before the adjudication of claims to the waters of Prickly Pear Creek, 68 parties claimed thirty times its average flow of about 50 cfs. Today, the Big Hole River with an average flow of about 1,000 cfs. has filings totaling 173,912 cfs. A person is unable to distinguish in the county courthouses the perfected rights from the unperfected ones since the law requires no official recordation of the completion of an appropriation. Recognition by the courts of unrecorded appropriations adds to the incompleteness of these records. To further complicate the situation, appropriators have used different names for the same stream in their filings. In

Montana many of the streams flow through several counties; consequently water right filings on these inter-county streams are found distributed in two or more county courthouses. Any one desirous of determining appropriations on a certain river or creek finds it difficult and expensive to examine records in several places. In addition, the records are sometimes scattered because the original nine counties of 1865 have now increased to 56. As the original counties have been divided and subdivided, the water right filings have frequently not been transcribed from the records of one county to the other. Thus, a record of an early appropriation in what is at present Powell County may be found in the courthouse of the original Deer Lodge County.

It can be readily seen that this system of recording offers little protection to rights in the use of water until they are determined by an adjudication. In other words, an appropriator does not gain a clear title to his water right until after adjudication and then the title may not be clear because the Montana system of determining rights is also faulty. In the first place, adjudications are costly, sometimes very costly when they are prolonged for years. It is estimated that litigation over the Beaverhead River, which has lasted more than twenty years, has cost the residents of the valley nearly one-half million dollars. In the second place, unless the court seeks the advice of a competent irrigation engineer, the adjudication may be based upon inaccurate evidence. In the third place, if some claimant has been inadvertently left out of the action, the decree is not final and may be reopened for consideration by the aggrieved party. Another difficulty arises in determining the ownership of a water right when land under an adjudicated stream becomes subdivided in later years and the water not apportioned to the land by deed or otherwise. There is no provision made by law requiring the recording of specific water right ownership on deeds and abstracts.

The Legislative Session of 1957 passed Chapter 114 providing for the policing of water released from storage to be transmitted through a natural stream bed to the place of use. The owner of the storage must petition the court for the right to have the water policed from the storage reservoir to his place of use. If there are no objections, the court may issue the right and appoint a water commissioner to distribute the water in accordance therewith. This law applies only to unadjudicated streams.

Administration of water on an adjudicated stream is done by the District Court, but it has its drawbacks. The appointment of a water commissioner is often delayed until the shortage of water is acute and the court frequently finds it difficult to obtain a competent man for a position so temporary. The present administration of adjudicated streams which cross the county boundaries of judicial districts creates problems. Many of the water decrees stipulate head gates and measuring devices for proper water distribution, but in many instances the stipulation is not enforced, causing disagreement among the water users.

Since a water right is considered property and may be bought and sold, the nature of water requires certain limitations in its use. One of the major faults affecting a stream after an adjudication is the failure of the District Court to have some definite control over the transfer of water rights from their designated places of use. The sale and leasing of water is becoming a common practice on many adjudicated streams and has created serious complications. By changing the water use to a different location, many of the remaining rights along the stream are disrupted, resulting in a complete breakdown of the purpose intended by the adjudication. To correct this situation, legal action must be initiated by the injured parties as it is their responsibility and not the Court's.

At one time or another all of the other Western Reclamation States have used similar methods of local regulation of water rights. Now all of them except Montana have more or less abandoned these practices and replaced them by a system of centralized state control such as the one adopted by the State of Wyoming. The key characteristics of the Wyoming system are the registration of both the initiation and completion of an appropriation in the State Engineer's Office, the determination of rights and administration by a State Board of Control headed by the State Engineer. These methods give the Wyoming water users titles to the use of water as definite and defensible as those which they have to their land.

When Montana began to negotiate the Yellowstone River Compact with Wyoming and North Dakota in 1939, the need for some definite information concerning our water and its use became apparent. The Legislature in 1939 passed a bill (Ch. 185) authorizing the collection of data pertaining to our uses of water and it is under this authority that the Water Resources Survey is being carried on. The purpose of this survey is six fold: (1) to catalogue by counties, in the office of the State Engineer, all recorded, appropriated and decreed water rights including use rights as they are found; (2) to map the lands upon which the water is being used; (3) to provide the public with pertinent water right information on any stream, thereby assisting in any transaction where water is involved; (4) to help State and Federal agencies in pertinent matters; (5) to eliminate unnecessary court action in water right disputes; (6) and to have a complete inventory of our perfected water rights in case we need to defend these rights against the encroachments of lower states, or Wyoming or Canada.

GROUND WATER

Ground water and surface water are often intimately related. In fact, it is difficult in some cases to consider one without the other. In times of heavy precipitation and surface runoff, water seeps below the land surface to recharge underground reservoirs which, in turn, discharge ground water to streams and maintains their flow during dry periods. The amount of water stored underground is far greater than the amount of surface water in Montana, and, without seepage from underground sources, it is probable that nearly all the streams in the state would cease to flow during dry periods.

It is believed that Montana's ground-water resources are vast and only partly developed. Yet this resource is now undergoing an accelerated development as the need for its use increases and economical energy for pumping becomes available. Continued rapid development without some regulation of its use would cause a depletion of ground water in areas where the recharge is less than the withdrawal. Experience in other states has shown that once over-use of ground water in a specific area has started, it is nearly impossible to stop, and may result in painful economic readjustments for the inhabitants of the area concerned.

Practical steps aimed at conserving ground-water resources as well as correcting related deficiencies in surface water laws became necessary in Montana. Prior to the Legislative Session of 1961, there was no legal method of appropriating ground water. Proposed ground-water codes were introduced and rejected by four sessions of the Montana Legislative Assembly in 1951, 1953, 1955, and 1959.

In 1961, during the 37th Legislative Session, a bill was introduced and passed which created a Ground-Water Code in Montana. (Chapter 237, Revised Codes of Montana, 1961.) This bill became effective as a law on January 1, 1962, with the State Engineer of Montana designated as "Administrator" to carry out provisions of the Act.

Some of the important provisions contained in Montana's New Ground-Water Law are:

Section 1. DEFINITIONS OR REGULATIONS AS USED IN THE ACT.

(a) "Ground-Water" means any fresh water under the surface of the land including the water under the bed of any stream, lake, reservoir, or other body of surface water. Fresh water shall be deemed to be the water fit for domestic, livestock, or agricultural use. The Administrator, after a notice of hearing, is authorized to fix definite standards for determining fresh water in any controlled ground-water area or sub-area of the State.

(b) "Aquifer" means any underground geological structure or formation which is capable of yielding water or is capable of recharge.

(c) "Well" means any artificial opening or excavation in the ground, however made, by which ground water can be obtained or through which it flows under natural pressures or is artificially withdrawn.

(d) "Beneficial use" means any economically or socially justifiable withdrawal or utilization of water.

(e) "Person" means any natural person, association, partnership, corporation, municipality, irrigation district, the State of Montana, or any political sub-division or agency thereof, and the United States or any agency thereof.

(f) "Administrator" means State Engineer of the State of Montana.

(g) "Ground-water area" means an area which as nearly as known facts permit, may be designated so as to enclose a single distinct body of ground water, which shall be described horizontally by surface description in all cases and which may be limited vertically by describing known geological formations, should conditions dictate this to be desirable. For purpose of administration, large ground-water areas may be divided into convenient administrative units known as "sub-areas."

Section 2. RIGHT TO USE. Rights to surface water where the date of appropriation precedes January 1, 1962, shall take priority over all prior or subsequent ground-water rights. The application of ground water to a beneficial use prior to January 1, 1962, is hereby recognized as a water right. Beneficial use shall be the extent and limit of the appropriative right. As to appropriations of ground water completed on and after January 1, 1962, any and all rights must be based upon the filing provisions hereinafter set forth, and as between all appropriators of surface or ground water on and after January 1, 1962, the first in time is first in right.

Any ground water put to beneficial use **after** January 1, 1962 **must** be filed upon in order to establish a water right thereto.

Montana's Ground-Water Code originally provided for four different types of forms that could be filed.

Form No. 1 "Notice of Appropriation of Ground Water"—shall require answers to such questions as (1) the name and address of the appropriator; (2) the beneficial use for which the appropriation is made, including a description of the lands to be benefited if for irrigation; (3) the rate of use in gallons per minute of ground water claimed; (4) the annual period (inclusive

dates) of intended use; (5) the probable or intended date of first beneficial use; (6) the probable or intended date of commencement and completion of the well or wells; (7) the location, type, size, and depth of the well or wells contemplated; (8) the probable or estimated depth of the water table or artesian aquifer; (9) the name, address, and the licence number of the driller engaged; and (10) such other similar information as may be useful in carrying out the policy of this Act. This form is optional, but it has an advantage in that after filing the Notice of Appropriation, a person has 90 days in which to commence actual excavation and diligently prosecute construction of the well. Otherwise, a failure to file the Notice of Appropriation deprives the appropriator of his right to relate the date of the appropriation back upon filing the Notice of Completion (Form No. 2).

Form No. 2 **"Notice of Completion of Ground Water by Means of Well"**—this form shall require answers to the same sort of questions as required by Form No. 1 (Notice of Appropriation of Ground Water), except that for the most part it shall inquire into accomplished facts concerning the well or means of withdrawal, including (a) information as to the static level of water in the casing or the shut-in pressure if the well flows naturally; (b) the capacity of the well in gallons per minute by pumping or natural flow; (c) the approximate drawdown or pumping level of the well; (d) the approximate surface elevation at the well head; (e) the casing record of the well; (f) the drilling log showing the character and thickness of all formations penetrated; (g) the depth to which the well is drilled; and similar information.

It shall be the responsibility of the driller of each well to fill out the Form No. 2, "Notice of Completion of Ground Water by Means of a Well", for the appropriator, and the latter shall be responsible for its filing.

Form No. 3 **"Notice of Completion of Ground-Water Appropriation Without a Well"**—is for the benefit of persons obtaining (or desiring to obtain) ground water without a well, such as by subirrigation or other natural processes so as to enable such persons to describe the means of using ground water; to estimate the amount of water so used; and requiring such other information pertinent to this particular type of ground water use.

Form No. 4 **"Declaration of Vested Ground-Water Rights"**—is no longer valid. This form was used to file on ground water put to beneficial use **prior** to January 1, 1962, but the filing on such rights became invalid after a two-year period which ended December 31, 1963.

Failure to file Form No. 4 "Declaration of Vested Ground-Water Rights" within the two-year period did not cause a forfeiture of a claimant's vested ground-water rights although he might be called upon at some future time to prove his rights in court. A valid filing of Form No. 4 however, will be accepted by the courts as prima facie evidence of a ground-water right.

It shall be recognized that all persons who have filed a Water Well Log Form as provided for under Section 1 and 2 of Chapter 58, Session Laws of Montana, 1957, shall be considered as having complied with the requirements of this Act.

It is important to note that the ground-water law states, **"UNTIL A NOTICE OF COMPLETION (filing form) IS FILED WITH RESPECT TO ANY USE OF GROUND WATER INSTITUTED AFTER JANUARY 1, 1962, NO RIGHT TO THAT USE OF WATER SHALL BE RECOGNIZED."**

Copies of the forms used in filing on ground water are available in the County Clerk and Recorder's office in each of Montana's 56 counties. It shall be the duty of the County Clerk in every instance to file the original copy for the county records; transmit the second copy to the Administrator (State Engineer); the third copy to the Montana Bureau of Mines and Geology; and the fourth copy to be retained by the appropriator (person making the filing).

Accurate records and the amount of water available for future use are essential in the administration and investigation of water resources. In areas where the water supply becomes critical, the ground-water law provides that the administrator may define the boundaries of the aquifer and employ inspectors to enforce rules and regulations regarding withdrawals for the purpose of safeguarding the water supply and the appropriators (see the wording of the law for establishing a "controlled area").

The filing of water right records in a central office under control of a responsible State agency, provides the only efficient means for the orderly development and preservation of our water supplies and it protects all of Montana's use—on both ground and surface water.

METHOD OF SURVEY

Water Resources data contained in Part I and Part II of this report are obtained from courthouse records in conjunction with individual contacts with landowners. A survey of this type involves extensive detailed work in both the office and field to compile a comprehensive inventory of water rights as they apply to land and other uses.

The material of foremost importance used in conducting the survey is taken from the files of the county courthouse and the data required includes; landownership, water right records (decrees and appropriations), articles of incorporation of ditch companies and any other legal papers in regard to the distribution and use of water. Deed records of landownership are reviewed and abstracts are checked for water right information when available.

Aerial photography is used by the survey to assure accuracy in mapping the land areas of water use and all the other detailed information which appears on the final colored township maps in Part II. Section and township locations are determined by the photogrammetric system, based on government land office survey plats, plane-table surveys, county maps and by "on the spot" location during the field survey. Noted on the photographs are the locations of each irrigation system, with the irrigated and irrigable land areas defined. All the information compiled on the aerial photo is transferred and drawn onto a final base map by means of aerial projection. From the base map color separation maps are made and may include three to ten overlay separation plates, depending on the number of irrigation systems within the township.

Field forms are prepared for each landowner showing the name of the owner and operator, photo index number, a plat defining the ownership boundary, type of irrigation system, source of water supply and the total acreage irrigated and irrigable under each. All of the appropriated and decreed water rights that apply to each ownership are listed on the field forms with the description of intended place of use. During the field survey, all water rights listed on the field form are verified with the landowner. Whenever any doubt or complication exists in the use of a water right, deed records of the land are checked to determine the absolute right and use.

So far as known, this is the first survey of its kind ever attempted in the United States. The value of the work has become well substantiated in the counties completed to date by giving Montana its first accurate and verified information concerning its water rights and their use. New development of land for irrigation purposes by State and Federal agencies is not within the scope of this report. The facts presented are as found at the time of completion of each survey and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in these reports can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up-to-date.

Complete data obtained from this survey cannot be included in this report as it would make the text too voluminous. However, if one should desire detailed information about any particular water right, lands irrigated, or the number and amount of water rights diverting from any particular stream, such information may be obtained by writing the State Engineer's Office in Helena.

Every effort is being made to produce accuracy of the data collected rather than to speed up the work which might invite errors.

PONDERA COUNTY

HISTORY AND ORGANIZATION

Pondera County, like other areas in Montana was first viewed by members of the Lewis and Clark expedition.

In May, 1805, they saw the Rocky Mountains for the first time from a point south of Havre, calling them the Shining Mountains. In June they reached the forks of the river, where the Marias empties into the Missouri. Each fork looked as large as the other and it was decided to explore both rivers in their travels on westward.

Lewis took some men of the party and pushed on up the river we call the Marias. In early days the Indians called it the Bear River and spoke of the district it drained as the Bear Creek country. This area was full of game and the home of the Blackfeet tribes. Lewis decided the stream should have a more modern name and called it Maria's River, in honor of his cousin, Miss Maria Wood.

The next event of historical importance was when James Kipp and a party of 75 men were sent up the Missouri in 1831 to establish a trading post at the mouth of the Marias where it emptied into the Missouri. It was called Fort Piegan and was the first fur post established in the territory. Kipp was a most experienced trader with the Indians and they always liked his methods of trade, calling him the "Fair One", because he never cheated them. The post was owned by the American Fur Company of St. Louis.

A few years later the Hudson Bay Company, hearing of the great number of pelts that Kipp was amassing through his Indian trading, sent in their trading parties who brought in much liquor which was given to the Indians with the understanding that Kipp's trade would be wiped out and the Piegan post destroyed. There followed several years of trouble, with many killings by both Indians and whites and an almost complete destruction of the fur business. It culminated in the famous Baker Massacre, one of the most cruel mass killings of Indians in the early history of the new northwest.

Fort Conrad was probably the first trading post of any kind built in the early days in what we know of today as Pondera County. It was built of logs in 1875 by L. B. Baker and persons associated with him in frontier trading. The trading post was built on the south side of the river, east of where the Dry Fork enters the Marias River, but due to ramifications of the Marias River during periods of high water its exact location has been lost.

In 1877 Joe Kipp, the Indian trader, bought Fort Conrad and operated it for several years, doing a good business in furs with the Indians and greatly increasing the trade in this region. The post was still in operation in 1888, when it was burned by a band of outlaw Indians who started a small uprising against the whites. The exact date and reason for this feud is not clear and has never been recorded historically. Fort Conrad in its heyday was also a stopping place for soldiers on patrol from Fort Shaw and such notable men as W. G. & Charles Conrad, Kipp, A. B. Hamilton and J. W. Schultz all lived there at different times.

The famous Whoop-Up Trail ran west out of Fort Benton, across the Teton River to Pend d'Oreille Springs (Pondera Coulee), then north through Fort Conrad to its termination at Fort Whoop-Up in Canada. Fort Whoop-Up got its name when John Power of Fort Benton asked a

visiting Canadian trader, John LaMotte, how things were going up north. "They're still whooping 'er up", LaMotte replied, and the north country became known as "Whoop-Up Country." In 1939, the townspeople of Conrad initiated a yearly celebration commemorating this old trail and called it "Whoop-Up Trail Days". It is a two day event consisting of Parades—Horse Shows—and celebration in the manner of the Old West.

The Conrad Brothers played an important part in the early development and future possibilities of Northern Montana and particularly the area that lies in the Pondera Valley. W. G. Conrad, with his brother acquired large holdings of land which he used to aid his extensive cattle interests, but on which he later spent large sums of money in improving and perfecting an irrigation system. The ranch holdings were known as the Seven-Block ranch and consisted of approximately 50,000 acres of deeded land. It was Conrad who first had the idea of building a large irrigation project to irrigate the prairie lands east of the mountains. This project later came into reality with the construction of the Valier Irrigation Project, known today as the Pondera County Canal and Reservoir Company.

In May 1908, Messrs. Cargill and Withee of LaCrosse, Wisconsin, took an option on the Conrad Ranch holdings and for three months their civil engineers and irrigation experts were busy examining the ground and testing the soil. On August 15, 1908, the deal was consummated, the consideration being one million dollars. In addition, the new owner began and organized the "Valier Irrigation Project" under provisions of the Congressional Act of August 18, 1894, known as the "Carey Act." (For a detailed description of the "Valier Irrigation Project," see the Pondera County Canal and Reservoir Company of this report.)

A part of the Blackfeet Indian Reservation extends into the northwestern part of Pondera County and contains approximately 17,000 acres of irrigable land under the Blackfeet Irrigation Project.

Agriculture is the main source of income for the residents of Pondera County and it is now ranked as one of the better agricultural counties in the State. There are more than 124,000 acres of irrigated land in the County with large stock ranches in the western section and dryland wheat operations in the eastern end.

When the Great Northern Railway established their line from Shelby to Great Falls early in the 1900's, the town of Pondera on the old narrow gauge road was abandoned and moved one mile west, to a site on the new standard gauge line. The new townsite was named Conrad in honor of W. G. Conrad, prominent and influential citizen in this part of the State, and noted for his extensive interests in banking, mining, merchandising and livestock.

Conrad, the county seat of Pondera County, is the largest town in the county having a population in 1960 of 2,665.

Other towns in the county are: Valier, Dupuyer, Brady, Heart Butte and Ledger.

Valier, the second largest town in the county, has a population of 724 and is located on the western terminal of the Montana Western Railway. It was named in honor of Peter Valier, supervisor of construction for the railway line from Conrad to Valier.

The town of Brady is located on the Great Northern Railway, 11 miles southeast of Conrad and has a population of 250. It is a large grain marketing center and in the fall of 1951, more wheat was marketed here than from any other shipping point in the State.

Dupuyer is located 18 miles southwest of Valier, having been established in the stock raising era early in the 1880's. It is surrounded by farming and grazing land and the vicinity has been the home of some of the oldest stock raisers in the State of Montana. Dupuyer is the oldest town in the county and had a population in 1960 of 125 people.

Heart Butte, located on the Blackfeet Indian Reservation in the extreme western part of the county, has a population of 250 people.

Ledger, a small community of 15 population is located on the Great Northern Railway in the east central part of Pondera County.

Pondera County was created by an Act of the Legislature in 1919, and was organized and started operating as a separate county unit on April 1, 1919. It was formed from parts of territory formerly included in Teton County and a small segment of Chouteau County. It was named after the old town Pondera which was located near the present location of Conrad. The original spelling Pend d'Oreille, was changed to Pondera, so it would not be confused with the town and lake in Idaho of the same name. The meaning of the name Pend d'Oreille is "a pendant of the ears", a name given to Indians who wore ear-rings in their ears.

Pondera County is served by two railroads, the Montana Western from Conrad to Valier and the Great Northern line from Shelby to Great Falls. U. S. Highway 89 and Inter-State highway 15 follow routes north to Canada through the county from Great Falls. The Greyhound and Inter-Mountain Bus Lines, four motor freight lines and a local airport at Conrad, provide additional transportation facilities for county residents. Latest census figures show Pondera County with a population of 7,653.

CLIMATE

With its western boundary coinciding with the Continental Divide from the summit of Marias Pass southeastward a distance of some 20 miles, Pondera County may be classed as one of Montana's more mountainous counties, particularly west of U. S. Highway 89. From ridges reaching elevations of 7,500 to 8,000 ft. above sea level along the western boundary, the county slopes eastward or northeastward to elevations near 4,000 ft. along Highway 89, then more gradually down to around 3,100 ft. where the Marias River touches the county line south of Shelby. From west to east the character of the county changes from mountainous to rolling arable plains. Principal drainages are: Birch, Blacktail and Dupuyer Creeks, which are fed by many smaller mountain streams, and which flow generally northeastward; Two Medicine Creek, flowing eastward along the northern border, where, after confluence with Two Medicine, it joins the combined Dupuyer-Birch Creek flow north of Valier to move northward to the county line, there joining Cut Bank Creek to form the Marias River which flows generally eastward; the Dry Fork of the Marias River, angling eastward to northeastward across the county from south of Dupuyer through Ledger and Fowler; and Pondera and Rocky Coulee (with many small sub-drainages as tributaries) draining generally eastward in the southeast part of the County.

These complex topographical and drainage features play a large role in the climate features of the county as is the case of all of Montana's mountain and foothill areas. Its location immediately east of the Continental Divide almost—but not without exception as we shall see—requires a classification of its climate as "continental", with cold relatively dry winters and warm relatively wet summers. The most important exception is the Foehn (locally known as "chinook") winds that blow a good share of the time each winter—often for several days at a time. These "chinook" winds, often developing gale force, have the effect of shortening cold spells, removing snow from exposed areas, and producing relatively sunny and warm winter weather. When these winds begin at the end of a cold spell, temperature rises of 40° or more within a few hours are not uncommon.

The county is in the path each winter of a few invasions of quite cold air from Arctic sources, and temperatures can fall to well below zero on clear nights after the cold air arrives. The coldest observed within county boundaries at any official station was -49° at Valier, February 15, 1963, but most winters produce minimums in the -20° to -30° range. Below zero readings seldom last more than a couple of days at a time, and most of the county will average 43° in a normal year.

Summers are mostly warm, with afternoon maximums averaging near 80° during July and August. The cooler summer areas are in the higher elevations of the western end of the county—perhaps as much as 5° cooler than around Valier and Conrad, which represent the more populous parts of the county. On the other hand, hot weather as such is seldom experienced, readings as high as 100° occurring only about once in 10-15 years. In 51 years, the warmest on record has been 105° at Conrad. Even during the warmest spells nighttime cooling produces minimums in the 50° range by the following morning. Relative humidity on the warmer days is rarely high enough to cause discomfort, and the overall result is that oppressive summer heat is practically unknown in Pondera County.

The 32° freeze-free season of 109 days at Conrad runs, in an average year, from May 28 to Sept. 14. At Valier the same season runs normally from May 25 to Sept. 16—114 days. These two values represent pretty well the freeze-free average periods of most agricultural sections, except perhaps the higher western range lands; about half the years will have later or earlier freeze dates than those shown.

Pondera County follows pretty well the rough rule in Montana that precipitation increases with elevation (see accompanying condensed precipitation table). The highest station (Dupuyer, 4,125 ft.) averages more than 2 inches more than the lowest elevation station (Conrad, 3,520 ft.). It is well known also that precipitation in the mountains along the western boundary is much heavier than at the lower elevations—perhaps as high as 40-50 inches a year. It is also likely that there are some areas along the eastern county line that average little if any more than 10 inches a year. Of primary importance to “dry-land” agriculture is the fact that about 75 per cent of an average year’s precipitation falls during the April-September so-called growing season, with May and June being the wettest months, normally.

Winter precipitation (December - March) usually totals less than an inch of water content from snow fall of about 30 inches (mountains excepted). In the mountains winter snows are usually substantial, and contribute a considerable volume of spring runoff to the many small streams originating there. Except along the western mountain ridges, the county has considerable clear and sunny weather throughout the year. The exposure of the entire county to prevailing winds provides good “ventilation”—air pollution potential, as far as weather factors are involved, is very low.

Stormy weather of several kinds can occur, the most troublesome being, in order of economic importance, wind, hail, and to a lesser degree, cold waves (blizzards are fairly uncommon—about one every 2 or 3 years, of short duration) and heavy rains (about once in 15 years or so). The strongest winds usually occur during well-developed Foehn conditions, which may occur from 2-8 times a season, producing gust speeds as high as 100 m.p.h. in the more exposed locations. Thunderstorms occur mostly in July and August on about 25 days in an average year. These thunderstorms sometimes carry enough hail of sufficient size to cause crop and property damage. Hail damage of really serious dimensions, however, seldom occurs over more than scattered small areas, and the eastern parts of the county experience more hail trouble than west of about Longitude 112°. Tornadoes are almost unknown. While a few funnel clouds have been seen over the years, there is no record of so much as one tornado injury in the county over the years. Fog is uncommon, and is classed as “rare” except in some of the river or creek bottoms.

Selected temperature and precipitation data for Pondera County appears in the following condensed table:

TEMPERATURE

Station	Highest of Record	Lowest of Record	January Average	July Average	Annual Average
Conrad (1911-61)	105	-45	19.6*	67.0*	43.1*
Valier (1912-62)	103	-49	19.8*	66.3*	42.6*
*1931-60					

PRECIPITATION

Station	Yearly Average	Growing Season Average	Per Cent Falling in Growing Season	Wettest Year	Driest Year
Conrad (1911-62)	12.18*	9.49	78	19.48 (1941)	5.80 (1962)
Dupuyer (1948-62)	14.42	10.52	73	19.17 (1953)	8.66 (1960)
Valier (1912-62)	12.76*	10.26	80	20.65 (1948)	5.66 (1919)
*1931-60					

SOILS

The rock formations beneath the county are the source of the parent material for the soils. The physiography drainage and glacial history of the area determined how these parent materials were deposited over the county and in this way directly influenced the composition and properties of the present soils. The depth, density, porosity, texture, and reaction are directly related within limits, to the parent material.

Most of the county is covered by material which was transported by glaciers and deposited as "till". This glacial "till" is the parent material which is altered by the **climate** and **living organisms** (including man's activity) over a period of **time** as modified by relief, and produces the soil we see today.

In some areas the "till" has been eroded leaving the underlying rock exposed at the surface; while in other areas the rock has had time to weather and shallow soils have developed. The chemical and physical properties of these young shallow soils are nearly the same as the properties of the materials from which they are formed.

The rock types that make up the parent materials for the soils are dominantly sedimentary. Shale and sandstone are most abundant in the east and central portions of the county. Limestone is more abundant in the western part of the county, especially at the higher elevations of the mountains. The Great Soil Groups most widely represented in Pondera County are: Alluvial, Brown, Chestnut, Chernozem, Solodized-Solonetz, Gray Wooded, and Grumosols.

Alluvial soils are young soils that occur along streams and may be flooded periodically. The only development that has occurred in these soils is the darkening of the surface by the accumulation of organic matter. The material below the surface is essentially the same as it was in the time of deposition.

The Brown, Chestnut, and Chernozem soils are those of the uplands. They have developed, in addition to the dark surface, a clayey prismatic subsoil. A zone of lime accumulation is usually present at 10-15 inches below the surface and this lime accumulation may extend to 50 inches below the surface. Below the lime zone the compact glacial "till" is encountered. Chernozems are those soils that have developed under a slightly higher precipitation and, consequently, have developed a darker surface soil than have the Chestnut and Brown soils.

Solodized-Solonetz soils usually have a thin platy surface soil and a distinct claypan subsoil that is very hard when dry. The upper part of claypan often has a light-colored (bleached) zone 1-4 inches thick. This bleached zone should not be confused with the lime zone which lies below the claypan. "Slick spots" or "Scab Land" occur with the Solonetz soils. These spots are barren and in some places constitute a large portion of the landscape.

Grumosols are soils that develop wide, deep cracks when they are dry. These soils contain large amounts of clay and are very sticky and plastic when wet and very hard when dry. The dark colored surface soil may extend downward to as much as 24-30 inches. This is brought about by the dark colored surface soil falling down the cracks when the soil is dry.

Gray wooded soils are associated with the timbered regions of the county. These soils have a bleached zone at the surface which may extend to depths of 1-2 feet. A clay concentration is encountered below the bleached zone, often as tiny bands that may extend downward as much as 7 feet.

CROPS AND LIVESTOCK

Pondera County, located on the west border of the Triangle Area, ninety miles long and thirty-four miles wide, covers an area of 1,658 square miles. The eastern and central areas produce mostly small grains, with some livestock, and the western portion produces the majority of the livestock. Covering an area of approximately 1,051,520 acres, it has around 630 farm operators, farming 85 per cent of it. The extreme western portion of the county is located in the Lewis and Clark National Forest.

According to the 1959 Bureau of Census report, the average farm is approximately 1,418 acres in size, with an average value of \$116,000. This places the average value per acre at approximately \$81.50. Around 282,800 acres of land is in crop each year, approximately 17,000 acres in pasture and 253,000 acres summer fallowed.

A majority of farms are dry land operations, although the county has more than 124,000 acres under irrigation. The bulk of irrigation is carried out by four main irrigation projects, namely, the Pondera County Canal and Reservoir Company, the Blackfoot Irrigation Project (Badger-Fisher and Birch Creek Units), The Brady Irrigation Company and the Birch Creek Water Company. The combined total of these projects accounts for more than 113,000 acres of irrigated land. Irrigation by private systems total an additional 11,000 acres. Sprinkler systems are used on more than 3,000 acres of land in the county and this method is increasing in popularity in the application of water for irrigation.

The major crops grown throughout the county are winter wheat, spring wheat, durum and barley. The largest acreage during normal years is planted to winter wheat, followed by spring wheat, barley and then durum. Some oats, flax, and rye are grown by a few farmers but normally the acreage is small. (See chart accompanying this text.)

The majority of the farms throughout the county follow the alternate crop and fallow system to build moisture reserves and carry out a weed control program. The entire county is included in a Soil and Water Conservation District with over 300 farmers cooperating under the program. Over 200 farms having access to irrigation also follow the alternate crop and fallow practice to take care of the acreage difficult to cover with water. The greatest acreage irrigated by farmers is winter wheat and barley grown for malting purposes.

The Pondera Weed District covers approximately the entire county with the exception of the area west of Dupuyer. County road right-of-ways and barrow pits are sprayed every year by equipment owned and operated by the district. All noxious weeds are sprayed in the district to prevent the spread of these weeds. A weed control program is also carried out by irrigation districts and individual farmers.

The 1960 statistical report from the Agricultural Marketing Service lists a total of 21,600 cattle raised in the county, 1,800 milk cows, 4,900 hogs and pigs, and 25,500 sheep and lambs. The cattle industry holds somewhat stable in numbers, with some increase in cattle feeding in the past ten years. The number being fed fluctuates with the price of feed barley and finished cattle. There are four purebred cattle breeders in the county, with one participating in the Montana Beef Performance Registry Association program.

The dairy herds in the county have been decreasing for the past five years, with the remaining herds increasing in size. The remaining herds supply milk to two milk plants in Conrad.

Hog production in the county has increased in the last three years, making the total probably closer to 8,000 head. Two producers are raising and selling weaner pigs and four others each selling over 1,000 hogs per year.

Sheep production appears to be decreasing in the county because of unstable prices on wool and lambs. Approximately 20,000 lbs. of wool were sold in 1962. This would indicate that sheep and lamb numbers are remaining the same or possibly on a slight decline. The majority are small farm flocks of the mutton and wool-type breeds, with the majority cross-breeding. There is one purebred breeder in the county. Approximately 20 producers sell their wool through the Pondera Wool Pool, marketing approximately 25,000 lbs. every year.

Poultry raised in the county continues to decline because of the prices and the improved quality of eggs shipped in at retail stores. Some farmers have increased their flocks and are marketing graded eggs to make it a profitable business. The 1959 census reports 27,249 chickens in the county, a decrease of over 8,500 in five years.

The following table contains data from the U.S.D.A. Statistical Report Service from Helena, Montana—1962:

CROP	Total Seeded Acres	Harvested Acres	Yield Per Acre Harvested Bu.	Production Bu.
Winter Wheat	112,800	76,500	19.7	1,509,600
Spring Wheat	38,000	37,300	14.6	543,000
Durum	29,000	28,700	16.0	459,900
All Wheat	179,800	142,500	17.6	2,512,500
Barley	111,000	109,900	27.1	2,975,500

The following table contains data from the U.S.D.A. Statistical Report Service from Helena, Montana, 1959:

CROP PRODUCTION—HARVESTED ACRES

CROPS	Irrigated		Non-Irrigated		Totals		
	Acres	Yield Per Acre	Acres	Yield Per Acre	Acres	Bushels	Value
Winter Wheat	3,600	40.0	69,700	32.5	73,000	2,409,200	\$3,830,600
Spring Wheat	5,600	31.0	73,300	22.5	78,900	1,822,800	3,135,200
Durum	400	37.0	19,200	22.0	19,600	437,200	813,200
Barley	10,000	43.0	107,600	34.0	117,600	4,088,400	2,657,500
Oats	1,500	46.0	1,700	27.0	3,200	114,900	64,300
Rye .....	.....	.....	700	27.0	700	18,900	12,300
Flaxseed	100	13.0	.....	.....	100	1,300	3,500
Potatoes	60	100.0	20	100.0	80	8,000	15,800
Alfalfa Seed	100	120.0*lbs.	.....	.....	100	1,200*lbs.	3,500
Mustard Seed ....	.....	.....	1,200	390.0*lbs.	1,200	46,800*lbs.	21,000
Alfalfa Hay	5,800	2.1 Ton	1,500	1.4 Ton	7,300	14,300 Tons	.....
Wild Hay	1,600	.80 Ton	5,100	.70 Ton	6,700	4,900 Tons	.....
All Hay	8,100	1.79 Ton	9,000	.98 Ton	17,100	23,300 Tons	547,600

*Yield—clean seed

TOTAL CASH RECEIPTS, 1959

CROPS	Livestock & Livestock Products	Total Marketing Receipts	Government Payments	Total
\$9,865,600	\$1,885,800	\$11,751,400	\$164,400	\$11,915,800

SNOW SURVEYS

Snow surveys are made to measure the snow depth and water equivalent of the mountain snow pack.

Measurements are obtained at periodical intervals during the snow accumulation season by two-man teams traveling on snowshoes, skis, or in an oversnow vehicle or helicopter.

The amount of water in the snow, water stored in the soil and other climatological data are used to forecast the probable streamflow during the following spring and summer months.

From water supply forecasts, farmers and ranchers who depend on streamflow for irrigation can adapt their crop plantings to the anticipated water supply. Irrigation projects and reservoir operators can regulate delivery and storage of water to obtain the most beneficial use from the runoff. Other water management agencies can plan their operations before the major runoff occurs.

The following snow courses provide water supply information for Pondera County.

Snow Course		Number	Elev.	Year Est.	Dates Meas.*
Name					
Birch Creek—					
Dupuyer Creek Drainage.....	Freight Creek.....	12A01	6,000	1948	3, 4, 5
Badger Creek—Two-Medicine					
Creek Drainage.....	Marias Pass.....	13A05	5,250	1934	1, 2, 3, 4, 5

Current information on winter snow accumulation and water supply forecasts is available at the Soil Conservation Service, Bozeman, Montana.

*Numerals 1, 2, 3, 4, 5 refer to January 1, February 1, March 1, April 1, and May 1 measurements.

STREAM GAGING STATIONS

The U. S. Geological Survey measures the flow of streams, cooperating with funds supplied by several State and Federal agencies. The results have been published yearly in book form by drainage basins as Water-Supply Papers through the year 1960. Beginning with 1961 the stream-flow records have been published annually by the U. S. Geological Survey for the entire State under the title "Surface Water Records of Montana". Data for 1961-65 and subsequent five year periods will be published in Water-Supply Papers. Prior to general issuance, advance copies of station records may be obtained from the U. S. Geological Survey. That agency's records and reports have been used in the preparation of this resume'.

Data given below covers the stream gaging records which are available for Pondera County. There are no active stream gaging stations at the present time. The water year begins October 1 and ends September 30 of the following year.

Following are equivalents useful in converting from one unit of measurement to another:

- (a) In Montana, one cubic foot per second equals 40 miner's inches.
- (b) One acre-foot is the amount of water required to cover an acre one foot deep.

- (c) One cubic foot per second will nearly equal two acre-feet (1.983) in 24 hours.
- (d) A flow of 100 miner's inches will equal five acre-feet in 24 hours.
- (e) One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

For reference purposes, the stream gaging stations are listed in downstream order.

Birch Creek at Swift Dam near Dupuyer

The staff gage was located about 600 feet downstream from Swift Dam and 17 miles west of Dupuyer. The drainage area is 75.3 square miles. Records are available from March 1913 through September 1929. The maximum discharge observed was 5,275 cfs. (June 21, 1916) and the minimum was no flow on part of January 2, 3, 1920. The average discharge for 16 years (1913-29) was 148 cfs. or 107,100 acre-feet per year. The highest annual runoff was 203,000 acre-feet (1916) and the lowest, 55,000 acre-feet (1919). Flow is regulated by Swift Dam. Two small diversions for irrigation above station.

Birch Creek near Dupuyer

The staff gage was located half a mile upstream from B canal headgates and 8 miles northwest of Dupuyer. The drainage area is 105 square miles. Records are available from July 1907 through September 1937. The maximum discharge (not determined) occurred about June 6, 1908, and the minimum observed, 3 cfs. (April 7, 1921, April 4-6, 8, 9, 1937) but may have been less during periods of ice effect. The average discharge for 30 years (1907-37) was 159 cfs. or 115,100 acre-feet per year. The highest annual runoff was 230,000 acre-feet (1908) and the lowest, 33,100 acre-feet (1931). Flow regulated by Swift Dam since 1913. Several small diversions for irrigation above station.

Birch Creek at Nelson's ranch near Dupuyer

The staff gage was located a quarter mile downstream from headworks of B canal and 7 miles northwest of Dupuyer. The drainage area is 111 square miles. Monthly records are available for irrigation seasons from May 1914 through September 1926 with complete monthly records in 1916 and 1922. The maximum discharge observed was 1,340 cfs. (June 15, 1924) and the minimum, no flow at times. B Canal of the Valier-Carey project and several small ditches divert water for irrigation above station. Flow regulated by Swift Dam and headworks of B Canal.

Birch Creek at Hall's ranch near Dupuyer

The staff gage was located about 4 miles downstream from headworks of B canal and 8 miles northwest of Dupuyer. The drainage area is 122 square miles. Monthly records are available for irrigation seasons from April 1913 through September 1920 with complete monthly records in 1914. The maximum discharge was not determined (probably occurred about June 21, 1916) and the minimum observed, 1.0 cfs. (May 3, 1914). B canal of the Valier-Carey project and several smaller ditches diverted water for irrigation above station. Flow regulated by Swift Dam and headworks of B canal.

Birch Creek at Robare

The staff gage was located half a mile downstream from the former Robare Post Office, U. S. Highway 89, and 10 miles north of Dupuyer. The drainage area is 128 square miles. Monthly records are available for irrigation seasons from June 1914 through September 1926. The maximum discharge was not determined (probably occurred about June 21, 1916) and the minimum, no flow at times. B canal of the Valier-Carey project and several smaller ditches diverted water for irrigation above station. Flow regulated by Swift Dam and headworks of B canal.

Dupuyer Creek at Dupuyer

The staff gage was located on the highway bridge at Dupuyer. The drainage area is 65.7 square miles. Records are available from April 1908 through December 1912. The maximum discharge observed was 1,080 cfs. (June 5, 1908) and the minimum observed, 1.8 cfs. (July 4 to September 3, 1910). There were a few small diversions for irrigation above station.

Dupuyer Creek near Valier

The water-stage recorder was located 6 miles downstream from Sheep Creek and 8 miles southwest of Valier. The drainage area is 137 square miles. Records are available from July 1912 through September 1937. The maximum discharge was 3,330 cfs. (June 7, 1934) and the minimum, no flow at times in several years. The highest annual runoff was 109,000 acre-feet (1927) and the lowest 6,070 acre-feet (1931). There were several small diversions for irrigation above station.

Dry Fork Marias River near Valier

The water-stage recorder was located a quarter of a mile upstream from the mouth of Heines Coulee and 6½ miles southeast of Valier. The drainage area is 131 square miles. Records are available from March 1911 through September 1915. The maximum discharge was not determined and the minimum, no flow at times. The highest annual runoff was 15,800 acre-feet (1912) and the lowest, 2,080 acre-feet (1914). There were many diversions upstream from station.

Dry Fork Marias River at Fowler

The wire-weight gage was located on the highway bridge at Fowler and 5 miles upstream from mouth. The drainage area is 314 square miles. Records are available from March 1921 through December 1931, except for winter months in some years. The maximum discharge observed was 1,220 cfs. (May 30, 31, 1927) and the minimum, no flow at times. The average discharge for 5 years (1921-22, 1923-24, 1925-27, 1930-31) was 23.8 cfs. or 17,230 acre-feet per year. The highest annual runoff was 52,100 acre-feet (1927) and the lowest, 5,730 acre-feet (1931). Practically the entire flow is diverted upstream from the station. Water passing station during summer months is largely return flow from irrigation projects.

Partial Record Stations and Miscellaneous Discharge Measurements

In order to provide information on more streams than are covered by stream gaging stations, the U. S. Geological Survey has for several years been collecting some partial records. These are in addition to the miscellaneous discharge measurements which have always been reported. These partial records, when correlated with simultaneous discharges of nearby continuous-record stations, give fair indications of available flow.

There are about twenty low flow and about 175 crest-stage partial-record stations in the Missouri Basin in Montana. Operation of many of these began in 1959. Crest-stage gages are being operated in Pondera County on three tributaries of Dry Fork Marias River.

The partial record stations as well as the miscellaneous discharge measurements are listed at the end of each U. S. Geological Survey Water-Supply Paper or Surface Water Records report.

RESERVOIRS

Details of the operation records of the following reservoirs are available in the U. S. Geological Survey publications.

Swift Reservoir

Swift Reservoir is located on Birch Creek 17 miles west of Dupuyer. The drainage area is 75.3 square miles. The dam was completed in 1915. The reservoir has a usable capacity of 30,000 acre-feet for irrigation. Records furnished by Pondera County Canal and Reservoir Co.

Lake Francis (off-stream storage)

Lake Francis, completed about 1913, is located 3 miles southeast of Valier. Water stored in the reservoir for irrigation is diverted by canals from Birch Creek and Dupuyer Creek. The usable capacity is 112,000 acre-feet. Records furnished by Pondera County Canal and Reservoir Co.

ECONOMIC MINERAL RESOURCES

METALLIFEROUS MINERAL DEPOSITS

There has been no metal production from mines in Pondera County, nor has there been extensive prospecting or exploration for metallic minerals. The Choteau titaniferous magnetite beds, present in the Virgelle Sandstone of Teton County, extend northward through Pondera County between Valier and Williams. These more northern exposures are not believed to contain the amount of possible iron or titanium ore that is present in the Bynum-Choteau area of Teton County. However, there are possibilities of magnetite concentrations in the Horsethief Sandstone of the Heart Butte area in western Pondera County.

The titaniferous magnetite of the Virgelle and Horsethief Sandstone formations originated as a black sand concentration. The deposits are radioactive because of the presence of monazite, a thorium-bearing mineral.

Beneficiation and mining of the titaniferous magnetite is not yet (1963) economically feasible because of the extreme difficulty of separating the iron and titanium.

MINERAL FUELS AND GROUND WATER

Pondera County is geologically situated with its eastern and largest part on the Sweetgrass Arch, while the more western part extends into the "disturbed belt", a complexly folded and faulted zone along the Rocky Mountain front. Nearly all of the eastern part of the county is covered by glacial debris, and there is extensive morainal material and terrace gravel deposits in the western part. The bedrock east of the Virgelle bench is Colorado Shale, and most of the bedrock in the west of this bench consists of the Two Medicine Formation.

OIL FIELDS

Oil and gas exploration has lead to the development of the West Pondera, Gypsy Basin, and Pondera Oil fields, common to both Pondera and Teton Counties. Brady and Midway oil fields are in Pondera County, and a portion of the southwest extension of the Cut Bank field extends into northern Pondera County. Statistics regarding the Midway and West Pondera fields are not available, and all production from the southwest extension of the Cut Bank field is included in reports for Glacier County.

Brady Oil Field: This field was discovered by the Texaco, Schlepp No. 1, in September 1943, located SESE Section 21, Township 27 North, Range 2 West. Twelve wells are now producing from the Sunburst Sandstone at a depth of 1,725 feet or more.

Total production through 1962.....	16,000 bbls.
1962 production	1,728 bbls.
Remaining reserves	46,000 bbls.

Gypsy Basin Oil Field: Discovery well was Western Oils, Bill's No. 1, July 8, 1951, located SESW Section 31, Township 28 North, Range 6 West. Four wells produce from the Madison Limestone at about 3,410 feet.

Total production through 1962.....	48,000 bbls.
1962 production	19,205 bbls.
Remaining reserves	27,000 bbls.

Pondera Oil Field: Mostly in Teton County, this field was discovered by the Midwest Refining, Hober No. 1, June, 1927, located SESE Section 17, Township 27 North, Range 4 West. This well was a gas discovery, but the gas was rapidly depleted and an oil field was developed. Two hundred ninety three wells now produce from the Madison Limestone at an average depth of about 6,350 feet.

Total production through 1962.....	16,057,000 bbls.
1962 production	463,070 bbls.
Remaining reserves	4,777,000 bbls.

Future deep drilling may encounter deep oil or gas fields in western Pondera County.

COAL

Bituminous coal occurs in a belt about 6 to 16 miles wide, beginning about 30 miles south of Choteau and extending north to the Canadian border. Host rocks are the Two Medicine and St. Mary River Formations. Coal has been mined near Valier from beds as much as 3½ feet in thickness. Commercial mining of coal in Pondera County for fuels use is not likely, because the seams are generally too thin to permit economical strip mining.

GROUND WATER

The general region of Pondera County has not been the site of ground-water studies. However, for general purposes the county can be divided by the Virgelle bench into two ground-water provinces. The area east of the bench consists of Colorado Shale bedrock covered by glacial drift. The general possibilities for developing other than small amounts of fair-to-poor quality ground water are not good. West of the Virgelle bench the situation is different, for the Virgelle Sandstone and the sandstone horizons of the Two Medicine Formation are good aquifers, as are the various deposits of terrace gravels. The alluvial fill of the various stream valleys is considered a good ground-water prospect in either the western or the eastern part of the county.

Pondera County does not yet have widespread ground-water use. There are only 33 filings under the new State statute as of November 1963, and about that many under the older 1957 statute.

SOIL AND WATER CONSERVATION DISTRICTS

Pondera County is served by the Pondera County Soil Conservation District which was organized in 1945. The area of Pondera County is 1,051,520 acres.

The District is governed by a board of five supervisors who are elected by the land occupiers of the District. They carry out a program of complete resource conservation including erosion control, water conservation, soil management, land improvement, wildlife management, recreation, and land use adjustment. This program is accomplished by providing assistance to farmers and ranchers, on a voluntary basis, the analyzing of all resources, and the planning and applying of economically sound conservation treatment.

Under state law, the supervisors have the power to call upon local, state, and federal agencies to assist in carrying out a soil and water conservation program. The Pondera County Soil

Conservation District has memoranda of understanding with the Soil Conservation Service, State Forestry Department and Extension Service to provide technical assistance to district co-operators in carrying out a sound soil and water conservation program. Close working relations are maintained with the Extension Service, the Bureau of Indian Affairs, the Farmers Home Administration, the Agricultural Stabilization and Conservation Committee and the United States Forest Service.

The Soil Conservation Service assists the district by furnishing and interpreting basic data on soils and plant cover and other features of the land. Technical data is interpreted in terms of acceptable alternative uses and treatments to help guide the farm and ranch operator in developing sound conservation plans. It also aids district cooperators in performing operations requiring technical skills beyond the experience of the individuals involved.

The Office of the State Forester and Forest Service cooperate with the district by coordinating the programs in tree planting.

The Extension Service assists the district with its education and information programs. An important function of each district is to inform land owners and occupiers of the benefits derived from wise use of the communities soil and water resources.

One of the major problems of these districts is to acquaint the urban people, who comprise a large percentage of the total population of the districts, of the need for conservation.

Technical phases of the district's program include detailed soil surveys, range site and condition surveys, ground water investigations, topographic and other engineering surveys. By a careful analysis of this basic resource information, proper land use, the needed conservation treatment of each field can be determined. The technician interprets the surveys and provides the district cooperator with alternatives in land use and treatment that will enable him to treat the hazards and limitations that occur on each tract of land. With this information and by counseling with the technician the farmer or rancher makes the final decisions. These decisions are recorded in the Conservation Plan. The cooperator determines what will be done on his place and when it will be carried out.

When the plan is completed the cooperator is given further technical assistance on lay out work essential in establishing conservation practices on the land as called for in the conservation plan. This technical assistance is provided without cost to the cooperating farmer or rancher.

There are 500,123 acres of cropland, 330,879 acres of rangeland, 5,621 acres tame pasture, 12,000 acres woodland and 7,500 acres of land considered other land, such as townsites, roads, and highways.

It is estimated that about 89,500 acres can be irrigated. Three irrigation projects operate in the district—the Pondera Canal and Reservoir Co., at Valier; Brady Irrigation Company and Badger-Fisher project on the Blackfeet Indian Land. Most farmers have been irrigating on an intermittent or drought year basis, using water only as an insurance.

There are 121,479 acres of federal lands in Pondera County. Approximately three - fourths of this is Forest Service land. The balance is Bureau of Land Management and Blackfeet Indian Land.

The major enterprises on agricultural lands are grain and livestock production. Beef cattle, sheep, and swine are produced. Cash crops produced are small grains.

Work done since the organization of the district on irrigated lands consists largely of improvement of irrigation systems within the farm boundaries, land leveling, construction of permanent ditches, installation of water control structures, farm drainage systems, improved cropping and pasture management systems, soil management and improved wildlife habitat. On dryland pasture and range the work has been improvement of vegetative cover through seeding, deferred-rotation grazing, fencing, livestock water development and improvement of wildlife habitat.

Since the district was organized assistance has been given on proper cropping systems on over 23,800 acres; windstrip cropping 296,000 acres; stubble mulching 200,000 acres; improved water application 24,000 acres; land leveling and grading 4,000 acres; drainage installed on 7,000 acres requiring nearly 100 miles of ditch, over 1,000 structures installed; 550 miles of irrigation ditch construction, range improvement on 175,000 acres; seeding of hay and pasture on 25,000 acres; 375 stock ponds constructed; 60 springs developed; 25 ponds stocked with fish; 400 acres improved wildlife habitat; 500 acres of trees planted and other approved conservation measures.

A considerable amount of conservation work has been accomplished through efforts of organized groups and this is encouraged wherever possible.

The Pondera County Soil Conservation District owns equipment consisting of scraper and tree planter which is available to district cooperators on a rental basis to carry out needed conservation measures.

Cooperative efforts of land owners and operators, other groups and agencies have contributed to the overall success of the district.

FISH AND GAME

Bounded on the west by the high alpine Continental Divide, Pondera County extends east into the upland plains and grass country typical of central Montana.

As in the days of the pioneers, when wild game supplemented their beans and salt pork diet, Pondera County still has an abundance and variety of fish, birds and game animals. Elk, bear, bighorn sheep and goat are found in the rugged mountain areas while white-tailed deer, mule deer, and antelope are found in the foothills, river bottoms, and sweeping prairies.

Fine rainbow and cutthroat trout fishing can be found throughout the county in the many farm ponds that also serve as erosion control and cattle watering structures. Two of the larger bodies of water in the county are Swift Reservoir and Lake Francis. Swift has yielded many fine catches of rainbow and cutthroat trout to anglers. Lake Francis has shown excellent production of rainbow trout and Kokanee salmon.

Both of these fish have established amazing growth rates with the Kokanee going up to three pounds. Perch have invaded Lake Francis and compete for food with the trout and salmon. The perch is excellent eating and can be a tremendous addition to the year around anglers in Lake Francis. Rainbow trout can be fished in the Marias River, Birch Creek, Sheep Creek, Dupuyer Creek and Two Medicine River. Lower portions of the Marias River have sauger, char, catfish, and ling to add a variety of fishing possibilities in the county. Although the waters of

Pondera County are fertile for fish production, the turbidity problem exists that hamper natural reproduction of game fish. Most waters have to be planted by the Fish and Game Department to sustain yield.

Bird hunting varies from blue and ruffed grouse hunting in the mountains to pursuing ringnecked pheasants, Hungarian partridge and waterfowl in the prairie areas. Farm ponds add tremendously to the waterfowl population. Few ponds are without a brooding pair of mallards or blue-winged teal. Lake Francis offers excellent duck and goose hunting. Huge flocks of snow geese stop over to rest and feed on their migrations.

Skillful hunters can harvest both snow geese and Canada honkers in the fields around Lake Francis.

Fur-bearing animals include Canada lynx, bobcat, coyote, beaver, muskrat, mink, badger and weasel. Martin and otter may also be found on rare occasions. Furs add a valuable source of income to the school boy with a dozen traps or the full-time trapper with hundreds of traps.

From elk to antelope, rainbow to Kokanee, blue grouse to honkers, Pondera County has much to contribute to the thousands of Montanans who take to the fields and waterways each year. By preserving the wildlife habitat and practicing sound conservation methods on the land, Pondera County can continue to perpetuate these valuable wildlife resources for future generations.

LEWIS & CLARK NATIONAL FOREST

The Rocky Mountain Division of the Lewis & Clark National Forest contains 776,000 acres; 110,000 acres are in the western portion of Pondera County. National Forest land represents approximately 10 percent of Pondera County's 1,058,560 acres.

The Lewis & Clark National Forest was established by Presidential Proclamation on February 22, 1897. At that time National Forest lands were called Forest Reserves. The Reserve extended to Flathead Lake on the west, Glacier Park to the north, along the face of the Rocky Mountains on the east and south to Lewis & Clark Pass. A Presidential Proclamation on June 9, 1903, enlarged the area by combining the Flathead and Lewis & Clark Reserves. Congress changed Forest Reserves to National Forests in 1907. Large areas of the Lewis & Clark National Forest were transferred July 1, 1908, to the Blackfoot, Flathead, and Kooteani National Forests. Further reductions were made in subsequent years. On April 8, 1932, the Lewis & Clark National Forest was consolidated with the Jefferson National Forest. The Jefferson included the Little Belts, Highwoods, Snowies and Little Rockies. The first recorded history of this area is based on Capt. Lewis' exploration of the headwaters of the Marias River in July of 1806. Trapping lured most of the early settlers; there was little mining or good agricultural potential in this mountainous area.

Timber harvesting started in this area early in the 1880's. By 1886 timber was being harvested on Badger Creek; a sawmill was built on the South Fork of Dupuyer Creek in 1899. The need for building material and fuel for the railroads stimulated much of the early timber harvest. However, there has been little logging activity on the Lewis & Clark National Forest in Pondera County. Many areas of commercial timber are inaccessible or are too scattered to be economically logged at present. There is no commercial timber on private lands in Pondera County.

While timber was probably one of the first resources used in this area, water is recognized as the most valuable and basic resource. Downstream structures at Swift Reservoir and Lake Francis reflect the early settlers' appreciation of the value and importance of water. In addition to the water supplied directly from the streams, these two structures store 142,000 acre feet of water. Other renewable National Forest resources—timber, forage and wildlife—are managed to control water quality, produce maximum water yield, reduce floods and time streamflow to best meet the multiple water needs.

National Forest land is managed under the multiple use concept of resource management. Use of the land is not limited to one resource; these public lands are managed for wood, water, forage, wildlife, and recreation.

Resource management on National Forests is designed to avoid conflicts in the use of these public lands. For example, this permits cattle to graze during the summer on land that elk and deer graze throughout the year. Also, cattle can graze National Forest lands in the fall that are used for camping and picnicking in the summer. Resources are managed on a sustained yield basis to insure opportunities and privileges for future generations.

Local ranchers, under paid special-use permits, graze 255 cattle for three months and 500 sheep for two months each year on the summer ranges of the Lewis & Clark National Forest in Pondera County. Grazing these ranges is important to the ranch operations of the area. Domestic grazing of these public lands is managed so as to avoid conflict with wildlife needs.

Sportsmen find good hunting and fishing on the Lewis & Clark National Forest in Pondera County. These public lands are open to hunting and fishing under the seasons, bag limits and licensing requirements established by the Montana Fish and Game Commission. Big game include moose, elk, mule deer, whitetail deer, Rocky Mountain goat, black bear and grizzly bear. There are various species of grouse.

More than one-half of the National Forest Land in Pondera County has been burned by forest fire. Some areas have been burned several times. Forest fires have been recorded on these lands from 1880 through the 1940's. Timber reproduction has not been achieved on some of the burn areas. Planting has been initiated in some areas—such as Hungry Man Creek—to re-establish timber stands. This is important for the control of the quantity and quality of runoff from local watersheds. Planting in the Hungry Man Creek will improve the watershed feeding Swift Reservoir.

Recreational use of this area increases every year. In keeping with the Forest Service program of multiple use management and planning, new recreational areas are being set aside to meet future needs.

**SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE
FOLLOWING COUNTIES COMPLETED TO DATE**

Big Horn, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Deer Lodge, Fallon, Gallatin, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis & Clark, Madison, Meagher, Missoula, Musselshell, Park, Pondera, Powder River, Powell, Ravalli, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Wheatland, Wibaux and Yellowstone

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Missouri River Drainage Basin:			
*Missouri River.....	107,339.50.....	24,787.33.....	132,126.83
Jefferson River.....	61,291.00.....	9,713.00.....	71,004.00
Beaverhead River.....	40,771.00.....	6,076.00.....	46,847.00
Big Hole River.....	23,775.00.....	1,950.00.....	25,725.00
Madison River.....	39,445.00.....	7,660.00.....	47,105.00
Gallatin River.....	111,914.00.....	21,097.00.....	133,011.00
Smith River.....	32,934.00.....	19,679.00.....	52,613.00
Sun River.....	124,474.58.....	4,385.00.....	128,859.58
Marias River.....	114,685.42.....	13,415.88.....	128,101.30
Teton River.....	74,653.00.....	15,882.33.....	90,535.33
Musselshell River.....	64,789.00.....	57,870.00.....	122,659.00
Milk River.....	2,334.00.....	2,595.33.....	4,929.33
Yellowstone River.....	303,501.00.....	96,148.00.....	399,649.00
Stillwater River.....	27,489.00.....	16,403.00.....	43,892.00
Clark Fork River.....	91,768.00.....	24,195.00.....	115,963.00
Big Horn River.....	65,395.00.....	25,579.00.....	90,974.00
Tongue River.....	28,170.00.....	7,762.00.....	35,932.00
Powder River.....	35,948.00.....	2,299.00.....	38,247.00
Little Missouri River.....	42,513.00.....	1,499.00.....	44,012.00
Grand Total Missouri River Basin.....	1,393,189.50.....	358,995.87.....	1,752,185.37
Columbia River Drainage Basin:			
Clark Fork (Deer Lodge, Hellgate, Missoula) River.....	145,804.70.....	14,934.20.....	160,738.90
Bitterroot River.....	111,102.43.....	3,200.00.....	114,302.43
Flathead River.....	111,208.61.....	1,702.82.....	112,911.43
Grand Total Columbia River Basin.....	368,115.74.....	19,837.02.....	387,952.76
Grand Total in the Counties Completed to Date.....	1,761,305.24.....	378,832.89.....	2,140,138.13

*Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF PONDERA COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Missouri River Basin:			
*Missouri River.....	0.....	0.....	0
Marias River.....	57.00.....	0.....	57.00
Two Medicine River.....	40.00.....	120.00.....	160.00
Badger Creek.....	15,647.72.....	7,204.48.....	22,852.20
Whitetail Creek.....	27.00.....	0.....	27.00
Birch Creek.....	89,718.70.....	5,239.40.....	94,958.10
Fish Creek.....	0.....	0.....	0
Fish Lake.....	460.00.....	9.00.....	469.00
Dupuyer Creek.....	2,201.00.....	26.00.....	2,227.00
Sheep Creek.....	783.00.....	75.00.....	858.00
Hay Coulee & Spring.....	8.00.....	0.....	8.00
Waste.....	22.00.....	24.00.....	46.00
Murray Springs & Coulee.....	0.....	22.00.....	22.00
Waste (AN Canal).....	105.00.....	0.....	105.00
Schultz (Flat) Coulee.....	31.00.....	0.....	31.00
Waste.....	0.....	57.00.....	57.00
Waste.....	10.00.....	23.00.....	33.00
Bullhead (Coulee) Creek.....	889.00.....	20.00.....	909.00
Winginaw (Green's) (South Branch Schultz) Coulee.....	35.00.....	82.00.....	117.00
Lonetree Coulee.....	8.00.....	0.....	8.00
Waste (L2) (Canal).....	17.00.....	30.00.....	47.00
Dry Fork Marias River.....	110.00.....	139.00.....	249.00
North Fork of Dry Fork Marias River.....	0.....	55.00.....	55.00
Campbell Coulee.....	22.00.....	0.....	22.00
Flat Coulee.....	80.00.....	18.00.....	98.00
Little Dry Coulee.....	0.....	0.....	0
Welch Coulee.....	19.00.....	19.00.....	38.00
Yeager Coulee.....	70.00.....	0.....	70.00
Flat (Little Flat) Coulee.....	12.00.....	0.....	12.00
Little Flat Coulee.....	49.00.....	0.....	49.00
Unnamed Coulee.....	23.00.....	0.....	23.00
Pondera (Antelope) (Snake) Coulee.....	1,522.00.....	0.....	1,522.00
Brady Coulee.....	158.00.....	0.....	158.00
South Pondera Coulee.....	161.00.....	0.....	161.00
Teton River.....	0.....	0.....	0
Muddy Creek.....	12,333.00.....	726.00.....	13,059.00
TOTAL IRRIGATION IN PONDERA COUNTY.....	124,618.42.....	13,888.88.....	138,507.30

*Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

BIRCH CREEK WATER COMPANY

HISTORY

The original incorporators of the Birch Creek Water Company were E. E. Leech and Mary E. Leech, his wife, of Dupuyer, Montana and William Cowgill and Belle Cowgill, his wife, of Choteau, Montana. They located in the Birch Creek country prior to 1900, and obtained lands principally through purchase of desert entries, homesteads and isolated tracts. Their principle business was stock raising and the lands were used for the raising of hay and the grazing of livestock. Through their purchases and by appropriation they obtained title to all or a portion of various water rights of an undetermined value for the Birch Creek Water Company. The most valuable of these rights have been covered in the history of the Birch Creek Adjudication Data, Volume II.

The business of these parties and their land transaction made it imperative that some means be provided for the conveyance of water to their holdings. Accordingly they obtained a part interest in two main ditches, namely, the Hall-Stewart-Leech Ditch and the Kingsbury Ditch together with several lateral ditches. The interest in the Kingsbury Ditch was obtained through an agreement between Kingsbury and Cowgill, whereby, Cowgill was deeded a twenty-five fifty-seventh ($25/57$) interest in the ditch with the understanding that an enlargement by either party would not create any greater interest than that above specified. This deed was made on May 10, 1904 and is recorded in Book No. 1-B of Deeds, page 287. From all the information available the lateral Hall-Stewart branch of the Hall-Stewart-Leech Ditch was abandoned early in the period of 1898 to 1909 as a part of the Birch Creek Water Company system. It is therefore evident that the two main ditches which the parties involved depended on for their water was the Leech Branch of the Hall-Stewart-Leech Ditch and the Cowgill Branch of the Kingsbury Ditch. The Cowgill Branch of the Kingsbury ditch was constructed in 1898. These ditches were the nucleus of the system as they were developed. At the present time the Leech Branch of the main Hall-Stewart-Leech Ditch and the Kingsbury Ditch including the Cowgill Branch are used by the Birch Creek Water Company.

Articles of Incorporation of the Birch Creek Water Company were formed on March 9, 1909 with a capitol stock of \$100,000.00, divided into 10,000 shares of a par value of \$10.00 per share. The stock of the company shall be assessable. The term of existence of the corporation shall be forty years from and after March 9, 1909. On February 2, 1951 the articles of incorporation were extended for an indefinite period of time.

PRESENT STATISTICS

Location: The waters used or intended for use are diverted from Birch Creek, Sober-Up Coulee and Cartwright Coulee. The Hall-Stewart-Leech Ditch diversion is from the right bank of Birch Creek near the NW corner of the NW $\frac{1}{4}$ SE $\frac{1}{4}$, Section 27, Township 29 North, Range 8 West. The Hall-Stewart Ditch and the Leech Ditch branch off of the main Hall-Stewart-Leech Ditch near SE corner of the SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23, Township 29 North, Range 8 West. The Kingsbury Ditch diverts in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 1, Township 29 North, Range 8 West. The Cowgill Ditch takes off from the Kingsbury Ditch in the NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 16, Township 29 North, Range 7 West. Land irrigated by the Birch Creek Water Company is located in Sections 13, 14, 23 and 24, Township 29 North, Range 8 West; Sections 4, 9, 11, 12, 14, 15, 22, 23, 24, 26, 27 and 28 in Township 29 North, Range 7 West.

Length and Capacity of Ditch: Hall-Stewart-Leech Ditch from its point of diversion to the junction of the Leech and the Hall-Stewart branches is one mile in length and has a capacity of 25 c.f.s. The Leech Ditch is 8 miles long and has a capacity of 13.12 c.f.s. The Hall-Stewart Ditch is 4¾ miles in length with a capacity of 8.09 c.f.s. Length of Kingsbury Ditch is 7¾ miles with a capacity of 17.14 c.f.s. From the Kingsbury Ditch the Cowgill branch extends a distance of 5½ miles and has a capacity of 7.52 c.f.s.

Operation and Maintenance: Charges for operation and maintenance are based on shares of stock owned by the stockholders in the company and vary from year to year. Assessments for each share of stock have averaged about ten cents per share for the last several years. The Leech Branch of the Hall-Stewart-Leech Ditch was cleaned in the fall of 1963 and will be put in use during the irrigation season of 1964. One water user in the company has an agreement with the Pondera County Canal and Reservoir Company to carry water in their ditch ("B" Canal). This water is then spilled into Cartwright Coulee where it is diverted into the Cowgill Ditch.

Present Users: Shares sold in the Birch Creek Water Company amount to 9,438 divided among four (4) shareholders as follows: 40, 300, 4,470 and 4,628 shares. One share of stock represents approximately one miner's inch of water.

Acres Irrigated: In 1963 there were 679 acres irrigated under the Birch Creek Water Company with 115 acres potentially irrigable under the ditch system.

WATER RIGHT DATA

Water rights that apply and are used by the Birch Creek Water Company are as follows:

BIRCH CREEK

An appropriation by William Cowgill & E. E. Leech dated 5-11-01 for 2,000 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 89). Deeded to Birch Creek Water Company: 1,000" from E. E. Leech to Company, (Book 2-D Deeds, page 213); 1,000" from William Cowgill to Company, (Book 2-D Deeds, page 212).

An appropriation by Sybill Cowell dated 6-21-00 for 1,000 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 79). Deeded to Birch Creek Water Company in Book 2-D Deeds, page 212.

An appropriation by Alfred Gardner and Cal Stewart dated 8-31-97 for 1,667 of 2,500 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 43). Deeded to Birch Creek Water Company: 1,250" from E. E. Leech to Company, (Book 2-G Deeds, page 315); 417" from William Cowgill to Company, (Book 2-D Deeds, page 212).

An appropriation by John Hall dated 7-7-1900 for 950 of 1,260 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 80). Deeded to Birch Creek Water Company: 950" from E. E. Leech to Company, (Book 2-D Deeds, page 213).

An appropriation by Jerry Mongon dated 10-14-95 for 2,500 of 5,000 miner's inches, (Ref. Book 1 Transcribed Water Right Records, page 15). Deeded to Birch Creek Water Company: 1,250" from William Cowgill to Company, (Book 2-D Deeds, page 212); 1,250" from E. E. Leech to Company, (Book 2-D Deeds, page 213).

An appropriation by Margaret Prince dated 4-12-06 for 200 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 199). Deeded to Birch Creek Water Company: from William Cowgill to Company, (Book 2-G Deeds, page 316).

An appropriation by Calvin Stewart dated 7-24-97 for 200 of 400 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 40). Deeded to Birch Creek Water Company: 200" from William Cowgill to Company, (Book 2-D Deeds, page 212).

An appropriation by George Barron and Hiram Upham dated 4-9-84 for 100 of 1,500 miner's inches, (Ref. Book 1 of Transcribed Deeds, page 48). Deeded to Birch Creek Water Company: 100" from E. E. Leech to Company, (Book 2-D Deeds, page 213).

CARTWRIGHT COULEE

An appropriation by William Cowgill dated 6-19-00 for 400 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 78).

SOBER-UP COULEE

An appropriation by E. E. Leech dated 3-30-01 for 400 miner's inches, (Ref. Book 1 of Transcribed Water Right Records, page 86).

See maps in Part II, Page 20.

BLACKFEET IRRIGATION PROJECT
(BADGER-FISHER UNIT and BIRCH CREEK UNIT)

HISTORY

Irrigation began on the Blackfeet Reservation in 1886, when a number of ranchers built a small ditch from Birch Creek to irrigate approximately 1,000 acres. In 1898 the Government constructed a canal approximately 5½ miles long to bring water from Birch Creek to irrigate the reservation lands adjoining the creek.

By 1904, upstream diversions on Birch Creek to non-reservation lands had so depleted the flow that irrigation on the reservation (from Birch Creek) was practically abandoned. In 1907, the United States Circuit Court enjoined the Conrad Investment Company, the principal upstream user, from diverting any of the waters of Birch Creek so as to impinge upon the rights of the Government to have flowing in the stream at all times 1,666-2/3 miner's inches; with the further provision that the Government may apply for modification of the decree at any time that it may determine that its needs will be in excess of the amount of water so designated. The case was appealed in 1908 and the decree was affirmed.

The Blackfeet Irrigation Project was authorized by the Act of March 1, 1907 (34 Stat. 1035). In accordance with instructions of the Secretary of the Interior and the agreement of March 8, 1907, between the Commissioner of Indian Affairs and the Director of the United States Reclamation Service, the investigation, construction, and operation of the irrigation system on the Blackfeet Reservation were put in direct charge of the United States Reclamation Service. (The Bureau of Indian Affairs was in control of appropriations.) This agreement remained in effect until 1924, when the project was turned over to the Indian Irrigation Service.

On August 21, 1907, Assistant Engineer C. E. Hewitt was detailed to have immediate charge of investigations. These investigations were conducted during the remainder of the field season. A magnetic transit stadia grade location ran from the south bank of Badger Creek to land known as Fisher Flats by way of Four Horns Lake, a possible reservoir site. A similar line was run from the north bank of Birch Creek in Section 22, Township 29 North, Range 8 West. In the fall of 1908, surveys were made to determine withdrawals for a reservoir at Four Horns Lake, which would be supplied from Badger Creek, to irrigate a Badger-Fisher Unit. Major construction was begun on the Badger-Fisher Unit in 1911 and on the Birch Creek Unit in 1915. These units, a part of the Blackfeet Irrigation Project, are in Pondera County.

Irrigation districts have not been formed on either the Badger-Fisher or the Birch Creek units. Water users have appointed committees to represent their units at various times.

A diversion dam turns water from Badger Creek into a 13-mile feeder canal which fills Four Horns Lake Reservoir to provide storage for the Badger-Fisher Unit. The Four Horns outlet canal spills into Blacktail Creek at Mile 2.5; then the water is carried through a diversion into the 31.4-mile Badger-Fisher main canal. The Badger-Fisher Unit contains 15,732.02 acres of presently irrigable (Class 1) lands and 7,721.98 acres of temporarily non-irrigable lands (Class 2) making a total of 23,454 ultimately irrigable lands. Of this acreage, 23,380.37 acres lie within Pondera County.

For the Birch Creek Unit, a headworks installation, located on Birch Creek six miles southwest of the junction of Highway 89 and Birch Creek, diverts water into a 6-mile main canal. The original canal, built in 1886 by the farmers, with the decreed water right for the irrigable

lands was taken over by the Government when the project was initiated. The Birch Creek Unit contains 1,440.80 acres of presently irrigable lands (Class 1) and 675.30 acres of temporarily non-irrigable lands (Class 2), making a total of 2,116 ultimately irrigable acres. Of this acreage, 1,873.80 acres lie in Pondera County.

PRESENT STATISTICS

Location: The location of the irrigated lands of the Badger-Fisher and the Birch Creek Units, Pondera County, of the Blackfeet Irrigation Project are:

Badger-Fisher Unit: Township 30 North, Ranges 5, 6, 7, 8, and 9 West; Township 31 North, Ranges 5, 6, 7, 8, and 9 West.

Birch Creek Unit: Township 29 North, Range 8 West; Township 30 North, Range 7 West; Township 30 North, Range 8 West.

Length and Capacity of Canals: Under the Badger-Fisher Unit there is an estimated 155 miles of canals and laterals in the distribution system, with 25 miles to be constructed. The capacities of the main canal are: The main canal from Four Horns Reservoir to the distribution area requires a capacity of 400 cubic second feet for the first 17 miles; it is now constructed to a capacity of 220 cubic second feet. From Mile 2.5 to Mile 5, the canal utilizes a natural water course, which flows into Blacktail Creek from where the water is diverted into the main canal.

At Mile 17, a lateral takes off to supply about half the unit acreage. From Mile 17 to Mile 35, the canal requires a capacity of 220 cubic second feet; it is now constructed to a capacity of 150 cubic second feet. The Four Horns Feeder Canal runs 13 miles from the diversion point on Badger Creek; it requires a capacity of 350 cubic second feet; it is now constructed to a capacity of 150 cubic second feet. The lower end of the canal utilizes a natural water course which flows into the Four Horns Reservoir.

On the Birch Creek Unit, a total of 19 miles of canals and laterals are presently in use, with 6 miles to be constructed to complete the system. The Main Birch Creek canal has a capacity of 416 cubic second feet.

Reservoir: The Four Horns Reservoir supplies storage for the Badger-Fisher Unit. It requires 30,000 acre feet of storage to supply the unit. The reservoir is now constructed to a capacity of 20,000 acre feet.

Operation and Maintenance: The water charge per acre on the Badger-Fisher and the Birch Creek Units includes operation and maintenance.

WHITE OWNED LAND AND INDIAN OWNED LAND (1963)

Badger-Fisher Unit	\$2.25 per acre
Birch Creek Unit.....	\$2.25 per acre

Present Water Users: On the Badger-Fisher Unit in 1963, there were 48 water users, and 10 on the Birch Creek Unit.

Acreage Irrigated (July 1963): The two units had the following irrigable acres: The Badger-Fisher Unit had 15,647.72 irrigable acres (Class 1—assessed) and 7,204.88 acres temporarily non-irrigable (Class 2—unassessed)—Total irrigable area 22,852.20 acres.

The Birch Creek Unit has 1,372.50 irrigable acres (Class 1—assessed) and 705.40 acres temporarily non-irrigable (Class 2—unassessed). Total irrigable area—2,077.90 acres.

WATER RIGHT DATA

The water rights applicable to the Badger-Fisher and the Birch Creek Units of the Blackfeet Irrigation Project were filed by the United States of America and are as follows: An appropriation of water from Badger Creek, dated June 12, 1910, for 100,000 acre feet (Ref. County Clerk & Recorder's Office, Conrad, Montana); decreed water right from Birch Creek in 1907 for 1,666-2/3 miner's inches to be modified as determined by needs and affirmed May 25, 1908, Conrad Inv. Co. vs. United States, Circuit Court of Appeals, Ninth Circuit, No. 1530.

Project Rights: A "reserved" right of Indian tribes to divert and use water flowing in river channels through Indian Reservations has been recognized by the Supreme Court of the United States since 1908 (*Winters vs. U. S.* (1908) 207 U. S. 564).

Filings on water rights have been made on all diversions and on all possible future diversions or storages. These filings are on record in the Pondera County Courthouse, Conrad, Montana. All filings prior to 1919 are on file in the Teton County Courthouse, Choteau, Montana.

Other water rights listed for the Blackfeet Irrigation Project for the Badger-Fisher Unit are: An appropriation filed by the U. S. A. from Badger Creek dated 8-29-08 for 480 miner's inches (Ref. Book A, W.R.R., Page 377); from Badger Creek dated 5-7-10 for 30,000 miner's inches (Ref. Book A, W.R.R., page 37); from Badger Creek dated 5-7-10 for 100,000 miner's inches (Ref. Book A, W.R.R., page 38); from Badger Creek dated 11-1-14 for 12,000 miner's inches (Ref. Book A, W.R.R., page 153); from Badger Creek dated 11-25-14 for 100,000 acre feet (Ref. Book A, W.R.R., page 164); from Badger Creek dated 10-27-17 for 2,000 miner's inches (Ref. Book A, W.R.R., Page 250); from Badger Creek dated 10-22-20 for 16,000 miner's inches (Ref. Book 1, W.R.R., page 37); from Badger Creek dated 5-7-10 for 100,000 miner's inches (Ref. Book A, W.R.R., Page 41); from Badger Creek dated 11-1-14 for 2,000 miner's inches (Ref. Book A, W.R.R., Page 150); from Blacktail Creek dated 5-7-10 for 20,000 miner's inches (Ref. Book A, W.R.R., Page 36); from Blacktail Creek dated 11-5-14 for 24,000 miner's inches (Ref. Book A, W.R.R., Page 162); All the above water rights are filed in Glacier County at Cut Bank, Montana.

(See Maps in Part II, Pages 21, 27, 28, 30, 31.)

BRADY IRRIGATION COMPANY

HISTORY

The Brady Irrigation Company was first incorporated on June 19, 1909 for a period of 40 years. Capital stock of the company was set at \$50,000 divided into 500 shares of a par value of \$100 each. The original shares of stock subscribed to were held by Alexander Truchot, 100 shares; Thomas O. Larson, 100 shares; and Kenneth McKenzie, 50 shares. Each of these men held the position as a director in the corporation.

On June 22, 1949, re-incorporation papers were filed to extend the company's corporate existence for another 40 year period. Two amendments were included in the re-incorporation articles; the first changed the company's principal place of business from Choteau in Teton County, to the town of Brady in Pondera County, and the second amendment increased the number of directors from three (3) to five (5).

A short time after the irrigation company was formed, a supplemental water supply was obtained from the Teton Co-operative Reservoir Company (Bynum Reservoir). One hundred and fifty-six (156) shares of stock were purchased by the Brady Irrigation Company in the Teton Co-operative Reservoir Company.

PRESENT STATISTICS

Location: The majority of land irrigated under the Brady Irrigation Project is in Pondera County, with only one water user in Teton County. Lands irrigated under the project in Pondera County are located in Sections 22 through 35 inclusive, T. 27N.—R. 2W; Sections 5 through 9 and 19, T. 26N.—R. 1W; Sections 1 through 7, 9 through 15, 17 through 20, and 24, T. 26N.—R. 2W; Sections 13, 15, 22 and 24, T. 26N.—R. 3W.

Length and Capacity of Canals: There are approximately 28 miles of canals in the system used by the Brady Irrigation Company. The supply canal to the reservoir system has its point of diversion from the left bank of Muddy Creek near the line between Sections 35 and 36 in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 36, T. 26N.—R. 4W., Teton County, and has a capacity of approximately 200 c.f.s. Its length is about 2 $\frac{1}{2}$ miles to a point where it spills into Round Lake. From Round Lake, the supply canal continues north $\frac{1}{4}$ mile to Eyraud Lake, and from this lake follows a course another $\frac{1}{4}$ mile to Brady Lake. All of these connecting canals are a part of the main supply system for the irrigation project.

The main canal diverts directly below the dam at Brady Lake in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 20, T. 26N.—R. 3W. in Teton County. The length of the Brady Canal from the reservoir to the division at the North and South Canals is 8 $\frac{1}{4}$ miles and has a carrying capacity of about 175 c.f.s. The lengths of the North and South Canals are 4 $\frac{1}{2}$ and 7 miles respectively. A private ditch diversion, named the Scott Ditch, from the main canal is 7 miles in length.

Reservoirs: The three reservoirs used in conjunction with the project are located along the Supply Canal in the order named; Round Lake, Eyraud Lake and Brady Lake. A combined capacity of 3,300 acre feet of water is stored in the three reservoirs with Brady Lake having the largest storage capacity of the three.

Operation and Maintenance: Usual average yearly charge for operation and maintenance is \$2.00 to \$2.50 per acre of land irrigated.

Present Users: Under this Ditch Company last year (1963), there were 42 stockholders owning 497 shares of 500 shares in the company; one stockholder owning shares in Teton County. Originally the company was set up for 5 shares to represent water requirements for the irrigation of 160 acres. At the present time the company does not recognize a stock share as representing a definite amount of water.

Acreage Irrigated: In 1963 there were 12,333 acres irrigated and 726 potentially irrigable under the Brady Irrigation Company in Pondera County. Acres irrigated in Teton County were 195 and 36 acres potentially irrigable by one water user.

WATER RIGHT DATA

In addition to owning 156 water shares in the Teton Co-operative Reservoir Company, the Brady Irrigation Company has the following appropriative water right filings: An appropriation by Alexander Truchot from Muddy Creek, dated April 1, 1909 for 400 c.f.s. (Ref. Book 9-B of Transcribed Records, Page 306); An appropriation by Alexander Truchot from Farmers Coulee, dated April 1, 1909 for 100 c.f.s. (Ref. Book 9-B of Transcribed Records, Page 307); An Appropriation by Alexander Truchot from Kropp Coulee, dated April 9, 1909 for 100 c.f.s. (Ref. Book 9-B of Transcribed Records, Page 330); An appropriation by the Brady Irrigation Company from the Milwaukee Railroad Drainage Canal, dated 12-13-13 for 100 c.f.s. (Ref. Bk. 9C of Water Right Records, Page 284). All of the above appropriations are located in the Clerk & Records, Office, Choteau, Montana.

(See Maps in Part II, Pages 1, 2, 3, 6.)

PONDERA COUNTY CANAL AND RESERVOIR COMPANY

HISTORY

The early history of this irrigation project originated with the land holdings of W. G. Conrad and his brother who owned a large cattle ranch in the area east of the present town of Conrad in Pondera County. Their main ranch headquarters was located on Dupuyer Creek, with other ranch buildings on the Dry Fork of the Marias River. The Conrad Brothers acquired title to some 50,000 acres of land by having their employees take up homesteads and desert land claims which in turn were deeded back to them. They filed water rights, including reservoir sites, along many of the streams and coulees in such a way that no other cattle outfits could utilize the open Government land near their holdings.

M. S. Darling, an engineer, became associated with the Conrads and constructed a ditch system for them some fifty miles in length, with diversions from both Birch and Dupuyer Creeks. This system placed five or six thousand acres of hay meadow under irrigation near the present town of Valier. Their original company was known as the Conrad Investment Company.

The Conrad Brothers also organized the Pondera Canal Company which diverted water from a reservoir site near Valier (Lake Francis) down the Dry Fork of the Marias, where it was diverted from that stream to an area east of the present Conrad townsite. Shares were sold in the company to landowners in the vicinity for the irrigation of about 13,000 acres of land. The present irrigation project today is an enlargement and extension of the "Old Conrad System" and originated from the Conrad Investment Company.

In 1908, the Conrad Brothers land and livestock holdings were sold to W. G. Cargill and members of his family for a reputed price of \$1,000,000.00.

The engineer, M. S. Darling, who was associated with the Conrad irrigation development, first conceived the idea of a Carey Land Act irrigation project in this area. With this knowledge the Cargills began and organized the irrigation project under provisions of the Congressional Act of August 18, 1894, known as the "Carey Act".

The Act provided for segregation of land from Public Domain to be obtained by the State of Montana which comprised 70,000 acres in Montana Segregation List No. 8 and 25,252 acres in Lists No. 12 and 14, making a total of 95,252 acres of public lands set aside for the project. To obtain patents to these lands from the Federal Government it required that at least five (5) acres of each forty (40) must be irrigated. Where it was impractical to comply with this requirement, the non-irrigable lands were relinquished to the government, resulting in about 70,000 acres of "Carey Lands" being patented to the State. In addition, there were about 50,000 acres of privately owned land included in the project.

Two companies were formed under provisions of the Carey Act for the irrigation project. The first was a "Settlers Corporation" and it was incorporated under the name of the "Teton County Canal and Reservoir Company" on May 26, 1909. This company was composed of the owners of the land under the project. The other corporation formed was known as the "Construction Company" and it incorporated on March 29, 1909 as the "Conrad Land and Water Company." Under the Carey Act, contracts were granted to the Conrad Land and Water Company for the construction of the irrigation system and the right to sell and dispose of water rights to the settlers or purchasers of public lands. Each of the water rights in the company were to be represented by one share of stock in the Teton County Canal and Reservoir Com-

pany, whose capital stock consisted of 160,000 shares, having a par value of \$1.00 each. These shares were issued in part to the settlers or purchasers, one share representing an acre of irrigated land. The Conrad Land and Water Company and its successors agreed to a final acceptance of the irrigation project by the State of Montana when 90% of the water rights or shares were sold and paid for by the settlers or purchasers and then to transfer their respective right, title and interest to the Teton County Canal and Reservoir Company.

The history of the "Construction Company" was one of constant financial difficulties, passing through several reorganizations and receiverships. At various times the "Construction Company" went under the names of the "Conrad Land and Water Company", "The Valier-Montana Land and Water Company" and finally "The Valier Company."

The original settlers were not very successful and became delinquent in their contracted land payments to the Construction Company and many failed to pay their county taxes. Foreclosures on delinquent lands increased the Construction Company holdings to 20,000 acres of irrigated land.

On August 10, 1926, Colonel James T. Stanford, who had served long and in many capacities with the company, passed away and the Cargill interests, headed by John H. MacMillan, Sr. assumed control. Under this leadership and by means of consolidation of various departments a considerable savings was noted.

The Articles of Incorporation of the Teton County Canal and Reservoir Company were amended on April 4, 1927 and its name changed to the Pondera County Canal and Reservoir Company.

In 1948, the physical part of the project was completed and the company made application for its acceptance by the State Engineer. After many inspections and compliances by the State Engineer under the provisions of the "Carey Act," the project was officially accepted by the Board on November 27, 1953 and the ownership turned over to the Settlers Corporation, the Pondera County Canal and Reservoir Company. A limit of 72,000 acres was set as the maximum irrigated acreage for the completed project works.

Of late years grain farming on the project has been so profitable that diversification of crops has not been practiced, as yields were high and holdings too large for successful diversified irrigation farming. For the last several years the irrigation project has been operated and maintained adequately with approximately 80,000 acres of land being served at the present time.

PRESENT STATISTICS

Location: The Pondera County Canal and Reservoir Company irrigation project is located wholly within Pondera County, approximately 100 miles northwest of Great Falls, fifty miles south of the Canadian border and 35 miles east of the main range of the Rocky Mountains. This project consists of two storage reservoirs and about 360 miles of canals and lateral ditches. The names and points of diversion of the main ditches in the project are: "B" Canal or "Feeder" Canal diverts from Birch Creek in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 27, T. 29N., R. 8W.; "D" Canal diverts from Dupuyer Creek in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 28, T. 29N., R. 6W.; "C" Canal branches off from the "D" Canal at the Division weir in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 14, T. 29N., R. 6W.; "A" Canal takes off from the "C" Canal in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 32, T. 30N., R. 5W.; "AN" Canal

diverts from the "C" Canal in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 33, T. 30N., R. 5W.; "C-3" Canal begins at the Division weir in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 14, T. 29N., R. 6W.; "L" Canal water is released into Hein Coulee about $\frac{1}{2}$ mile below the Lake Francis reservoir outlet and is diverted into the "L" Canal in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 24, T. 29N., R. 5W.; "P" Canal water is turned out of Lake Francis and carried down Hein Coulee into the Dry Fork of the Marias River where it is diverted into "P" Canal in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 26, T. 29N., R. 4W.; "S" Canal begins at the end of the "L" Canal in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 17, T. 29N., R. 3W.

The Birch Creek (Swift) Reservoir is located in Section 27, T. 28N., R. 10W. and the Lake Francis Reservoir in T. 29N., R. 5W. and T. 30N., R. 5W.

The lands that are irrigated by the Pondera County Canal and Reservoir Company are located in Township 28 North, Ranges 1, 2, 3, West; Township 29 North, Ranges 1, 2, 3, 4, 5, 6, 7 West; Township 30 North, Ranges 2, 3, 4, 5, 6 West; Township 31 North, Ranges 3, 4, 5 West.

Length and Capacity of Canals: "B" Canal—Length 14.5 miles to Dupuyer Creek, capacity 700 c.f.s.; "D" Canal—Length 3.3 miles to "C" Canal Division weir, capacity 900 c.f.s.; "C" Canal—Length 28 miles, capacity 470 c.f.s.; "A" Canal—Length 7 miles, capacity 54 c.f.s.; "AN" Canal—Length 20 miles, capacity 271 c.f.s.; "C-3" Canal—Length 1 $\frac{3}{4}$ miles, capacity 900 c.f.s.; "L" Canal—Length 13.5 miles, capacity 520 c.f.s.; "P" Canal—Length 26 miles, capacity 160 c.f.s.; "S" Canal—Length 17 miles, capacity 378 c.f.s. The syphon that connects the outlet of the "L" Canal to the intake of the "S" Canal has been replaced with steel. The capacity of the new pipe is 265 c.f.s.

The Birch Creek Reservoir has a capacity of 30,000 acre feet and Lake Francis, 112,000 acre feet.

Operation and Maintenance: The operation and maintenance charges are \$1.35 for each share of stock owned in the company, one share of stock being equivalent to 1 $\frac{1}{2}$ acre feet of water. Total operation and maintenance assessment for 1963 amounted to \$96,436.61.

Present Users: There are 71,434.53 subscribed shares in the company allocated to 404 shareholders.

Acreage Irrigated: This Irrigation Company had 83,303.20 acres irrigated in 1963 and 2,438 acres potentially irrigable under the present ditch system.

WATER RIGHT DATA

The water rights that are filed and claimed by the Pondera County Canal and Reservoir Company are as follows:

An appropriation by George Barron and Hiram D. Upham from Birch Creek, dated 4-9-1884 for 750 of 1,500 miner's inches. (Ref. Book 1 of Deeds, page 48.)

An appropriation by W. G. Conrad from Birch Creek, dated 7-12-1897 for 10,000 miner's inches. (Ref. Book 1 of Miscellaneous, page 16.)

An appropriation by Conrad Investment Company from Birch Creek, dated 7-16-1898 for 20,000 miner's inches. (Ref. Book 1 Miscellaneous, page 19.)

An appropriation by Conrad Investment Company from Birch Creek, dated 7-6-1898 for 20,000 miner's inches. (Ref. Book 1 of Miscellaneous, page 56.)

An appropriation by Alfred Gardner et al, from Birch Creek, dated 6-18-1897 for 3,600 of 4,000 miner's inches. (Ref. Book 1 of Water Rights, page 36.)

An appropriation by Joseph A. Ingram and Isabell Thomas from Birch Creek, dated 9-18-01 for 125.20 of 500 miner's inches. (Ref. Book 1 of Water Rights, page 102.)

An appropriation by Samuel L. Potter, Thomas McGovern and J. W. McKnight from Birch Creek, dated 4-20-1897 for 19,350 of 20,000 miner's inches. (Ref. Book 1 of Water Rights, page 37.)

An appropriation by Jerry Mongon from Birch Creek, dated 10-14-1895 for 1,250 of 5,000 miner's inches. (Ref. Book 1 of Water Rights, page 15.)

An appropriation by Raphael Morgan & Anna M. Steel from Birch Creek, dated 6-4-1897 for 2,500 of 5,000 miner's inches. (Ref. Book 1 of Water Rights, page 35.)

An appropriation by Pondera Canal Company from Birch Creek, dated 2-1-1904 for 40,000 miner's inches. (Ref. Book 1 of Water Rights, page 159.)

An appropriation by Charles P. Thomas from Birch Creek, dated 3-18-1893 for 500 miner's inches. (Ref. Book 1 of Miscellaneous, page 3.)

An appropriation by Valier-Montana Land & Water Company from Birch Creek, dated 7-1-1912 for 200,000 miner's inches. (Ref. Book 1 of Miscellaneous, page 560.)

An appropriation by Conrad Investment Company from Dupuyer Creek, dated 2-20-1909 for 60,000 miner's inches. (Ref. Book 1 of Water Rights, page 255.)

An appropriation by Lillian F. Jones from Dupuyer Creek, dated 8-9-1895 for 500 miner's inches. (Ref. Book 1 of Water Rights, page 7.)

An appropriation by William D. Jones from Dupuyer Creek, dated 11-1-1888 for 500 miner's inches. (Ref. Book 1 of Deeds, page 63.)

An appropriation by Joseph Kipp, Charles Thomas and H. D. Upham from Dupuyer Creek, dated (none given) for 1,800 miner's inches. (Ref. Book 1 of Water Rights, page 65.)

An appropriation by Joseph Kipp, Charles Thomas and H. D. Upham from Dupuyer Creek, dated 8-22-1883 for 1,800 of 3,000 miner's inches. (Ref. Book 1 of Deeds, page 66.)

An appropriation by Perkins and Mumper from Dupuyer Creek, dated 3-20-1884 for 500 miner's inches. (Ref. Book 1 of Deeds, page 69.)

An appropriation by Pondera Canal Company from Dupuyer Creek, dated 2-1-1904 for 20,000 miner's inches. (Ref. Book 1 of Water Rights, page 160.)

An appropriation by Valier-Montana Land & Water Company from Dupuyer Creek, dated (none given) for 52,000 miner's inches. (Ref. Book 1 of Water Rights, page 35.)

An appropriation by John S. Gordon from Flat Creek, dated 5-12-1900 for 100 miner's inches. (Ref. Book 1 of Water Rights, page 74.)

An appropriation by Charles E. Davis from Dry Fork Marias, dated 11-23-1901 for 200 miner's inches. (Ref. Book 1 Water Rights, page 107.)

An appropriation by Pondera Canal Company from Dry Fork Marias, dated 2-1-1904 for 20,000 miner's inches. (Ref. Book 1 Water Rights, page 158.)

An appropriation by Fred G. Zimmerman from Dry Fork Marias, dated 10-6-1888 for 1,000 miner's inches. (Ref. Book 1 of Deeds, page 73.)

An appropriation by John Zimmerman from Dry Fork Marias, dated 3-1-1889 for 900 miner's inches. (Ref. Book 1 of Deeds, page 75.)

An appropriation by Valier-Montana Land & Water Company from Blacktail Creek, dated 12-2-1937 for 1,000 miner's inches. (Ref. Book 1 of Water Rights, page 113.)

An appropriation by Valier-Montana Land and Water Company from Bullhead Coulee, dated 6-8-1937 for 1,000 miner's inches. (Ref. Book 1 of Water Rights, page 110.)

An appropriation by the Valier Company from Bullhead Coulee, dated 3-31-1947 for 80 miner's inches. (Ref. Book 26 of Deeds, page 154.)

An appropriation by Valier-Montana Land and Water Company from Badger Creek, dated 12-2-1937 for 8,000 miner's inches. (Ref. Book 1 of Water Rights, page 188.)

(See Maps in Part II, pages 8, 9, 10, 15, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 29, 30.)

WATER RIGHT DATA—PONDERA COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS			DECREED RIGHTS			
	(Filings of Records)						
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
MISSOURI RIVER BASIN							
*Missouri River	0....	0....	0				
Marias River	3....	1,800.00....	45.00				
Two Medicine River.....	0....	0....	0				
Badger Creek	15....	232,000.00....	5,800.00	+ 950,000 Ac. Ft.			
Whitetail Creek	1....	100,000.00....	2,500.00				
North Fork							
Whitetail Creek	2....	4,400.00....	110.00				
Birch Creek	60....	481,545.00....	12,038.62....	720....	1....	1,666.80....	41.67
Grif Jones Spring	1....	80.00....	2.00				
Eagle Creek	1....	100.00....	2.50				
Fish Creek	8....	4,300.00....	107.50				
George Davis or							
Hay Coulee	2....	1,400.00....	35.00				
Hall Creek or Springs....	1....	800.00....	20.00				
Angel Springs	1....	1,200.00....	30.00				
Blacktail Creek	3....	49,000.00....	1,225.00				
Four Horns Reservoir	2....	150,000.00 Ac. Ft.					
Fisher Spring	1....	2,000.00....	50.00				
Fagerlie Swamp	2....	800.00....	20.00				
Alkali Coulee	2....	560.00....	14.00				
Morgan Coulee	2....	400.00....	10.00				
Spring Coulee	1....	100.00....	2.50				
Cartwright (Alkali							
Creek) Coulee	4....	1,880.00....	47.00				
Cooper Springs	1....	400.00....	10.00				
Sober Up (Cartwright							
Coulee) Creek	11....	4,980.00....	124.50				
Dupuyer Creek	32....	155,660.00....	3,891.50				
Waters Slough	1....	288.00....	7.27				
Scoffin Creek	3....	700.00....	17.70				
Spring Creek	2....	325.00....	8.12				
Unnamed Spring	1....	200.00....	5.00				
Salvis Coulee	1....	100.00....	2.50				
Jones Coulee	2....	300.00....	7.50				
Hagers Coulee	3....	600.00....	15.00				
Sheep Creek (South							
Fork Sheep Creek)...	28....	12,000.00....	300.00....	5228....	12....	4,705.20....	117.63
North Fork							
Sheep Creek	16....	8,420.00....	210.50				
Bog Spring							
(Triple Lakes)...	1....	400.00....	10.00				
Riff Lake &							
Springs	1....	3,000.00....	75.00				
Round Lake	1....	200.00....	5.00				
Muskrat Lake	2....	1,000.00....	25.00				
Hunter Lake	1....	200.00....	5.00				
Hunter Spring	1....	100.00....	2.50				
Johnson Spring	1....	200.00....	5.00				
Pfeiffer Lake	2....	400.00....	10.00				
Murphy Lakes	1....	200.00....	5.00				
Davis Creek	2....	600.00....	15.00				
Spring Creek	2....	400.00....	10.00				
Spring Coulee	1....	200.00....	5.00				
Hay Coulee	0....	0....	0				
Hay Coulee Spring...	1....	200.00....	5.00				

*Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA—PONDERA COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

APPROPRIATIONS

(Filings of Records)

DECREED RIGHTS

STREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Perkins Coulee	1...	200.00...	5.00				
Unnamed Spring	1...	200.00...	5.00				
Waste (B-1 Canal).....	1...	200.00...	5.00				
Wilson Coulee	1...	400.00...	10.00				
Laughlin Coulee	1...	2,000.00...	50.00				
Spring Lake	1...	200.00...	5.00				
Round Lake	1...	200.00...	5.00				
Waste Water Coulee	1...	80,000.00...	2,000.00				
Unnamed Springs	1...	80.00...	2.00				
Total Dupuyer Creek & Tributaries	115...	269,173.00...	6,729.32				
Scott Coulee	2...	840.00...	21.00				
Whiskers Coulee	1...	200.00...	5.00				
Waste (AN-6 Canal)...	2...	400.00...	10.00				
Rock Coulee	0...	0...	0				
Alkali Lake	0...	0...	0				
Rocky Bridge Coulee	1...	400.00...	10.00				
Total Birch Creek & Tributaries....	224...	820,558.00...	20,513.94				
Abbott (Willow Round) Coulee	2...	2,000.00...	50.00				
Abbott Lake	1...	1,000.00...	25.00				
Waste (AN8-1 Canal).....	1...	200.00...	5.00				
Murray Springs & Coulee.....	1...	200.00...	5.00				
Waste (AN Canal).....	4...	4,400.00...	110.00				
Schultz (Flat) Coulee.....	5...	1,660.00...	41.50				
Stimble Coulee	1...	200.00...	5.00				
Waste	1...	400.00...	10.00				
Waste & Runoff.....	1...	160.00...	4.00				
Bullhead (Coulee) Creek..	11...	3,880.00...	97.00				
Bullhead Lake	1...	400.00...	10.00				
Waste	1...	200.00...	5.00				
Mayden Coulee	1...	120.00...	3.00				
Unnamed Spring	1...	100.00...	2.50				
A Coulee	1...	400.00...	10.00				
Winignaw (Green's) (South Branch Schultz) Coulee	4...	1,680.00...	42.00				
Waste & Spring	2...	400.00...	10.00				
Ringwald (Little Bullhead) Coulee	5...	2,200.00...	55.00				
Waste (C Canal).....	1...	200.00...	5.00				
Unnamed Coulee	1...	120.00...	3.00				
Waste (AN-3 Canal).....	2...	400.00...	10.00				
Waste (L-2 Canal).....	2...	240.00...	6.00				
Lonetree Coulee	2...	3,000.00...	75.00				
Abbott Coulee	1...	200.00...	5.00				
Waste	1...	200.00...	5.00				
Waste	1...	120.00...	3.00				
Friend Coulee	1...	400.00...	10.00				
Waste (AN5-4-2 Canal)....	1...	200.00...	5.00				
Total Schultz (Flat) Coulee & Tributaries	48...	16,880.00...	422.00				

WATER RIGHT DATA—PONDERA COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

APPROPRIATIONS

(Filings of Records)

DECREED RIGHTS

STREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Hilger (Connelly) Coulee.....	1....	400.00....	10.00				
A Coulee	1....	30.00....	0.75				
Waste (K Canal).....	1....	600.00....	15.00				
Pearson Coulee	1....	80.00....	2.00				
Dry Fork Marias River							
(North Fork of Dry Fork Marias River)	33....	13,440.00....	336.00				
Middle Fork of Dry Fork Marias River							
(Jensen Coulee)	6....	11,500.00....	287.50				
Crook Coulee	1....	200.00....	5.00				
South Fork of Dry Fork Marias River	0....	0....	0				
Spring Coulee	1....	400.00....	10.00				
Smith Coulee	1....	400.00....	10.00				
West Butte Coulee.....	2....	400.00....	10.00				
East Black Butte Gulch & Sentinel Butte Gulch.....	4....	900.00....	22.50				
Mine Coulee & Spring.....	1....	200.00....	5.00				
Coal Springs & Coulee..	1....	200.00....	5.00				
North Fork of Dry Fork Marias River							
(Lawrence Coulee)	5....	1,300.00....	32.50				
Woods Coulee (North Fork of Dry Fork Marias River)	2....	600.00....	15.00				
Lawrence Coulee	1....	400.00....	10.00				
Dry Coulee	1....	400.00....	10.00				
Hein Coulee	1....	200.00....	5.00				
Hay Coulee & Springs....	1....	200.00....	5.00				
Cowell Coulee	0....	0....	0				
Wilcox Springs & Waste	1....	200.00....	5.00				
Lyter Coulee	1....	400.00....	10.00				
Dry Fork Spring.....	1....	100.00....	2.50				
Hein Coulee	1....	200.00....	5.00				
Zimmerman Coulee	4....	1,680.00....	42.00				
Johnson (Alkali) (Shepard) Coulee ..	6....	1,360.00....	34.00				
Klay Coulee	1....	800.00....	20.00				
Fromyr Coulee	1....	400.00....	10.00				
McTaggart Coulee	0....	0....	0				
North McTaggart Coulee	1....	80.00....	2.00				
South McTaggart Coulee	1....	80.00....	2.00				
Compound Coulee	2....	400.00....	10.00				
Barber Coulee	1....	800.00....	20.00				
Campbell Coulee	1....	800.00....	20.00				
Spring Creek (Coulee).....	14....	18,110.00....	452.75				
Unnamed Spring	1....	40.00....	1.00				
Unnamed Spring	1....	80.00....	2.00				
Unnamed Spring	1....	80.00....	2.00				
Crighton (Lenora) Coulee (Spring Branch Sheep Creek)	2....	1,200.00....	30.00				

WATER RIGHT DATA—PONDERA COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

APPROPRIATIONS				DECREED RIGHTS			
(Filings of Records)							
STREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unknown Coulee	1....	120.00....	3.00				
Scoffin Coulee	1....	100.00....	2.50				
Hettinger Coulee	1....	200.00....	5.00				
Two Certain Coulees.....	1....	160.00....	4.00				
Haatvedt Coulee	1....	200.00....	5.00				
Coulees & Spring.....	1....	80.00....	2.00				
Springs & Coulee.....	1....	400.00....	10.00				
DeBoer Coulee	1....	200.00....	5.00				
Unnamed Spring	1....	120.00....	3.00				
Unnamed Springs	1....	80.00....	2.00				
Whiteman Coulee	1....	200.00....	5.00				
Ward-Yeager Coulee	1....	200.00....	5.00				
Flat Coulee	2....	500.00....	12.50				
Munyon Coulee	1....	200.00....	5.00				
Spillway Coulee	1....	200.00....	5.00				
Waste (S-1 Canal).....	1....	120.00....	3.00				
Waste	1....	80.00....	2.00				
Little Dry Coulee.....	1....	200.00....	5.00				
Welch Coulee	2....	400.00....	10.00				
Spring Coulee	2....	900.00....	22.50				
Fowler Coulee	1....	300.00....	7.50				
Middle Coulee	1....	1,000.00....	25.00				
Flat Coulee	1....	800.00....	20.00				
Nason Coulee	2....	1,200.00....	30.00				
Fowler Coulee	1....	800.00....	20.00				
Flat Coulee							
(Little Flat Coulee).....	3....	520.00....	13.00				
Waste	1....	400.00....	10.00				
Little Flat Coulee.....	1....	200.00....	5.00				
Swift Coulee	2....	400.00....	10.00				
A Coulee (Known as							
"F" Ditch Wasteway)...	1....	100.00....	2.50				
Russell Spring	1....	400.00....	10.00				
Hoover Snohomish							
Coulee	2....	400.00....	10.00				
East Fork							
Hoover Coulee	1....	200.00....	5.00				
Divide Coulee	1....	600.00....	15.00				
Unnamed Springs	1....	20.00....	0.50				
Fowler Coulee (Upper).....	1....	400.00....	10.00				
Fowler Coulee (Lower)....	1....	400.00....	10.00				
Total Dry Fork Marias River							
& Tributaries	149....	71,460.00....	1,786.50				
Pondera (Antelope)							
(Snake) Coulee	33....	21,676.00....	541.90....	642....	2....	400.00....	10.00
Levitt Branch	2....	400.00....	10.00				
Bynum Springs (Hanson)							
(South Pondera)							
Coulee	5....	1,300.00....	32.50				
O'Connell (West Fork							
Pondera) Coulee	1....	400.00....	10.00				
Favot (Sollid) Coulee....	2....	400.00....	10.00				
Unnamed Spring	1....	100.00....	2.50				
Buchannon Coulee	1....	200.00....	5.00				
McDonald Coulee	3....	2,300.00....	57.50				

WATER RIGHT DATA—PONDERA COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

APPROPRIATIONS

(Filings of Records)

DECREED RIGHTS

S'TREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Parker Coulee & Spring....	2...	400.00....	10.00				
Boucher Coulee	1...	200.00....	5.00				
Antelope Creek	1...	200.00....	5.00				
Uncle Sam Coulee.....	1...	200.00....	5.00				
Basin Spring Coulee.....	6...	3,400.00....	85.00				
Unnamed Spring	1...	40.00....	1.00				
Ping's Coulee	3...	1,200.00....	30.00				
Savage Coulee	1...	500.00....	12.50				
Nauman Coulee	1...	100.00....	2.50				
Barr Coulee	1...	800.00....	20.00				
Unnamed Coulee	1...	120.00....	3.00				
Thompson Coulee	2...	4,100.00....	102.50				
Cox Coulee	1...	400.00....	10.00				
Dean Coulee	1...	800.00....	20.00				
Railroad Coulee	3...	640.00....	16.00				
School Section							
(Railroad) Coulee	4...	1,200.00....	30.00				
Slavin Coulee	1...	400.00....	10.00				
Banka Coulee	2...	280.00....	7.00				
Banka Spring	2...	300.00....	7.50				
Telephone Coulee	1...	200.00....	5.00				
Oliver Coulee	1...	400.00....	10.00				
Jim Oliver Coulee.....	1...	400.00....	10.00				
Power Coulee	2...	1,000.00....	25.00				
Ferguson Coulee	1...	200.00....	5.00				
Vermulm Coulee	1...	200.00....	5.00				
Waste	1...	2,000.00....	50.00				
Wilcox Coulee	1...	200.00....	5.00				
Freebury Coulee	1...	400.00....	10.00				
Favat Coulee	1...	200.00....	5.00				
Wilson							
(Reservoir) Coulee ...	2...	720.00....	18.00				
Red Lake Coulee.....	1...	200.00....	5.00				
Yeast Powder							
Flat Coulee	1...	1,040.00....	26.00				
Koenes Coulee	1...	200.00....	5.00				
Soo Coulee	1...	200.00....	5.00				
Wilson Coulee	1...	1,000.00....	25.00				
Twin Coulees	1...	400.00....	10.00				
Waste	2...	17,040.00....	426.00				
Waste (P-6 Canal).....	2...	800.00....	20.00				
North Branch							
Flat Coulee	1...	200.00....	5.00				
Sheep Coulee	1...	400.00....	10.00				
Waste & Drainage.....	1...	1,000.00....	25.00				
Campbell Coulee	3...	1,000.00....	25.00				
Bird Coulee	1...	400.00....	10.00				
Miller Coulee	1...	400.00....	10.00				
Gibbons Coulee	2...	600.00....	15.00				
South Pondera Coulee.....	9...	14,900.00....	372.50				
Luce Coulee	2...	700.00....	17.50				
Fence Coulee	1...	400.00....	10.00				
Devlin Coulee	2...	1,000.00....	25.00				
Trail Coulee	2...	2,000.00....	50.00				
Certain Coulee	1...	300.00....	7.50				
Brady Coulee	4...	2,100.00....	52.50				
Unnamed Lakes	2...	640.00....	16.00				

WATER RIGHT DATA—PONDERA COUNTY **APPROPRIATIONS AND DECREES BY STREAMS**

APPROPRIATIONS

(Filings of Records)

DECREED RIGHTS

STREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Certain Coulee	1....	500.00....	12.50				
A Coulee	1....	700.00....	17.50				
Rigby Coulee	2....	1,600.00....	40.00				
Cage Coulee	1....	400.00....	10.00				
Tributary of South							
Pondera Coulee	1....	600.00....	15.00				
Bevins (Berens) Coulee	6....	2,300.00....	57.50				
Unnamed Spring	1....	200.00....	5.00				
Rocky (McDermund)							
Coulee	8....	5,100.00....	127.50				
Ives & Wagner Coulees..	2....	480.00....	12.00				
Seepage & Overflow....	1....	None shown					
Weed's Reservoir	1....	100.00....	2.50				
Rocky Lake	1....	500.00....	12.50				
Snake Creek	2....	1,200.00....	30.00				
Dry Coulee	1....	200.00....	5.00				
Floberg Coulee	1....	400.00....	10.00				
East Powder (Antelope)							
Coulee	5....	2,200.00....	55.00				
Fowler Coulee	4....	1,600.00....	40.00				
Hay Lake Coulee.....	1....	400.00....	10.00				
Unnamed Coulee	1....	400.00....	10.00				
Shed (Buckskin) Coulee	2....	1,600.00....	40.00				
Piser Coulee	5....	1,040.00....	26.00				
Two Coulees	2....	280.00....	7.00				
Waste Flood &							
Surface Water	3....	1,600.00....	40.00				
Dead Indian Coulee.....	3....	2,700.00....	67.50				
West Fork Dead							
Indian Coulee	3....	2,400.00....	60.00				
East Coulee	1....	600.00....	15.00				
Middle Coulee	1....	600.00....	15.00				
West Coulee	1....	600.00....	15.00				
Coffman Coulee	1....	400.00....	10.00				
Total Pondera (Antelope) (Snake)							
 Coulee & Tributaries.....	202....	125,596.00....	3,139.90				
Teton River	0....	0....	0				
Muddy Creek	0....	0....	0				
Kropp (Muki) (Maucki)							
(Old Joe) Coulee.....	1....	4,000.00....	100.00				
Aldrich Coulee	2....	1,400.00....	35.00				
Geisert Springs	1....	120.00....	3.00				
Sweet (Maginn) Coulee	2....	1,280.00....	32.00				
West Branch							
Rocky Coulee	1....	400.00....	10.00				
Certain Coulee	1....	200.00....	5.00				
Raub Coulee	1....	100.00....	2.50				
A Coulee	1....	All....	All				
Unnamed Lake	1....	All....	All				
A Coulee	1....	500.00....	12.50				
Thompson Coulee	1....	4,000.00....	100.00				
Flat Coulee	3....	520.00....	13.00				
East Fork Flat Coulee....	1....	100.00....	2.50				
Total Teton River & Tributaries....	17....	12,620.00....	315.50				
Total Marias River & Tributaries..	672....	1,393,114.00....	34,827.84				
Grand Total Pondera County.....	672....	1,393,114.00....	34,827.84....		15....	6,772.00....	169.30

WATER RESOURCES SURVEY

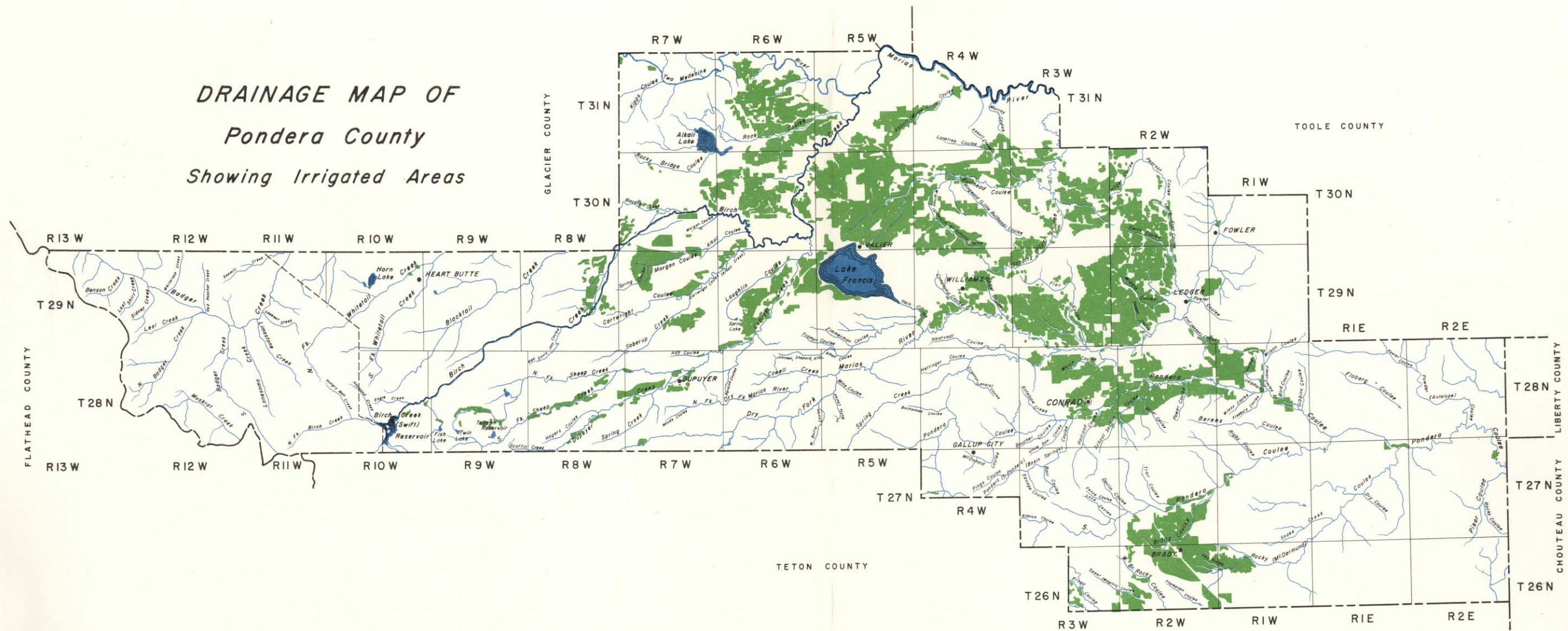
Pondera County, Montana

Part II

Maps Showing Irrigated Areas

Published by
STATE ENGINEER'S OFFICE
Helena, Montana
June, 1964

*DRAINAGE MAP OF
Pondera County
Showing Irrigated Areas*



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Township	Range	Page
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30 North	6 West.....	27
30 North	7 West.....	28
31 North	3 West.....	24
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31 North	5 West.....	30
31 North	6 West.....	31
31 North	7 West.....	32

MAP SYMBOL INDEX







BOUNDARIES

- COUNTY LINE
- NATIONAL FOREST LINE

DITCHES

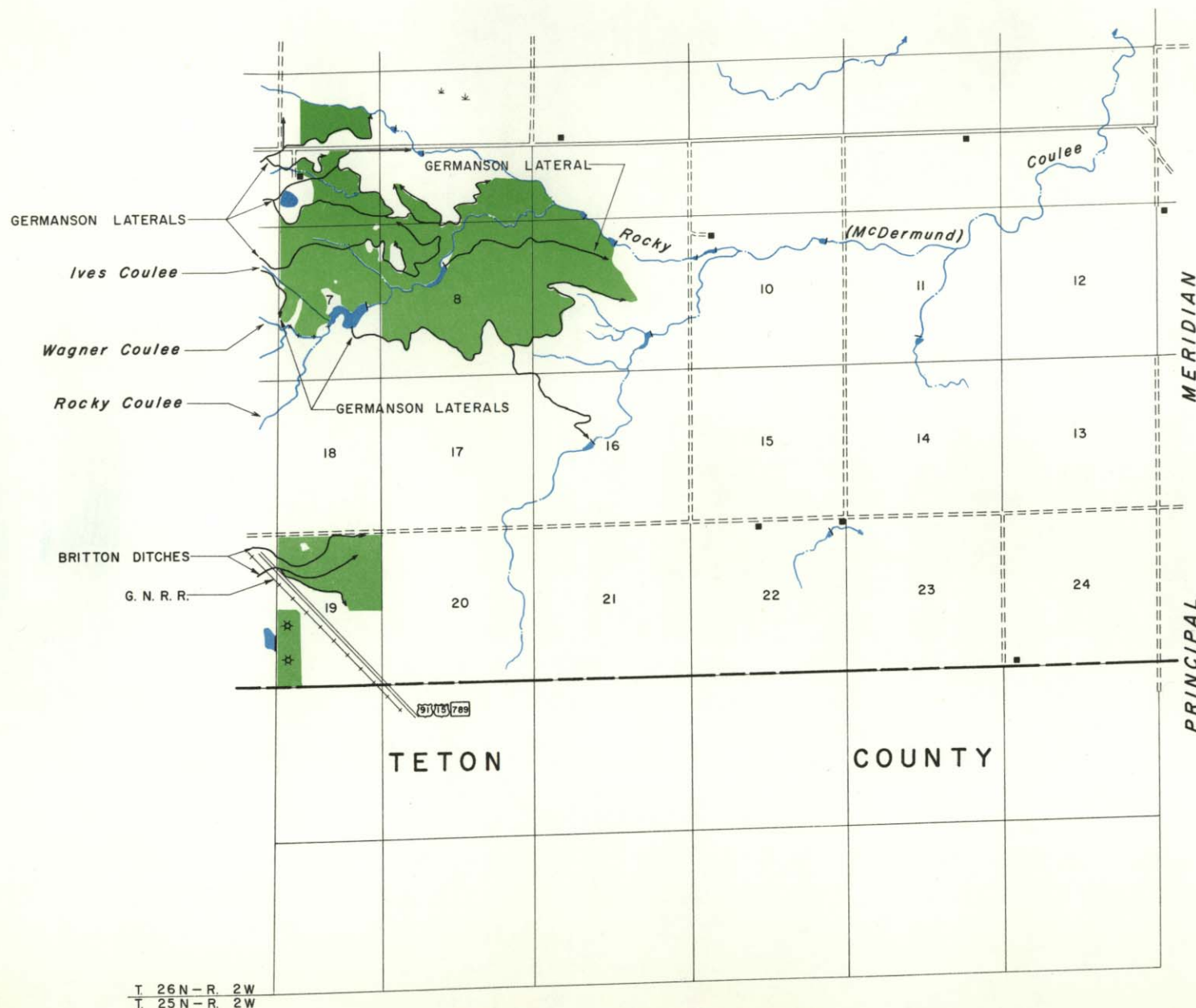
-  CANALS OR DITCHES
- > DRAIN DITCHES
- > PROPOSED DITCHES

STRUCTURES & UNITS

- \ DAM
-  DIKE
-  FLUME
-  SIPHON
-  SPILL
- ⊙ SPRINKLER SYSTEM
-  WEIR
- == PIPE LINE
- PUMP
- PUMP SITE
-  RESERVOIR
- ⊖ WELL
- +++ NATURAL CARRIER USED AS DITCH

TRANSPORTATION

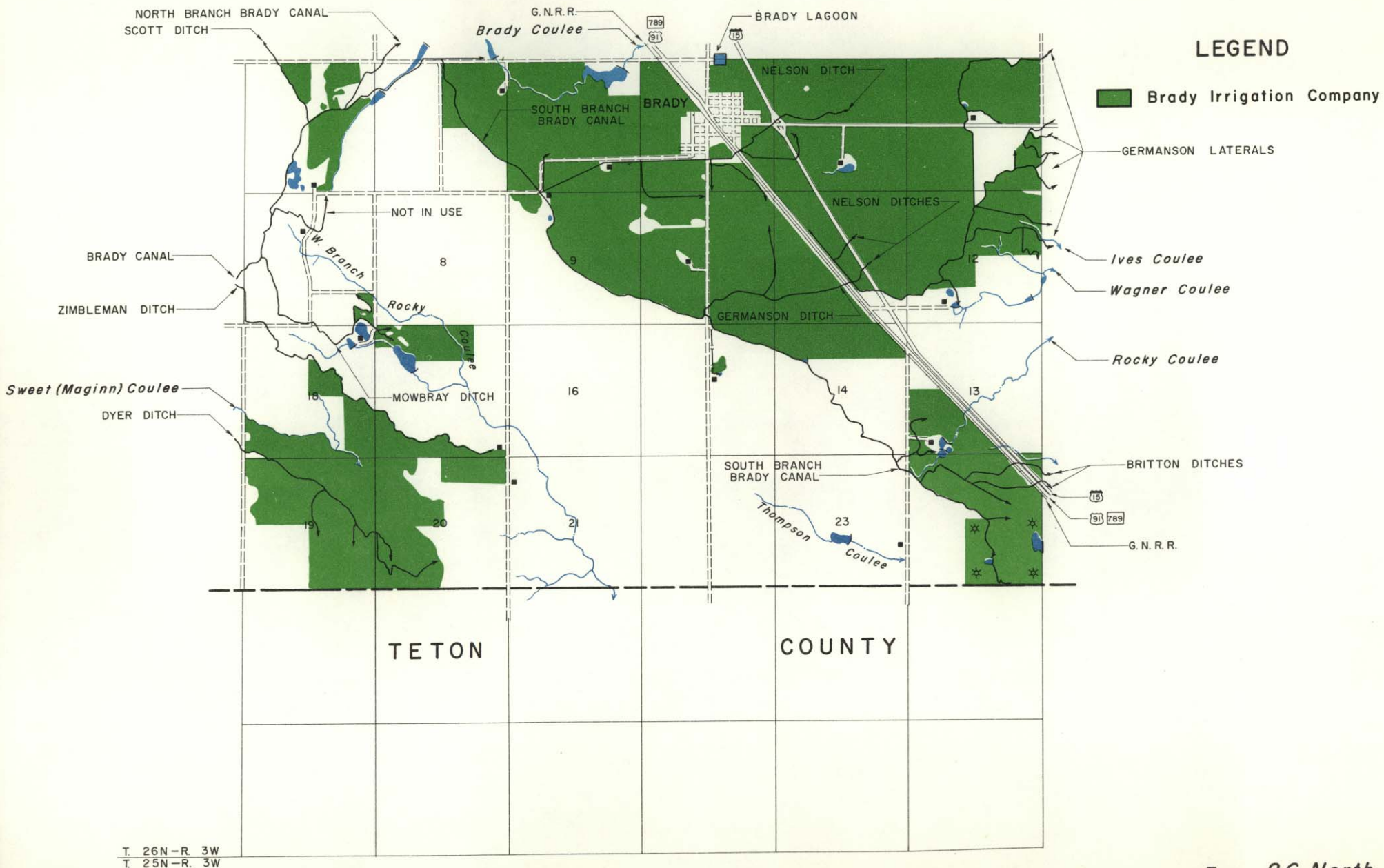
- == PAVED ROADS
- === UNPAVED ROADS
- +++ RAILROADS
-  STATE HIGHWAY
-  U. S. HIGHWAY
- ⬠ AIRPORT
- ✱ SPRING
- ⬇ SWAMP
- ⊙ GAUGING STATION
- POWER PLANT
- ⊙ STORAGE TANK
- [+] CEMETERY
- ⊙ FAIRGROUND
- FARM OR RANCH UNIT
- ⬆ LOOKOUT STATION
- ⬆ RANGER STATION
- > RAILROAD TUNNEL
- 1 SCHOOL
- ✂ SHAFT, MINE, OR DRIFT



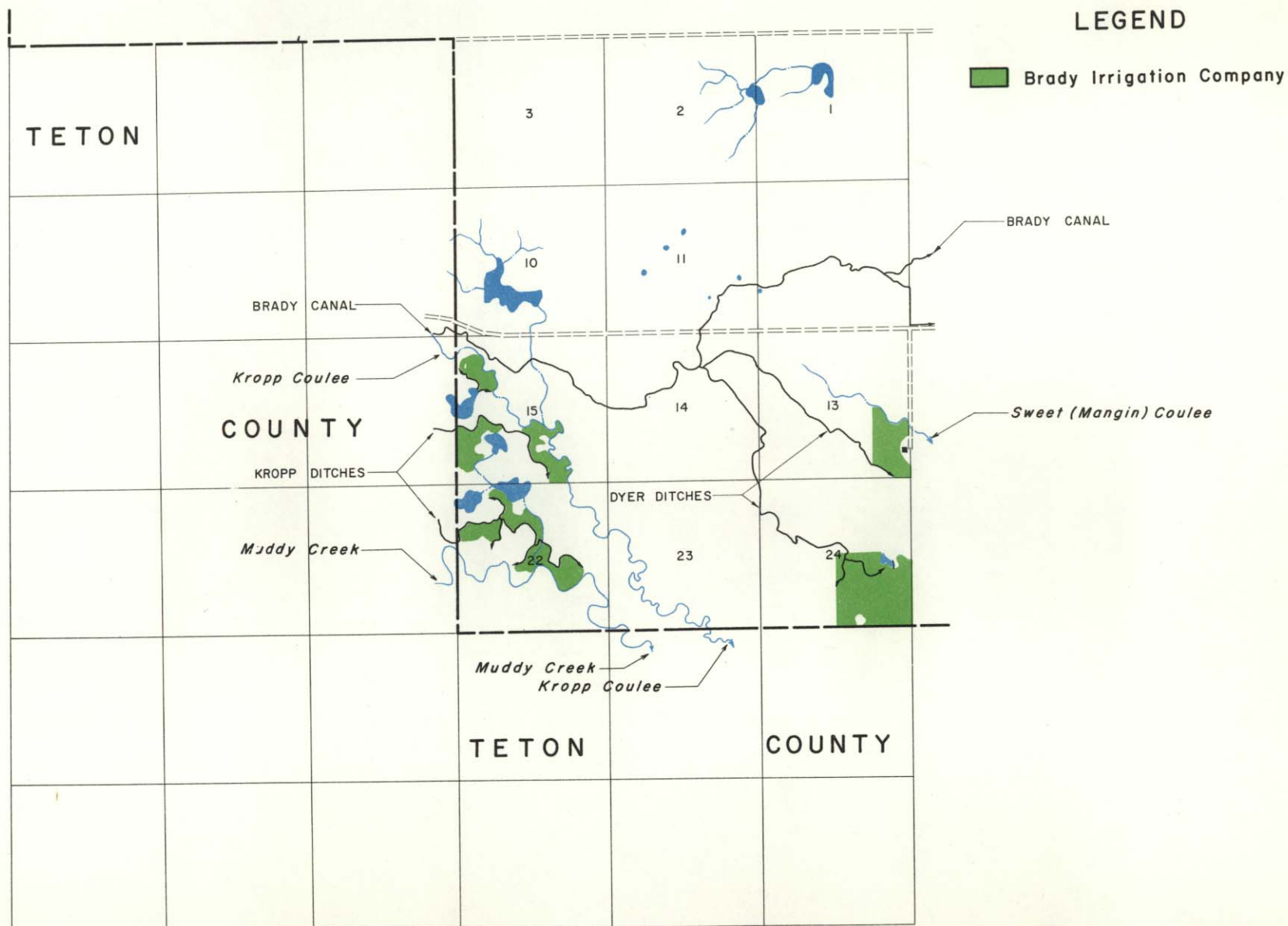
LEGEND

Brady Irrigation Company

Twp. 26 North
Rge. 1 West



Tw. 26 North
Rge. 2 West



T. 26N - R. 4W
T. 25N - R. 4W

Twp. 26 North
Rge. 3 West

South Pondera Coulee

Pondera Coulee

PORTABLE PUMP

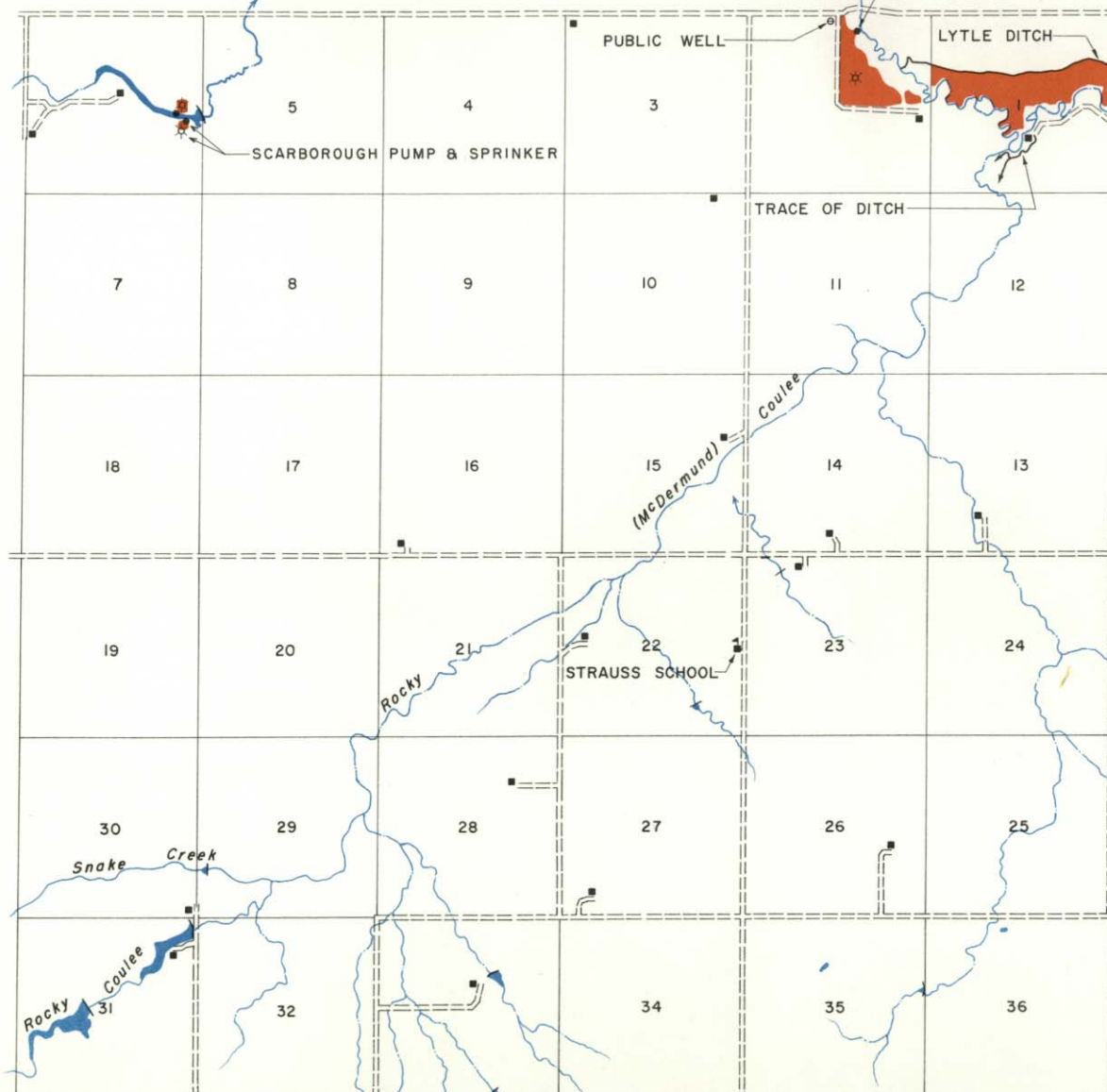
LEGEND

Private Irrigation

Pondera Coulee

MERIDIAN

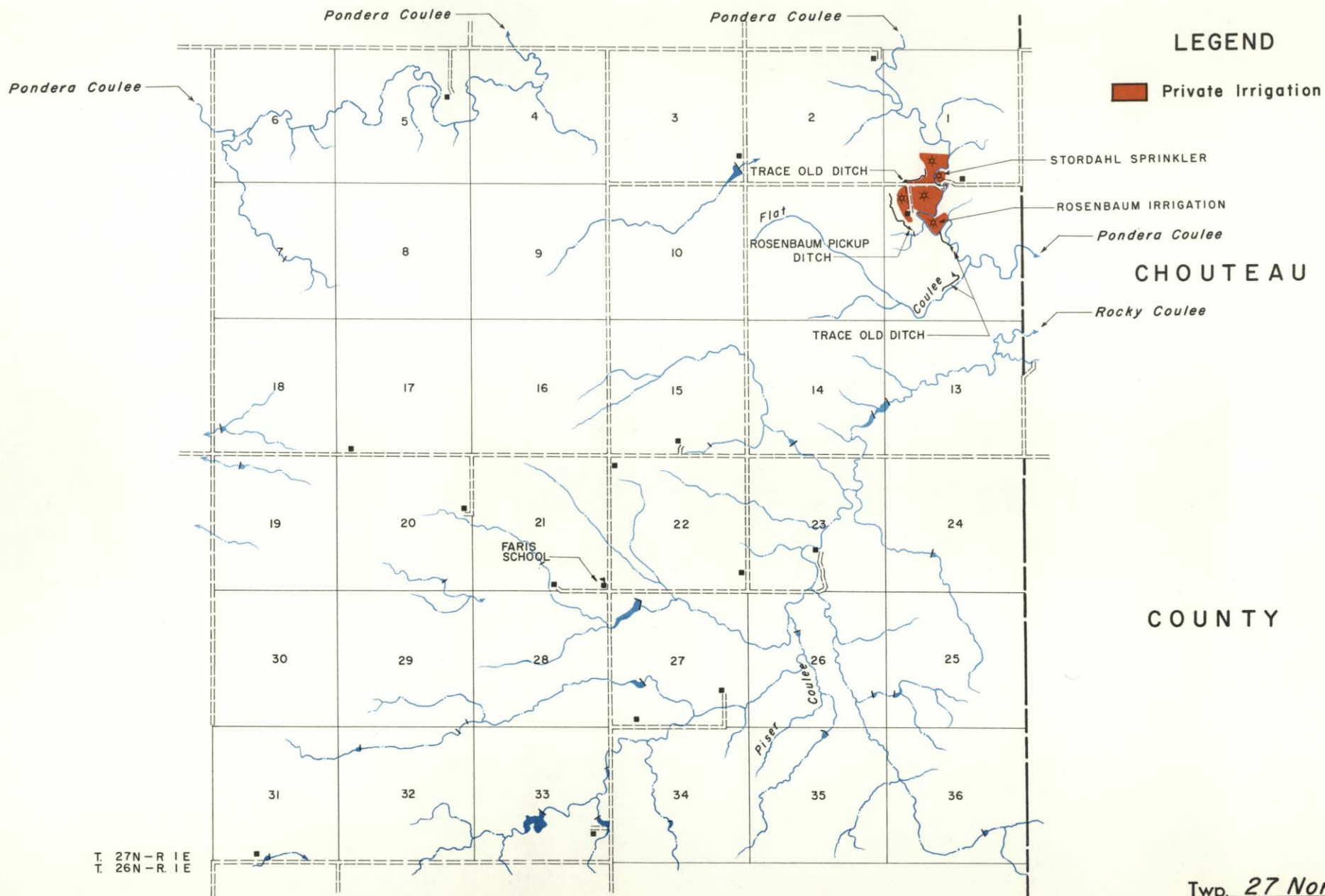
PRINCIPAL

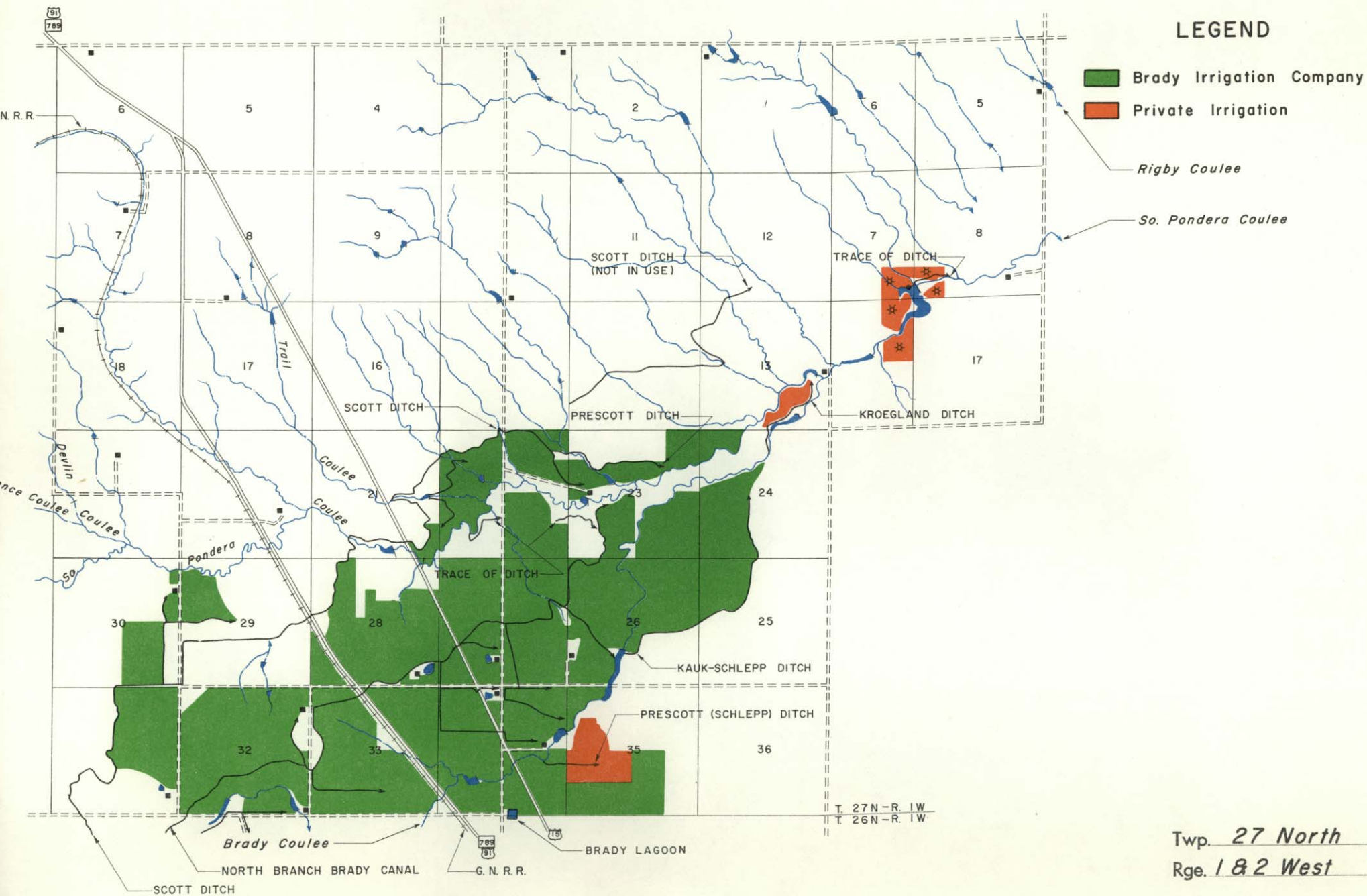


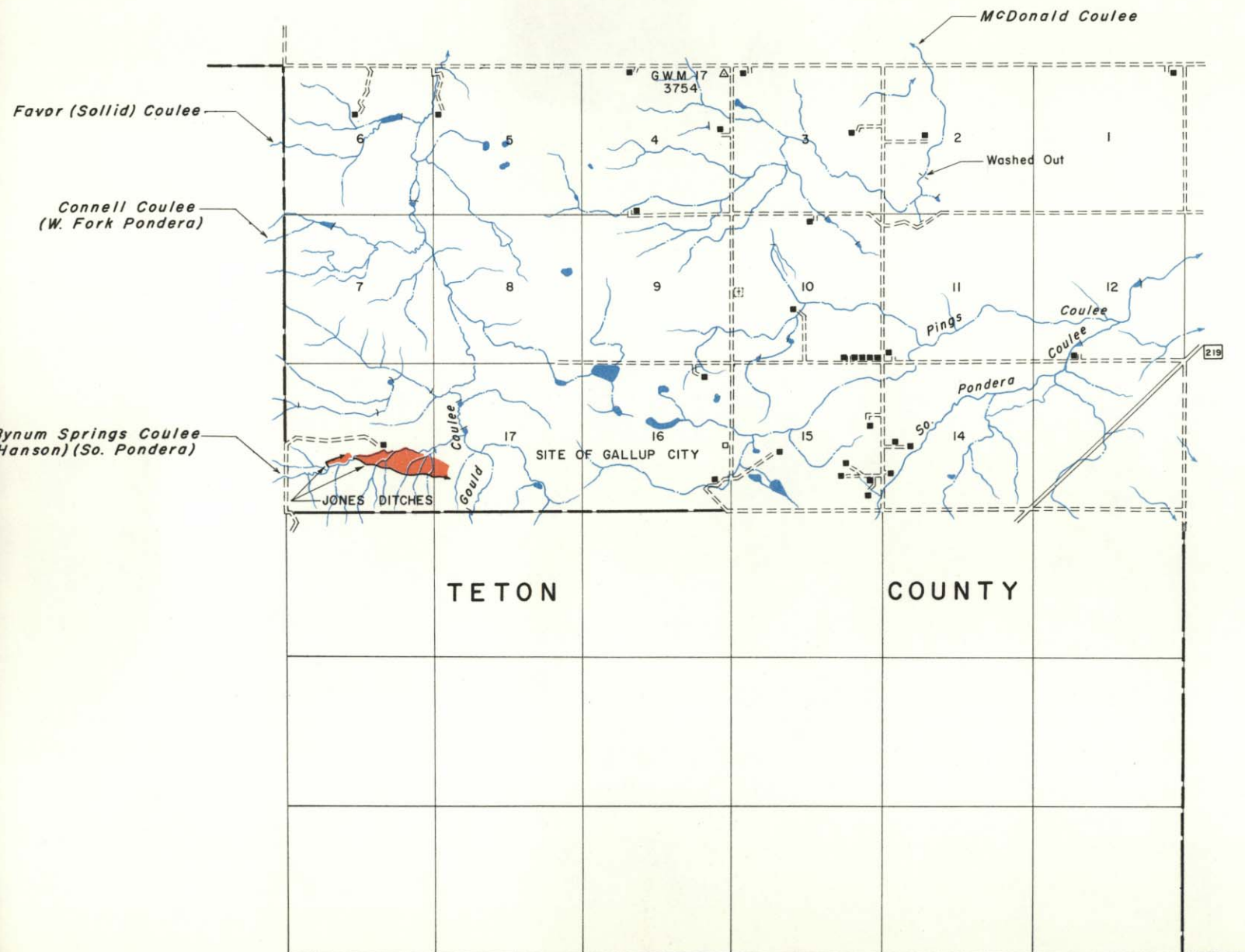
T. 27N - R. 1W
T. 26N - R. 1W

Twp. 27 North

Rge. 1 East







LEGEND

Private Irrigation

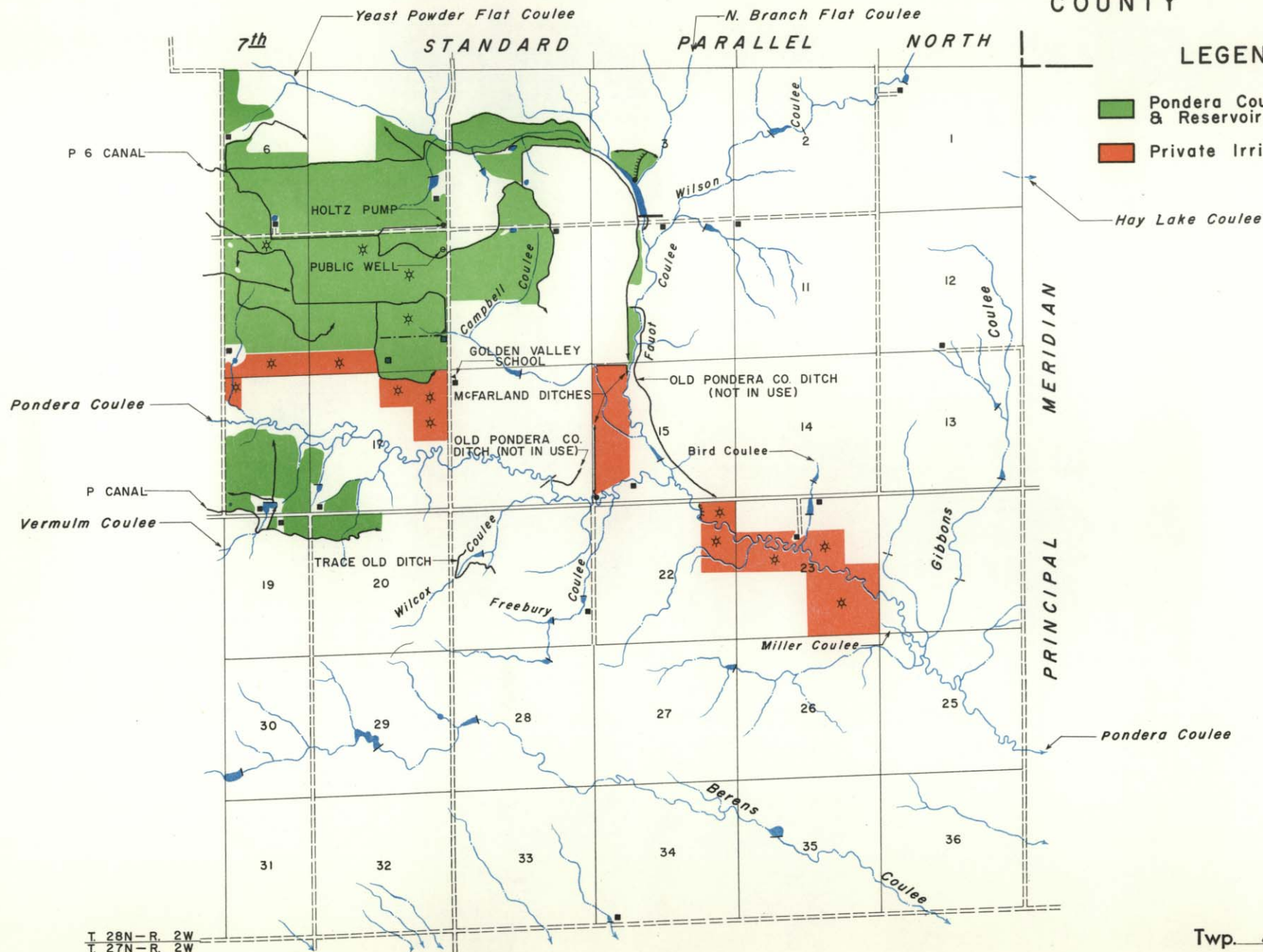
Twp. 27 North

Rge. 4 West

TOOLE COUNTY

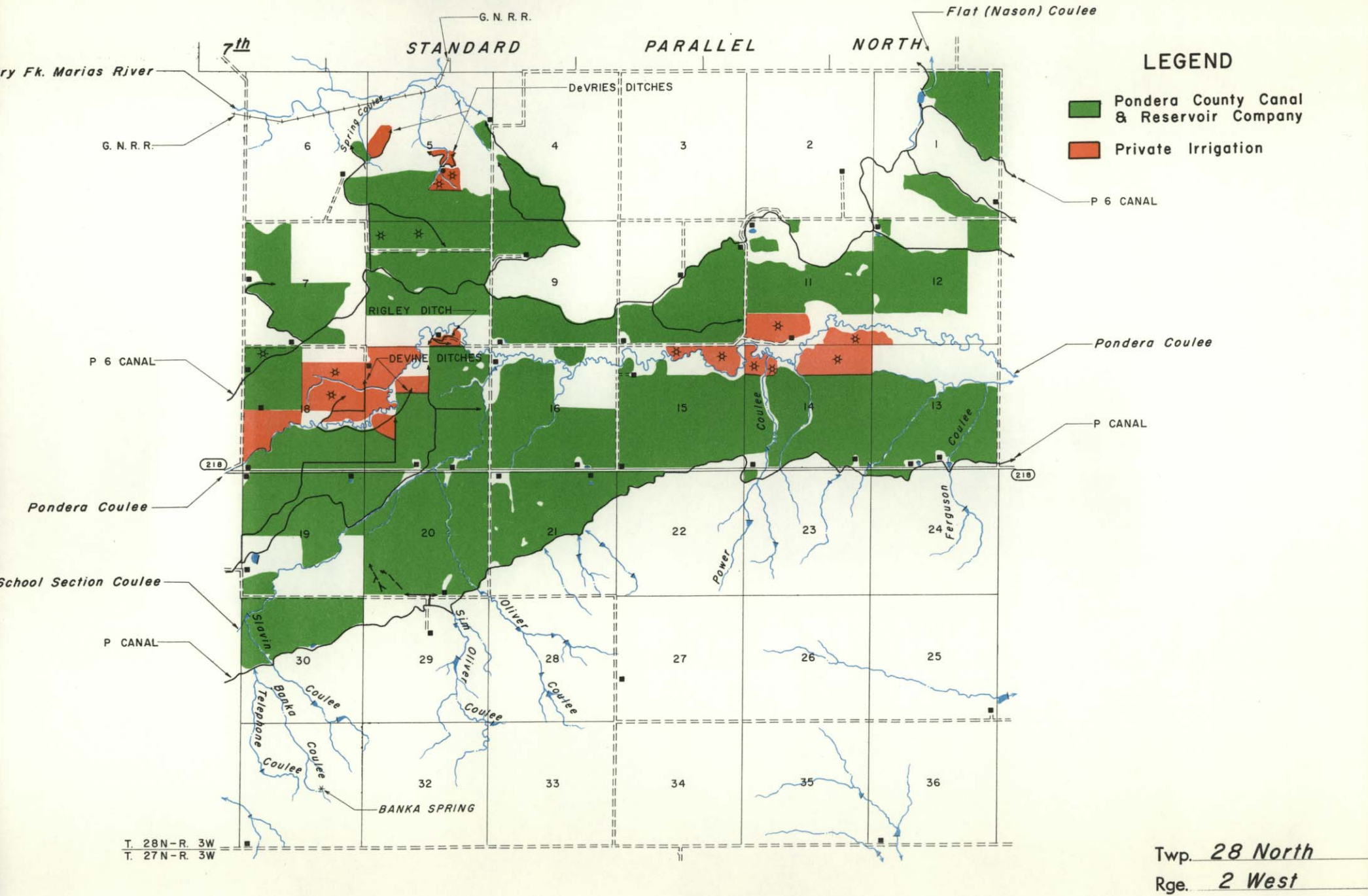
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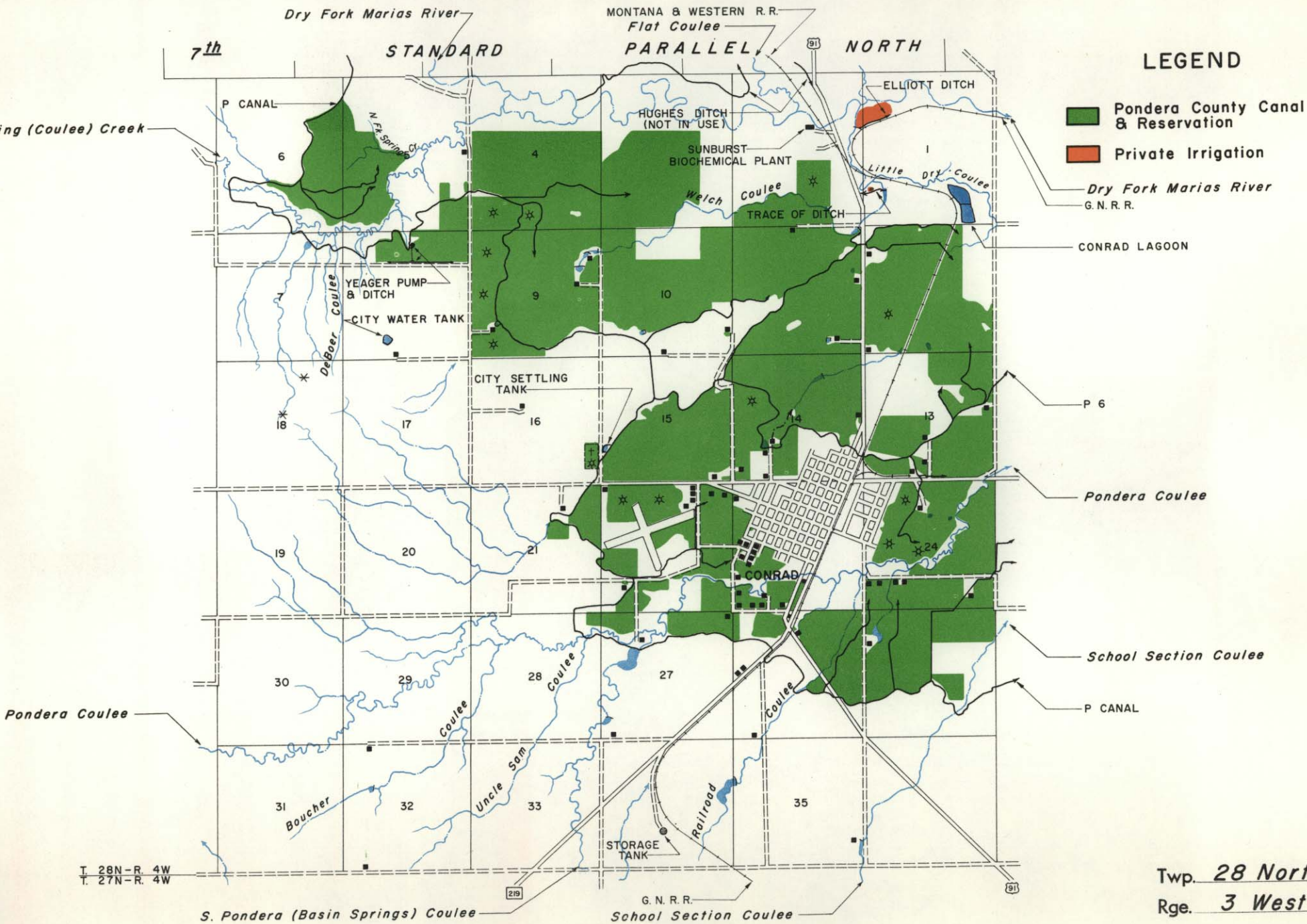
- Pondera County Canal & Reservoir Company
- Private Irrigation

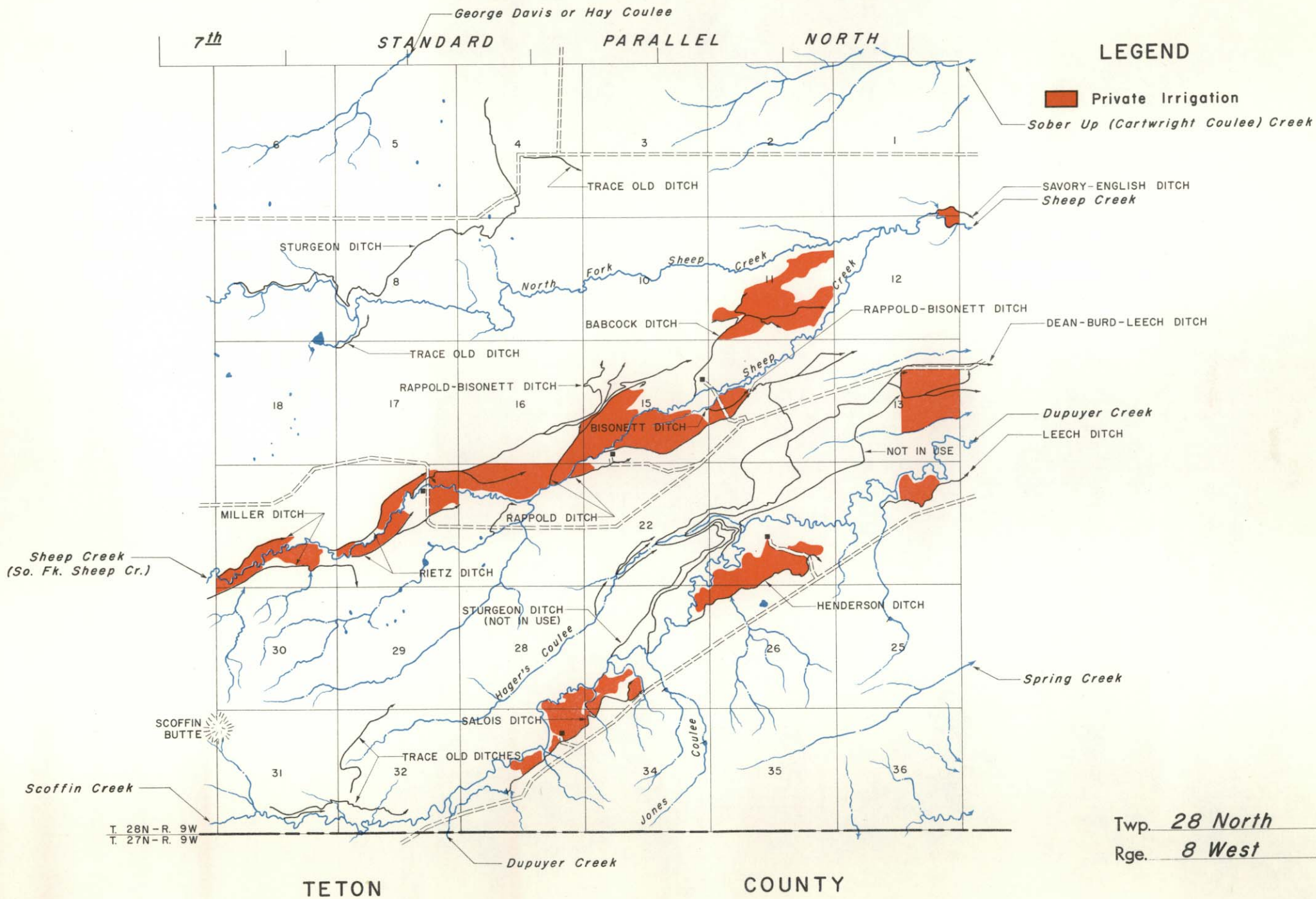


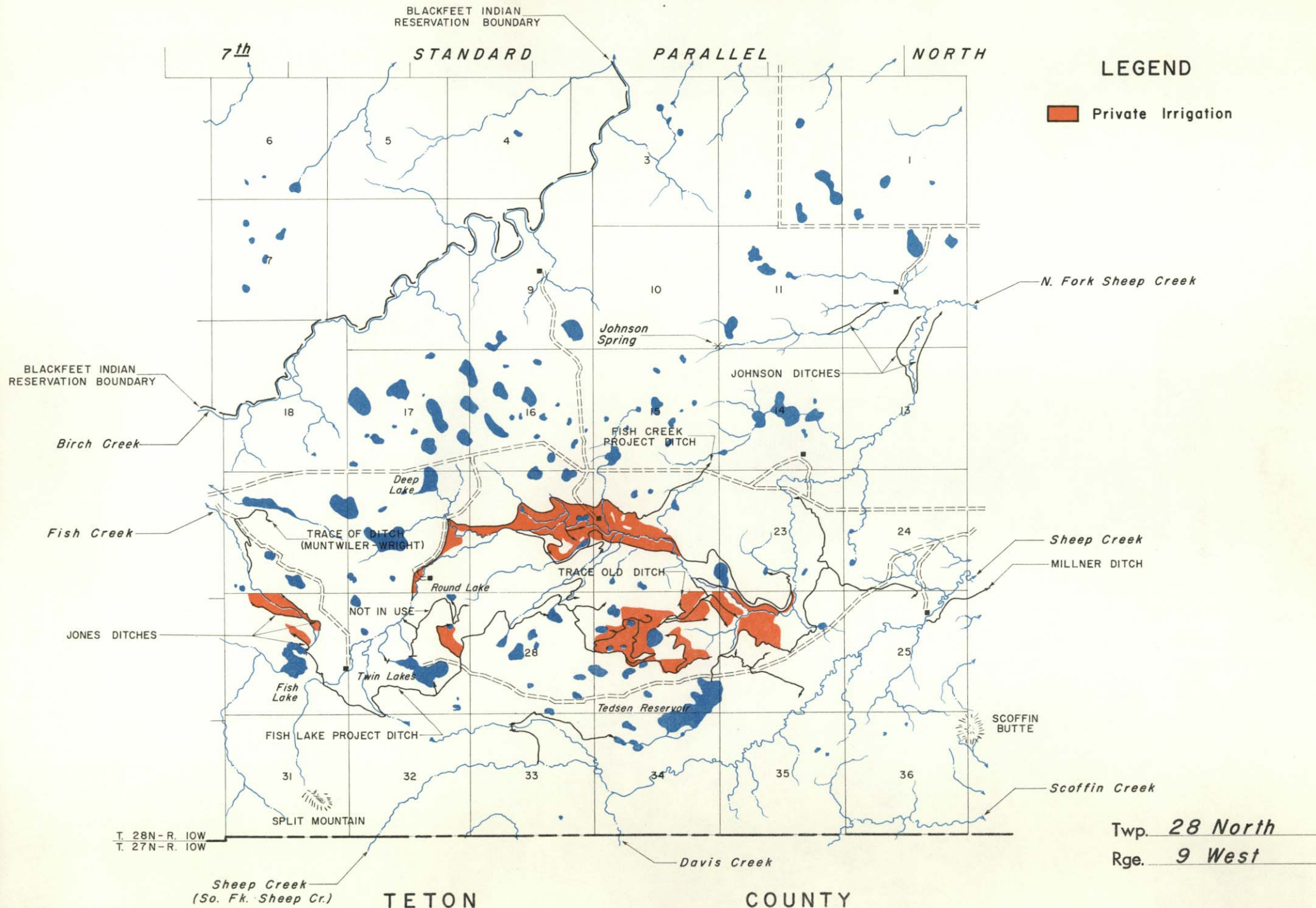
T. 28N-R. 2W
T. 27N-R. 2W

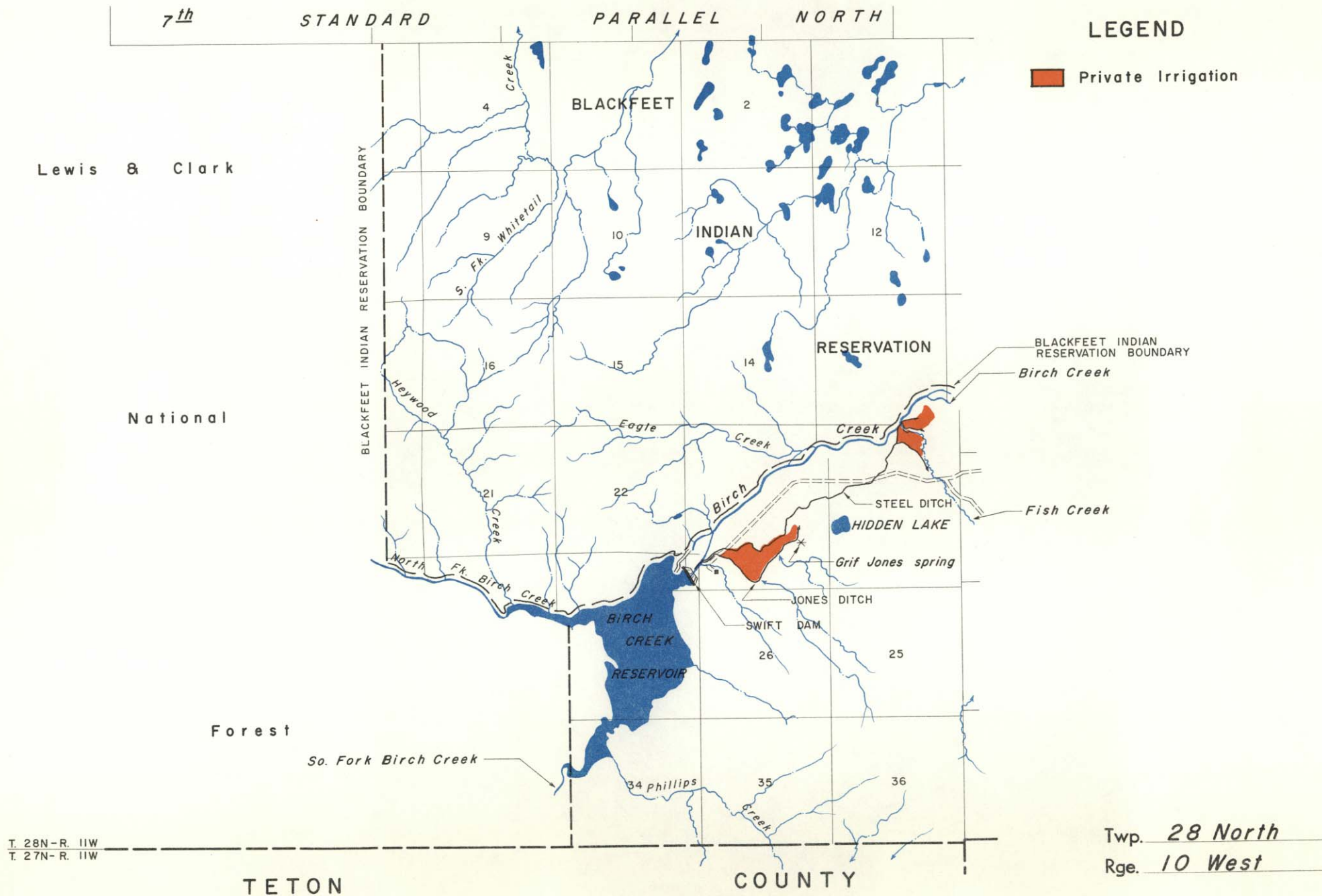
Twp. 28 North
Rge. 1 West

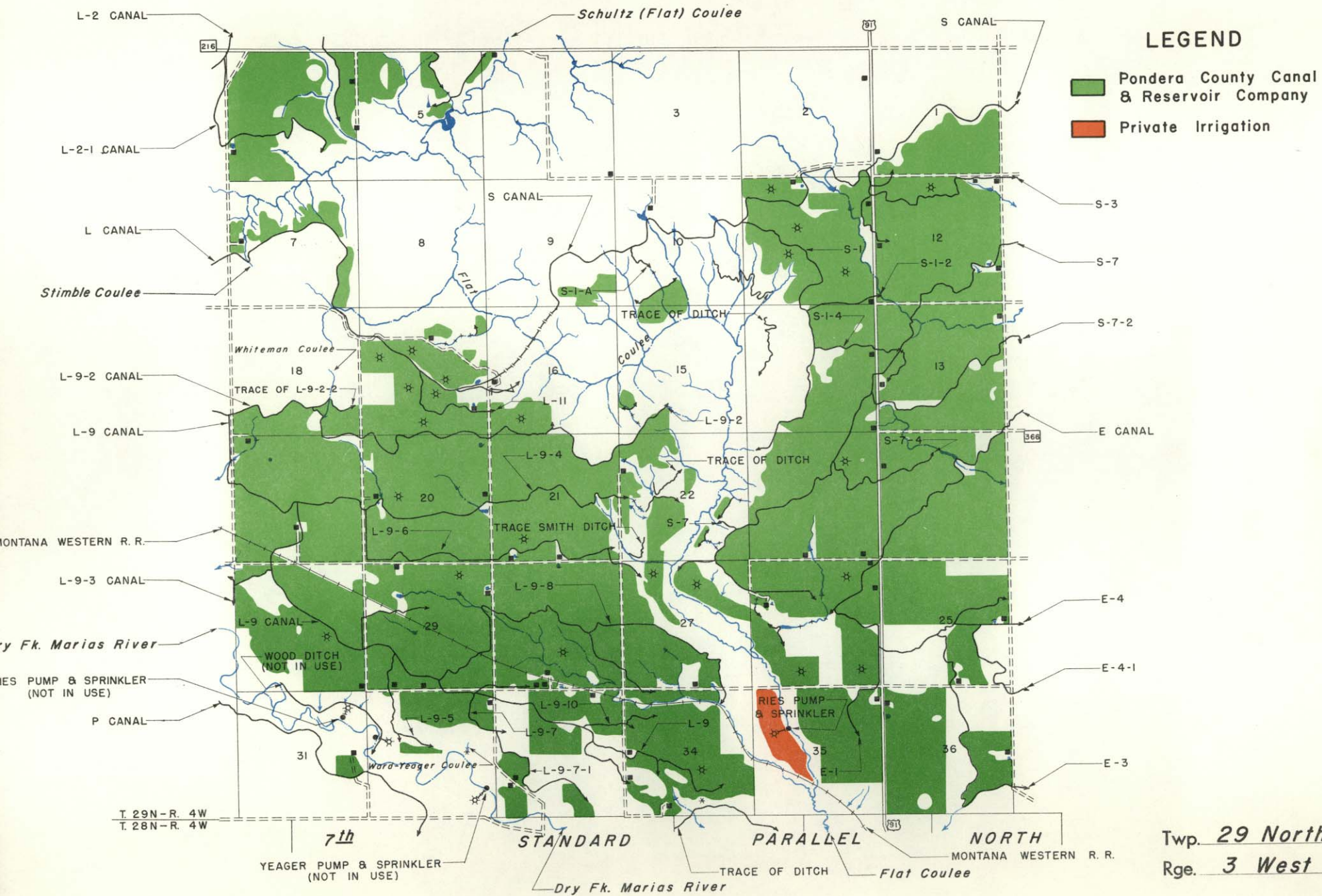


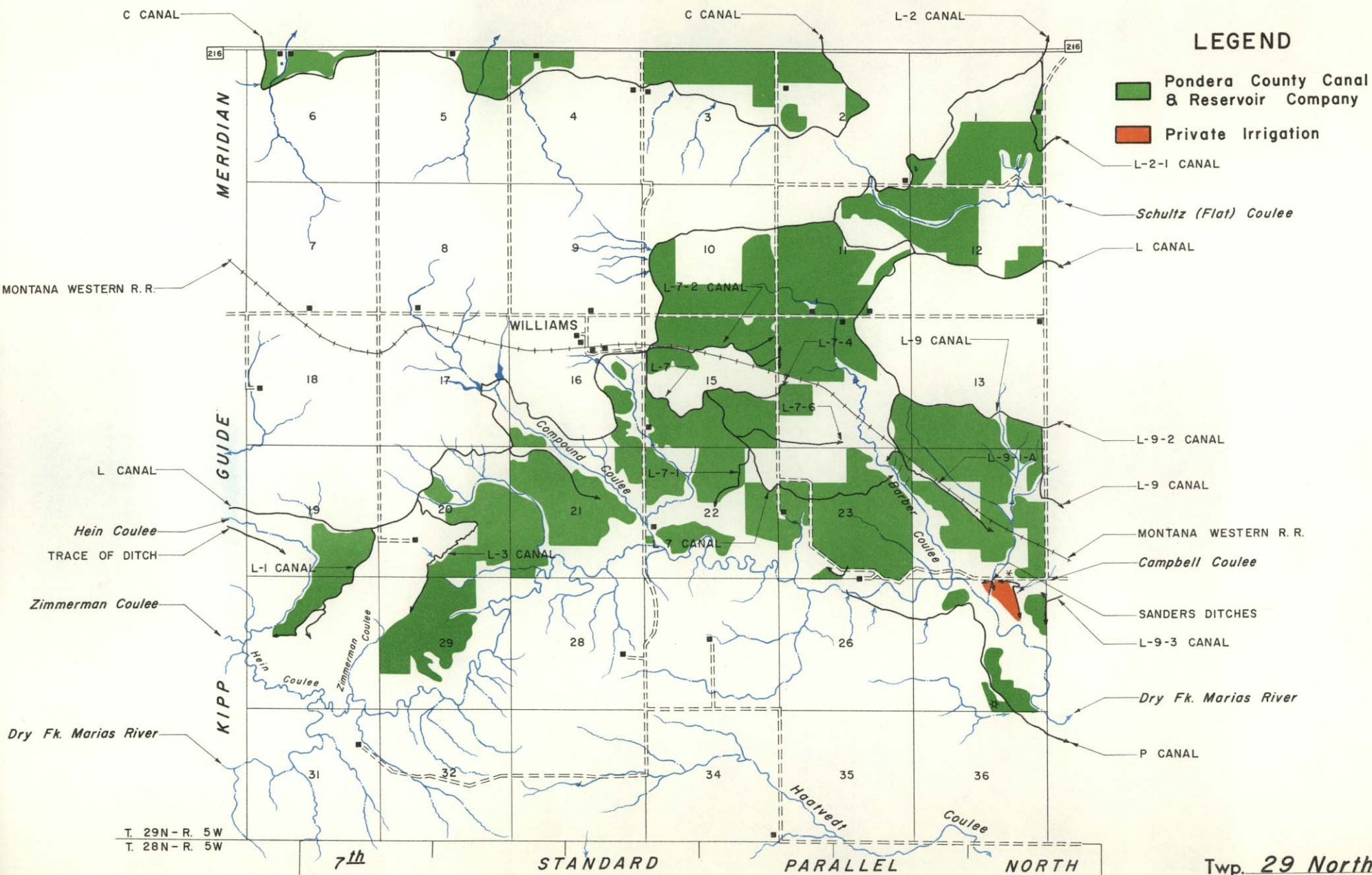




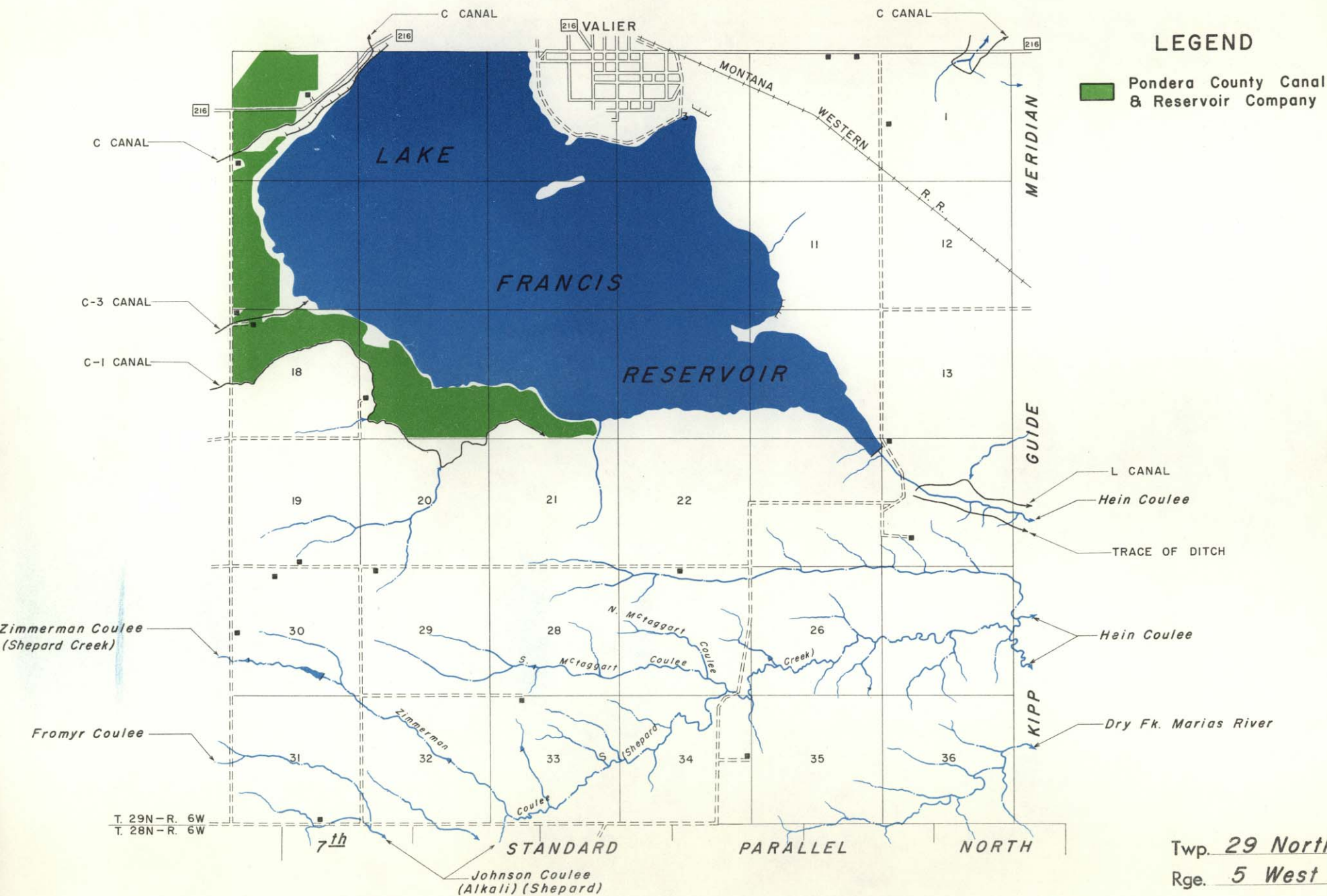




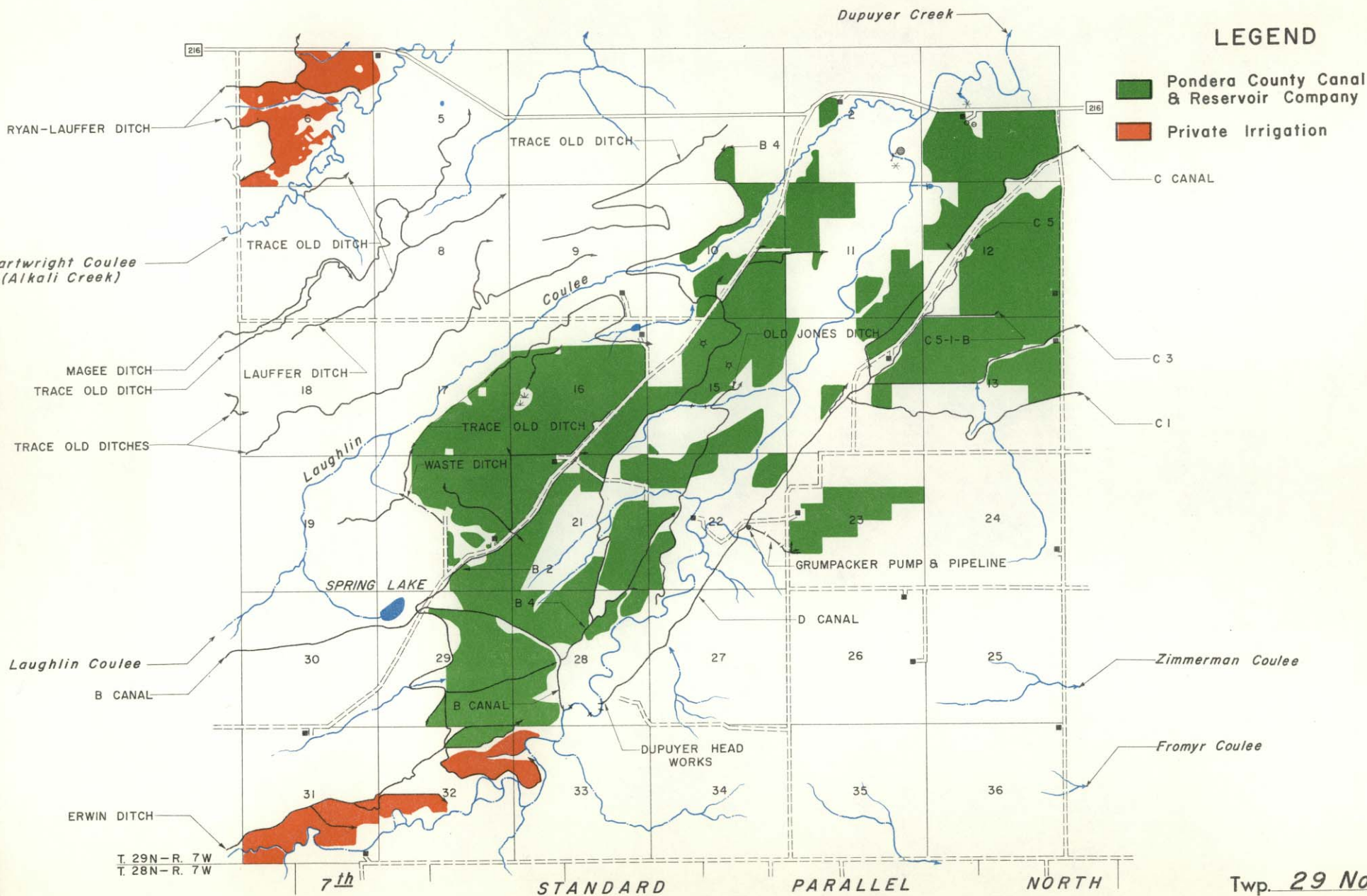




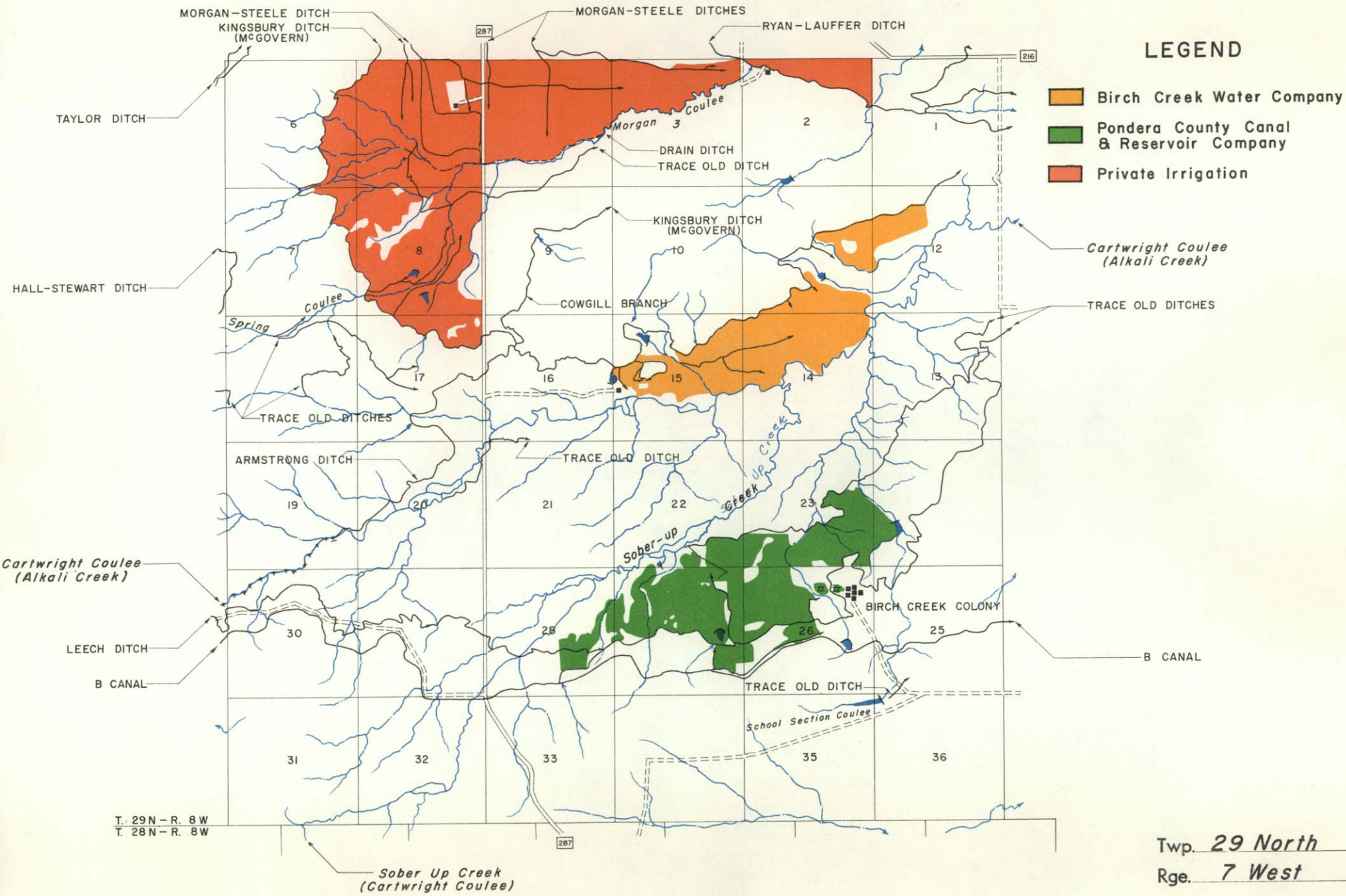
Twp. 29 North
Rge. 4 West



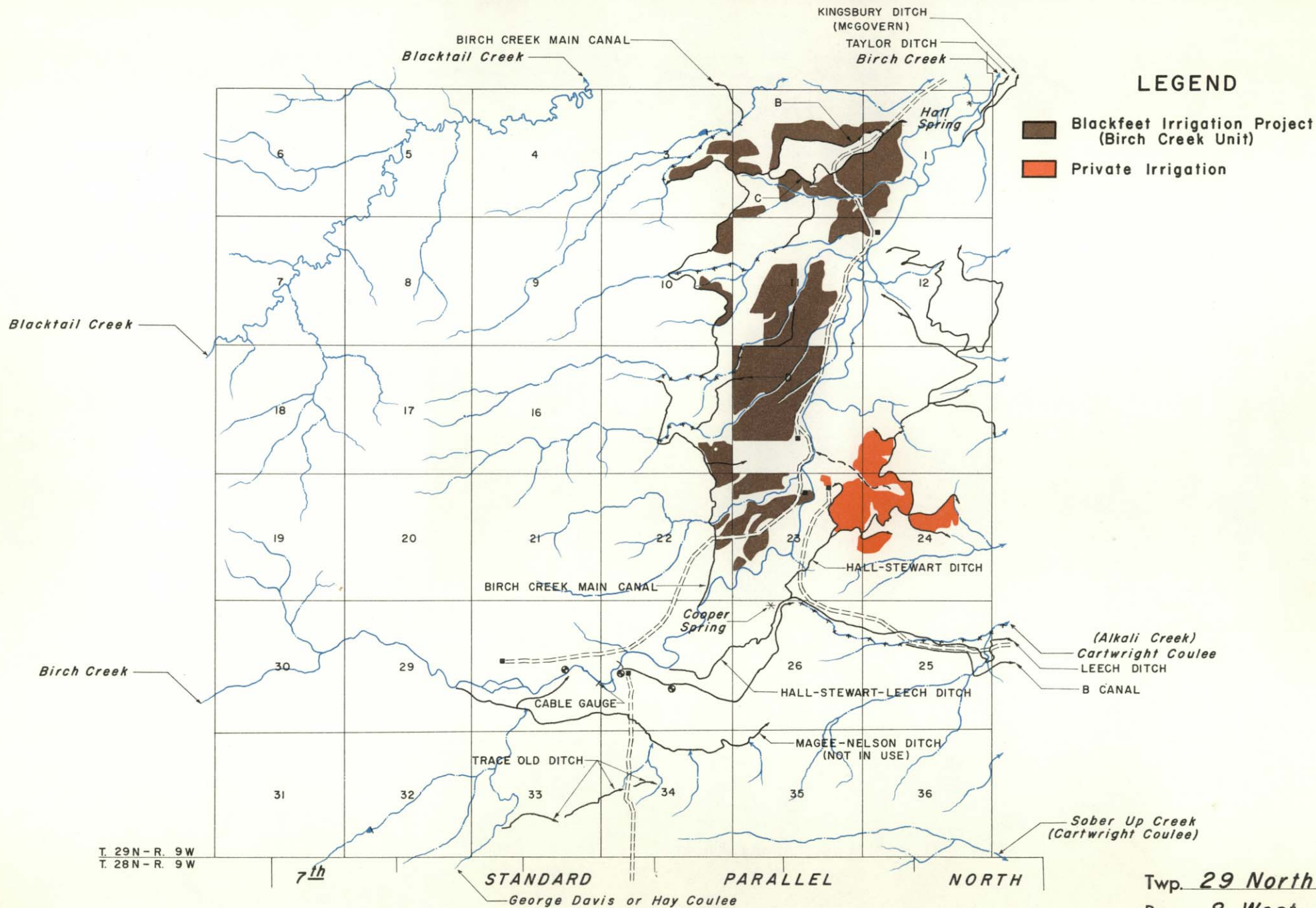
Twp. 29 North
 Rge. 5 West



Twp. 29 North
Rge. 6 West



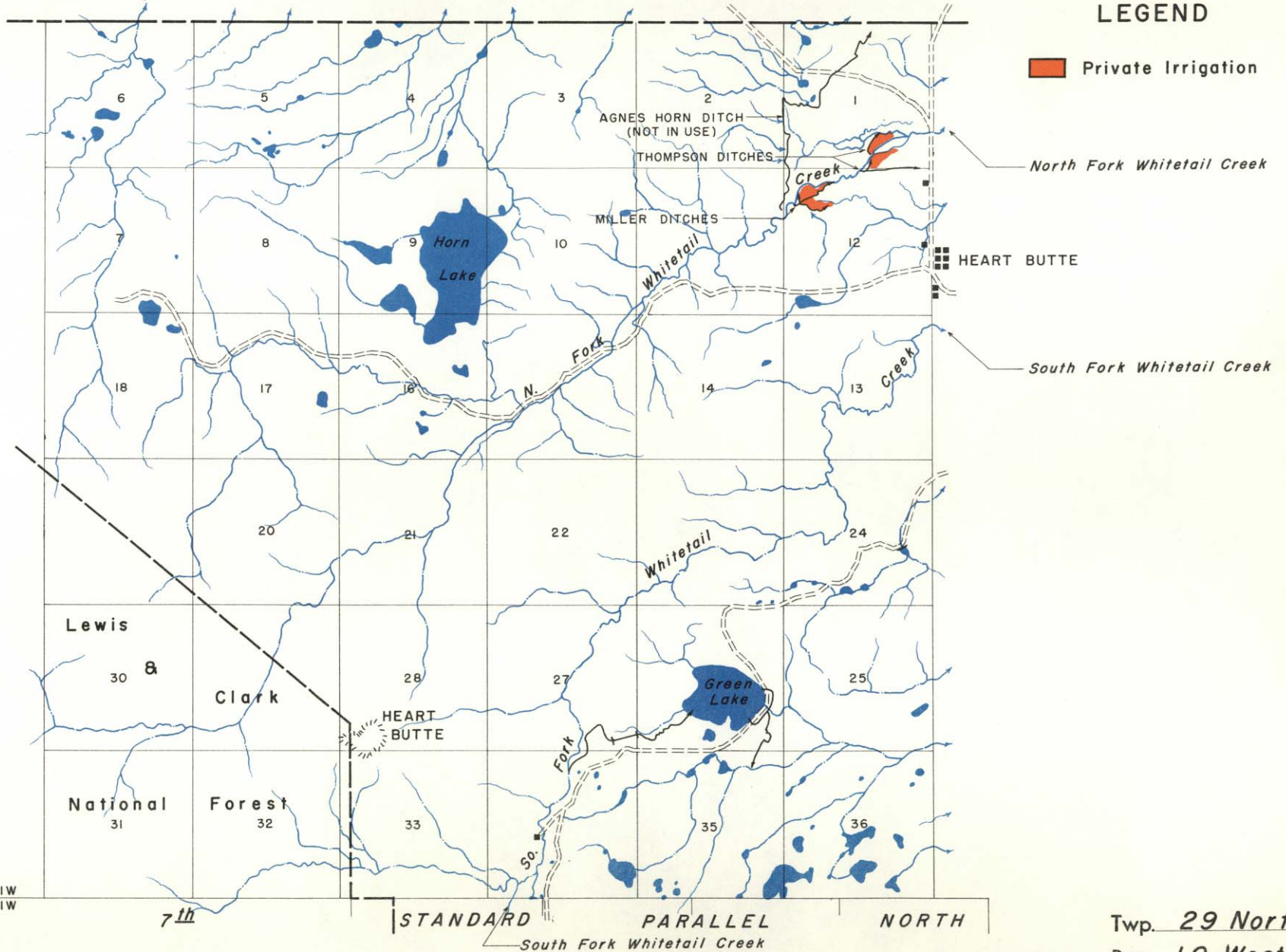
Twp. 29 North
Rge. 7 West



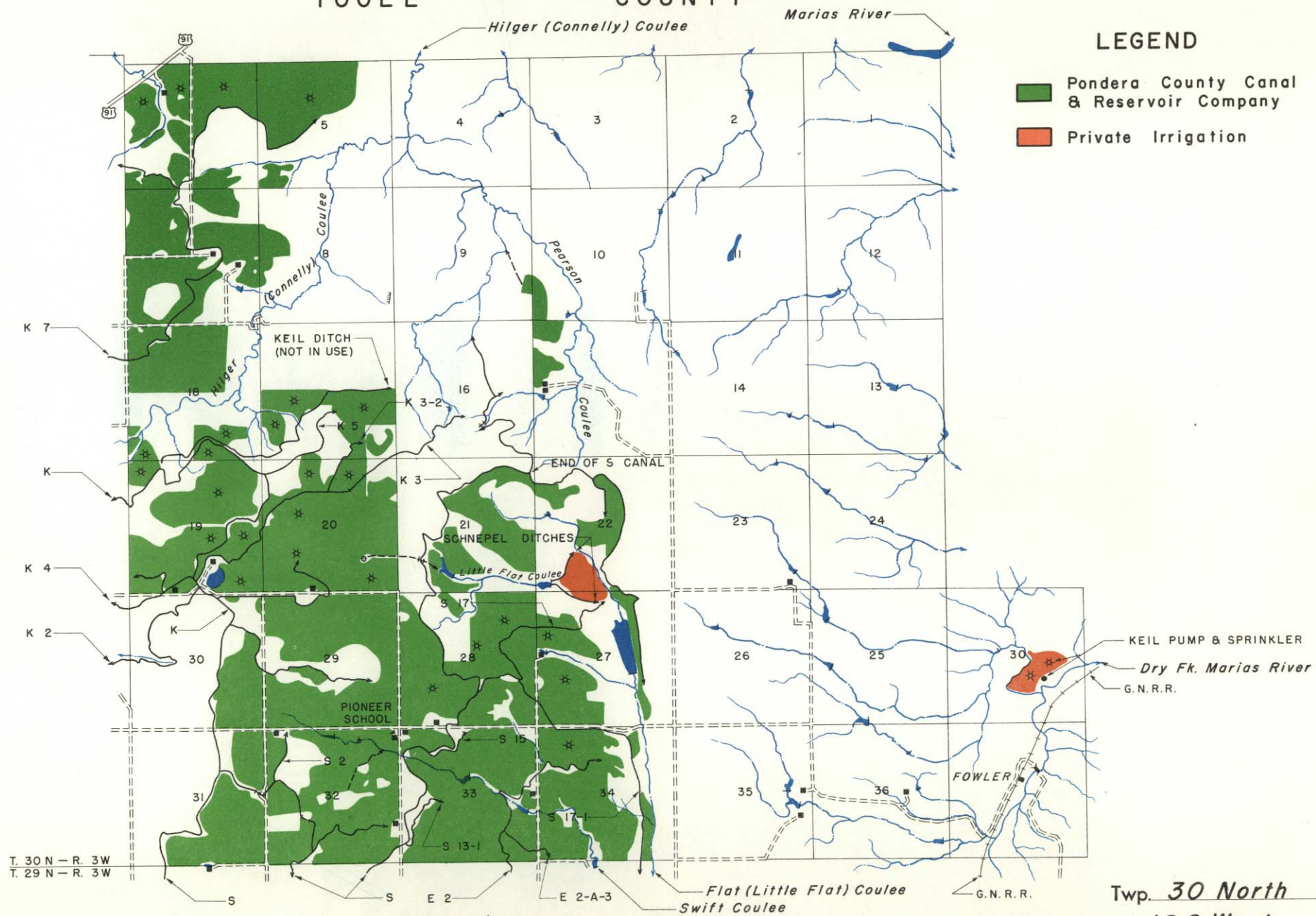
South Fork Badger Creek

LEGEND

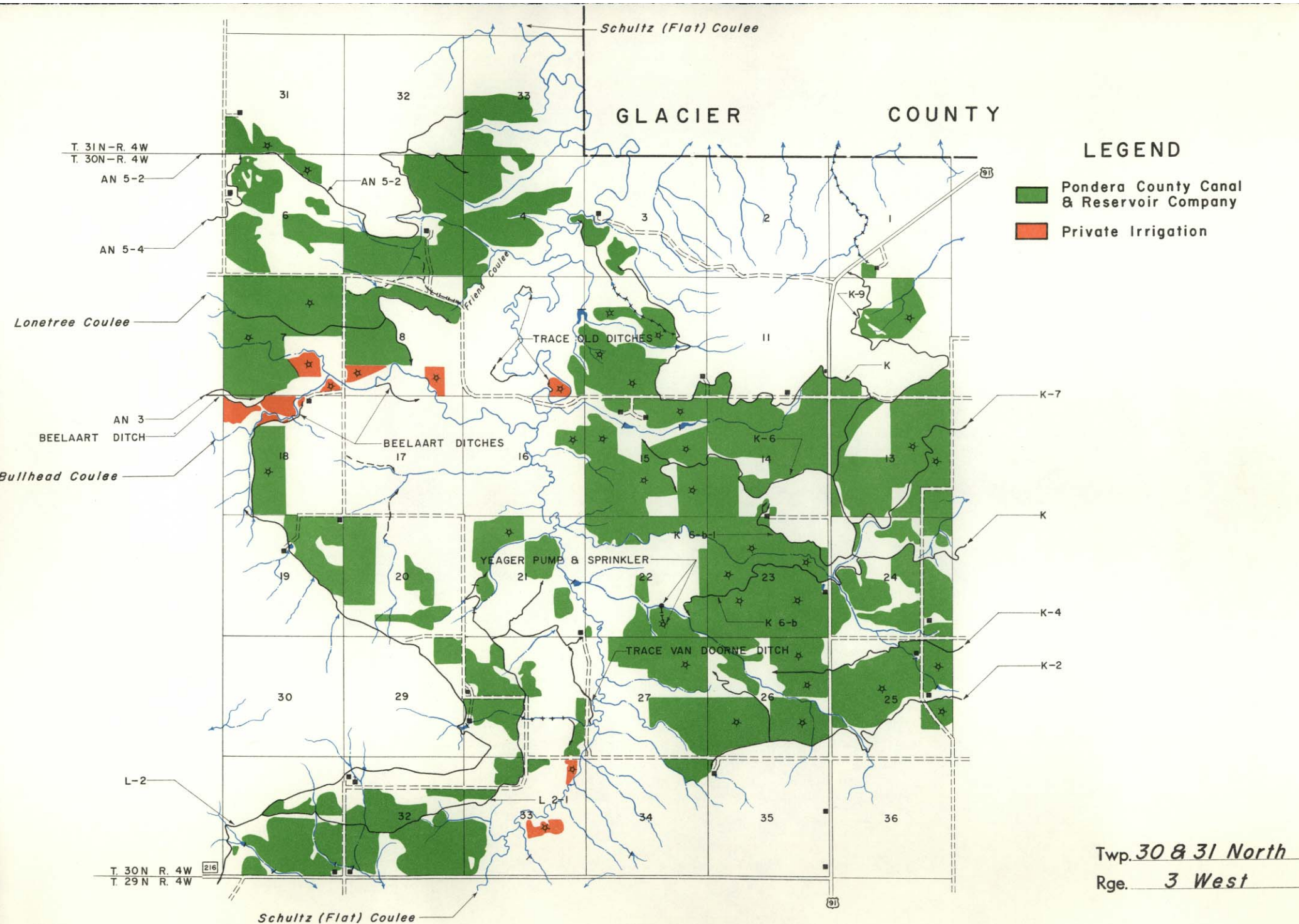
Private Irrigation

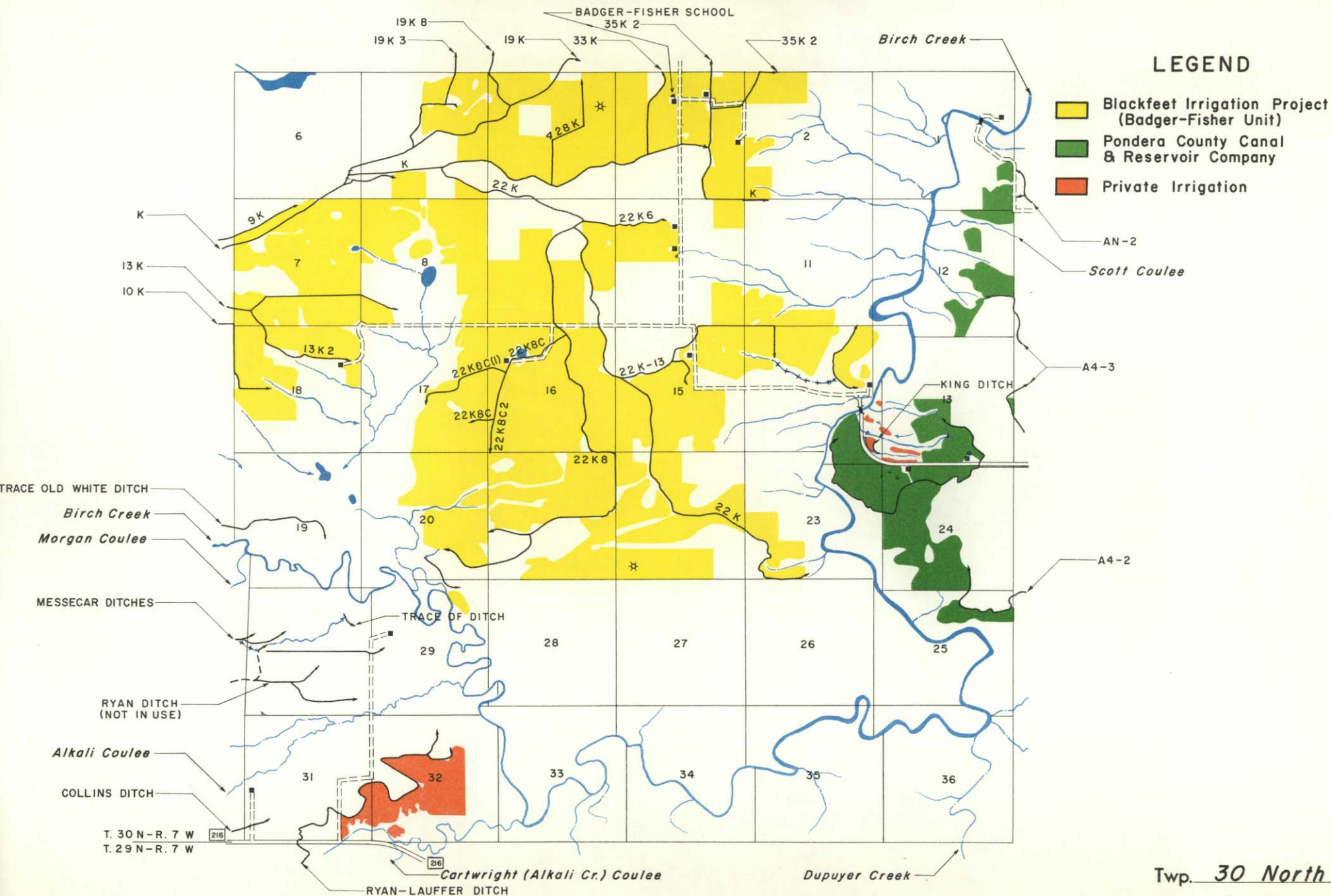


TOOLE COUNTY



Twp. 30 North
Rge. 182 West





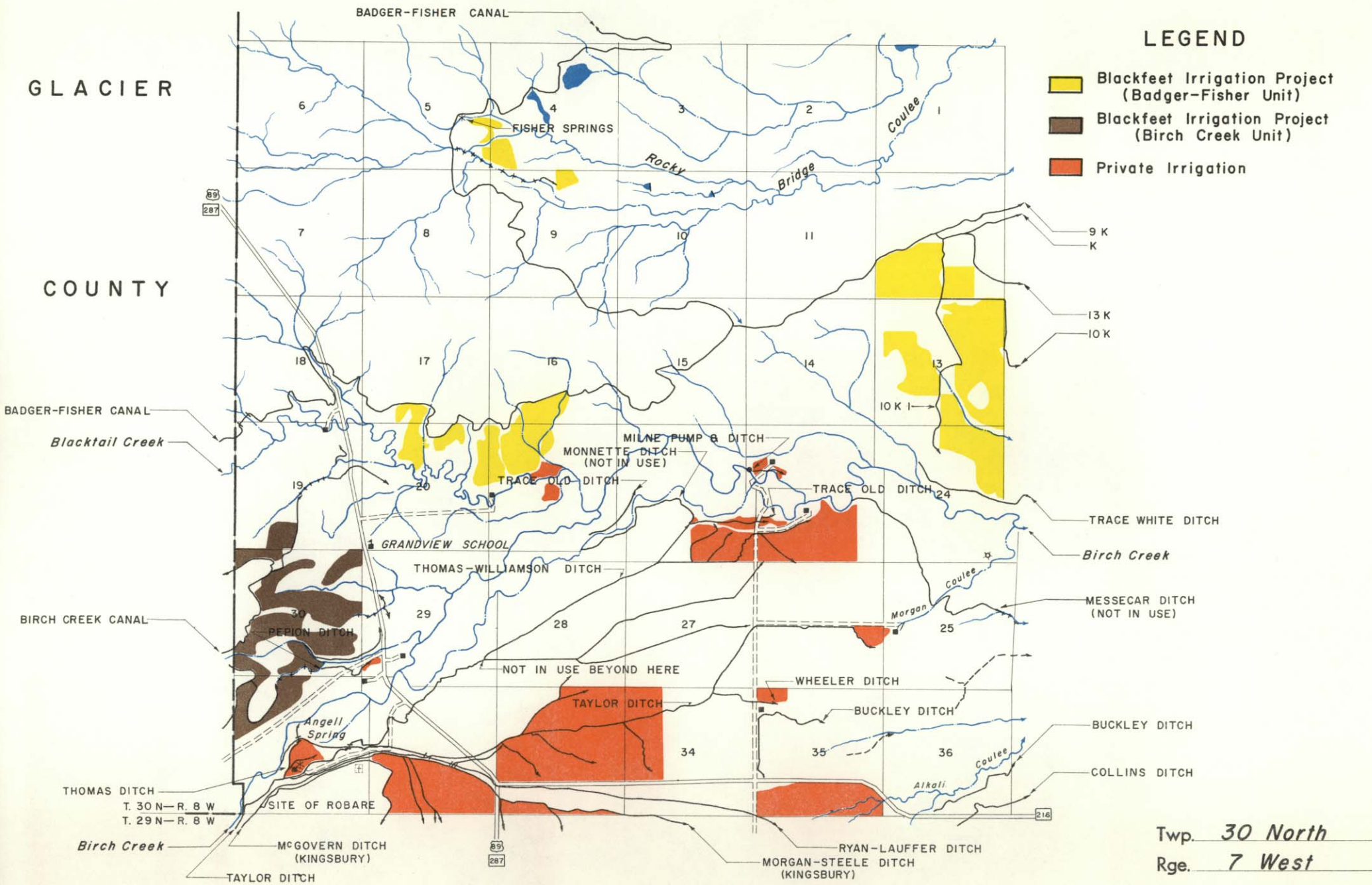
Tw. 30 North
Rge. 6 West

GLACIER

COUNTY

LEGEND



- Blackfeet Irrigation Project (Badger-Fisher Unit)
- Blackfeet Irrigation Project (Birch Creek Unit)
- Private Irrigation

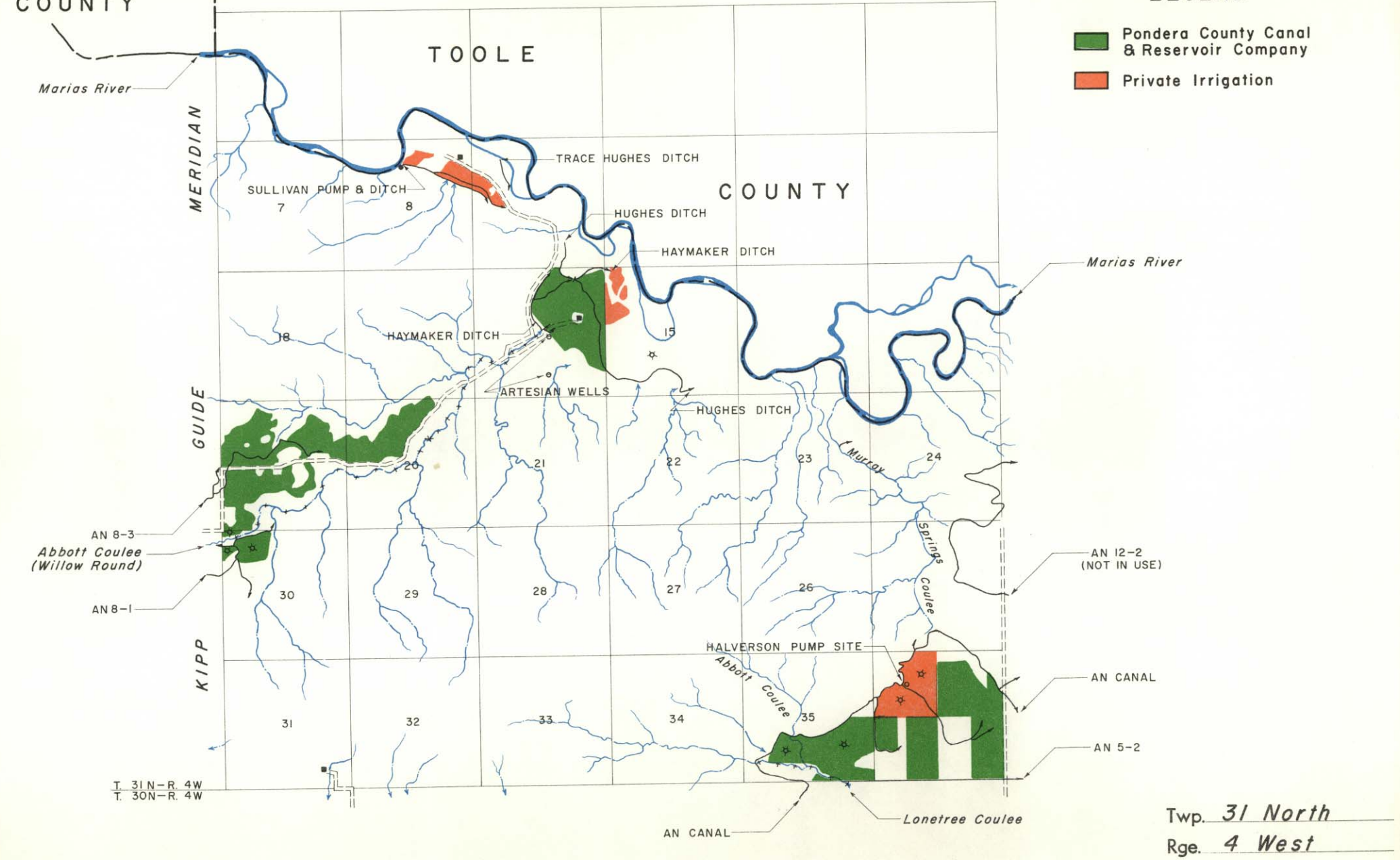


Twp. 30 North
Rge. 7 West

GLACIER
COUNTY

LEGEND

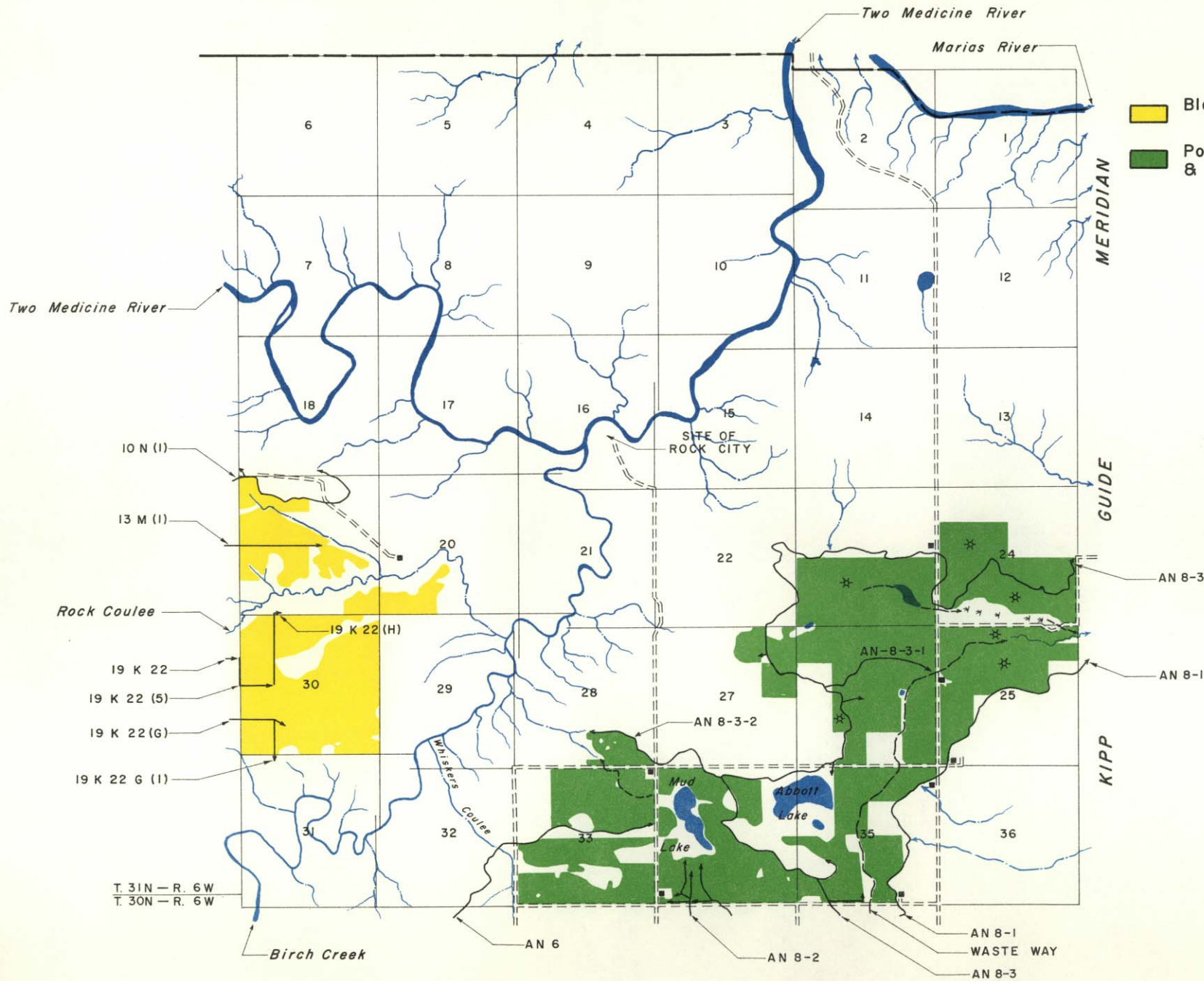
-  Pondera County Canal & Reservoir Company
-  Private Irrigation



Tw. 31 North
Rge. 4 West

LEGEND

- Blackfeet Irrigation Project (Badger-Fisher Unit)
- Pondera County Canal & Reservoir Company



Twp. 31 North
Rge. 5 West

GLACIER

COUNTY

LEGEND

Blackfoot Irrigation Project
(Badger Fisher Unit)

Two Medicine River

Two Medicine River

BADGER—FISHER
MAIN CANAL

Alkali
Lake

Rock Coulee

Birch Creek

T. 31N—R. 7W
T. 30N—R. 7W

Alkali Lake

Twp. 31 North
Rge. 6 West

GLACIER

COUNTY

LEGEND

 Private Irrigation

Two Medicine River

LENOIR DITCH
(NOT IN USE)

MCTAGGART DITCH

LENOIR PUMP & DITCH

GLACIER

Two Medicine River

Kipps Coulee

BADGER-FISHER MAIN CANAL

COUNTY

Alkali
Lake

Alkali

Lake

T. 31 N - R. 8 W
T. 30 N - R. 8 W

Twp. 31 North

Rge. 7 West