Water Resources Survey

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

and

Part II:
MAPS SHOWING IRRIGATED AREAS IN COLORS DESIGNATING THE SOURCES OF SUPPLY

Lake County, Montana

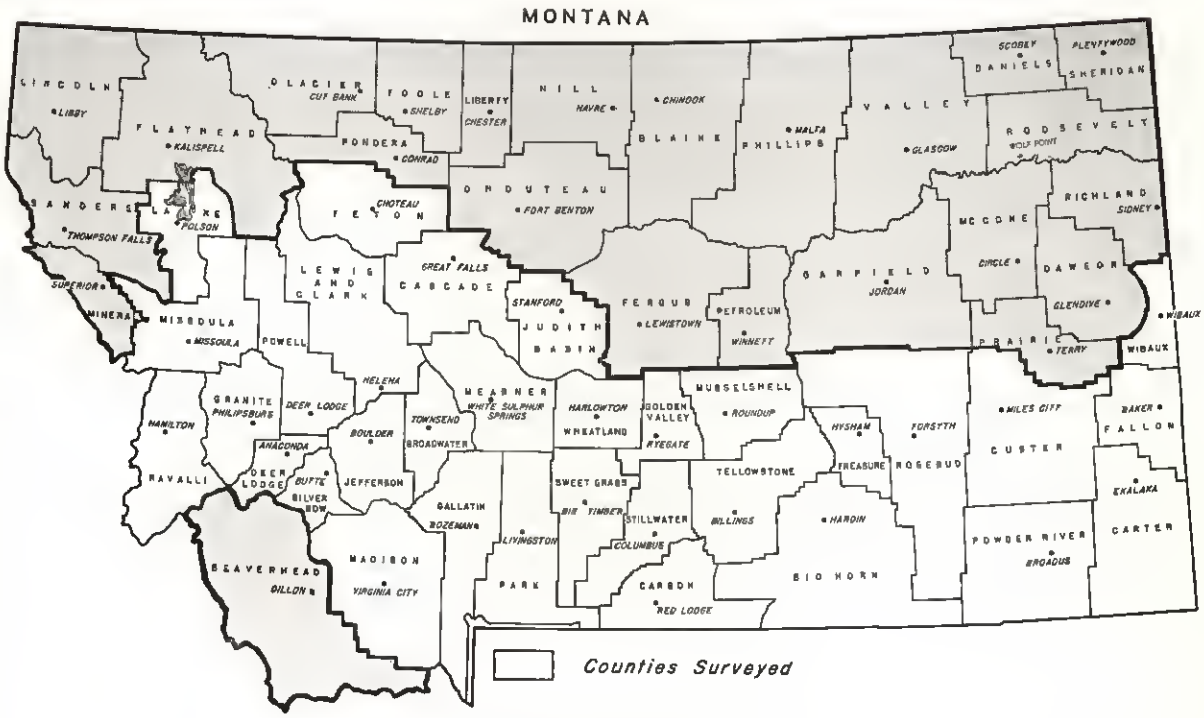
Published by
STATE ENGINEER'S OFFICE
Helena, Montana, June 1963

WATER RESOURCES SURVEY

LAKE COUNTY
MONTANA

Part I

History of Land and Water Use
of Irrigated Areas



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June, 1963

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C. C. Bowman, Irrigation Engineer and Consultant, Bozeman

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

June, 1963

Dear Governor Babcock:

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

This work was accomplished with funds made available to the State Engineer by the 37th Legislative Session, 1961, 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, Custer, Deer Lodge, Fallon, Gallatin, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Madison, Meagher, Missoula, Musselshell, Park, 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 cooperation 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.

COUNTY OFFICIALS

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The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers and stockmen who have given their helpful co-operation in this survey.

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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. Anyone 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 accelerating development as the need for its use increases and economical energy for pumping becomes available. Continued rapid development without some regulation of its use will cause a depletion of ground water in areas where the recharge is less than the withdrawal. Experience in other states has shown that once overuse 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 have become 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 water fit for domestic, livestock, or agricultural use. The Administrator, after a notice and 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 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 and 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.

Montana's Ground Water Code provides for four different types of forms that may 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 license 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"** — shall be used by persons who have put ground water to a beneficial use (including sub-irrigation or other natural processes), prior to January 1, 1962 and will require the person within two (2) years after January 1, 1962, to file a declaration in the office of the county clerk of the county in which the claimed right is situated and shall contain the following information: (1) Name and address of the claimant; (2) the beneficial use on which the claim is based; (3) the date or approximate date of the earliest beneficial use, and how continuous the use has been; (4) the amount of ground water claimed; (5) if the beneficial use has been for irrigation, the acreage and description of lands to which such water has been applied and the name of the owner thereof; (6) the means of withdrawing such water from the ground and the location of each well or other means of withdrawal; (7) the date of commencement and completion of the construction of the well, wells or other works for withdrawal of ground water; (8) the depth of the water table; (9) so far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of ground water; (10) the estimated amount of ground water withdrawn each year; (11) the log of the formations encountered in the drilling of each well; and (12) such other information of similar nature as may be useful in carrying out the policy of the Act.

Failure to comply with this requirement shall in nowise work a forfeiture by not filing form No. 4, "Declaration of Vested Ground Water Rights," or prevent any such claimant from establishing such rights in the courts, but he must maintain the burden of proving such

unrecorded rights. The law provides, however, that the court shall accept the filing of a "Declaration of Vested Ground Water Rights" as prima facie evidence of the right. This means that if a user has failed to make a filing and a case comes up in court to adjudicate the rights, the one who has not made a filing must prove his case by witnesses.

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, Sessions Laws of Montana, 1957, shall be considered as to having complied with the requirements of this Act.

Copies of the four types of 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, will provide the only efficient means for the orderly development and preservation of our water supplies and will protect all of Montana's use—on both ground and surface waters.

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 irigable 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.

HISTORY AND ORGANIZATION*

The earliest history of white men inhabiting the area of what is now Lake County tells of the fur traders and trappers in 1807. Prior to that time, in 1804-1805, the Lewis and Clark Expedition had crossed the mountains south of Lake County in search of a route to the Pacific Ocean and also to gather information about the Indians and the Far West country.

Many years before the Indians occupied the area, it was covered by a huge glacial ice mass. The change to warmer climatic conditions resulted in periods of freezing and thawing to form the topographic characteristics of the region, which included its mountains, valleys, lakes and streams. Because of its natural scenic beauty, Lake County is often referred to as "God's Country."

Before the arrival of the white settlers, the area was a paradise for the early-day Indians. It was a haven for wild game, and the lakes and streams were well supplied with fish. The Indians never knew hunger, for the land supplied them with all their needs.

When the first white men came to the Flathead country, they found three major Indian tribes: the Salish, commonly known as the Flatheads; the Kalispel, known as the Upper Pen d'Oreille; and the Kootenai. In 1805, when Lewis & Clark first met the Flatheads in what is now Ravalli County they described them as friendly and exceptional Indians.

Although the Flathead Indians had a few small wars with other tribes, they were generally peaceful. An exception to their friendly nature occurred only when they crossed the mountains to the plains to hunt buffalo. Here they would usually encounter a hunting party of Blackfeet, their hereditary enemies, and a skirmish would result. It is said that the Flathead tribes never took the life of a white man in war.

Among the early fur traders in the Flathead region were David Thompson, Jocko Finlay and Angus McDonald. David Thompson was one of the first white men to see the Flathead Indian country which was in the year 1808, when he was sent into the area as an employee of the Northwest Fur Company to explore the region and establish trade with the Indians. One of the first trading posts he established was where the present-day town of Libby now stands. In 1812, Thompson built another post near the present site of Thompson Falls. His fair trading with the Flathead Indians earned him their friendship as well as a thriving business in the fur trade. Making a trip one day to the present-day site of Dixon, Thompson was told about Flathead Lake and the surrounding country. Becoming interested in seeing the lake, the Indians provided him with a guide and ontic beauty of Flathead Lake.
became the first white men to view the majes March 1, 1812, David Thompson and his party

Jocko Finlay, another fur trader, was associated with Thompson and assisted him in building the Kalispel House on Flathead Lake. Jocko Finlay was born in Montreal, Canada in 1768, the son of James Finlay, one of the founders of the Northwest Fur Company. The Jocko River and valley were named in honor of this popular fur trader.

The competition for the fur trade increased when the Hudson Bay Fur Company established posts in the Montana territory at Fort Hall and Fort Colville and also at Fort Boise in Idaho. The chief trader in charge of the forts for the Company was Angus McDonald. He was born on October 15, 1816 and after graduating from college as a lawyer he emigrated to America, entering the employ of the Hudson Bay Fur Company in 1838. When Fort Connah

was estbalished in 1845, the Company put Angus McDonald in charge to complete construction of the buildings. Fort Connah was located six miles north of the present town of St. Ignatius and one of the buildings still stands as a memorial to McDonald and the fur trade. He was in charge of the thriving fur business at Fort Connah for many years, enjoying his popularity with the Indians to such an extent that they included him in most of the tribal activities. In 1864, Angus McDonald was promoted to the position of general supervisor of various trading posts in the region.

Skirmishes between the Blackfeet and the Flathead tribes harassed the fur trading industry for many years after the establishment of the trading posts. In an effort to control the war-like tendencies between the tribes, the Flatheads were told stories of the white medicine men (Black Robes) who might help them overcome difficulties with their Blackfeet enemies. In April, 1840, Father Pierre Jean DeSmet, a young Jesuit Priest left Westport (now Kansas City) with a party of American Fur Company traders to fulfill his promise of the year before to meet with the Indians of the great northwest. He was met at Green River, Wyoming by a large band of Flatheads who had been sent to meet this man of God. They escorted him into the Montana territory where they were joined by members of the Nez Perce and Kalispel Indian tribes until they numbered about sixteen hundred. After two months of missionary work among the Indians, 200 children and fifty adults were baptized. Father DeSmet then went back to St. Louis, promising to return the next year. In the spring 1841, DeSmet made good his promise to return, and in September the first Catholic Mission in the territory was established 28 miles south of Missoula, between Stevensville and Fort Owen. Many other missionaries came into the region during the next decade. On September 24, 1854, Father Hoecken and his party officially founded the St. Ignatius Mission in what is now Lake County. A log hut was erected for the missionaries and before the end of the year, 82 Indians had been baptized; a chapel, two houses, a carpenter and blacksmith shop were constructed. Within the year, over 1,000 Indians, Kootenai, Flathead, Kalispel and Pend d'Oreille, arrived to make their homes near the new mission. A new church was built in 1910, the interior of which contains frescoes, requiring many months of work by J. Canignano, a coadjutor Brother of the Society of Jesus. This marvelous art work today is admired by many people traveling through the St. Ignatius area.

The agreement creating the Flathead Indian Reservation was completed on July 16, 1855, at a place called Council Grove, six miles west of the present city of Missoula. Signers of the agreement were: Governor Isaac Stevens, representing the United States Government, Chief Alexander of the Kalispel, Chief Michelle of the Kootenai and Chief Victor of the Salish (Flathead) Indian tribes. It was agreed that the Kalispel and Kootenai tribes would be located within the present boundaries of the Flathead Indian Reservation and Chief Victor and his Flatheads would settle in the Bitterroot valley. An alternate clause in the agreement empowered the President of the United States to make surveys which would determine whether it was better for the Flatheads to remain in the Bitterroot or be moved to the Jocko Agency on the Reservation.

In 1856, Dr. R. H. Landsdale, the first Indian Agent, established the Jocko Agency. Later that year, Major John Owen was appointed Indian Agent for the Flatheads, which position he served for 6 years. He kept his residence at Fort Owen but made frequent trips to the Jocko Agency. In 1871, a presidential order was issued decreeing that the Salish tribe move from the Bitterroot valley to the Jocko Agency on the reservation. Chief Charlot (Charlo), who

had followed in the footsteps of his father, Chief Victor, as leader of the Salish tribe, refused to leave and began a resistance that was to last for twenty years. After many investigations and attempts were made to move Chief Charlot and his people to the Jocko, he finally consented to leave the Bitterroot. On October 17, 1891, after consulting with the Indian agent Major Ronan and his friend Amos Buck, a Stevensville merchant, Charlot and his people, totaling less than three hundred, moved to the Jocko. The government built the old Chief a nice home in the square near the Agency. Chief Charlot, broken in health and spirit died on January 10, 1910.

In the early 1860's and 70's many white men came to the northwest seeking their fortunes. Some became discouraged and moved on, but those who remained had enough vision to see a bright future in the Flathead country. The people who remained were of high caliber and played a vital part in the agricultural development of the Flathead. Many of their descendants, from the second to fourth generations, live on the reservation at the present time. Space will not permit an individual history of each, but among some of the more prominent pioneers were: Angus McLeod, Sr.; Joseph Ashley, Sr.; Louis Clairmont; Camille Dupuis, Sr.; Alexander Morigeau, Sr.; Dave, Louis and Octave Couture, Raphael Bisson; Louis Courville, Sr.; Joe Greiner, Sr.; Edwin Dubay; Joe Houle, Sr.; Jean B. Jette; Frank Jette; Isaac and Eli Pauline; Fred W. Glover, Sr.; August Finley; George Ledoux; Fred Roullier; Mike Matt; Joe Matt, Sr.; Garcon Demers; Bob Vinson and many others. Most of those named were engaged in agriculture, raising grain, cattle and horses.

In 1887 Congress passed the Dawes Act that would open the lands of the Flathead Indian Reservation to white settlement. The best of the lands were to be allotted to the Indians with the surplus lands to be sold to homesteaders. Several years passed, until April 23, 1904 when a bill was passed in Congress authorizing surveys to be made of the reservation lands and allotments made to the Indians. Work was begun under the administration of a new Indian superintendent, Major Samuel Ballew and completed in 1908. On May 22, 1909, President Taft issued a proclamation opening the balance of the reservation lands to white settlement. Out of 3,000 names drawn, only 403 people at that time chose to homestead on the reservation. Each person had to meet certain qualifications and after selecting the land, a down-payment of one-third the appraised price was required, with the balance to be paid in five equal installments.

In the 1904 Bill, Congress authorized a preliminary survey to determine whether or not an irrigation project was feasible on the reservation, and in 1907 an arrangement was made between the Office of Indian Affairs and the Reclamation Service whereby the latter furnished the engineering organization to make the surveys and carry on the construction work. Engineer Robert S. Stockton was detailed to the reservation in 1907 to make the preliminary survey and report on the feasibility of an extensive irrigation devlopment. His report was completed in 1908. Construction was begun in 1909 and has been carried on continuously since that date. Until April, 1924, the engineering work was done by the Reclamation Service and submitted to the Commissioner of Indian Affairs for approval, but since then, all of the work on the project has been under the Bureau of Indian Affairs.

The development of the Flathead Irrigation Project provides the basic economy for the majority of the Lake County residents. Briefly, the present irrigation system consists of fifteen storage reservoirs, having a total of 148,725 acre-feet of stored water. There are approximately 1,300 miles of feeder and distribution canals in the irrigation system. The water users

are organized into three irrigation districts; the Flathead, Mission and Jocko Valley. For a detailed account of the project see the "Flathead Irrigation Project" of this report. (Page 40)

There are industrial and recreational developments in Lake County, in addition to agriculture that make this county one of the important areas in Western Montana.

Kerr Dam, with a total capacity of 180,000 Kilowatts, is located five miles below Polson on the Flathead River and is the largest electrical generating power plant in the Montana Power Company system. The dam is a concrete arch 204 feet high anchored deep in a solid rock base, which extents to either side. Kerr Dam stores water in Flathead lake amounting to 1,217,000 acre-feet and the water level of the lake is kept at an elevation between 2,883 and 2,893 feet above sea level. Kerr Dam was named in honor of Frank M. Kerr, President of the Montana Power Company from 1933 to 1940.

The lumber industry is second to agriculture in the amount of income derived from Lake County. Sawmills located north of Pablo are the Tom Wheeler, Danielson Brothers and Plum Creek Lumber Company No. 2; at Polson are the James Lumber Company, Inc., Dupuis Brothers Lumber Company and the U. S. Plywood Corporation Plant. The U. S. Plywood Corporation is the largest manufacture of plywood in the world, having plants in many other areas of the United States. A by-product, consisting of two and a half carloads of wood chips are shipped from the plant each day to the Waldorf-Hoerner Paper Products Company, near Frenchtown, for paper manufacturing. Another source of income connected with the lumber industry is the market for Christmas trees. Although seasonal, only during the months of October and November, the average harvest per year is about 150,000 bales. The source of supply comes mostly from tribal lands and brings in approximately $75,000 annually to the tribes.

In 1908, Congress at the request of President Theodore Roosevelt, appropriated $40,000 to purchase 19,000 acres of land from the Flathead tribes for a National Bison Reserve. It is located in the southern part of the Flathead Indian Reservation with about one-third of the land in Lake County and two thirds in Sanders County. The original foundation herd of 41 buffalo has now increased to 342 head. To maintain a herd consistent with the grazing area, about 100 head are butchered in November each year. The buffalo meat is sold by the quarter to the lucky individuals who register for the drawing that is held each summer. In addition to buffalo, there are seventy-five elk, 300 mule deer, 100 white tail deer, 35 bighorn sheep and 12 to 25 prong-horn sheep on the reserve.

The picturesque Flathead Lake and surrounding area is noted as a summer vacation land.

Polson, on the south end of Flathead lake, offers fishing, swimming, boating, water skiing, and golfing for the vacationing tourist. Nearby attractions are the Mission Mountain Range, Blue Bay Resort, Yellow Bay, St. Ignatius Mission, Kerr Dam and the National Bison Reserve. The annual Copper Cup Regatta is held at Polson during the third week-end in August. This event is a highlight of the boating season and attracts boat racing enthusiasts from all over the northwest.

The real estate development around Flathead Lake began soon after 1923, when Colonel A. A. White envisioned the Villa Sites and other lake shore properties as prospective sites for summer homes and tourists resorts. In 1924, prices for lake shore property were listed at $50-$100

an acre, which people thought too high. Since that time real estate development along the lake shore has been spectacular. Many beautiful summer homes have been built and lots that once sold for $50 now sell for $5,000 and more.

The east and south land areas bordering Flathead Lake are particularly adaptable to the growing of fruits and vegetables. Grown abundantly are several varieties of sweet cherries and apples. Yellow and red Delicious apples are raised commercially; other species are McIntosh, Wealthies, Ben Davis, Yellow Transparent and Crab apples. Plums, pears, strawberries and sour cherries grow equally well. One fruit which has been developed and always finds a ready market is the Flathead sweet cherry. This popular fruit arrives on the market after the Washington sweet cherries have been harvested and due to its superiority in color, firmness and size, commands a premium price. Carloads of the fruit are shipped yearly to the eastern market. The average price received for the cherry crop provides a real stimulus to the economy of the area in the amount of $250,000 annually.

Towns and small rural communities in Lake County are: Polson, Ronan, St. Ignatius, Charlo, Arlee, Pablo, Ravalli, Proctor, Rollins, Moiese, Dayton, Elmo, Big Arm, Radio and Round Butte.

Polson the county seat of Lake County, was originally known as Lamberts Landing and is located at the southern end of Flathead Lake. According to the last census in 1960, it had a population of 2,314 people. The town was named after David Polson, an early-day settler in the vicinity. The first post office was established there in 1898. Prior to the creation of Lake County in 1923, an election was held to determine which of the towns, Polson or Ronan would become the county seat. Results of the election gave Polson the honor by a margin of 674 votes.

Ronan, the second largest town in Lake County, with a population of 1,334 is located in the center of the rich agricultural area of the Lower Flathead and Mission valleys. In 1883, the town was a small trading post known as Spring Creek. When the government constructed a flour mill and saw mill at the post in 1885, the name was changed to Ronan Springs in honor of Peter Ronan, who was Indian agent from 1873 to 1892. A few years later in 1894, a post office was established and the name shortened to Ronan.

St. Ignatius is by far the oldest town in the county, being founded in 1854 by the Jesuit Fathers who established the St. Ignatius Mission. Located at St. Ignatius is the U. S. Indian Irrigation Service for the Flathead Project. It is the third largest town in the county and has a population of 940.

Charlo, known as Tabor in the early 1900's was named in honor of E. F. Tabor, a Reclamation Service Engineer. The name was changed to Charlo when a post office became established there in 1918, to honor the great Indian Chief Charlot (Charlo) and his descendants who were allotted acreage in the area. The population of Charlo, according to the 1960 census, was 200.

Arlee began as a community with the establishment of the Jocko Agency by the government in the spring of 1856. Jocko Agency was located about three miles east of the settlement of Arlee. The route of the Northern Pacific Railway to the west coast missed Jocko Agency by two miles and when a post office was established at the settlement on the railroad, April 27, 1882, it was named for the Indian Chief Arlee. This small community had a rich early-day pioneer history and had a population of 200 people in 1960.

Pablo is the youngest town on the reservation, becoming a townsite on September 13, 1917. When the Northern Pacific branch line from Dixon was nearing completion through the area to Polson, the U. S. Government held a public lot sale to establish the present town of Pablo. Today, Pablo has a population of about 100 people.

Ravalli was believed to have been named in honor of the popular Jesuit Father, Anthony Ravalli, who founded the St. Mary's Mission church in the Bitterroot. It is located on the passenger line of the Northern Pacific Railway and near the south boundary of the National Bison Reserve.

Proctor and Rollins are the only two towns in Lake County located outside the boundaries of the Flathead Indian Reservation. Both of these communities have populations of about 100 people.

Big Arm takes its name from its location on the big arm of Flathead Lake. It is a small community which depends upon vacationers and tourist business for its livelihood.

Moiese started as a small rural community in 1910, when the Moiese valley became well populated with settlers and the establishment of the bison range nearby created the need for a general store and post office. On May 4, 1918 James D. Sloan became the first postmaster of Moiese and proprietor of the new general store.

Dayton and Elmo are small resort communities located on the big arm of Flathead Lake. Each of these resort towns contain a post office, general store and lodging accommodations for the vacationing traveler.

Radio and Round Butte are now just rural farming areas. The post office and stores that were once a part of these communities, no longer exist.

Lake County was created in Montana on August 11, 1923. It was formed from the northern part of Missoula County and the southern portion of Flathead County and has a total land area of 1,654 square miles.

Transportation facilities in Lake County consist of the Northern Pacific Railway, U. S. Highways 93 and 10A, and State highways 35, 212, 28 and 209. In the southern part of the county, the main line of the Northern Pacific Railway passes through the towns of Arlee and Ravalli on its route to the west coast. At Dixon, in Sanders County, a branch freight line from the Northern Pacific Railway enters Lake County south of the community of Moiese and follows a northerly course through the towns of Charlo, Ronan, and Pablo, terminating at Polson. In addition to the main highways, there are many improved county roads to all of the outlying rural areas in Lake County. Passenger buses and auto freight lines serve the area. Polson has a local airport that will accommodate small private aircraft and chartered planes for those people who prefer air travel into and from the Flathead area.

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*Historical information and facts are taken mostly from the manuscript "The Fabulous Flathead," by J. F. McAlear. Copyright 1962, by the Reservation Pioneers, Inc. Also consulted was Major John Owen's Diary, 1850-1870, and other writings.

CLIMATE

Located well west of the Continental Divide, Lake County is nevertheless quite mountainous, a feature shared with all of Western Montana's counties. Although some of the valleys, particularly that of the Flathead River in some sections, are fairly broad with comparatively level bottoms, the fact that most of the county's area is either hilly or mountainous produces marked differences in climate within short horizontal distances. The area is well supplied with lakes, the largest of which is Flathead, situated in and occupying much of the northern end of the county. The lakes also produce local climate influences, but here the main effects are found along the shores of Flathead Lake, and are observed mainly during the winter season. By noting that elevations within the county vary from about 2,500 ft. above sea level where the Flathead River flows into Missoula County near Dixon, to 9,255 ft. on Swan Peak of the Swan Range—a change in elevation of nearly 7,000 ft. — the differences in climate can be better understood.

The larger drainages are the Flathead (flowing generally southward from the lake at Polson), the Swan (flowing north-northwestward and entering the lake south of Bigfork), and the Jocko (flowing westward across the south edge of the county—into Missoula County near Arlee). Located as it is, west of the Continental Divide but well within "mountain" country, Lake County climate can best be classified as modified Continental. This means that although the climate in general has continental characteristics, there are periods during which these characteristics are interrupted by invasions of Pacific Maritime air masses. These periods can last for days and may recur several times a year, although the more important Pacific weather effects occur during the winter season. It should be remembered, too, that there are large differences between valley floors and mountains — the mountains generally are much wetter than the valleys, with the greatest differences during the winter.

The area generally averages a little warmer than Montana East of the Continental Divide, due mainly to the sheltering effect of the Divide on polar cold air invasions from the North during the winter. While cold waves of this type can occur when the polar air masses develop enough vertical depth to spill westward over the Divide, such cold spells occur only about half as often as in the more typical continental climate of Eastern Montana. The coldest observed in 51 years at St. Ignatius was -36°, while along the shores of Flathead Lake, lowest of record at several points ranges from -20° to -30°. The warming effect of Flathead Lake perhaps has been exaggerated at times but it does exist, mainly on clear, still, winter nights when cool air drainage from surrounding hills moves onto the lake water surface and can there be warmed to a sufficient depth at times to reach a few hundred feet inland from the shore. That this effect may be important climatically is underlined by the fact that during recorded history, Flathead Lake has "frozen over" during the winter only about one winter out of seven. Summer temperatures average warm, but seldom become oppressive, having reached a county maximum as warm as 104° only at Polson (53 years of record). It should be noted that higher elevations run cooler most of the time than the valley bottoms where most weather observing stations are located.

The wettest month of the year is June, over the valleys, but it is thought (although actual measurements are lacking) that late fall, winter, and early spring mountain precipitation is heavier than in summer over the mountains. This substantial mountain cold season snowfall (largely from Pacific Ocean moisture sources) is stored on the slopes, and produces most

of the spring season runoff observed in all major streams almost every year. Over the main valleys about 55 to 60 per cent of the annual average precipitation falls during the April-September so-called growing season, but east and southeast of Flathead Lake along Mission and Swan Ranges, most of an average year's moisture falls during the October-March half. The latter effect shows up especially where precipitation has been measured at some higher points, such as Upper Holland Lake in northeastern Missoula County, where it takes more than 60 inches to produce an average year—most of which (perhaps as much as 80 per cent) falls during the snow season.

Over the county as a whole the sun shines about half of the possible time during an average year (estimated from Missoula); from about 80 per cent of the time in July to about 25 per cent in December. Cloudy days outnumber partly cloudy and clear, but on most cloudy days the sun breaks through for short periods. The freeze-free period averages about 140 days around Flathead Lake to less than 100 days over many of the higher valleys. Valley fog is observed occasionally during the fall season, mainly in November and December. High relative humidity rarely occurs with high temperature, and the combination of these elements, therefore, is rarely oppressive.

Really severe weather seldom occurs. Instances of timber "blow-down" have been reported from high winds but not often. Summer thunder-showers produce occasional local hail or wind gust damage but here again the phenomenon is unusual. Severe cold (-10° to -20°) can occur once a year or so, usually with some snow, but real blizzard conditions are practically unknown. The following tabulation of weather data observed in and near Lake County will illustrate some of points made in the preceding paragraphs.

Selected Temperature and precipitation data for Lake County are listed in the following tables:

TEMPERATURE

Station	Highest of Record	Lowest of Record	January Average	July Average	Annual Average
Big Fork (1939-1960)	100	-20	26.2	67.5	46.0
Polson (1907-1960)	104	-30	25.1*	67.4*	45.5*
Polson Kerr Dam (1951-1960)	104	-23	25.9	68.1	46.2
St. Ignatius (1909-1960)	103	-36	25.1*	67.6*	46.0*

*1931-1960

PRECIPITATION

Station	Yearly Average	Growing Season† Average	Per Cent Falling in Growing Season	Wettest Year	Driest Year
Big Fork (1939-1960)	22.01	11.57	53%	28.79 (1951)	16.10 (1952)
Polson (1907-1960)	15.03*	8.53*	57%	21.90 (1958)	10.17 (1931)
Polson Kerr Dam (1951-1960)	15.28	8.81	58%	19.93 (1959)	10.03 (1952)
St. Ignatius (1909-1960)	15.10*	9.31*	62%	25.15 (1916)	8.77 (1935)
Round Butte (1941-1960)	12.92	7.66	59%	17.39 (1948)	7.46 (1952)
Swan Lake (1941-1960)	28.19	11.41	40%	37.33 (1959)	17.23 (1952)

*1931-1960
†April-September

SOILS

The character of soils is determined by parent material, relief, vegetation, climate, and the length of time the soil has been developing. In Lake County the soil forming factors, except parent materials, are highly variable and there are numerous distinctly different soils. The original source of parent materials is chiefly quartzites and argillites of the Belt Formation. These rocks are pre-Cambrian in age. Most of the farming and grazing lands are developed from glacial till alluvium or lacustrine deposits derived from the Belt rocks. Some of the forested soils are also derived from these reworked deposits, but many of them are weathered in place from the hard Belt rocks. The wide variation in elevation and climate (both in temperature and precipitation) is the chief contributing factor to soil variation. Variation in soil texture and in the amount of gravel, cobble, and stone in the soil also contributes to soil differences. Of common occurrence in Lake County are soils belonging to Alluvial, Regosol, Lithosol, Brown, Chestnut Chernozem, Solonetz, Humic Gley, Gray Wooded and Brown Podsolic great soil groups with minor areas of Alpine soils at elevations above 8,000 feet. There are also large areas of barren rockland in the higher mountains.

Agricultural soils are largely confined to Alluvial, Brown, Chestnut, Chernozem and Solonetz soils. They include, however, some Regosols, Gray Wooded and Brown Podsolic soils from which timber has been cleared. Soils developed in glacial lacustrine deposits make up about half of the farming and grazing soils. A large portion of the irrigated cropland is on soils derived from these lacustrine deposits. The remainder are developed in glacial till or alluvial deposits on fans, terraces and on bottomlands in narrow stream valleys. The lacustrine deposits range from sandy loam to clay in texture with clay loam and clay textures predominating. Glacial till and alluvial materials are of clay loam to sandy loam texture but contain varying amounts of gravel, cobbles, or stones throughout the soil.

Problems associated with irrigated soils include impeded drainage and salinity on the more clayey materials with the additional problems of slow water intake rate on the Solonetz soils. Some irrigated soils developed in alluvium are of coarse texture or overlie loose gravel and sand at shallow depths. Such soils can store only limited soil moisture for use by plants.

The published soil survey of the Lower Flathead Valley shows the location and relative extent of the more important soils in the irrigated and dry farmed lands in Lake County. More detailed soil surveys are being made on individual farms and ranches as they are needed for conservation planning.

CROPS AND LIVESTOCK

Lake County consists of approximately 960,000 acres of land, of which 162,397 acres are Federal lands and 18,503 acres are taken up by towns, roads, water and etc. There is a great deal of variation in the climate as well as the soil types located within the county. Flathead Lake, which lies predominately in Lake County, helps to regulate the weather in the area around the lake, making possible the raising of many fruit crops. The Mission Mountain Range split the county from north to south, thereby helping to hold some of the moisture in the productive Flathead Valley.

Due to the mild climate within the valley, a variety of all types of crops are produced abundantly. There are no main crops because of the tremendous variety raised. In 1959, there were 103,430 acres of cropland harvested. Included in the cropland harvested were 49,860* acres of irrigated land and 53,570 acres of non-irrigated land. Crops taken from the irrigated land totaled $3,219,900 with an average value per acre of $64.48. The non-irrigated land crops had a valuation of $1,828,700, for an average of $34.14 per acre. (See table for major crops raised and their valuation).

The U. S. Indian Irrigation Service has a project located in Lake County covering nearly all the Lower Flathead Valley. This project has a storage capacity of about 148,725 acre-feet of water in its system of fifteen reservoirs. There are about 1,300 miles of canals and laterals on the project.

According to the 1960 Agricultural Statistics there has been a steady increase in the number of cattle, calves and hogs over the past few years. Dairy animals, horses and sheep have steadily but slowly declined. In 1959, the total receipts of livestock and livestock products sold, totaled $6,094,900. A table included at the end of this section gives valuation and number of livestock in the county.

Lake County is broken into several definite communities. These include the East Shore, Valley View, Round Butte, Charlo, Mission, Moiese, Arlee, Irvine Flats, Ronan and Polson. These communities are based primarily on the type of agriculture, which in itself, is based on the soil types.

The people living on the East Shore of Flathead Lake are basically horticulturists, cherries being the main crop raised there. Most of these cherries are sold through the Flathead Cherry Growers' Association.

Farmers located in the Valley View and Irvine Flats area are basically dryland and livestock men. Most of these farms and ranches are larger than the county average.

Dairying is the most important enterprise of farmers living in the Round Butte, Charlo and Mission areas. These farms are located within the Irrigation Project and are quite diversified. Many other areas are too diversified to list a major crop.

Lake County has one of the most active weed control districts in the State. The entire county is within the district boundaries and generally the farmers' attitude toward the district is excellent.

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*Figure does not correspond with the irrigated acreage compiled by Water Resource Survey.

Weed control is a major problem in Lake County with serious infestations of Spotted Knapweed, St. Johnswort, White Top, Canada Thistle, Field Bindweed, Dalmation and Yellow Toadflax, Leafy Spurge and several other weeds. Due to the large amount of hay and feed grains which are transported from out of state and counties within the state, it is very hard to do an effective job of eradication. One of the major expenses of many farms is weed control.

The Lake County Soil and Water Conservation District includes nearly all of Lake County. The District owns some machinery and does a considerable amount of work each season.

Listed below is a table showing the crops, their acreages, yields and value, with a total of livestock and livestock products sold during the year 1959.

CROPS PRODUCTION, 1959, HARVESTED ACRES

CROPS	Irrigated Acres	Irrigated Yield Per Acre	Non-Irrigated Acres	Non-Irrigated Yield Per Acre	TOTALS Acres	TOTALS Yield Per Acre	Value
Rye	.....	.....	100	19.0	100	1,900 bu	$ 1,200
Winter Wheat	700	38.0	15,000	27.0	15,700	431,600 bu	703,500
Spring Wheat	2,200	27.0	5,300	21.0	7,500	170,700 bu	273,100
Corn	200	40.0	.....	.....	200	800 bu	10,400
Oats	4,400	52.0	2,900	30.0	7,300	315,800 bu	202,100
Barley	4,200	31.0	8,800	29.0	13,000	385,400 bu	323,700
Potatoes (Certified Seed)	790	180 cwt	70	50 cwt	860	145,700 cwt	502,700
Alfalfa Hay (@ $18 per ton)	24,200	2.10 ton	16,100	1.50 ton	40,300	75,000 ton	1,450,000
Wild Hay (@ $12 per ton)	1,600	1.3 ton	1,800	1.00 ton	3,400	3,900 ton	46,000
Alfalfa Seed	.....	.....	200	70 lbs	200	1,400 lbs	4,000
Red Clover Seed	100	200 lbs	.....	.....	100	20,000 lbs	5,800
Crested Wheatgrass Seed	.....	.....	100	100	100	10,000 lbs	2,400
Sugar Beets	470	13.0	.....	.....	470	6,100 ton	76,900

LIVESTOCK, 1960 CENSUS OF AGRICULTURE

Horses and Mules	2,800 head	$ 280,000
Sheep and Lambs	16,000	401,200
Hogs and Pigs	8,800	273,680
Chickens	60,100	75,125
Dairy Animals	8,500	1,963,500
Cattle and Calves	53,900	9,270,800

Total Cash Receipts, 1959

Crops	Livestock & Livestock Products	Total Marketing Receipts	Government Payments	Total
$2,396,500	$6,094,900	$8,491,400	$117,700	$8,609,100

SNOW SURVEYS

Snow surveys are made annually in Lake County for the purpose of predicting the probable streamflow from the winter snowpack which will be available for use during spring and summer months. This information is useful to farmers and ranchers who irrigate, reservoir operators, power companies and other water management agencies. With water forecast information, farmers and ranchers can plan crops for the year, amounts of water for each crop, number of irrigations, etc. Other water users can plan economic operation of reservoirs and flood control structures.

Snow surveys consist of measuring the snow water equivalent, depth and density[1] of the snowpack. Thirty five snow survey courses are measured to serve the Flathead River drainage contiguous to Lake County. The seven high elevation stations used to prepare seasonal forecasts of water used on agricultural land are:

SNOW COURSE

Name	Number	Elevation	Year Established	Dates Measured[1]
Mission Valley drainage				
North Fork Jocko	13-B-7	6330	1941	3, 4, 5, 6
Big Creek	13-B-3	6750	1941	3, 4, 5, 6
TV Mountain	14-B-1	6800	1956	1, 2, 3, 4, 5
Little Bitterroot River drainage				
Brush Creek	14-A-4	5000	1937	3, 4, 5
Logan Creek	14-A-5	4300	1937	3, 4, 5
Griffin Creek	14-A-9	5150	1960	3, 4, 5
Bassoo Peak	14-B-3	5150	1961	3, 4, 5

Current season information predicting probable streamflow from the winter snow pack is available at the Soil Conservation Service, Bozeman, Montana.

[1] Numerals 1, 2, 3, 4, 5, 6 refer to January 1, February 1, March 1, April 1, May 1 and June 1 measurements.

STREAM GAGING STATION

The U. S. Geological Survey measures the flow of streams, co-operating 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 streamflow records are being 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 cover the stream gaging records which are available for Lake County from the beginning of measurements through the water year 1961. The water year begins October 1 and ends September 30 of the following year. The irrigated acreage figure for diversions above the gage on Swan River near Bigfork are taken from the results of the Water Resources Survey. Acreage figure for irrigation above other gaging stations were estimated by the U. S. Geological Survey at the date of operation.

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.

Swan River near Bigfork*

The water-stage recorder is at outlet of Swan Lake, 1,000 feet downstream from Johnson Creek, and 5 miles southeast of Bigfork. The drainage area is 671 square miles. Records are available from May 1922 to date (1963) and gage heights only from October 1910 to May 1911. The maximum discharge computed was 8,400 cfs (May 24, 1948) and the minimum observed, 193 cfs (January 26-29, 1930). The average discharge for 39 years (1922-61) was 1,127 cfs or 815,900 acre-feet per year. The highest annual runoff was 1,350,000 acre-feet (1928) and the lowest 439,300 acre-feet (1941). There are diversions for irrigation of about 360 acres above the station.

Hell Roaring Creek (Big Creek) near Polson†

The water-stage recorder was just downstream from the power plant, three-quarters of a mile upstream from mouth, and 7 miles east of Polson. The drainage area is 6.41 square miles. Records are available from June 1917 through September 1932, and crest-stage records

*This gaging station is now in operation (1963).

†Name officially changed from Big Creek in 1932.

from 1960 to date. The maximum discharge observed was 104 cfs (June 9, 1917) and the minimum, no flow at times during November and December, 1932 when power plant was shut down. The average discharge for 15 years, (1917-32) was 6.64 cfs or 4,807 acre-feet per year. The highest annual runoff was 7,420 acre-feet (1928) and the lowest 3,180 acre-feet (1920). Records include water diverted by the Flathead irigation project canal for irrigation of lands downstream and the Polson municipal water-supply pipeline. The flow is regulated by the power plant and two reservoirs with a combined capacity of about 200 acre-feet.

Flathead River near Polson*

The water-stage recorder is half a mile downstream from Kerr Dam, 4 miles west of Polson, and 5 miles downstream from Flathead Lake. The drainage area is 7,096 square miles. Records are available from July 1907 to date (1963). The maximum discharge was 82,800 cfs (May 29, 1928), the minimum, probably less than 5 cfs (April 13, 1938) and the minimum daily, 32 cfs (April 12, 1938). Flood of June 1894 was about 110,000 cfs, from lake elevation-discharge study. The average discharge for 54 years (1907-1961) was 11,610 cfs or 8,405,000 acre-feet per year, adjusted since October 1, 1952 for change in contents in Hungry Horse Reservoir and Flathead Lake. The highest annual runoff was 12,500,000 acre-feet (1927) and the lowest 3,762,000 acre-feet (1941) not adjusted for Flathead Lake regulation. There are diversions above the station for irrigation of about 10,000 acres. Flathead Projects pumps can divert up to 12,000 acre-feet per month when required for irrigation of lands downstream from station. Flow has been regulated by Flathead Lake (Kerr Dam) since April 1938 and Hungry Horse Reservoir since September 1951.

Crow Creek near Ronan

The staff gage was 500 feet upstream from bridge on former St. Ignatius-Ronan highway, a quarter of a mile upstream from bridge on present route, and 3 miles south of Ronan. The drainage area is 46.1 square miles. Records are available from September 1906 through September 1917 except for winter months. The maximum discharge observed was 1,400 cfs (June 6, 1908) and the minimum observed, 2.0 cfs (April 4-9, 1913). There were diversions above gage for lands below the station during 1913-17.

Mud Creek near Ronan

The staff gage was at Jeffrey's Ranch, 3 miles northwest of Ronan. The drainage area is 30.4 square miles. Records are available for open-water periods from August 1908 through December 1910. The maximum discharge observed was 40 cfs (discharge measurement June 27, 1908) and the minimum observed, 1.6 cfs (April 7-8, 1909). There were diversions for irrgation above the station.

Crow Creek at Lozeau's Ranch near Ronan

The chain gage was at private bridge about 1 mile downstream from Mud Creek, 2½ miles upstream from mouth, and 8 miles southwest of Ronan. The drainage area is 139 square

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*This gaging station is now in operation (1963).

miles. Records are available from April 1911 through September 1916 with those for many winter months missing. The maximum discharge observed was 960 cfs (June 29, 1911) and the minimum observed, 4 cfs (March 21, 1913). There were diversions above the station for irrigation on lands below.

Dry Creek near St. Ignatius

The staff gage was at Felsman Ranch, 4 miles downstream from St. Marys Lake (now called Tabor Reservoir), and 5 miles southeast of St. Ignatius. The drainage area is 19.5 square miles. Records are available from May 1908 through September 1916 with those for many winter months missing except for 1910-14 when there was no winter flow. The maximum discharge observed was 220 cfs (June 19, 1916) and the minimum, no flow during most winters. There was one small diversion above the station. Flow is regulated by Tabor Reservoir (St. Marys Lake).

Mission Creek near St. Ignatius

The staff gage was about 1 mile northwest of St. Ignatius. The drainage area is 74.8 square miles. Records are available from October 1906 through September 1917 except for a few missing months during winters of 1911-12 and 1914-15. The maximum discharge was 1,700 cfs (June 10, 1908 from floodmark and rating curve extended above 340 cfs), and the minimum observed, 5 cfs (March 2, 3, 1911). The average discharge for 9 years (1906-11, 1912-14, 1915-17) was 71.7 cfs or 51,910 acre-feet per year. The highest annual runoff was 76,500 acre-feet (1908) and the lowest, 30,900 acre-feet (1910). There are several diversions above the station for irrigation.

Post Creek at Fitzpatrick's Ranch near Ronan

The staff gage was at bridge near house of J. A. Fitzpatrick, 2 miles upstream from Marsh Creek, (formerly North Fork Post Creek), 7 miles southeast of Ronan, and 9 miles north of St. Ignatius. The drainage area is 28.4 square miles. Records are available from October 1906 through May 1911. The maximum discharge was 2,800 cfs (about June 10, 1908 from floodmark and rating curve extended above 210 cfs) and the minimum, not determined. The highest annual runoff (1907-10) was 107,000 acre-feet (1908) and the lowest 50,200 acre-feet (1910). There were two small diversions for irrigation above the station.

Post Creek at Deschamps' Ranch near Ronan

The staff gage was 600 feet upstream from Marsh Creek (formerly North Fork Post Creek), 7½ miles southeast of Ronan, and 6½ miles northeast of St. Ignatius. The drainage area is 29.7 square miles. Records are available from April through November 1911. The maximum discharge observed was 546 cfs (June 25) and the minimum observed, 16 cfs (April 20). There were a few small diversions for irrigation above the station.

Post Creek near St. Ignatius

The chain gage was on highway bridge on road between St. Ignatius and Ronan 2 miles downstream from Marsh Creek (formerly North Fork Post Creek) and 5 miles north of St. Ignatius. The drainage area is 47.6 square miles. Records are available from October 1911

through September 1917 with some winter months missing. The maximum discharge observed was 680 cfs (June 29, 1916) and the minimum observed, 20 cfs (September 3, 1914). There were diversions above the station for the irrigation of several hundred acres.

Middle Fork Jocko River near Jocko

The staff gage was 300 feet upstream from South Fork, 10 miles northeast of Jocko and 11½ miles east of Arlee. The drainage area is 14.9 square miles. Records are available from May 1912 through September 1916 with winter months missing. The maximum discharge observed was 134 cfs (June 1, 1912) and the minimum, not determined. There were no diversions or regulation above the station.

South Fork Jocko River near Jocko

The staff gage was 300 feet downstream from Middle Fork, 10 miles northeast of Jocko, and 11½ miles east of Arlee. The drainage area is 72.3 square miles. Records are available from June 1912 through September 1916 except for winter months. The maximum discharge observed was 782 cfs (May 31, 1913) and minimum observed, 28 cfs (December 7, 1912). There was no diversions or regulation above the station.

North Fork Jocko River near Jocko

The staff gage was three-quarters of a mile upstream from Falls Creek, 11 miles northeast of Jocko, and 11½ miles northeast of Arlee. The drainage area is 19.5 square miles. Records are available from May 1912 through September 1916, with winter months missing. The maximum discharge observed was 492 cfs (May 31, 1913) and the minimum, not determined. There was no diversions or regulation above the station.

Falls Creek near Jocko

The staff gage was a quarter of a mile upstream from mouth, 10 miles northeast of Jocko, and 11 miles northeast of Arlee. The drainage area is 3.57 square miles. Records are available from May 1912 through September 1916 except for winter months. The maximum discharge observed was 110 cfs (June 17, 1916), and the minimum was not determined. There were no diversions or regulation during period of record.

Jocko River near Jocko

The staff gage was 500 feet upstream from headworks of Jocko "K" Canal, 800 feet upstream from Big Knife Creek, 2 miles northeast of Jocko, and 4½ miles east of Arlee. The drainage area is 140 square miles. Records are available from May 1918 through September 1919. The maximum discharge observed was 2,720 cfs (June 11, 1918) and the minimum observed, 48 cfs (March 7, 1919). The flood of May-June, 1948 reached a discharge of 2,660 cfs, from slope-area measurement. There was no diversion above the station.

Big Knife Creek above Big Knife Canal near Jocko

The staff gage was 200 feet upstream from Big Knife Canal headgate, 1 mile upstream from mouth, 2½ miles northeast of Jocko, and 5½ miles east of Arlee. The drainage area is 7.16 square miles. Records are available from August 1910 through September 1916 except

for the winter periods. The maximum discharge observed was 78 cfs (June 30, 1916) and the minimum observed, 4.3 cfs (April 17, 1911). There were no diversions or regulation above the station.

Big Knife Creek near Jocko

The staff gage was 25 feet upstream from county bridge, about a quarter of a mile upstream from mouth, and 2 miles northeast of Jocko. The drainage area is 7.44 square miles. Records are available from May 1909 through November 1910 except for December through February. A fragmentary gage-height record is available for August to November 1908. The maximum discharge was 52 cfs (June 19, 1909) and the minimum observed, 0.9 cfs (September 28, October 24, 29, and 31, 1910). Water was diverted above the station for irrigation by Big Knife Canal since August 1, 1910.

Jocko River below Big Knife Creek near Jocko

The staff gage was on the bridge pier 1 mile north of Jocko, about 2 miles downstream from Big Knife Creek, and 3 miles east of Arlee. The drainage area is 154 square miles. Records are available from May 1909 through September 1916 with many winter months missing. A fragmentary gage-height record is available for August to November 1908. The maximum discharge observed was 1,630 cfs (June 20, 1916) and the minimum observed, 21 cfs (August 1, 1910). The flood of June 6, 1908 had a discharge of 6,200 cfs (by float measurement). There were several diversions for irrigation above the station. This station was referred to as Jocko River near Jocko in the early reports.

Agency Creek near Jocko

The staff gage was just above the intake of Matt ditch, 1½ miles southeast of Jocko, and 5 miles southeast of Arlee. The drainage area is 4.00 square miles. Records are available for most of the open-water months from May 1909 through September 1916. Occasional gage heights are available for August to November 1908. The maximum discharge observed was 228 cfs (June 20, 1916, from rating curve extended above 110 cfs) and the minimum observed, 2.0 cfs (December 12, 1913). There were no diversions or regulation above the station. It is in Missoula County about a mile north of the county boundary line, but data were omitted from the report for that county.

Blodgett Creek Near Jocko

The staff gage was a third of a mile upstream from mouth, 1½ miles northeast of Jocko, and 4 miles east of Arlee. The drainage area is 5.48 square miles. Records are available from June through November 1909. Gage heights only have been reported from March to November 1910. The maximum discharge observed was 3.5 cfs (June 11) and the minimum observed 0.4 cfs at times in November.

East Finley Creek near Jocko

The staff gage was 100 feet upstream from intake of Indian ditch, 200 feet downstream from crossing of Jocko "N" Canal, 3 miles southwest of Jocko, and 5 miles southeast of Arlee. The drainage area is 8.35 square miles. Records are available from May 1909 through Septem-

ber 1916 with those for most winter months missing. The maximum discharge observed was 165 cfs (June 20, 1916 from rating curve extended above 65 cfs) and the minimum observed, no flow at times during irrigation season. The Jocko "N" Canal diverts the entire flow at times for irrigation. This station is in Missoula County, but data for it were omitted from the report for that county.

Finley Creek near Jocko

The staff gage was an eighth of a mile downstream from confluence of East and West Forks, 4 miles southwest of Jocko, and 5 miles southeast of Arlee. The drainage area is 36.7 square miles. Records are available from May 1909 through September 1916 with those for most winter months missing. Occasional gage heights and discharge measurements are available for August to November 1908. The maximum discharge observed was 518 cfs (June 20, 1916 from rating curve extended above 170 cfs) and the minimum, not determined. Jocko "N" Canal, Indian Ditch and several smaller irrigation ditches divert water above the station. This station is in Missoula County, but data for it were omitted from the report for that county.

Valley Creek near Ravalli

The staff gage was 25 feet upstream from highway bridge near mouth, 2 miles south of Ravalli and 7 miles northwest of Arlee. The drainage area is 64.1 square miles. Records are available for open water months from May 1909 through June 1910, and some gage heights and discharge measurements in 1908 and 1911. The maximum discharge observed was 302 cfs (June 3, 1909) and the minimum, not determined. There were a few small diversions for irrigation above the station.

Jocko River at Ravalli

The chain gage was near the railroad station at Ravalli. The drainage area is 348 square miles. Records are available from October 1903 through March 1911. The maximum discharge was 7,500 cfs (June 10, 1908 from rating curve extended above 1,900 cfs) and the minimum, not determined. The highest annual runoff for the three years of complete record was 310,000 acre-feet (1908) and the lowest 201,000 acre-feet (1910). There were several diversions for irrigation above the station.

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 two dozen crest-stage partial-record stations in the Clark Fork Basin in Montana. Operation of most of these began in 1959. Crest-stage stations are now being operated in Lake County on Teepee Creek near Polson, Hell Roaring (Big) Creek near Polson and on Dayton Creek near Proctor.

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

Flathead Lake at Somers

The water stage recorder is at the steamboat dock at Somers. The drainage area is 7,086 square miles. Records are available from January 1910 to date. They were published as "at Polson" prior to April 1923. Staff gage readings were reported prior to 1924. Some supplemental readings were obtained in 1900, 1908 and 1909. The Polson readings were obtained at the south end of the lake at Polson in Lake County, while Somers is in Flathead County. The maximum contents was 2,208,000 acre-feet (June 19, 1933) and the minimum 347,000 acre-feet (December 5, 1936). The lake was nearly 4 feet higher during the flood of June, 1894. Natural storage was increased by construction of Kerr Dam 4 miles downstream from natural lake outlet. Storage began April 11, 1938. The usable capacity is 1,791,000 acre-feet. Water is used for power, flood control and irrigation.

Mission Valley Reservoirs

A group of eight reservoirs in an area tributary to Flathead River from the east extending from Flathead Lake to Jocko River has been operated for irrigation and recreation. Records for December 1939 and from September 1940 to date have been furnished by the U. S. Bureau of Indian Affairs. They are:

Twin Reservoir

4 miles southeast of Polson, fed by canals, has a usable capacity of 899 acre-feet.

Pablo Reservoir

3 miles south of Polson, fed by canals, some water supplies by Flathead pumping plant, has a usable capacity of 27,100 acre-feet.

Lower Crow Reservoir

On Crow Creek 6 miles west of Ronan, has a usable capacity of 10,350 acre-feet.

Mission Reservoir

On Mission Creek 4 miles east of St. Ignatius, has a usable capacity of 7,250 acre-feet.

Tabor Reservoir

On Dry Creek 8 miles southeast of St. Ignatius, fed by water diverted from Jocko River, has a usable capacity of 23,300 acre-feet.

McDonald Reservoir

On Post Creek 9 miles east of Charlo has a usable capacity of 8,220 acre-feet.

Kicking Horse Reservoir

5 miles south of Ronan, fed by canals, has a usable capacity of 8,350 acre-feet.

Ninepipe Reservoir

2 miles northeast of Charlo, fed by canals, has a usable capacity of 14,870 acre-feet.

Lower Jocko Lake

The staff gage is at dam on Middle Fork of Jocko River 15 miles east of Arlee. The drainage area is 7.39 square miles. Data for most of the month-end reservoir contents since 1940 have been furnished by the U. S. Bureau of Indian Affairs. Transmountain diversion takes water from Placid Creek in the Clearwater basin to Upper Jocko Lake, thence to Lower Jocko Lake. The usable capacity is 6,380 acre-feet. The station is in Missoula County about 3 miles east of the Lake County boundary, but the data were omitted from the report for Missoula County.

MINING

The geomorphic form of Lake County originated in early Tertiary time (70,000,000 years ago) when the land area of western Montana was involved in massive uplift and deformation. After a period of relative quiescence and erosion, lasting perhaps 10 to 20 million years, deformation in the form of block faulting took place forming large northwestward-trending intermontane valleys and mountain ranges similar to the present Flathead Valley and its nearby mountains.

This valley of the Flathead is part of what is known in geologic literature as the Rocky Mountain trench and is described as a "narrow wonderfully straight depression". It continues north from Lake County 800 miles to the Laird River in British Columbia, and is an orogenic depression of great magnitude.

In Pleistocene time (1,000,000 years ago) vast sheets of ice and their lobes (valley glaciers) advanced and retreated in successive stages during periods of climatic change. One such lobe or glacier from the Cordilleran ice sheet advanced southward through the Flathead Valley, leaving glacial debris strewn along its path upon melting; another such lobe advanced similarly along the Burcell trench near the Montana-Idaho border. Its consequence was of extreme importance as it blocked the westward drainage of the Clark Fork River whose waters then inundated the land, creating a glacial lake known as Lake Missoula. This vast glacial lake covered an area of 2,900 square miles, including much of Lake County, and contained an estimated 500 cubic miles of water. Evidence of its former existence can still be seen today by the faint shorelines preserved on grassy slopes and by local deposits of glacial lake sediments.

Glacial lake deposits and glacial drift occupy most of the valley floors in Lake County whereas the predominant rock types in the mountains are quartzites, argillites, limestones, and dolomites of the Precambrian Belt Series. Noteworthy is the absence of exposures of igneous rocks within the county as contrasted with most other counties in western Montana. As it is firmly and widely established in geologic literature that metallic mineralization is genetically associated with igneous rocks, the lack of such rock exposures accounts for the paucity of metallic lode deposits in the area. As a result, metal mining has been of little importance in Lake County.

Only two mining properties, the Chief Cliff and Silverstone lead-silver mines, are known to have been worked—neither one has been a significant producer of ore nor active in recent years.

The real mineral wealth of Lake County, however, may eventually come from the exploitation of the nonmetallic or industrial mineral type of natural resource, such as clay, sand, and gravel. Deposits of glacial clay occur extensively throughout the countryside, though as yet no deposits are known to contain clay of quality useful for ceramic purposes. The best known clays are suitable for blending with other higher-quality clays or for use as low-firing bonding material; many of the other clays are much too silty and low in plasticity to be used even as bonding material.

Lake County undoubtedly contains enough sand and gravel deposits to be self-sufficient in its needs. The best sources may be from the gravel terraces along the Flathead valley from Ravalli northward to Polson.

SOIL CONSERVATION DISTRICTS

Lake County is served by three soil conservation districts, but the major portion is served by the Lake County Soil Conservation District, which was organized in 1945.

Areas that are not included within the district are about 6 sections of land in T. 26N, R. 18W; and T. 26N, R. 19W; which were included in Flathead Soil Conservation District and 68 sections of land in T. 22N, R. 23W; and T. 23N, R. 23W; which were included in the Eastern Sanders County Soil Conservation District. Lake County has an area of 960,000 acres of which 920,000 acres are within the Lake County Soil Conservation District.

Each district is governed by a board of five supervisors who are elected by the land occupiers of the respective district. They carry out a program in erosion control, water conservation, soil fertility management, land improvement and land adjustment to proper land use.

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 Lake 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 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 are interpreted in terms of accepted alternative land uses and treatments to help guide the farm and ranch operators in developing sound conservation plans. It also aids district co-operators in performing operations requiring technical skills beyond the experience of the individuals involved.

The Office of the State Forester and U. S. Forest Service co-operate with the district by co-ordinating the programs in timber management, tree planting, forest and range fire control and watershed management on federal, state and private lands.

The Extension Service assists the district with its education and information program. An important function of each district is to inform landowners 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, with the need for conservation.

Technical phases of the district's program include detailed soil surveys, forest site and utilization investigations, 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 and needed conservation treatment of each field can be determined. The technician interprets the surveys and provides the district co-operator 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 co-operator determines what will be done on his place and when it will be carried out.

When the plan is completed the co-operator 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 co-operating farmer or rancher.

There are 162,397 acres of federal lands in Lake County. Approximately one third of the total area is held in trust for the Indians of the Flathead Indian Reservation. Of the total area approximately 128,500 acres are cropland. It is estimated that about 111,208 acres are irrigated and 50,000 acres are dryland. Approximately 225,100 acres are devoted to pasture and range use of which 186,000 is native range, 28,500 acres seeded dryland pasture and 10,000 rougher irrigated lands permanently seeded to pasture. There are 564,397 acres of wooded land of which 162,397 are federally owned, 56,000 small private ownerships, 90,000 large corporate ownerships and 255,000 controlled by the Bureau of Indian Affairs. There are approximately 42,003 acres of land considered other land such as townsites, roads and highways, railroads and like lands.

The major enterprise on agricultural lands is livestock production. Beef cattle, dairy cattle, sheep and swine are produced. Cash crops produced are potatoes, sugar beets, grains and sweet cherries.

Work done since the organization of the district on irrigated lands consists largely of improvement of irrigation systems within the farm boundaries, installation of sprinkler systems, land leveling, construction of permanent ditches, installation of water control structures, farm drainage systems, improved cropping and pasture management systems, soil management and improvement of wildlife habitat. On dryland pasture and range the work done has been improvement of vegetative cover through seeding, deferred-rotation grazing, fencing, livestock water development and improvement of wildlife habitat. On private woodlands the emphasis has been toward stand improvement for long term timber production plus production of higher quality Christmas trees. Pruning, thinning and weeding have been emphasized along with improved harvest methods.

Since the district was organized assistance has been given on proper cropping systems on over 32,000 acres, improved water application 25,000 acres, land leveling and grading 2,500 acres, 130 sprinkler systems installed, drainage installed on 4,000 acres requiring nearly 110 miles of ditch, over 500 structures installed, 100 miles of irrigation ditch construction, range improvement on 27,000 acres, pasture improvement on 37,000 acres, seeding of hay and pasture on 20,000 acres, 70 stock ponds constructed, 40 springs developed, 55 wells developed, 1,500 acres of land cleared, 7 ponds stocked with fish, 1,600 acres improved wildlife habitat, 100 acres of trees planted, improved methods of harvest cutting on 4,700 acres of woodland, 900 acres woodland trimming and pruning, 1,900 acres woodland thinning and other approved conservation measures.

An inventory of soil and water conservation needs in Lake County has recently been completed. This inventory is a part of a National Inventory and estimates remaining conservation needs by land uses. The inventory is based upon statistically expanded data obtained from randomly selected 160 acre samples on which detailed soil surveys were completed. The inventory estimates that approximately 64% of the non-irrigated cropland and approximately 80% of the irrigated cropland needs additional treatment and is feasible to treat; that approximately 67% of native range, 70% of tame pasture and 78% of irrigated native grassland is in need of additional conservation treatment. It estimates that approximately 80,000 acres of private woodland needs planting, 135,000 acres need improvement of the existing stand and most of the privately owned woodland needs protection from fire, insects, disease and from animals. The needed treatment consists primarily of a combination of practices to adequately control erosion and conserve moisture.

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

The most of the irrigation water used is delivered to the farm by the United States Indian Irrigation Service. Some is from private water rights.

The Lake County Soil Conservation District owns equipment consisting of D-7 Cat, TD-14 tractor, dragline, land plane, ripper, scraper and truck-transport which is available to district co-operators on a rental basis to carry out needed conservation measures.

Co-operative efforts of landowners and operators, other groups and agencies have contributed to the overall success of the district.

FISH AND GAME

Lake County is richly gifted with a wide variety of wildlife. The Mission area is one of the last great strongholds of the grizzly bear. Other big game animals in the county include white-tailed and mule deer, elk, moose, mountain goat, mountain sheep and black bear.

The National Bison Range is located near Moiese where remnants of the once great herd can be studied and photographed.

For years, big horn sheep have been live-trapped on Wild Horse Island at Flathead Lake and have been transplanted to many areas of the state by the Montana Fish and Game Department.

The cultivated lands in the lower Flathead Valley have produced bird hunting that compares with the best in the nation. The ring-necked pheasant has found the cover and cultivated fields to be ideal.

Waterfowl hunting is excellent in the pot-holes that dot the lower Flathead Valley.

Kicking Horse Reserve, Ninepipe and Pablo all produce ducks and geese. The bays and sheltered areas of Flathead Lake provide excellent hunting for mallards, pintails and scaup as well as the Canada goose. The Flathead River also provides excellent goose hunting.

Mountain grouse are found throughout the forested areas of the county. Blue, Franklin's and Ruffed grouse all inhabit the area. Hungarian and Chukar partridge provide added sport to the shot gunner.

Furbearing animals that once coaxed mountain men in this area are still present. They include: marten, coyote, beaver, muskrat, mink and otter.

There are probably few places in the nation where a mixed bag of upland game birds, waterfowl and mountain grouse can be taken within a few miles distance that can compare with Lake County.

Fishermen needn't look far to enjoy their favorite sport. Flathead Lake produces Kokanee salmon, Mackinaw and Dolly Varden trout in record size. Large Cutthroat trout also add to the bag. Perch and large-mouth bass are warm-water species that are enjoyed by the sportsmen on Ninepipe and Kicking Horse Reservoir.

Kokanee salmon spawn on the rocky edges of Flathead and Swan Lake and are taken by snagging during a special season. Lake Mary Ronan, Swan Lake and the Flathead are all famous fishing spots for bass, trout and Kokanee. The Swan and Flathead rivers produce a variety of fishing to test the angler. Pablo Reservoir is managed for rainbow trout.

Winter fishing is becoming more popular every year and Pablo and Ninepipe produce bumper crops of yellow perch for the warmly-clothed fisherman.

With its wealth of wildlife and scenic beauty, Lake County attracts visitors from every state and many nations. It provides unparalleled outdoor recreation for people who like to boat, fish, hunt or just look.

NATIONAL FORESTS

Most of the 148,614 acres of National Forest land in Lake County are on the Flathead National Forest. A small acreage of Lolo National Forest land is in Lake County just north of Frenchtown. The majority of National Forest lands in this county are in the Swan Valley and about 17,000 acres are along the east shore of Flathead Lake. These National Forest lands in Lake County are managed under a multiple use concept by Forest Rangers and their staffs at the Condon, Bigfork, Swan Lake, and Ninemile Ranger Stations.

A large area of wild lands, in what is now Lake County, was set aside by President Cleveland as a Forest Reserve in 1897. Eleven years later, in 1908, President Theodore Roosevelt designated part of this Forest Reserve as National Forest.

Topography on National Forest land in Lake County ranges from flat, level land in the Swan Valley bottom to rugged, mountainous terrain in the Swan and Mission Mountain ranges. Elevations vary from 3,100 feet to 9,300 feet. Wide valleys are flanked by parallel steep, rocky ridges. The Swan Valley is four to five miles in width; thirty miles of this valley is in Lake County. Drainages to the Swan River flow westward from the Swan Divide and eastward from the Mission Divide. These drainages are five to eight miles in length; the upper three to five miles are steep and rugged.

While water is undoubtedly the most valuable resource on these public lands in Lake County, it is difficult to assign a dollar value and measure this important resource. Water stored in the heavy snows on National Forest land is released into the Columbia River system in warmer months and makes significant contributions to irrigation, power production, domestic needs, and industrial demands in the local area as well as throughout the Columbia River Valley.

Along the east shore of Flathead Lake residents depend on water originating on National Forest lands in the west slopes of the Mission Mountains. Because of dependence on this source of domestic water, the Mission Mountain water shed must be managed as would any municipal water supply water shed.

The National Forest lands in Lake County have stable soils. Watershed conditions are considered good. Recognizing the importance of favorable soil-water conditions as the foundation for all other uses and resource management, the Forest Service gives first consideration to soil and water in all planning. Timber is cut and roads are built only when adequate provision is made to prevent harmful erosion and stream pollution. Fire prevention and suppression, balancing the number of livestock against available forage, maintaining wildlife numbers within the support capacity of these public lands and insect and disease control all contribute to watershed protection of these National Forest lands.

Water is but one of the basic resources managed by the Forest Service under the multiple use concept. Wildlife, wood, recreation, forage, as well as water, contribute to the economy of Lake County. In addition to their impact on the local economy, Lake County receives 25 percent of Forest Service revenue from National Forest lands within the county. These funds are made available to the county for local schools and roads.

Grazing on National Forest land in this county is transitory. In the past year temporary grazing permits allowed 206 cattle and 36 horses to be grazed on these public lands.

National Forest lands are playing a big part in the growing outdoor recreation activity in Lake County. There is heavy and increasing recreational use of the East Shore of Flathead Lake. The recently completed Swan Valley highway is contributing to a recreational boom throughout the Valley. Indications are that increased recreational use of this area will continue for many years.

An estimated 40,000 recreational visits were made to National Forest lands in Lake County in 1962. Camping and picnic facilities are available at several popular sites. Forest Service plans include more and improved recreational facilities in Lake County.

A part of the Mission Mountain Primitive Area is within the county. The Bob Marshall Wilderness Area is adjacent to the county on the east. These two popular recreational areas bring many tourists and vacationers to Lake County. These two areas and other National Forest lands offer beautiful mountain lakes, quiet mountain trails, and excellent hunting and fishing.

National Forest fish and game resources are important to the local economy and recreation. Big game animals in the area include white-tailed deer, mule deer, moose, elk, mountain goat, black bear and grizzly bear. Fishing and hunting attracted an estimated 20,000 visits to the National Forest lands in Lake County in 1962. Indications are that this number will increase each year.

There is extensive timber on the Swan Lake Ranger District and the Condon Ranger District in the county. Since World War II there has been considerable commercial logging and road construction into these timber stands. Prior to 1945 there was significant timber harvesting in the Swan Lake area. On January 3, 1913, fifty-two million board feet of National Forest timber in the Swan Lake area was sold to the Somers Lumber Company. This timber was harvested over a 3-year period, 1914-1917.

The first harvest of Flathead National Forest timber using anything other than horsepower was in 1918-19. A ledgerwood skidder was used in skidding thirty-four million board feet of timber to the railroad. These logs, harvested from 5,719 acres in the Swan Lake area, were transported by railroad to the banking ground on the lake.

During this period of logging on National Forest lands in Lake County, a wagon road was completed through the Swan Valley. This road was completed before Lake County was created in 1923.

Today National Forest lands in Lake County have a sustained yield annual allowable timber cut of approximately twenty million board feet. This stabilized sustained timber production capacity is important to the local economy.

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

Big Horn, Broadwater, Carbon, Carter, Cascade, Custer, Deer Lodge, Fallon, Gallatin, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis & Clark, Madison, Meagher, Missoula, Musselshell, Park, 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**	**98,430.50**	**22,286.50**	**120,717.00**
Jefferson River	61,291.00	9,713.00	71,004.00
Beaverhead River	40,771.00	6,076.00	48,847.00
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	1,724.00	0	1,724.00
Teton River	61,228.00	14,255.00	75,483.00
Musselshell River	64,789.00	57,870.00	122,659.00
Little Missouri River	42,513.00	1,499.00	44,012.00
Grand Total Missouri River Basin	**703,289.08**	**166,470.50**	**869,759.58**
Yellowstone River Drainage Basin			
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
Grand Total Yellowstone River Basin	**552,271.00**	**172,386.00**	**724,657.00**
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	**1,623,785.82**	**358,706.52**	**1,982,492.34**

*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 LAKE COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Columbia River			
***Clark Fork Columbia River**	0	0	0
Flathead River	0	0	0
Flathead Lake	185.00	0	185.00
Swan River (Below Lake)	0	0	0
Johnson (Tinkle) Creek	0	31.00	31.00
School Meadow Creek	14.00	5.00	19.00
Karney Creek	13.00	0	13.00
Swan Lake	0	0	0
Bond Creek	8.00	0	8.00
Unnamed Creek	15.00	7.00	22.00
Swan River (Above Lake)	0	0	0
Kaser Creek	100.00	0	100.00
Lost Creek	0	0	0
North Fork Lost Creek	35.00	6.00	41.00
Stopher Creek	0	19.00	19.00
Unnamed Lake	1.00	9.00	10.00
Unnamed Stream	38.00	0	38.00
Dads (Crow) (Mosai) Creek	25.00	0	25.00
Porcupine Creek	0	0	0
Unnamed Creeks & Springs	23.00	0	23.00
Big Lodge Creek	44.00	14.00	58.00
Birch (Louie) Creek	14.00	0	14.00
Rock Spring Creek	1.00	0	1.00
Howsley Creek	10.00	0	10.00
Unnamed Creek & Spring	9.00	0	9.00
Hutchins Creek	19.00	0	19.00
Michaels Creek	0	0	0
Michaels Springs	2.00	0	2.00
Springs & Seepage	5.00	0	5.00
Henry Creek	38.00	0	38.00
Springs (3)	2.00	0	2.00
Parker (Glen) (Logan) Creek	60.00	0	60.00
Alma (Yellow Bay) Creek	138.00	3.00	141.00
Unnamed Stream	5.00	0	5.00
Proctor (Spring) Creek	0	0	0
Miller Creek	47.00	0	47.00
Indian Springs	11.00	0	11.00
Spring Creek	24.00	0	24.00
Dayton Creek	363.00	0	363.00

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

IRRIGATION SUMMARY OF LAKE COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Ronan (Irvine) (Ervin) (Gardner) Creek	208.00	60.00	268.00
Lake Mary Ronan	0	0	0
Donaldson Creek	17.00	0	17.00
Kootenai Creek	56.00	0	56.00
Well	17.00	0	17.00
Blue Boy (Meadow) Creek	4.00	1.00	5.00
Sunset Spring	6.00	0	6.00
Starvation (Four Mile) Creek	3.00	0	3.00
Boulder (Five Mile) Creek	9.00	0	9.00
Station Creek	27.00	0	27.00
Mann Springs	3.00	0	3.00
Spring	3.00	0	3.00
Unnamed Creek & Spring	6.00	0	6.00
Mahood Creek	1.00	0	1.00
Skidoo (Big) (Hellroaring) Creek	102.00	0	102.00
Holmes Creek	1.00	0	1.00
Weishair Spring	16.00	0	16.00
Gingras Springs (3)	26.00	0	26.00
Unnamed Creek	0	0	0
Unnamed Stream & Springs	16.00	0	16.00
Unnamed Creek	18.00	0	18.00
Ducharme (Smith) (Centipede) Creek	0	108.00	108.00
Moss Creek	0	70.00	70.00
Springs	97.90	0	97.90
Twin Reservoir (Turtle Lake)	0	0	0
Dupuis Creek	0	40.00	40.00
White Clay Creek	0	0	0
Irvine (White Clay) Creek	131.00	0	131.00
North Fork White Clay Creek	3.00	0	3.00
Springs (2)	20.00	0	20.00
Little Bitterroot River	0	0	0
Sullivan Creek	53.00	0	53.00
Artesian Wells	561.00	0	561.00
Crow Creek	0	0	0
North Crow Creek	510.30	5.60	515.90
Middle Crow Creek	7.00	0	7.00
Drainage	11.00	0	11.00
Lost (Rainbow) (Koupal) Creek	46.00	0	46.00
Courville Creek	7.00	0	7.00

IRRIGATION SUMMARY OF LAKE COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Spring Creek	0	0	0
Well	33.00	0	33.00
Courville Creek	103.00	10.20	113.20
South Fork Courville (Rock) (Spring) Creek	18.00	10.00	28.00
Mud Creek	459.80	34.00	493.80
Unnamed Springs	10.00	0	10.00
Meinsinger Spring & Creek	40.00	0	40.00
Unnamed Springs	6.00	0	6.00
Drain Ditch	130.00	0	130.00
Big Creek	78.20	0	78.20
Bisson Creek	87.02	0	87.02
Spring	8.00	0	8.00
Mission Creek	968.00	0	968.00
Spring	5.00	0	5.00
Dry Creek	222.90	0	222.90
Mikes Creek	95.50	0	95.50
Sabine Creek	680.00	0	680.00
Thorne Creek	23.30	0	23.30
Post Creek	974.50	30.20	1,004.70
Mollman (Marsh) Creek	338.50	17.00	355.50
Unnamed Stream (Seepage)	8.00	0	8.00
Unnamed Creek	40.00	0	40.00
Poison Oak (Lantow) (Beachmin) Creek	289.50	0	289.50
Dimmick Spring	7.00	0	7.00
Ashley (Dry) Creek	428.46	0	428.46
Ashley Creek	31.70	0	31.70
Unnamed Creek & Spring	6.70	0	6.70
Unnamed Streams	263.10	10.40	273.50
Matt Creek	18.00	0	18.00
Big (Dublin) Gulch	0	0	0
Well & Pond	19.00	0	19.00
Jocko River	241.50	47.43	288.93
North Fork Jocko River	0	0	0
Unnamed Creek	58.00	7.00	65.00
Big Knife Creek	0	20.50	20.50
Agate Stevens Creek	8.50	0	8.50
Moiese Creek	10.40	5.30	15.70
Pellew Creek	2.40	0	2.40
Barnaby Creek	23.40	0	23.40

IRRIGATION SUMMARY OF LAKE COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Finley Creek	403.70	19.60	423.30
Agency Creek	367.70	173.37	541.07
Adams Creek	0	0	0
Alkali (Flat) Creek	25.00	0	25.00
Spring Creek	290.00	0	290.00
Lamoose (Big) Creek	81.30	43.00	124.30
Valley Creek	677.80	0	677.80
Swamp & Seepage	13.00	0	13.00
Total Private Irrigation	**10,830.08**	**806.60**	**11,636.68**
Flathead Irrigation Project*			
Flathead Irrigation District	75,526.28	90.68	75,616.96
Mission Irrigation District	18,953.74	8.60	18,962.34
Jocko Valley Irrigation District	5,898.51	796.94	6,695.45
Total Project Irrigation	**100,378.53**	**896.22**	**101,274.75**
Total Irrigation in Lake County	**111,208.61**	**1,702.82**	**112,911.43**

*Due to the mingled water supply, irrigated acreage totals from each stream were not determined for the Flathead Irrigation Project.

FLATHEAD IRRIGATION PROJECT

(Including Jocko Valley, Mission and Flathead Irrigation Districts)

HISTORY

Irrigation was practiced in the region of what is now Lake County as long ago as 1854 to flood small areas for the production of garden crops and grain. Shortly after the mission was founded at St. Ignatius in 1854, water was taken from Mission Creek by the Jesuit Priests for the irrigation of lands adjacent to that stream. This was the first record of irrigation on the present Flathead Indian Reservation.

In 1904, Congress authorized a preliminary survey of the reservation lands to determine whether or not an irrigation project was feasible. Three years later, in 1907, an arrangement was made between the Office of Indian Affairs and the Reclamation Service whereby the latter would furnish the engineering service for the survey and to carry on the construction work. Engineer Robert S. Stockton was in charge of the first preliminary survey. His report on the feasibility and irrigation development was completed in 1908. Actual construction of the project began in 1909 and has been carried on continuously to the present time. Until April, 1924, the engineering work was done by the Reclamation Service, but since then, all of the work in connection with the Flathead Irrigation Project has been under the Bureau of Indian Affairs.

The water users on the project are represented by three Irrigation District Boards, the Confederated Kootenai and Salish Tribal Council, and the Flathead Agency Superintendent. The irrigated lands are located in Lake, Sanders and Missoula counties; and extend along the Jocko River from above Arlee to below Dixon, along the Flathead River from the Bison Range to Polson, and along the Little Bitterroot River from below Hot Springs to above Lonepine.

Organized under the Flathead Irrigation Project are Flathead, Mission and Jocko Valley Irrigation Districts. All three districts were created by a district court decree on August 26, 1926. (For the exact location of the land under the three districts see Maps in Part II of this report).

In Lake County, the Jocko Valley Irrigation District is served mainly from the "K" canal complex with the major diversion in the Jocko River north of Arlee.

The Mission Valley, which includes all of Flathead and Mission Irrigation Districts in Lake County totals 114,900 acres and is a unified and highly interrelated complex of nine storage reservoirs, two pumping plants and the Pablo Feeder Canal. By the way of the Placid Creek trans-mountain diversion canal, water is brought from Placid Creek on the Clearwater River drainage into the North Fork of the Jocko above the Jocko Lakes. This water and Jocko River water are then diverted through the Tabor Feeder Canal into Tabor Reservoir (St. Mary's Lake) on Dry Creek. Tabor Dam and Reservoir stores Placid Creek, Jocko and Dry Creek water and regulates that supply into the Pablo Feeder Canal heading in Dry Creek and ending in Pablo Reservoir, approximately 30 miles north. Two mountain reservoirs, Mission and McDonald, store Mission and Post Creek water which they then supply to the Pablo Feeder or for direct diversion from the creeks. Enroute to Pablo Reservoir, the Pablo Feeder Canal also supplies water to three valley floor reservoirs, Kicking Horse, Ninepipe and Crow and to several main canals. The Pablo Feeder also supplies water to part of the Polson area

of the Pablo Division. The balance of the Polson area is supplied by flows from Big Creek and other creeks through Twin Reservoir about 5 miles southeast of Polson.

The 216 cfs Flathead pumping system supplies water to Pablo Reservoir and to the western part of the Polson area. The pumps are operated only when there is a need to supplement gravity supplies. The pump supply has averaged about 15,000 acre feet per year. The small 25 cfs Crow Creek pump lifts water from Post Creek which is primarily return flow from irrigation above, into a sub-main canal in the Post Division. This is also used only to supplement short supplies from the gravity system as the occasion demands.

A small acreage of irrigated land of the Camas Division extends into Lake County. The water supply for the Camas "B" canal enters Lake County from the Little Bitterroot drainage. Included in the Camas Division water supply are the Little Bitterroot River, several of its tributaries and storage in four reservoirs. Two of the reservoirs are located in Flathead County and two in Sanders County.

PRESENT STATISTICS

Location: The location of the irrigated land areas of the three districts under the Flathead Irrigation Project are:

Jocko Valley Irrigation District; Township 16 North, Ranges 19 and 20 West; Township 17 North, Ranges 19 and 20 West; and Township 18 North, Range 20 West.

Mission Irrigation District; Township 18 North, Ranges 19 and 20 West; Township 19 North, Ranges 19 and 20.

Flathead Irrigation District; Township 19 North, Ranges 19, 20, 21 and 22 West, Township 20 North, Ranges 19, 20, 21 and 22 West, Township 21 North, Ranges 19, 20 and 21 West, Township 22 North, Ranges 19, 20, 21 and 23 West.

Length and Capacity of Canals: Under this project there is estimated 1,300 miles of canals and lateral ditches in the distribution system. There are approximately 16 miles of concrete lining on some of the major canals of the project. This was necessary in certain areas to eliminate excessive water loss due to seepage and ditch bank erosion. The capacities of some of the main canals are: For the Jocko Valley Irrigation District, Jocko "K" canal at the intake has a capacity of 231 cfs. Capacities of major canals affecting both the Mission and Flathead Irrigation Districts are: the Tabor Feeder Canal, 200 cfs, Pablo Feeder Canal, 500 cfs and the Pablo "A" canal 485 cfs.

Reservoirs: The following are reservoirs of the project and their capacities: Tabor 23,300 ac. ft., Mission 7,250 ac. ft., McDonald 8,225 ac. ft., Kicking Horse 8,350 ac. ft., Ninepipe 14,870 ac. ft., Crow 10,350 ac. ft., Pablo 27,270 ac. ft., Twin 836 ac. ft., Horte 260 ac. ft., Hillside 95 ac. ft., Little Bitterroot Lake 24,000 ac. ft., Hubbart 12,125 ac. ft., Upper Dry Fork 2,700 ac. ft., and Dry Fork 4,000 ac. ft.

Operation and Maintenance: The water charge per acre on this project includes both operation and maintenance and the cost of pumped water. The charges for the different types of land ownership on the Flathead Reservation are as follows:

WHITE OWNED LAND (1962)

Jocko Valley Irrigation District	$3.50 per acre
Mission Irrigation District	$3.30 per acre
Flathead Irrigation District	$3.50 per acre

INDIAN OWNED LAND (1962)

Jocko Valley Division	$2.75 per acre
Mission Valley Division	$3.36 per acre
Camas Division	$4.57 per acre

Water charges for the Non-District White Owned Land are the same as those listed above for Indian Owned Land. Non-district white owned land is land sold by an Indian that requires a time period before the transaction is completed to become legally included in an irrigation district.

Present Water Users: On the Flathead Irrigation Project in 1962 there were approximately 73 water users listed under the Jocko Valley Irrigation District, 227 for the Mission Irrigation District and 1,040 under the Flathead Irrigation District.

Acreage Irrigated: In 1962, the three districts of the project had the following irrigated acreage: Jocko Valley 5,898.51 irrigated acres with 796.94 irrigable acres; Mission 18,953.74 irrigated acres with 8.60 irrigable acres and Flathead has 75,526.28 irrigated acres with 90.68 irrigable acres.

WATER RIGHT DATA

The water rights applicable to the Flathead Irrigation Project were filed by the United States of America and are as follows:

An appropriation from Agency Creek, dated 1-22-10 for 4,000 miner's inches (Ref. Book A, Page 46); from Agency Creek, dated 4-2-10 for 4,000 miner's inches (Ref. Book A, Page 52); from Agency Creek, dated 10-10-13 for 4,000 miner's inches (Ref. Book A, Page 290); from Agency Creek, dated 10-9-13 for 4,000 miner's inches (Ref. Book A, Page 286); from Ashley Creek, dated 12-27-09 for 20,000 miner's inches (Ref. Book A, Page 14); from Ashley Creek, dated 2-8-18 for 4,000 miner's inches (Ref. Book A, Page 327); from Barnaby Creek, dated 1-22-10 for 2,000 miner's inches (Ref. Book A, Page 42); from Big Creek (Flood), dated 7-21-32 for 3,000 miner's inches (Ref. Book 5, Misc. Records, Page 179); from Big Knife Creek, dated 1-22-10 for 40,000 miner's inches (Ref. Book A, Page 35); from Big Knife Creek dated 4-2-10 for 4,000 miner's inches (Ref. Book A, Page 59); from Big Knife Creek, dated 8-1-10 for 4,000 miner's inches (Ref. Book A, Page 282); from Crow Creek, dated 12-27-09 for 80,000 miner's inches (Ref. Book A, Page 7); from Crow Creek, dated 12-27-09 for 160,000 miner's inches (Ref. Book A, Page 8); from North Fork Crow Creek, dated 4-4-12 for 80,000 miner's inches (Ref. Book A,

Page 240); from South Fork Crow Creek, dated 12-27-09 for 40,000 miner's inches (Ref. Book A, Page 5); from Dry Creek, dated 12-27-09 for 80,000 miner's inches (Ref. Book A, Page 15); from Dry Creek, dated 12-27-09 for 40,000 miner's inches (Ref. Book A, Page 18); from Falls Creek, dated 7-27-11 for 8,000 miner's inches (Ref. Book A, Page 73); from Finley Creek, dated 1-22-10 for 20,000 miner's inches (Ref. Book A, Page 40); from Finley Creek, dated 4-2-10 for 200,000 miner's inches (Ref. Book A, Page 57); from Finley Creek, dated 10-10-13 for 4,000 miner's inches (Ref. Book A, Page 288); from East Branch Finley Creek, dated 1-22-10 for 20,000 miner's inches (Ref. Book A, Page 38); from Flathead River, dated 3-15-13 for 800 miner's inches (Ref. Book A, Page 99); from Griffin Creek, dated 9-28-54 for 8,000 miner's inches (Ref. Book 18, Misc. Records, Page 173); from Jocko River, dated 1-22-10 for 200,000 miner's inches (Ref. Book A, Page 34); from Jocko River, dated 5-21-13 for 16,000 miner's inches (Ref. Book A, Page 268); from Jocko River, dated 9-7-20 for all miner's inches (Ref. Book A, Page 371); from Middle Fork Jocko River, dated 11-23-11 for 4,000 miner's inches (Ref. Book A, Page 81); from North Fork Jocko River, dated 7-27-11 for 16,000 miner's inches (Ref. Book A, Page 72); from South Fork Jocko River, dated 11-23-11 for 8,000 miner's inches (Ref. Book A, Page 79); from LaMoose Creek, dated 1-22-10 for 2,000 miner's inches (Ref. Book A, Page 45); from Marsh Creek, dated 12-27-09 for 20,000 miner's inches (Ref. Book A, Page 30); from Marsh Creek, dated 6-22-12 for 4,000 miner's inches (Ref. Book A, Page 248); from Branch Marsh Creek, dated 6-22-12 for 4,000 miner's inches (Ref. Book A, Page 246); from Mikes Creek, dated 12-27-09 for 800 miner's inches (Ref. Book A, Page 16); from Mission Creek, dated 12-27-09 for 120,000 miner's inches (Ref. Book A, Page 12); from Mission Creek, dated 3-8-10 for 160 miner's inches (Ref. Book A, Page 49); from Mission Creek, dated 7-1-10 for 8,000 miner's inches (Ref. Book A, Page 264); from Mission Creek, dated 3-13-13 for 8,000 miner's inches (Ref. Book A, Page 91); from Mission Creek, dated 3-14-13 for 6,000 miner's inches (Ref. Book A, Page 232); from Mission Creek, dated 4-2-13 for 12,000 miner's inches (Ref. Book A, Page 260); from Moise Creek, dated 1-22-10 for 2,000 miner's inches (Ref. Book A, Page 41); from Mud Creek, dated 4-4-12 for 4,000 miner's inches (Ref. Book A, Page 242); from Pellew Creek, dated 1-22-10 for 2,400 miner's inches (Ref. Book A, Page 44); from Pellew Creek, dated 4-2-10 for 2,000 miner's inches (Ref. Book A, Page 64); from Post Creek, dated 12-27-09 for 200,000 miner's inches (Ref. Book A, Page 4); from Post Creek, dated 5-9-12 for 20,000 miner's inches (Ref. Book A, Page 254); from "S-14" Creek, dated 7-27-11 for 4,000 miner's inches (Ref. Book A, Page 70); from Sabin Creek, dated 8-8-11 for 2,000 miner's inches (Ref. Book A, Page 75).

The above appropriations may be found in the County Clerk and Recorder's Office, Polson, Montana.

An appropriation from Big Creek, dated 10-2-09 for 40,000 miner's inches (Ref. Book 71, Page 382); from Big Creek, dated 9-25-15 for 4,000 miner's inches (Ref. Book 129, Page 386); from Big Creek, dated 9-17-18 for 2,000 miner's inches (Ref. Book 129, Page 432); from Hell Roaring Creek, dated 10-2-09 for 20,000 miner's inches (Ref. Book 71, Page 367); from Hell Roaring Creek, dated 2-10-20 for 800 miner's inches (Ref. Book 129, Page 463); from Flathead River, dated 1-22-10 for 4,000,000 miner's inches (Ref. Book 71, Page 403); from Little Bitterroot River, dated 9-1-09 for 40,000 miner's inches (Ref. Book 71, Page 364); from Little Bitterroot River, dated 10-2-09 for 400,000 miner's inches (Ref. Book 71, Page 376); from Mud Creek, dated 12-27-09 for 8,000 miner's inches (Ref. Book 71, Page 397); from Branch Mud Creek, dated 12-27-09 for 2,000 miner's inches (Ref. Book 71, Page 391); from Branch Mud Creek, dated 12-27-09 for 800 miner's inches (Ref. Book 71, Page 392); from Little Bitterroot River, dated 12-

21-13 for 400,000 miner's inches (Ref. Book 71, Page 500); from Little Bitterroot River, dated 12-20-13 for 400,000 miner's inches (Ref. Book 71, Page 502).

The above appropriations may be found in the County Clerk and Recorder's Office, Kalispell, Montana.

An appropriation from Jocko River 12-27-09 for 1,600 miner's inches (Ref. Book D, Page 524); from Placid Creek, dated 5-9-31 for 8,000 miner's inches (Ref. Book J, Page 287); from Placid Creek, dated 5-7-34 for 200 miner's inches (Ref. Book J, Page 324).

The above appropriations may be found in the County Clerk and Recorder's Office, Missoula, Montana.

An appropriation from Alder Creek, dated 7-19-32 for 3,000 miner's inches (Ref. Book 3, Page 118); from Little Bitterroot River, dated 10-2-09 for 200,000 miner's inches (Ref. Book 1, Page 341); from Little Bitterroot River, dated 12-22-13 for 200,000 miner's inches (Ref. Book 1, Page 591); from Little Bitterroot River, dated 3-8-17 for 400,000 miner's inches (Ref. Book 3, Page 18); from Mill Creek, dated 12-23-13 for 40,000 miner's inches (Ref. Book 1, Page 588).

The above appropriations may be found in the County Clerk and Recorder's Office, Thompson Falls, Montana.

In addition to filings listed above, there are more than 100 other filings made by the United States for this project on surplus and flood water from unnamed creeks and coulees too numerous to mention here. A list of these other recorded filings and their location may be obtained from the State Engineer's Office, Water Resources Survey.

See Maps in Part II, Pages 1-2, 4-12, 14-20.

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
COLUMBIA RIVER BASIN							
*Clark Fork							
Columbia River	0	0	0				
Big Blackfoot River	0	0	0				
Clearwater River	0	0	0				
Owl Creek	0	0	0				
Placid Lake	0	0	0				
Placid Creek	2	8,200.00	205.00				
Flathead River (Below Lake)	37	94,473,520.00	2,361,838.00				
Flathead Lake	11	2,180.00	54.50				
Flathead River (Above Lake)	0	0	0				
Stillwater River	0	0	0				
Logan Creek	0	0	0				
Griffin Creek	2	16,000.00	400.00				
Swan River (Below Lake)	0	0	0				
Johnson (Tinkle) Creek	5	796.00	19.90				
North Fork Johnson (Tinkle) (Schmidt) (Lost) Creek	4	1,100.00	27.50				
South Fork Johnson (Tinkle) Creek	1	60.00	1.50				
Horseshoe Lake	0	0	0				
Unnamed Creek	1	All	All				
School Meadow Creek	4	1,060.00	26.50				
Karney Creek	3	140.00	3.50				
Unnamed Spring	2	100.00	2.50				
Swan Lake	0	0	0				
Bond Creek	5	4,080.00	102.00				
Spring Creek	1	20.00	0.50				
East Branch Spring Creek	1	13.00	0.32				
Groom Creek	4	360.00	9.00				
Unnamed Spring	1	40.00	1.00				
Small Spring Branch	4	200.00	5.00				
Unnamed Spring	1	100.00	2.50				
Hall Creek	3	180.00	4.50				
Unnamed Spring	1	1,000.00	25.00				
Unnamed Creek	2	300.00	7.50				
Six Mile Creek	2	800.00	20.00				
Camp Creek	1	2,000.00	50.00				
Swan River (Above Lake)	0	0	0				
Lost Lake (& Swan River)	1	14,000.00	350.00				
High Park Lake (& Swan River)	1	20,000.00	500.00				
Gray Wolf Lake (& Swan River)	1	18,000.00	450.00				
Glacier Creek & Turquoise Lake	1	14,000.00	350.00				

*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 — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Kaser Creek	2	6,100.00	152.50				
Pony Creek	1	80.00	2.00				
Jim Creek	1	10,000.00	250.00				
Piper Creek	1	80.00	2.00				
Lion Creek	3	1,960.00	49.00				
Cedar Creek	1	240.00	6.00				
Squeezer Creek	1	1,000.00	25.00				
Soup Creek	2	190.00	4.75				
Cilly Creek	0	0.00	0.00				
Southwest Branch Cilly Creek	1	All	All				
Lost Creek	0	0.00	0.00				
North Fork Lost Creek	2	320.00	8.00				
Stopher Creek	1	40.00	1.00				
North Fork Stopher Creek	2	160.00	4.00				
Lime Creek	1	100.00	2.50				
Total Swan River & Tributaries	**69**	**98,619.00**	**2,465.47**				
Unnamed Spring	1	2,000.00	50.00				
Boulder Spring	1	20.00	0.50				
Unnamed Springs	2	20.00	0.50				
Shearers Creek	1	40.00	1.00				
Canyon Spring	1	All	All				
Unnamed Spring	1	80.00	2.00				
Unnamed Lakes	1	8,000.00	200.00				
Hunger Creek	2	160.00	4.00				
Dads (Mosai) (Crow) Creek	3	172.00	4.30				
Lost Spring	1	40.00	1.00				
Unnamed Spring	1	5.00	0.12				
Crane Creek	7	1,138.40	28.46				
Unnamed Spring	6	120.00	3.00				
Porcupine Creek	2	65.00	1.62				
Unnamed Creek	2	126.80	3.17				
Unnamed Spring	1	40.00	1.00				
Unnamed Spring	6	444.80	11.12				
Big Lodge Creek	6	5,050.00	126.25				
Unnamed Springs	5	720.00	18.00				
The North Spring	1	40.00	1.00				
Birch (Louie) Creek	1	200.00	5.00				
Unnamed Springs	4	10.00	0.25				
Unnamed Stream	1	40.00	1.00				
Rock Spring Creek	3	460.00	11.50				
Unnamed Spring	1	20.00	0.50				
Unnamed Spring	1	20.00	0.50				
Unnamed Creek	2	140.00	3.50				
Howsley Creek	3	280.00	7.00				
Unnamed Spring	1	160.00	4.00				
Unnamed Creek	1	All	All				
Unnamed Spring	5	235.00	5.87				
Fred T. Purvis Spring	2	15.00	0.37				
Hutchins Creek	8	355.00	8.87				
Unnamed Spring	1	40.00	1.00				
Two Unnamed Springs	1	20.00	0.50				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Michaels Creek	2	160.00	4.00				
Michaels Springs	1	40.00	1.00				
Seepage	1	25.00	0.62				
Unnamed Spring	2	820.00	20.50				
Henry Creek	2	400.00	10.00				
Unnamed Spring	2	200.00	5.00				
Parker (Glen) (Logan) Creek	9	534.00	13.35	2476	10	All	All
Loten Creek	1	150.00	3.75				
Unnamed Spring	1	80.00	2.00				
Lolo (Reds) Creek	8	32,240.00	806.00				
Alma (Yellow Bay) Creek	11	41,920.00	1,048.00				
Unnamed Creek	2	200.00	5.00				
Meredith Spring	1	20.00	0.50				
Malmo Creek	1	40.00	1.00				
Malmo Spring	1	20.00	0.50				
Unnamed Creek	1	200.00	5.00				
Big Willow Spring	1	40.00	1.00				
Little Willow Spring	1	0	0				
Poplar Spring Creek	1	40.00	1.00				
Poplar Spring	1	40.00	1.00				
Unnamed Stream	0	0	0				
Unnamed Spring	2	40.00	1.00				
Bickford Spring	2	100.00	2.50				
Chief Spring	1	300.00	7.50				
Unnamed Springs	2	160.00	4.00				
Spring (Clear) Creek	1	240.00	6.00				
Unnamed Spring	2	All	All				
Foss Springs	1	40.00	1.00				
Unnamed Springs	2	120.00	3.00				
Proctor (Spring) Creek	5	820.00	20.50				
Miller Creek	1	60.00	1.50				
Indian Springs	1	40.00	1.00				
Spring Creek	1	20.00	0.50				
Unnamed Springs	1	11.57	0.29				
Mikes Pond	1	160.00	4.00				
Dayton Creek	16	6,438.00	160.95				
Middle Fork Dayton Creek	1	80.00	2.00				
South Fork Dayton Creek	0	0	0				
Unnamed Creek	1	20.00	0.50				
Gillard Spring	2	106.00	2.65				
Ronan (Ervin) (Irvine) (Gardner) Creek	12	8,380.00	209.50				
Lake Mary Ronan	2	All	All				
Donaldson Creek	2	70.00	1.75				
Unnamed Springs	1	400.00	10.00				
Little Spring Creek	1	50.00	1.25				
Red Lake	1	40.00	1.00				
Kootenai Creek	2	200.00	5.00				
Unnamed Springs	2	40.00	1.00				
Unnamed Creek	1	120.00	3.00				
Blue Bay (Meadow) Creek	20	39,600.00	990.00				
Unnamed Creek	1	200.00	5.00				
Black Lake	0	0	0				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Spring	1	All	All				
Unnamed Spring	1	500.00	12.50				
Sunset Spring	1	10.00	0.25				
Unnamed Creek	2	10.00	0.25				
Starvation (Four Mile) Creek	7	32,410.00	810.25				
Boulder (Five Mile) Creek	11	48,700.00	1,217.50				
Laugh A Way Creek	1	400.00	10.00				
Unnamed Spring	1	20.00	0.50				
Bear Track (Dee) (Six Mile) Creek	11	18,280.00	457.00				
Unnamed Springs	1	13.33	0.33				
McIntire Springs	1	40.00	1.00				
Unnamed Creek	1	20.00	0.50				
Rock Creek	1	5,000.00	125.00				
Unnamed Creek	2	55.00	1.37				
Station Creek	9	32,480.00	812.00				
Unnamed Springs	1	80.00	2.00				
Unnamed Spring	4	140.00	3.50				
Mann Springs	2	120.00	3.00				
Unnamed Springs	2	All	All				
Mahood Creek	2	105.00	2.62				
Unnamed Spring	5	540.00	13.50				
Skidoo (Big) (Hellroaring) Creek	21	64,835.00	1,620.87	1600	2	80.00	2.00
Unnamed Spring	1	10.00	0.25				
Holmes Creek	2	80.00	2.00				
Unnamed Spring	2	80.00	2.00				
Unnamed Creek	1	80.00	2.00				
Weishair Spring	1	100.00	2.50				
Unnamed Spring	1	All	All				
Unnamed Creek	1	20.00	0.50				
Jette (Turtle) Lake	3	1,400.00	35.00				
Unnamed Spring	3	240.00	6.00				
Gingras Springs (Three)	1	160.00	4.00				
Unnamed Springs	4	260.00	6.50				
Unnamed Creek	7	451.39	11.28				
Unnamed Spring	4	42.00	1.05				
Unnamed Springs	6	256.00	6.40				
Rosenberger Spring	2	100.00	2.50				
Unnamed Creek	1	40.00	1.00				
Leader Spring	1	6.00	0.15				
Unnamed Spring	6	626.00	15.65				
Hellroaring (Big) (Deep) Creek	17	121,080.00	3,027.00				
Unnamed Spring	2	160.00	4.00				
Ducharme (Smith) (Centipede) Creek	4	290.00	7.25				
Unnamed Spring	2	26.00	0.65				
Moss Creek	2	30.00	0.75				
Unnamed Springs	2	160.00	4.00				
Unnamed Spring	1	40.00	1.00				
Unnamed Stream	2	160.00	4.00				
Unnamed Spring	6	245.50	6.13				
Addison M. Sterling Spring	1	10.00	0.25				
Unnamed Spring	1	5.00	0.13				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Twin Reservoir (Turtle Lake)	0	0	0				
Dupuis Creek	0	0	0				
Michell Spring	1	40.00	1.00				
Polson Spring	1	50.00	1.25				
Grandview Drainage Flume	1	20.00	0.50				
Killdeer Spring	1	20.00	0.50				
Unnamed Springs, Seeps, Potholes	3	580.00	14.50				
Unnamed Springs	2	40.00	1.00				
Unnamed Spring	3	40.00	1.00				
Unnamed Stream	2	440.00	11.00				
White Clay Creek	3	40,000.00	1,000.00				
Mary's Springs	1	40.00	1.00				
Irvine (White Clay) Creek	3	280.00	7.00				
Unnamed Spring	6	110.00	2.75				
Little Bubbler Spring	1	20.00	0.50				
Hillside Spring	1	20.00	0.50				
Unnamed Creek	1	40.00	1.00				
Unnamed Spring	4	320.00	8.00				
La Rose Creek	1	80.00	2.00				
Unnamed Springs	1	10.00	0.25				
Holt Spring & Creek	1	120.00	3.00				
Unnamed Springs	2	80.00	2.00				
Burton Spring	1	All	All				
Unnamed Creek	1	100.00	2.50				
Unnamed Spring	1	All	All				
North Fork White Clay Creek	4	840.00	21.00				
Unnamed Springs	1	All	All				
Vinson Creek	2	400.00	10.00				
Unnamed Springs	3	260.00	6.50				
Buffalo Springs	1	80.00	2.00				
Unnamed Spring	4	85.21	2.13				
Unnamed Creek & Tributaries	1	200.00	5.00				
Unnamed Creek	1	All	All				
Little Bitterroot River	4	440,130.00	11,003.25				
Sullivan Creek	2	120.00	3.00				
Unnamed Creek	1	150.00	3.75				
Jansen's Spring	1	All	All				
Big Creek	2	600.00	15.00				
Unnamed Springs	2	1.16	0.03				
Unnamed Creek	2	240.00	6.00				
Unnamed Spring	2	60.00	1.50				
Suny-Side Springs	1	1.16	0.03				
Mary's Springs	4	250.00	6.25				
Grant's Spring	1	40.00	1.00				
Unnamed Spring	3	80.00	2.00				
Unnamed Spring	1	240.00	6.00				
Dubay Creek	2	240.00	6.00				
Minesinger Creek	1	200.00	5.00				
Unnamed Spring Creek	1	60.00	1.50				
Unnamed Spring	1	40.00	1.00				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS No. Case	Decrees No. of	Inches Miner's	Per Sec. Cu. Ft.
Poirier Creek	2	120.00	3.00				
Bisson Creek	2	400.00	10.00				
Bishop Creek	1	200.00	5.00				
Underground Stream (Artesian Well)	1	120.00	3.00				
West Miller Coulee	1	80.00	2.00				
Unnamed Spring	1	20.00	0.50				
Unnamed Springs	2	86.00	2.15				
Drainage	1	200.00	5.00				
Total Crow Creek and Tributaries	**84**	**637,216.00**	**15,930.40**				
Unnamed Spring	1	100.00	2.50				
Unnamed Springs	1	40.00	1.00				
Mission Creek	38	328,392.00	8,209.80				
Dry Creek	7	201,110.00	5,027.75				
Unnamed Spring	1	All	All				
Cold Creek	1	1,600.00	40.00				
Mike's Creek	2	840.00	21.00				
Unnamed Spring	1	All	All				
Unnamed Spring	2	204.00	5.10				
Sabine Creek	25	35,420.00	885.50	2167	2	Ditch Decree	
Thorne Creek	1	20.00	0.50				
Unnamed Stream	1	60.00	1.50				
McCollum Creek	1	100.00	2.50				
Unnamed Stream	1	2,000.00	50.00				
Pistol (Johnson) Creek	3	440.00	11.00				
Unnamed Spring & Pond	1	150.00	3.75				
Unnamed Springs	1	All	All				
Post Creek	6	440,800.00	11,020.00				
Seepage Water (Unnamed Creek)	2	850.00	21.25				
Mollman (Marsh) Creek	4	28,120.00	703.00				
Unnamed Spring	1	40.00	1.00				
Unnamed Stream	1	80.00	2.00				
Unnamed Spring	1	All	All				
June Creek	1	80.00	2.00				
Samathy Well	1	6.00	0.15				
Valentine Creek	1	200.00	5.00				
Deschamp's Spring	1	All	All				
Baker Creek	1	150.00	3.75				
Unnamed Spring	3	280.00	7.00				
Unnamed Stream	1	50.00	1.25				
Unnamed Springs	5	200.00	5.00				
Crystal Spring	1	2,000.00	50.00				
Dan Springs Creek	1	120.00	3.00				
Unnamed Creek	0	0	0				
Unnamed Spring	1	40.00	1.00				
Unnamed Springs	1	80.00	2.00				
Coyote Creek	0	0	0				
Unnamed Spring	1	40.00	1.00				
Total Little Bitterroot & Tributaries	**41**	**444,872.32**	**11,121.81**				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS No. Case	Decrees No. of	Inches Miner's	Per Sec. Cu. Ft.
Mahoney Spring	1	200.00	5.00				
Spring Creek	1	600.00	15.00				
Unnamed Spring	1	20.00	0.50				
A Gulch (Waste Water)	1	200.00	5.00				
Crow Creek	3	400,000.00	10,000.00				
North Crow Creek	9	94,760.00	2,369.00				
Waste Water	1	80.00	2.00				
Middle Crow Creek	2	160.00	4.00				
Unnamed Stream	1	2,000.00	50.00				
Lost (Rainhow) (Koupal) Creek	4	220.00	5.50				
Courville Creek	1	120.00	3.00				
South Crow Creek	4	91,000.00	2,275.00				
Spring Creek	3	3,360.00	84.00				
Huckleberry Spring	1	60.00	1.50				
Courville Creek	2	160.00	4 00				
Unnamed Stream	1	80.00	2.00				
South Fork Courville (Rock) (Spring) Creek	4	300.00	7.50				
South Fork Spring	1	160.00	4.00				
Unnamed Springs (3)	1	100.00	2.50				
Mud Creek	12	36,090.00	902.25				
Branch of Mud Creek	3	2,400.00	60.00				
South Fork Mud Creek	1	440.00	11.00				
Unnamed Spring	3	200.00	5.00				
Unnamed Creek	1	160.00	4.00				
Unnamed Springs (3 or more)	2	40.00	1.00				
Meinsinger Spring Creek	2	420.00	10.50				
Meinsinger Springs	1	100.00	2.50				
Unnamed Spring	2	120.00	3.00				
Big Creek	3	1,900.00	47.50				
Poison Oak (Lantow) (Beauchmin) Creek	5	664.00	16.60				
Poison Oaks Spring	1	24.00	0.60				
Big Spring	1	100.00	2.50				
Red Horne Springs	1	24.00	0.60				
Unnamed Spring	1	40.00	1.00				
Ashley (Dry) Creek	9	44,620.00	1,115.50				
Unnamed Creek	1	100.00	2.50				
Unnamed Spring	1	100.00	2.50				
Unnamed Springs	1	100.00	2.50				
Ashley Creek	1	4,000.00	100.00				
Dishman Spring	1	60.00	1.50				
Unnamed Streams	101	85,800.00	2,145.00				
Unnamed Spring	4	290.00	7.25				
Unnamed Stream	14	12,800.00	320.00				
Unnamed Springs	1	80.00	2.00				

WATER RIGHT DATA — LAKE COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAM	APPROPRIATIONS (Filings of Records) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	DECREED RIGHTS No. Case	Decrees No. of	Inches Miner's	Per Sec. Cu. Ft.
Matt Creek	22	16,500.00	412.50				
Camp Spring	1	30.00	0.75				
Unnamed Spring	1	80.00	2.00				
Dry Lake Creek	1	All	All				
Unnamed Gulch	1	100.00	2.50				
Unnamed Spring	1	25.00	0.62				
Total Mission Creek & Tributaries	**275**	**1,206,049.00**	**30,151.22**				
Jocko River	17	421,610.00	10,540.25				
North Fork Jocko River	4	48,500.00	1,212.50				
Falls Creek	5	40,000.00	1,000.00				
S-14 Creek	4	16,000.00	400.00				
Middle Fork Jocko River	4	16,000.00	400.00				
South Fork Jocko River	4	32,000.00	800.00				
Big Knife Creek	2	44,000.00	1,100.00				
Unnamed Spring	1	10.00	0.25				
Moiese Creek	2	4,000.00	100.00				
Unnamed Spring	2	18.00	0.45				
Pellew Creek	2	4,400.00	110.00				
Unnamed Springs	1	All	All				
Unnamed	2	160.00	4.00				
Unnamed Springs	1	86.00	2.15				
Barnaby Creek	3	4,010.00	100.25				
Spring Creek	2	660.00	16.50				
Unnamed Springs	1	All	All				
Finley Creek	9	1,430.00	35.75				
Agency Creek	1	160.00	4.00				
Blodgett Creek	2	200.00	5.00				
Unnamed Spring	1	50.00	1.25				
Waste Water	1	160.00	4.00				
Mary Creek	1	50.00	1.25				
Unnamed Spring & Creek	1	350.00	8.75				
Adams Creek	3	45.00	1.12				
Unnamed Spring	3	20.00	0.50				
Alkali (Flat) Creek	2	60.00	1.50				
Spring Creek	6	6,600.00	165.00				
Unnamed Spring	1	10.00	0.25				
Lamoose (Big) Creek	2	4,000.00	100.00				
Unnamed Spring	1	80.00	2.00				
Valley Creek	9	13,600.00	340.00				
Copper Creek	2	140.00	3.50				
Unnamed Springs (Four)	1	160.00	4.00				
Total Jocko River & Tributaries	**103**	**658,569.00**	**16,464.22**				
Grand Total Lake County	**1,088**	**98,074,897.32**	**2,451,872.43**				

DRAINAGES IN LAKE COUNTY NOT LOCATED

STREAM	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.
Morrow Creek	1	300.00	7.50
Waste, Seep	1	400.00	10.00
Spring, Near Arlee	1	All	All
Spring	1	3.00	0.07
Spring	1	50.00	1.25
Unnamed Stream	1	8,000.00	200.00
Unnamed Stream	1	2,000.00	50.00
Unnamed Stream	1	800.00	20.00
Unnamed Stream	1	800.00	20.00
Unnamed Stream	1	800.00	20.00
Unnamed Stream	1	1,600.00	40.00
Unnamed Stream	1	1,600.00	40.00
Unnamed Creek	1	800.00	20.00
Unnamed Stream	1	800.00	20.00
Unnamed Stream	1	800.00	20.00
Unnamed Creek	1	800.00	20.00
Unnamed Stream	1	800.00	20.00
Unnamed	1	100.00	2.50
Total	**18**	**20,453.00**	**511.32**

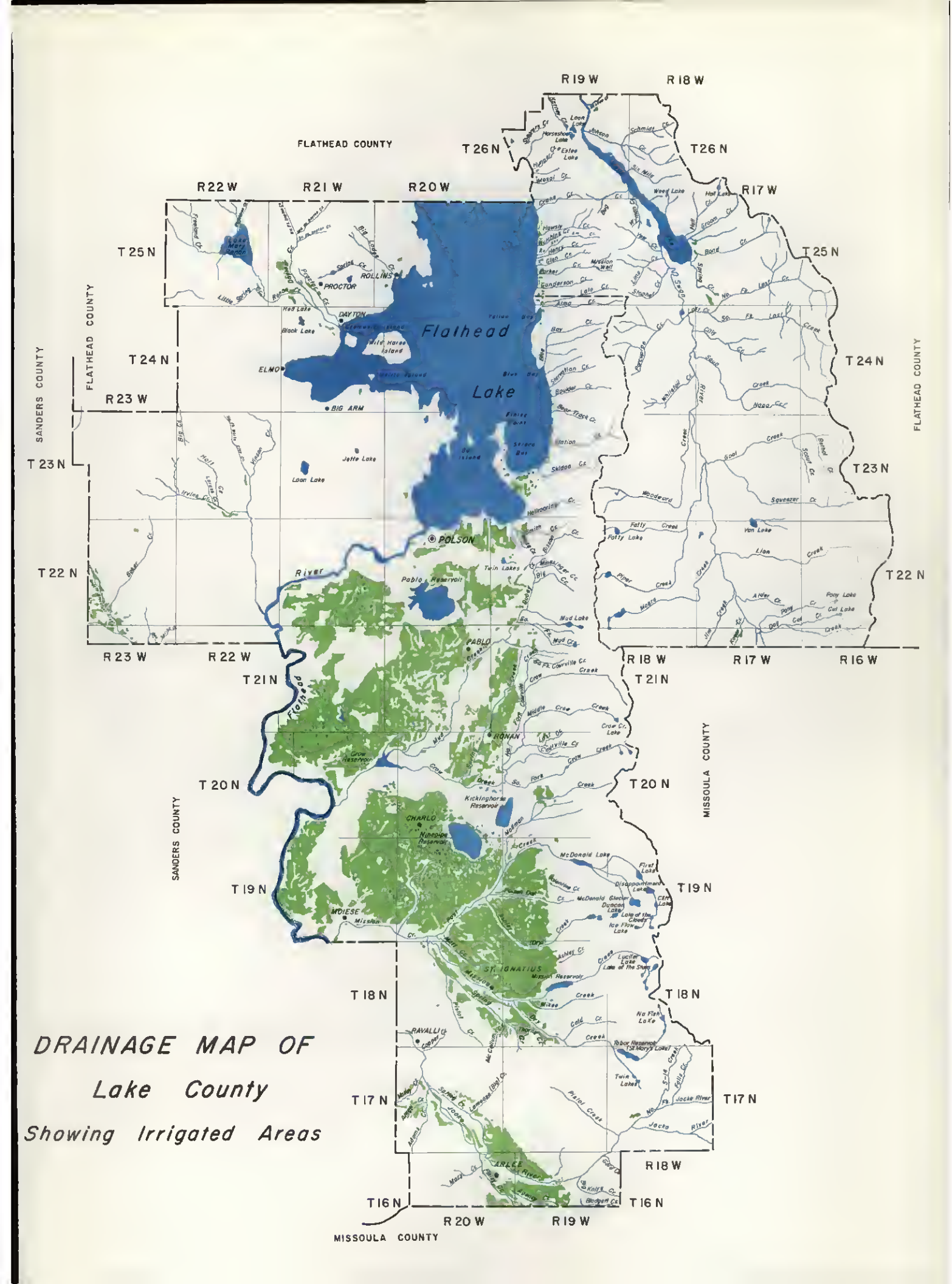
WATER RESOURCES SURVEY

Lake County, Montana

Part II

Maps Showing Irrigated Areas

Published by
STATE ENGINEER'S OFFICE
Helena, Montana
June, 1963



DRAINAGE MAP OF

Lake County

Showing Irrigated Areas

MAP INDEX

Township	Range	Page	Township	Range	Page
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16 North	20 West	2	21 North	23 West	17
17 North	18 West	3	22 North	19 West	18
17 North	19 West	4	22 North	20 West	19
17 North	20 West	4	22 North	21 West	20
18 North	19 West	5	22 North	23 West	17
18 North	20 West	6	23 North	19 West	21
19 North	19 West	7	23 North	20 West	22
19 North	20 West	8	23 North	22 West	23
19 North	21 West	9	23 North	23 West	24
19 North	22 West	9	24 North	19 West	25
20 North	19 West	10	24 North	21 West	26
20 North	20 West	11	25 North	18 West	27
20 North	21 West	12	25 North	19 West	28
20 North	22 West	12	25 North	20 West	29
21 North	17 West	13	25 North	21 West	30
21 North	19 West	14	25 North	22 West	31
21 North	20 West	15	26 North	19 West	32

ALL MAPS HAVE BEEN MADE FROM AERIAL PHOTOGRAPHS

MAP SYMBOL INDEX

BOUNDARIES

- COUNTY LINE
- NATIONAL FOREST LINE

DITCHES

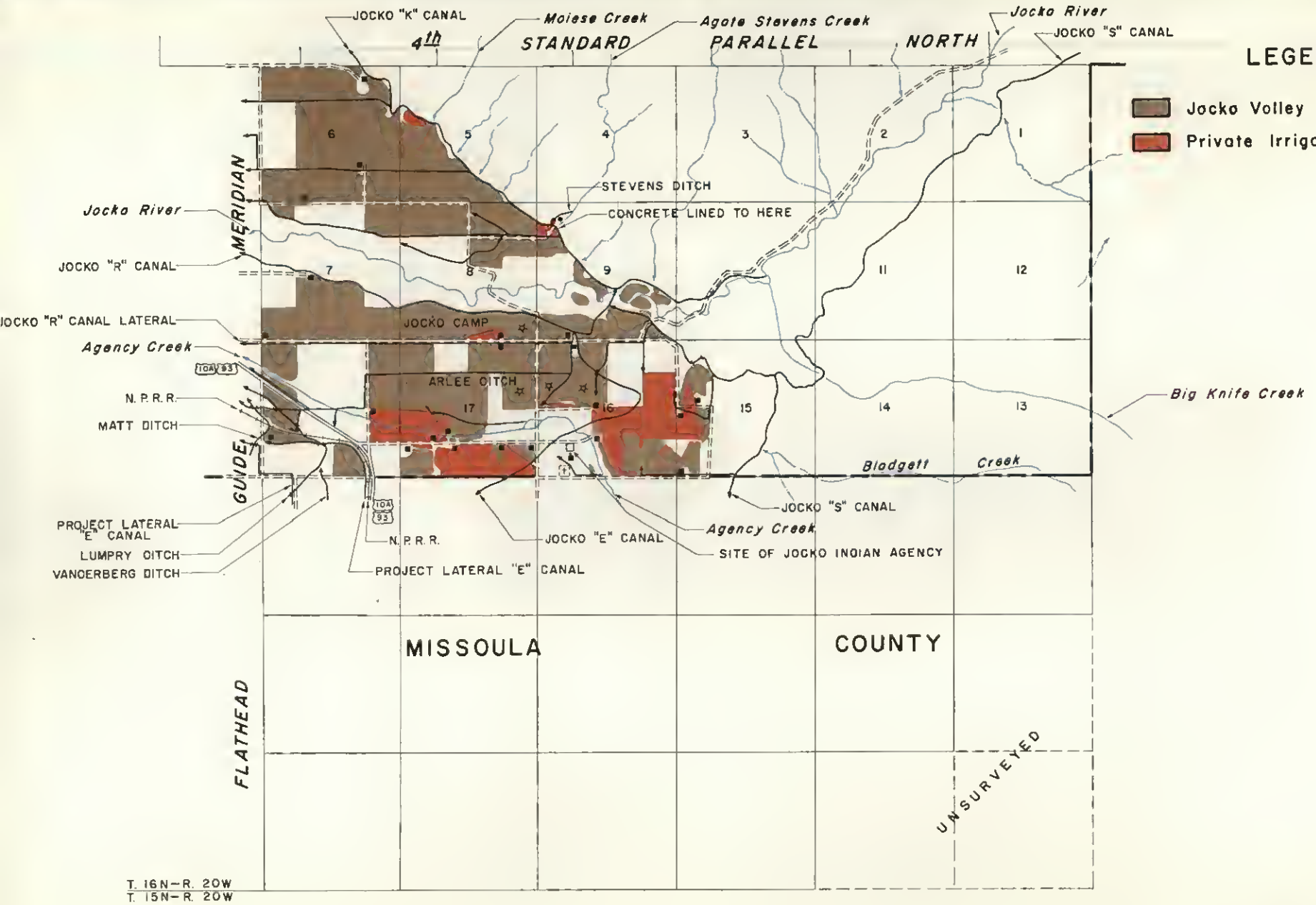
- CANALS OR DITCHES
- DRAIN DITCHES
- PROPOSED DITCHES

TRANSPORTATION

- PAVED ROADS
- UNPAVED ROADS
- RAILROADS
- STATE HIGHWAY
- U.S. HIGHWAY
- AIRPORT

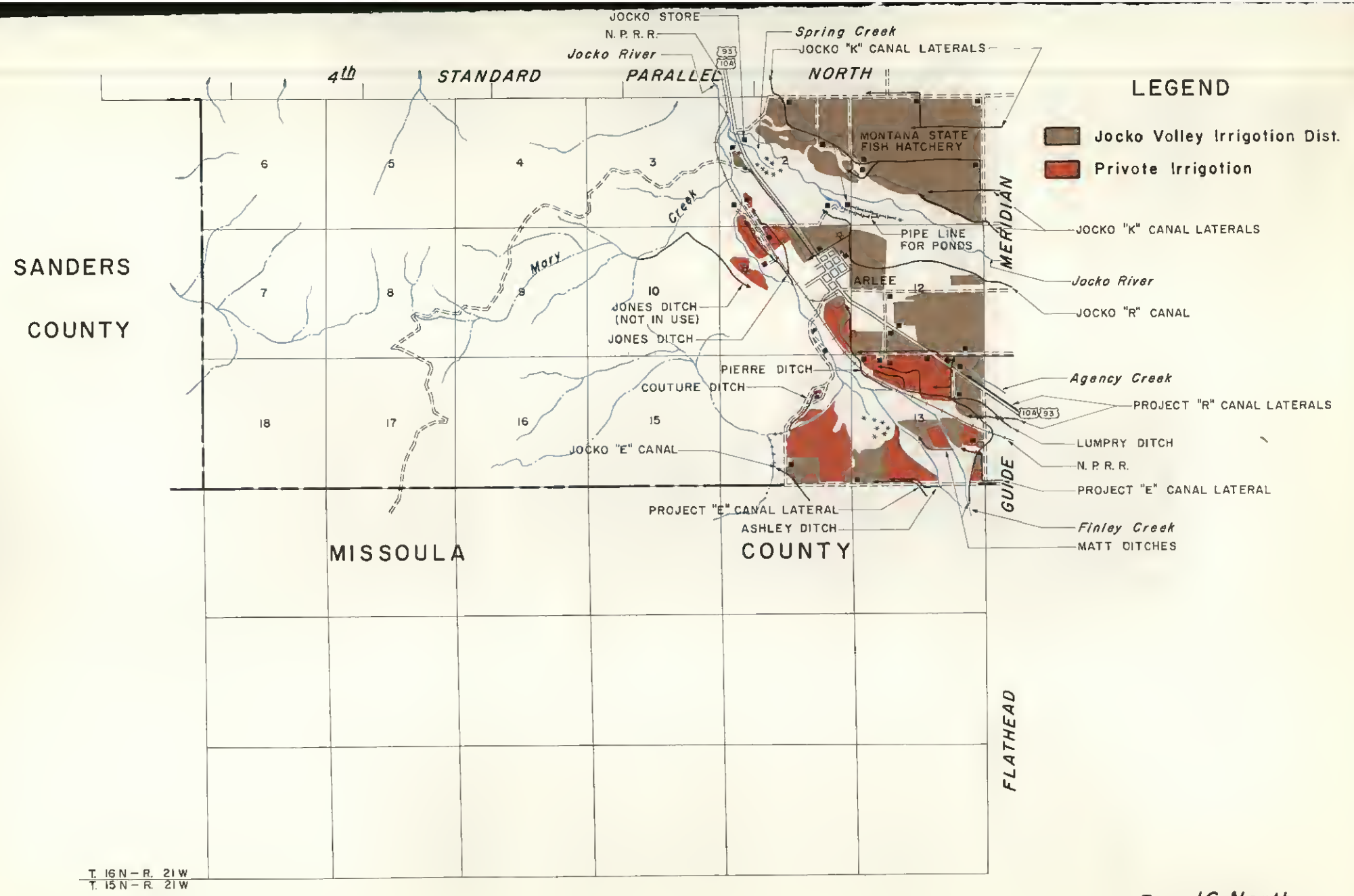
STRUCTURES & UNITS

- DAM
- DIKE
- FLUME
- SIPHON
- SPILL
- SPRINKLER SYSTEM
- WEIR
- PIPE LINE
- PUMP
- PUMP SITE
- RESERVOIR
- WELL
- NATURAL CARRIER USED AS DITCH
- SPRING
- SWAMP
- GAUGING STATION
- POWER PLANT
- STORAGE TANK
- CEMETERY
- FAIRGROUND
- FARM OR RANCH UNIT
- LOOKOUT STATION
- RANGER STATION
- RAILROAD TUNNEL
- SCHOOL
- SHAFT, MINE, OR DRIFT

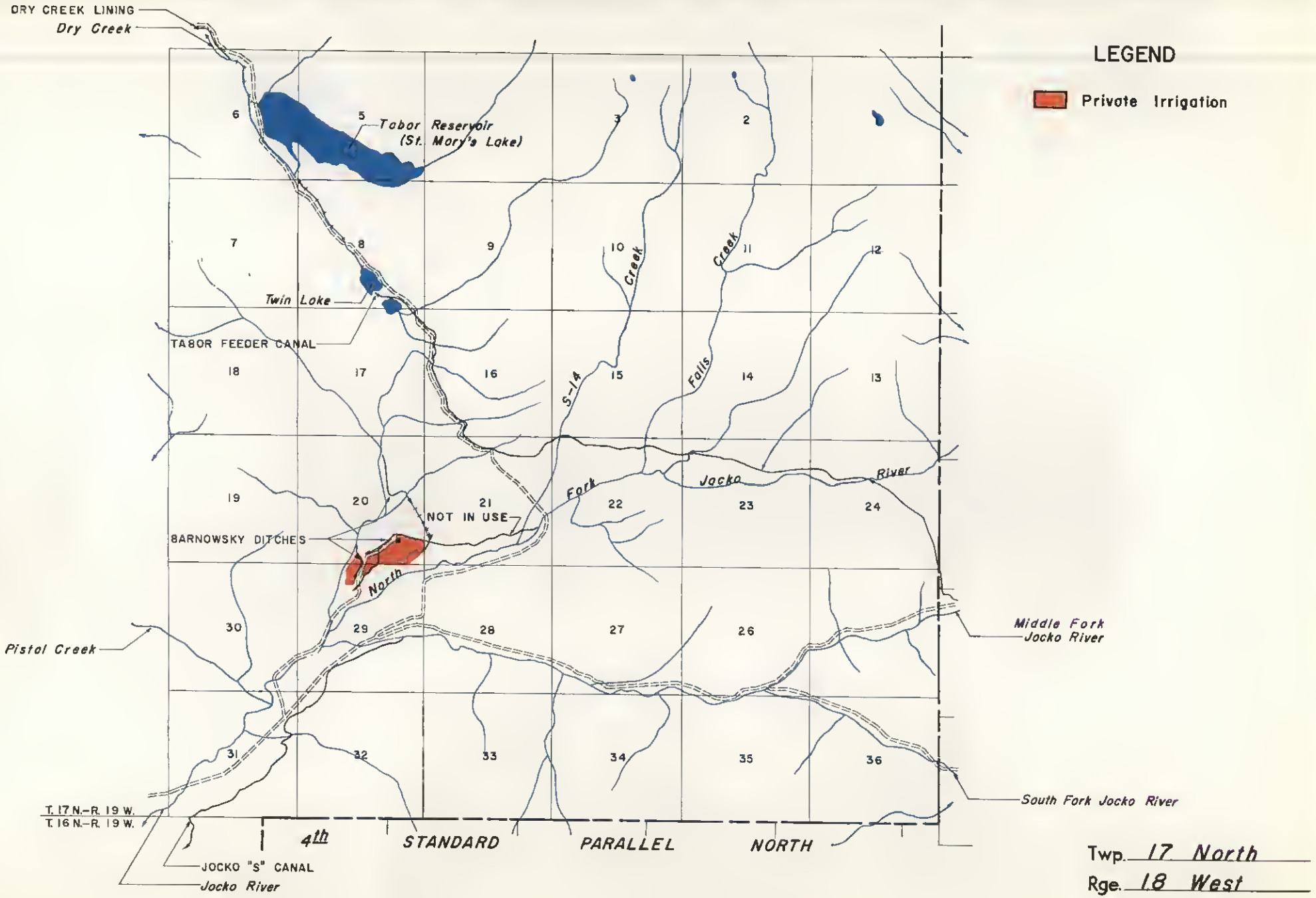


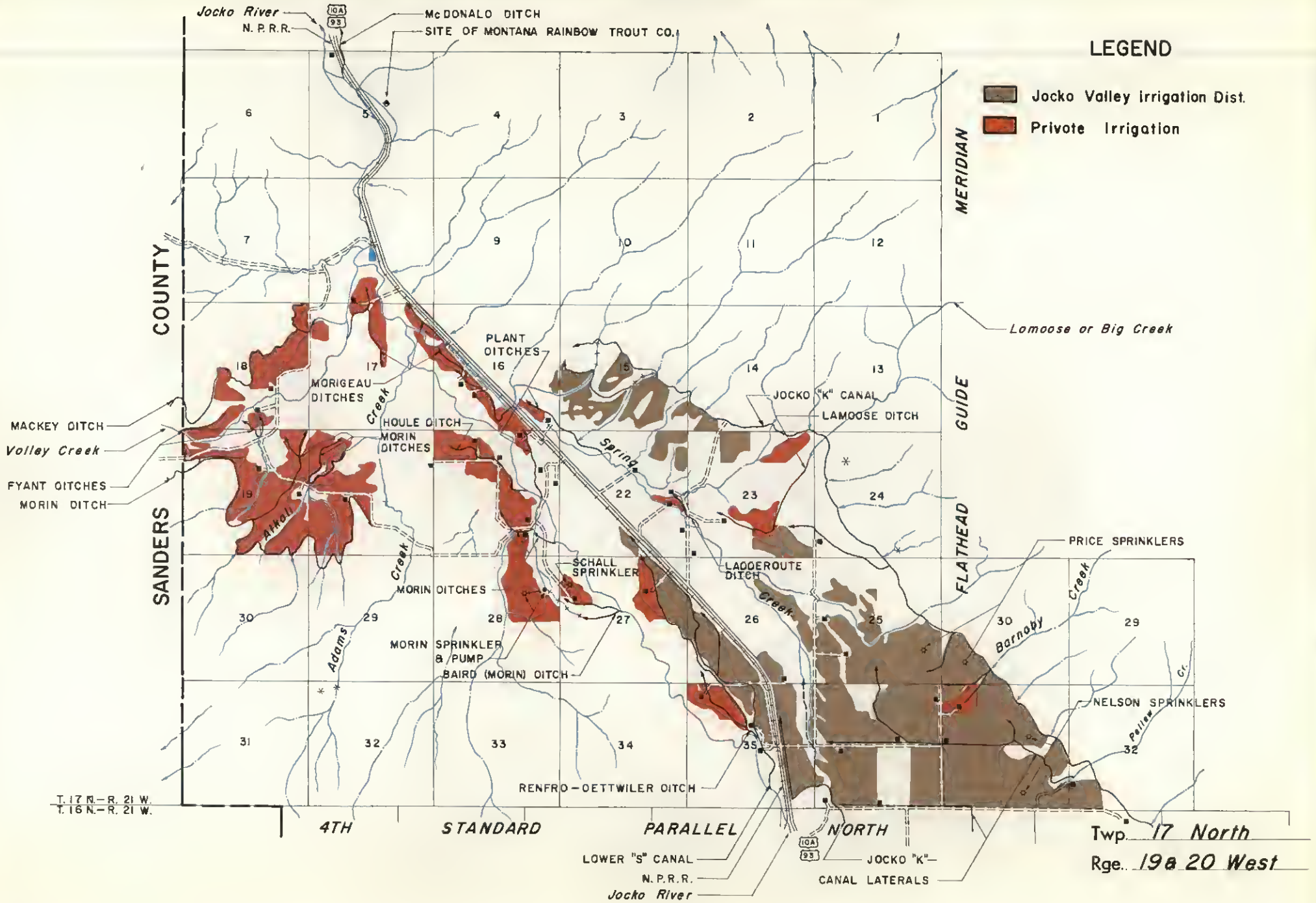
Twp. 16 North

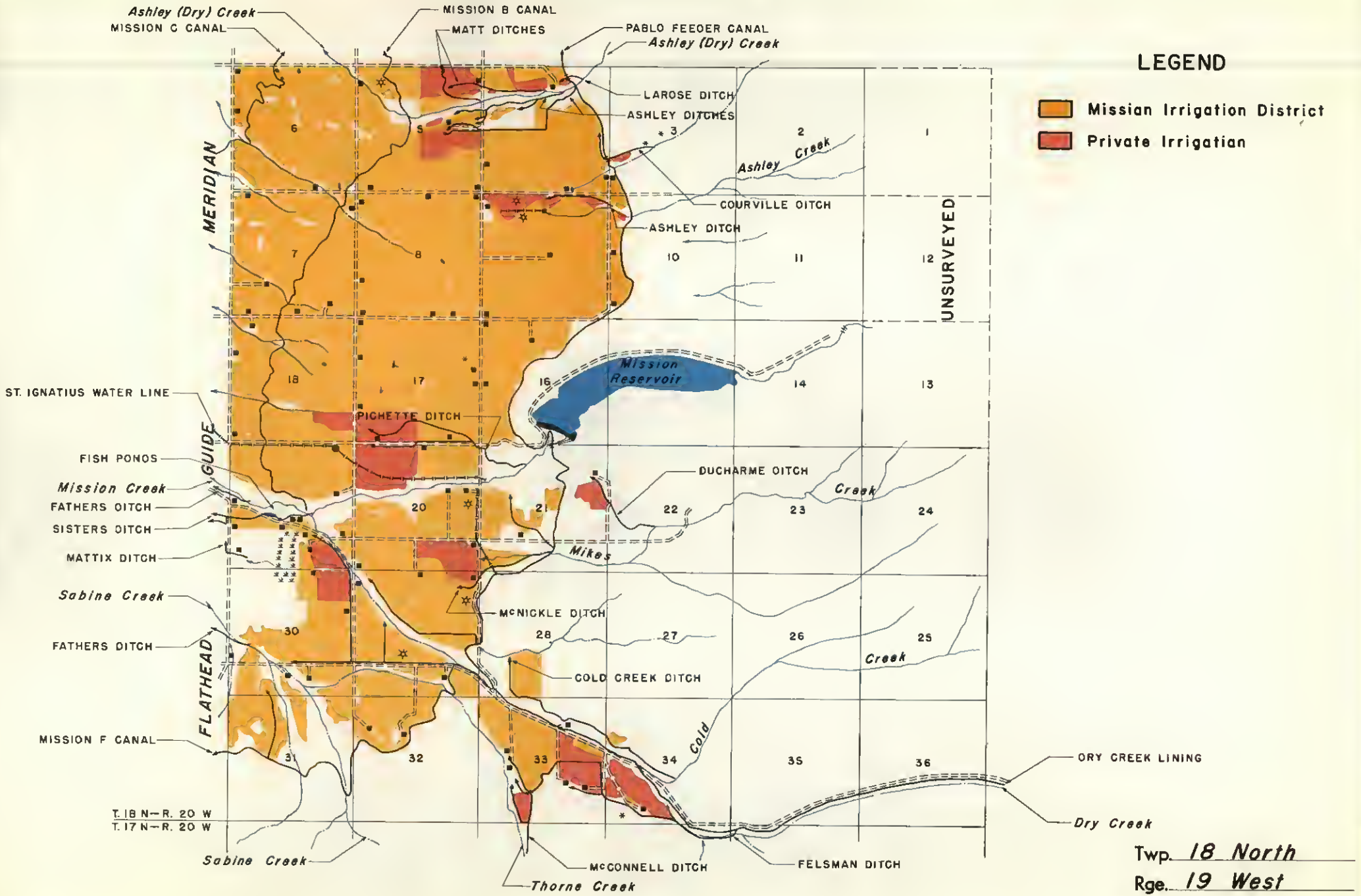
Rge. 19 West



Twp. 16 North
Rge. 20 West


DRY CREEK LINING
Dry Creek
Tabor Reservoir
(St. Mary's Lake)
Twin Lake
TABOR FEEDER CANAL
S-14
Falls
Creek
Creek
Fork
Jocko
River
NOT IN USE
BARNOWSKY DITCHES
North
Pistol Creek
Middle Fork
Jocko River
South Fork Jocko River
T. 17 N.–R. 19 W.
T. 16 N.–R. 19 W.
4th
STANDARD
PARALLEL
NORTH
JOCKO "S" CANAL
Jocko River
6
5
3
2
7
8
9
10
11
12
18
17
16
15
14
13
19
20
21
22
23
24
30
29
28
27
26
31
32
33
34
35
36
LEGEND
Private Irrigation
Twp. 17 North
Rge. 18 West


LEGEND
Jocko Valley Irrigation Dist.
Private Irrigation
Jocko River
N. P. R. R.
McDONALD DITCH
SITE OF MONTANA RAINBOW TROUT CO.
SANDERS COUNTY
MERIDIAN
GUIDE
FLATHEAD
Lomoose or Big Creek
PLANT DITCHES
MORIGEAU DITCHES
Creek
HOULE DITCH
MORIN DITCHES
JOCKO "K" CANAL
LAMOOSE DITCH
Spring
MACKEY DITCH
Valley Creek
FYANT DITCHES
MORIN DITCH
Arnoll
Creek
SCHALL SPRINKLER
LADDEROUTE DITCH
PRICE SPRINKLERS
MORIN DITCHES
Creek
Barnaby
Creek
Adams
MORIN SPRINKLER & PUMP
BAIRD (MORIN) DITCH
NELSON SPRINKLERS
Pellew
Cr.
RENFRO-OETTWILER DITCH
T. 17 N.-R. 21 W.
T. 16 N.-R. 21 W.
4TH STANDARD PARALLEL NORTH
LOWER "S" CANAL
N. P. R. R.
Jocko River
JOCKO "K"-
CANAL LATERALS
Twp. 17 North
Rge. 19 & 20 West

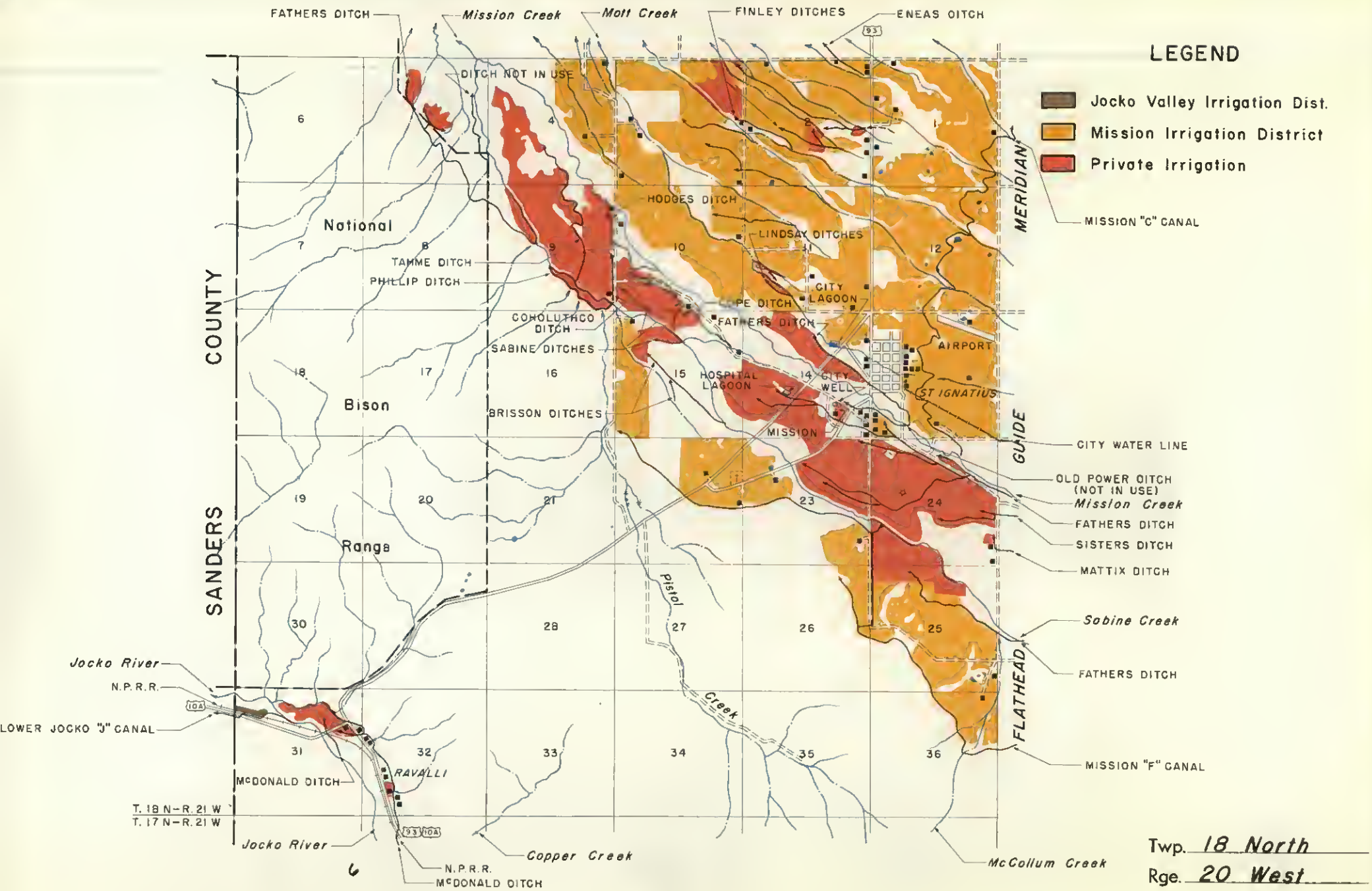


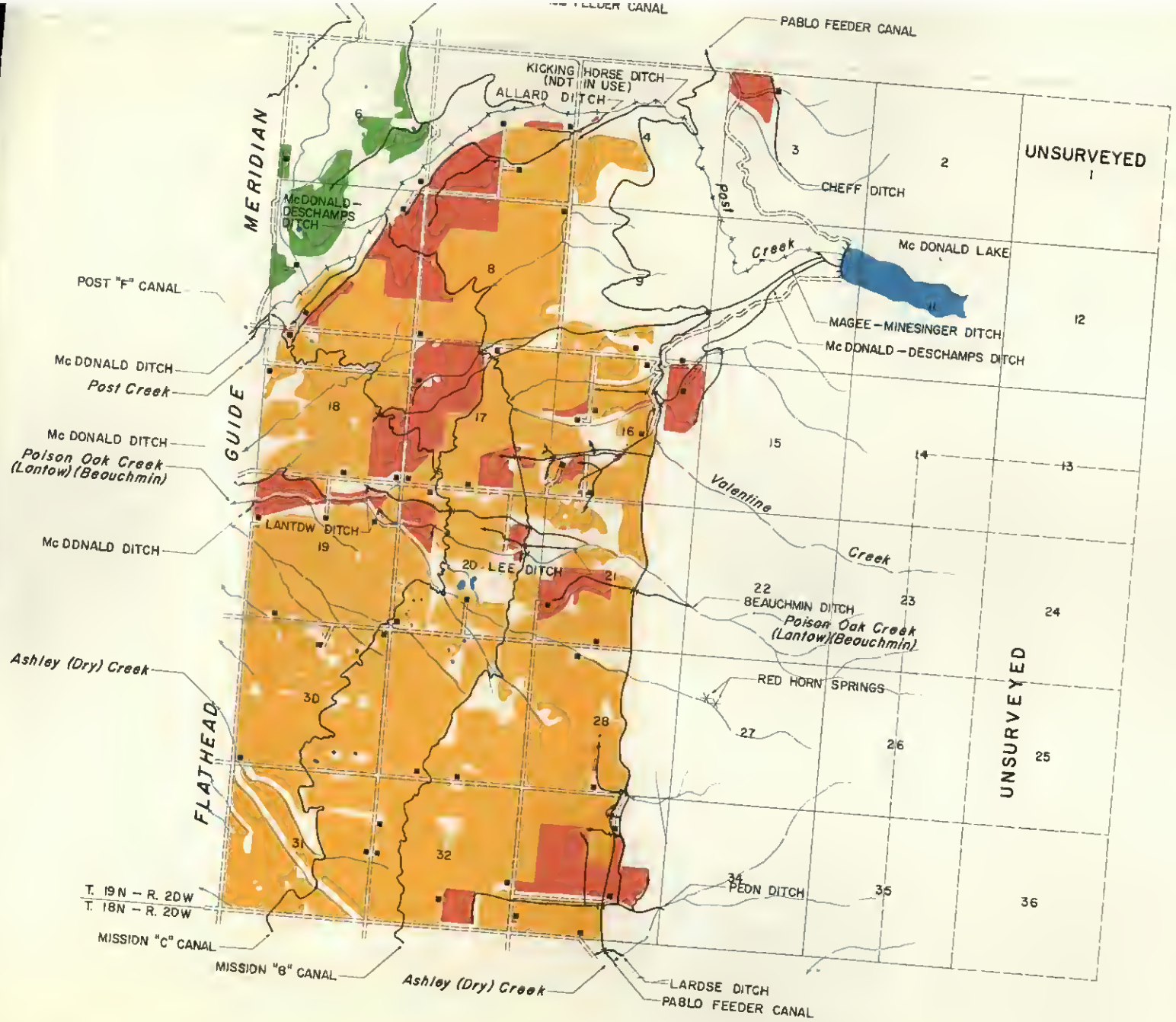
LEGEND

- Missian Irrigation District
- Private Irrigatian

Twp. 18 North

Rge. 19 West


FATHERS DITCH
Mission Creek
Mott Creek
FINLEY DITCHES
ENEAS DITCH
93
DITCH NOT IN USE
LEGEND
Jocko Valley Irrigation Dist.
Mission Irrigation District
Private Irrigation
MERIDIAN
MISSION "C" CANAL
National
HODGES DITCH
LINDSAY DITCHES
TAHME DITCH
PHILLIP DITCH
CITY LAGOON
PE DITCH
COHOLUTHCO DITCH
FATHERS DITCH
AIRPORT
SABINE DITCHES
HOSPITAL LAGOON
CITY WELL
ST IGNATIUS
COUNTY
Bison
BRISSON DITCHES
MISSION
CITY WATER LINE
GUIDE
OLD POWER DITCH (NOT IN USE)
Mission Creek
FATHERS DITCH
SISTERS DITCH
MATTIX DITCH
SANDERS
Ranga
Pistol
Sobine Creek
FATHERS DITCH
Jocko River
N.P.R.R.
10A
LOWER JOCKO "J" CANAL
Creek
FLATHEAD
MISSION "F" CANAL
McDONALD DITCH
RAVALLI
T. 18 N - R. 21 W
T. 17 N - R. 21 W
Jocko River
93
10A
Copper Creek
McCollum Creek
N.P.R.R.
McDONALD DITCH
Twp. 18 North
Rge. 20 West

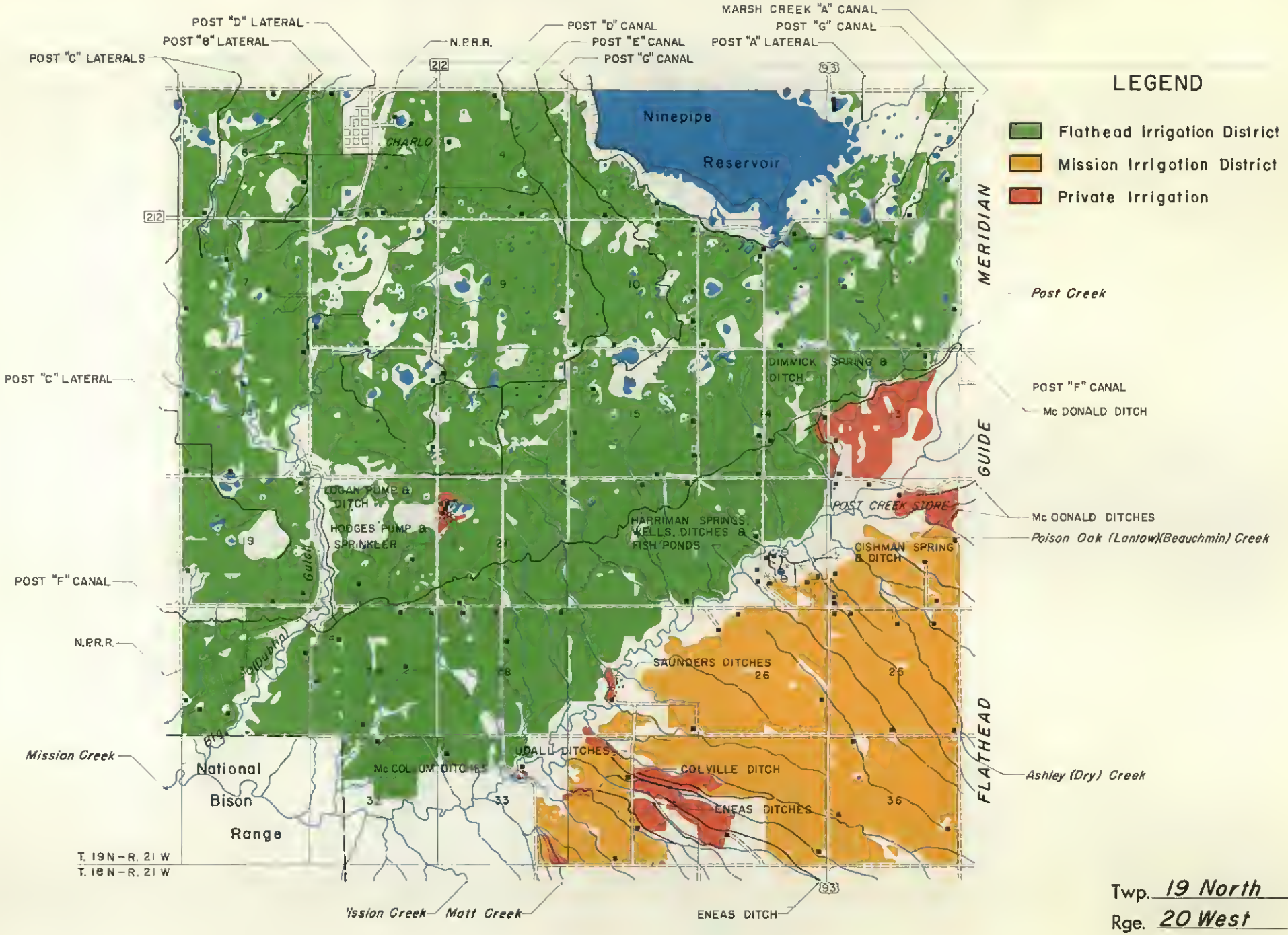


LEGEND

- Flathead Irrigation District
- Mission Irrigation District
- Private Irrigation

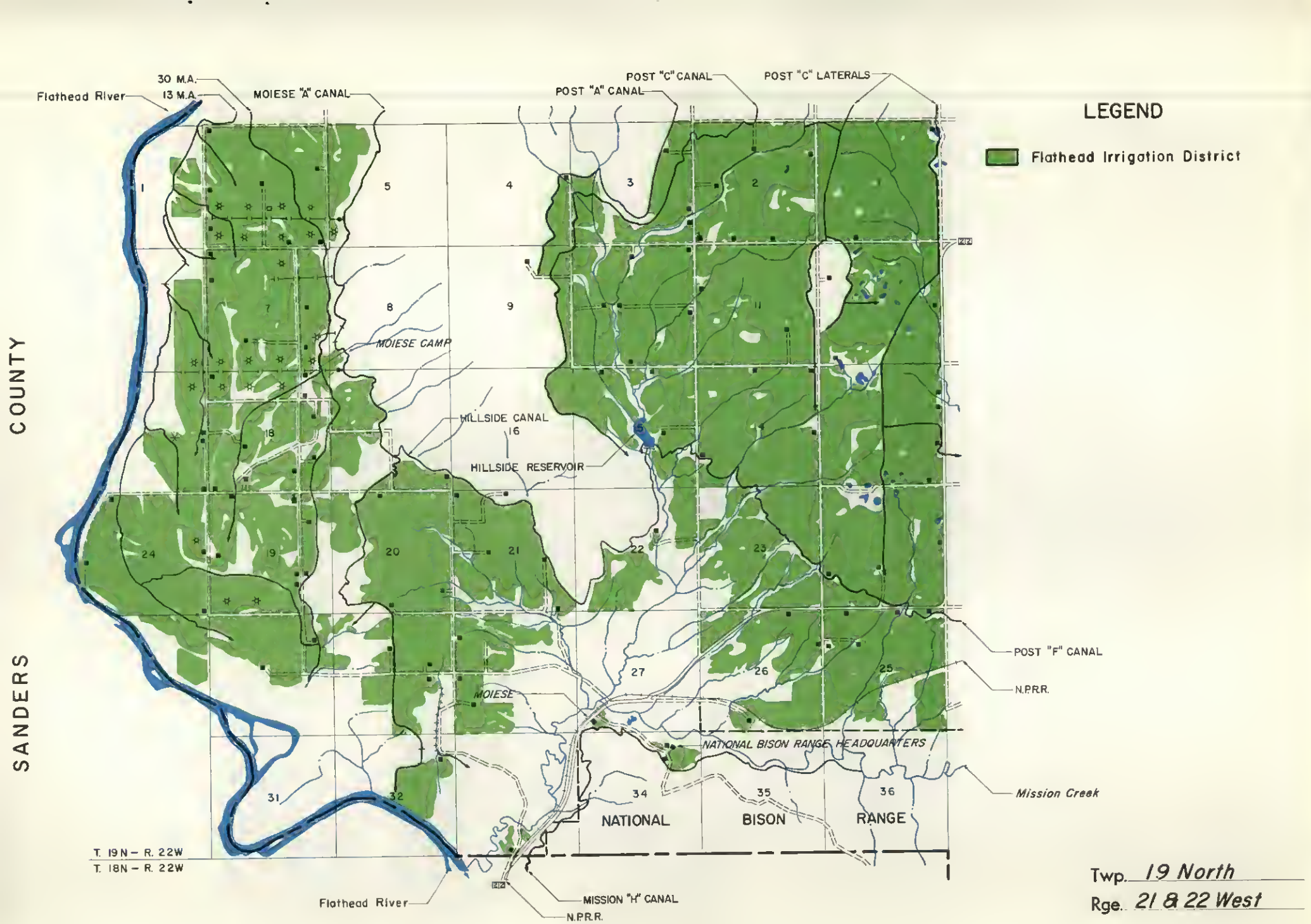
Twp. 19 North

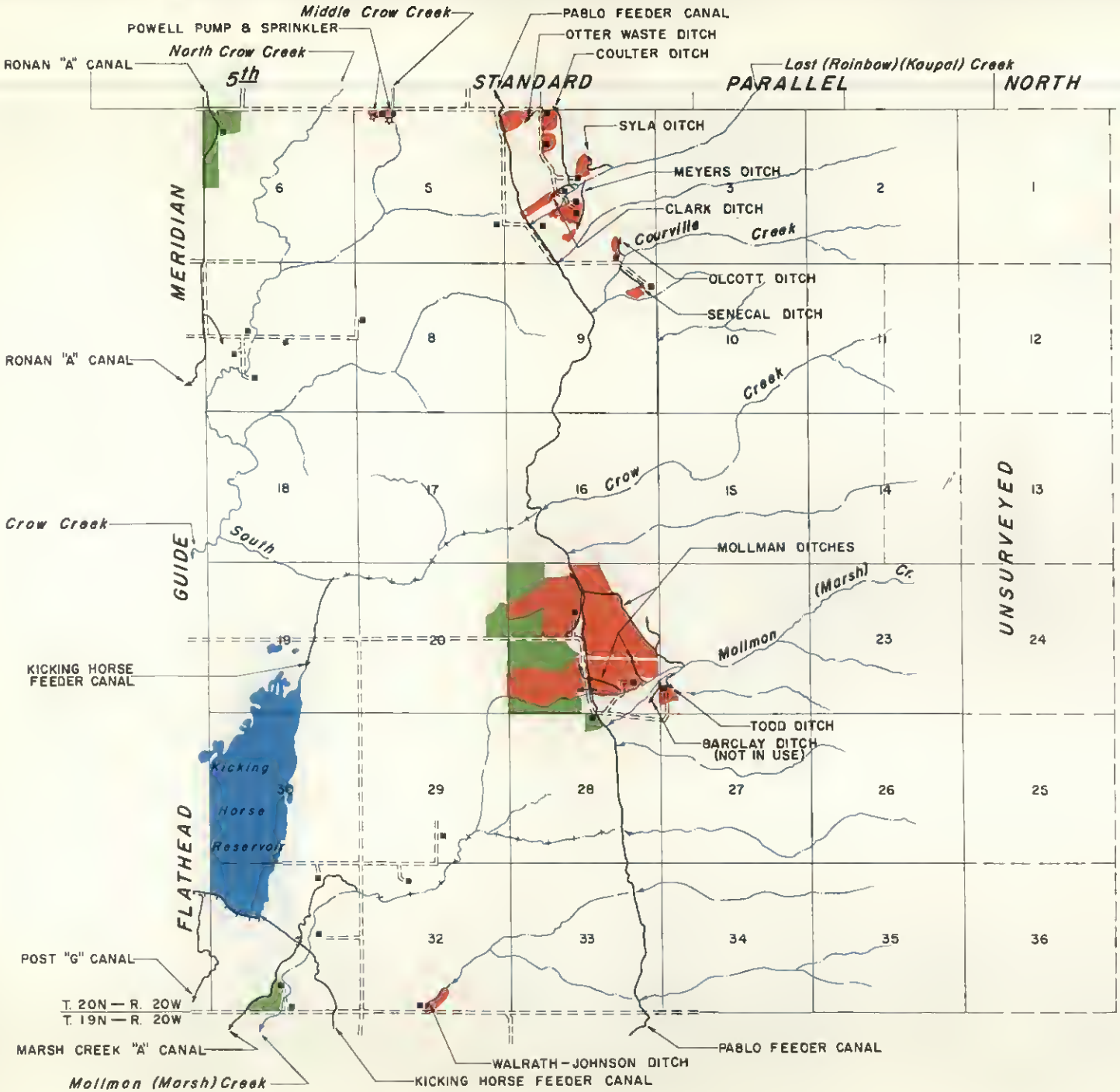
Rge. 19 West



Twp. 19 North

Rge. 20 West


30 M.A.
13 M.A.
Flathead River
MOIESE "A" CANAL
POST "A" CANAL
POST "C" CANAL
POST "C" LATERALS
LEGEND
Flathead Irrigation District
MOIESE CAMP
HILLSIDE CANAL
HILLSIDE RESERVOIR
POST "F" CANAL
N.P.R.R.
MOIESE
NATIONAL BISON RANGE HEADQUARTERS
Mission Creek
NATIONAL
BISON
RANGE
T. 19 N – R. 22W
T. 18N – R. 22W
Flathead River
MISSION "H" CANAL
N.P.R.R.
SANDERS COUNTY
Twp. 19 North
Rge. 21 & 22 West

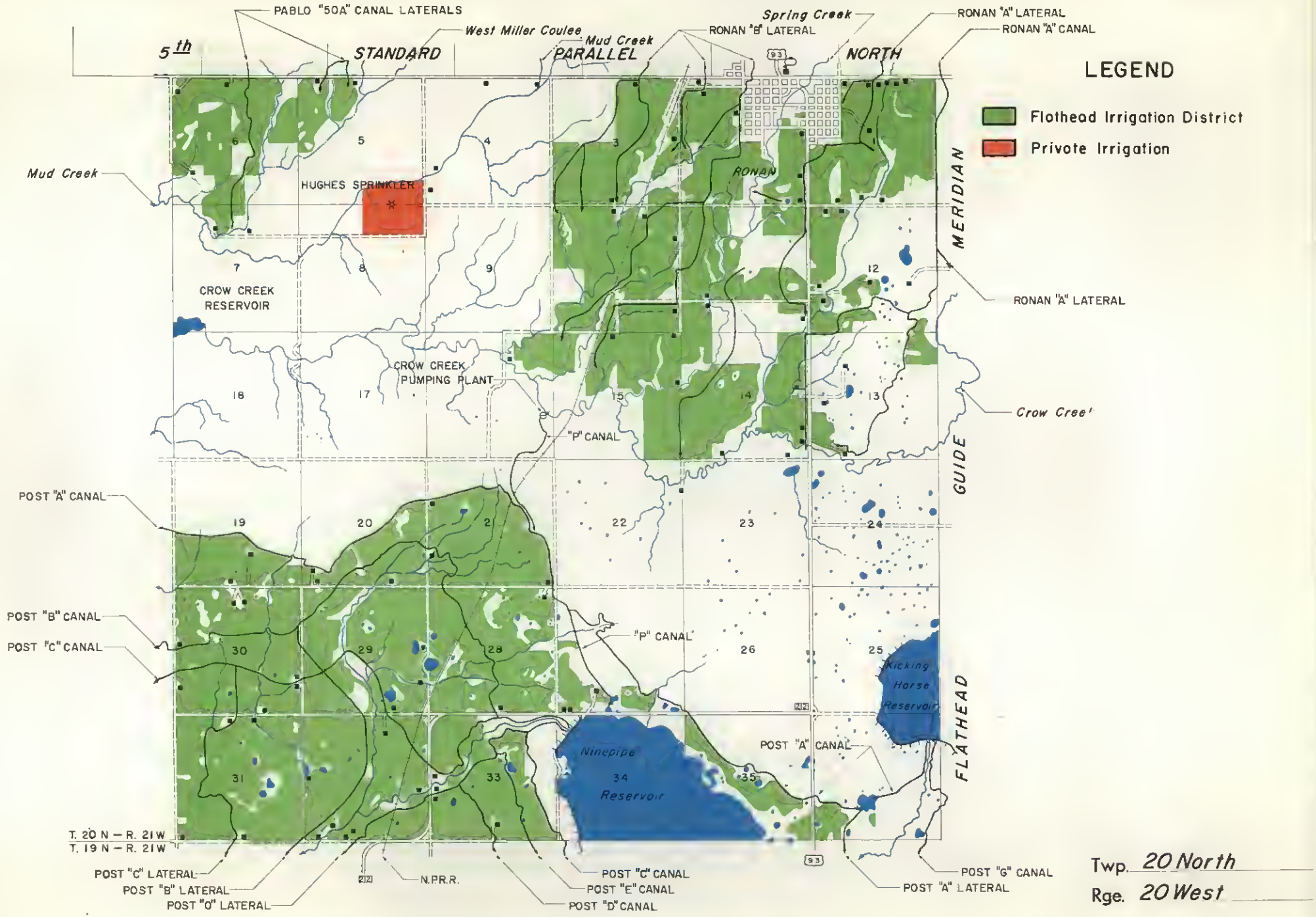


LEGEND

- Flathead Irrigation Project (Flathead District)
- Private Irrigation

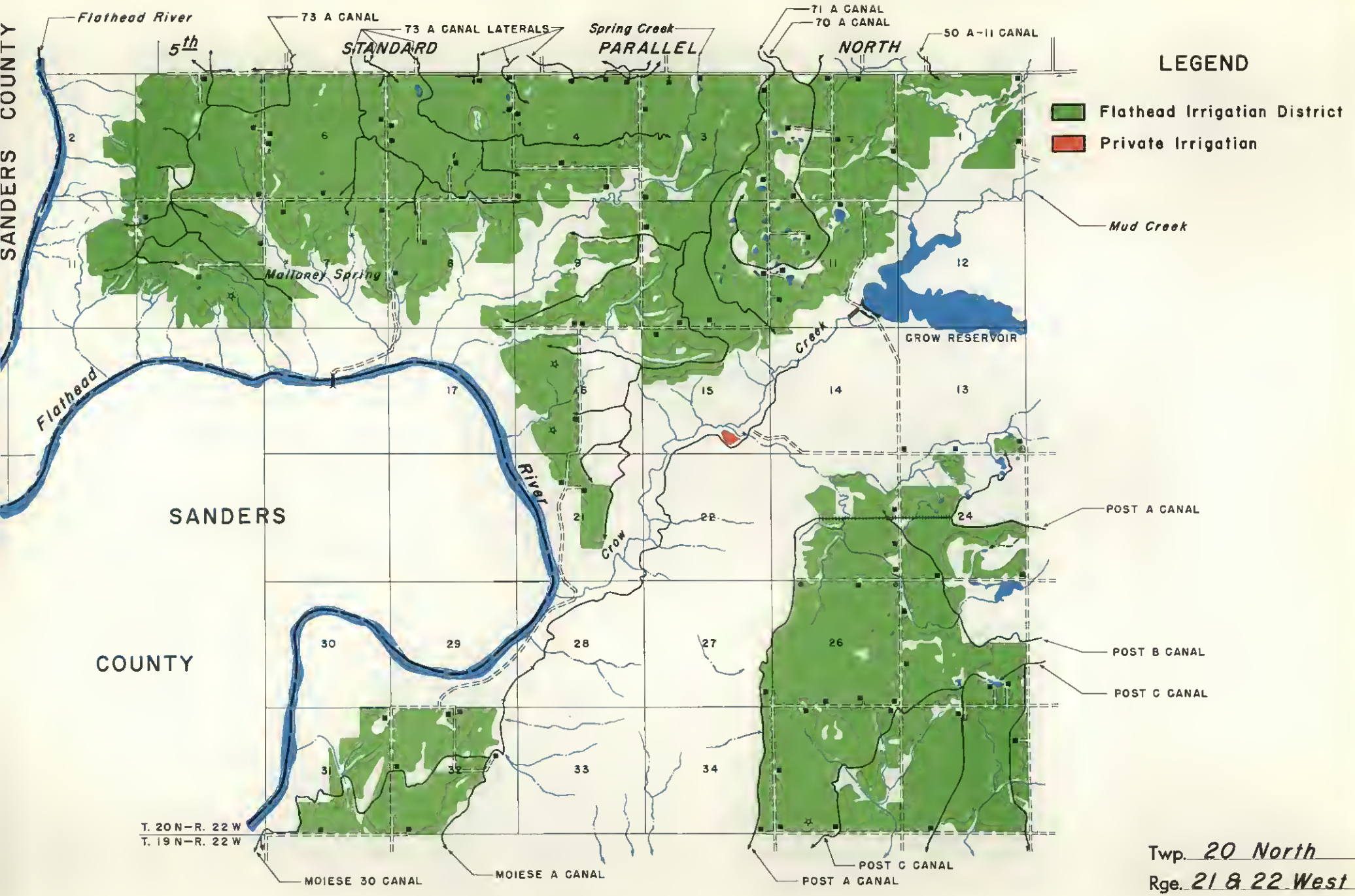
Twp. 20 North

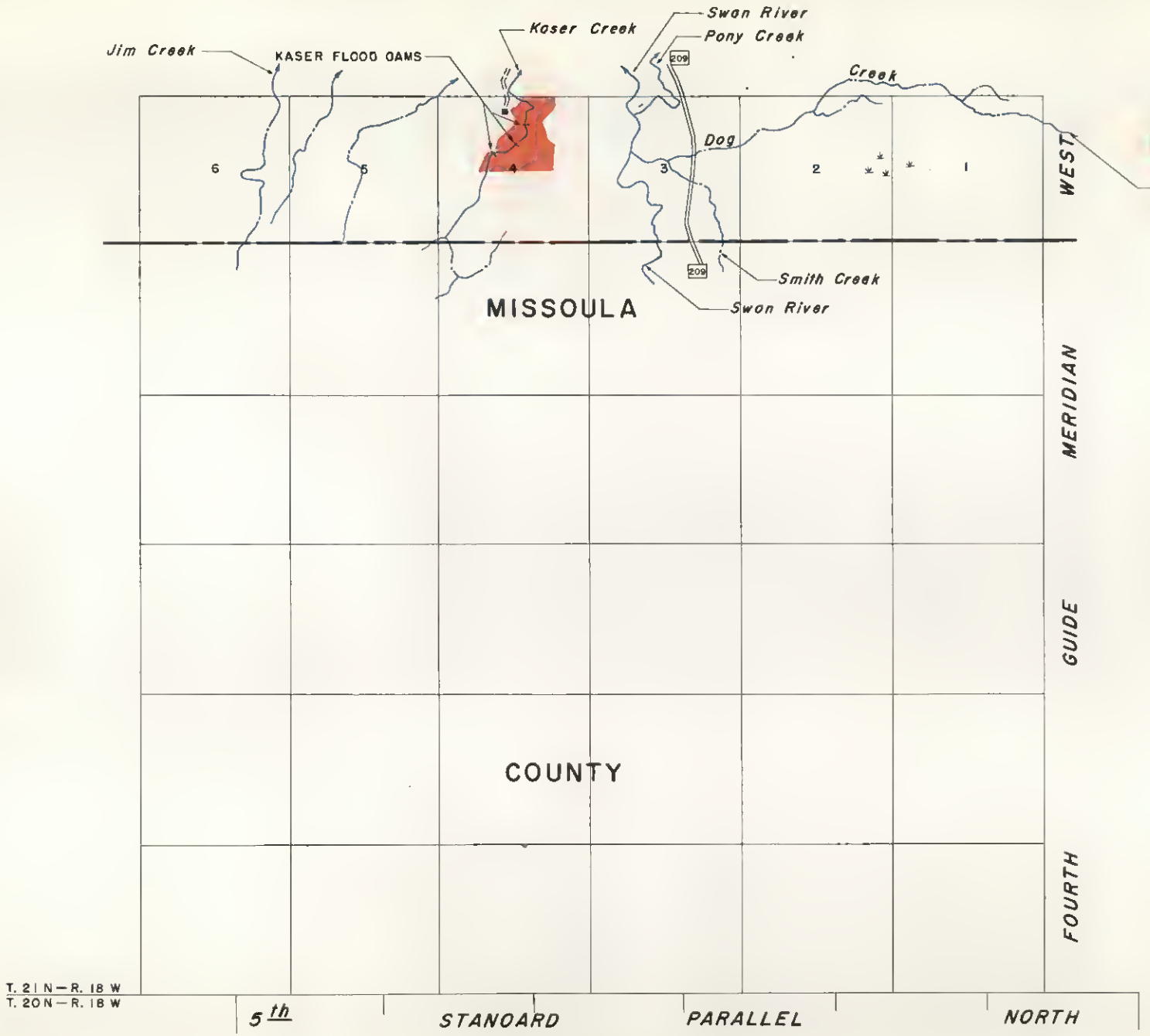
Rge. 19 West



Twp. 20 North

Rge. 20 West


Flathead River
5th
73 A CANAL
73 A CANAL LATERALS
STANDARD
Spring Creek
PARALLEL
71 A CANAL
70 A CANAL
NORTH
50 A-11 CANAL
LEGEND
Flathead Irrigation District
Private Irrigation
Mud Creek
Maltorey Spring
GROW RESERVOIR
Flathead
River
SANDERS
COUNTY
SANDERS COUNTY
Crow Creek
POST A CANAL
POST B CANAL
POST C CANAL
T. 20 N-R. 22 W
T. 19 N-R. 22 W
MOIESE 30 CANAL
MOIESE A CANAL
POST C CANAL
POST A CANAL
Twp. 20 North
Rge. 21 & 22 West

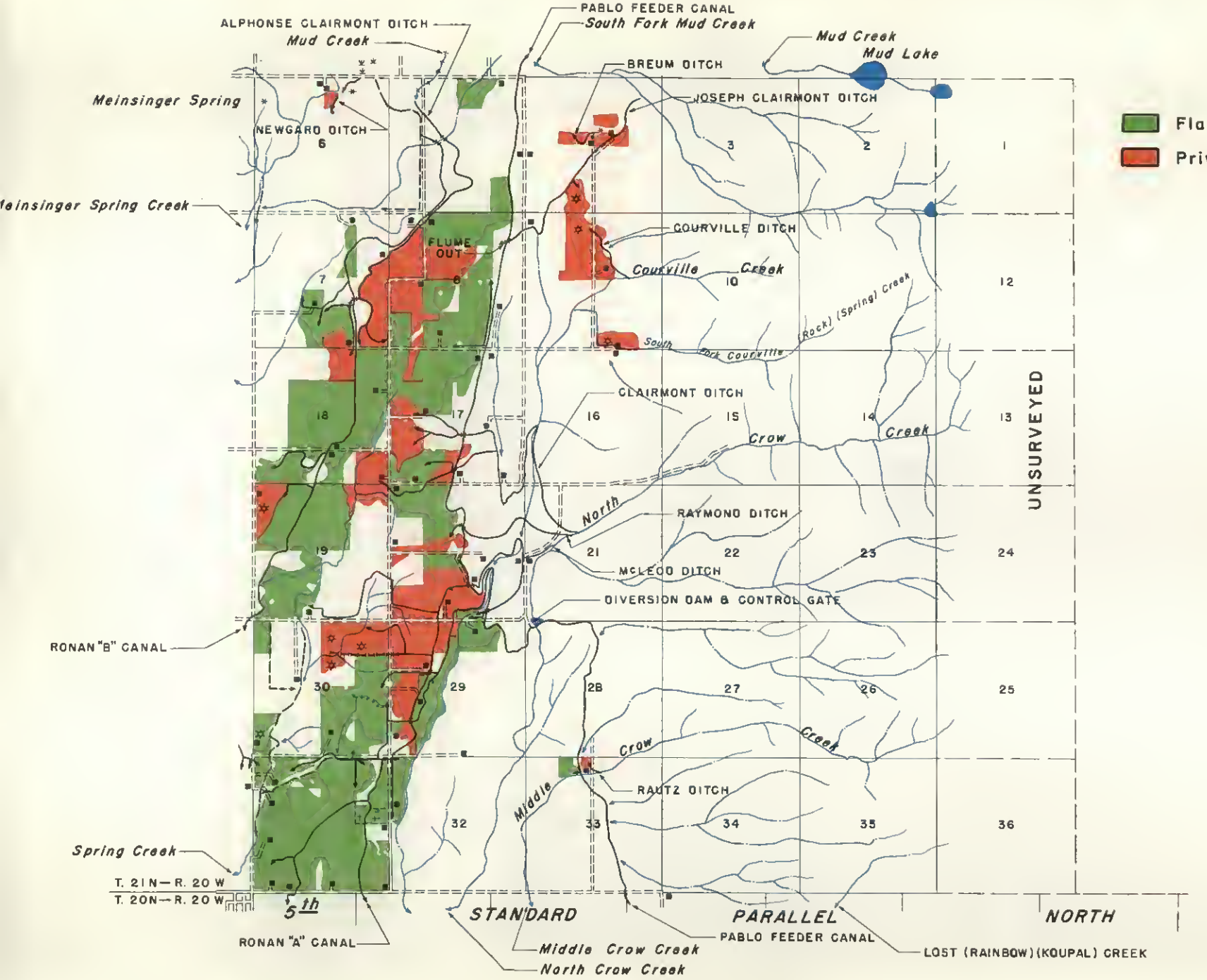


LEGEND

Private Irrigation

Twp. 21 North

Rge. 17 West

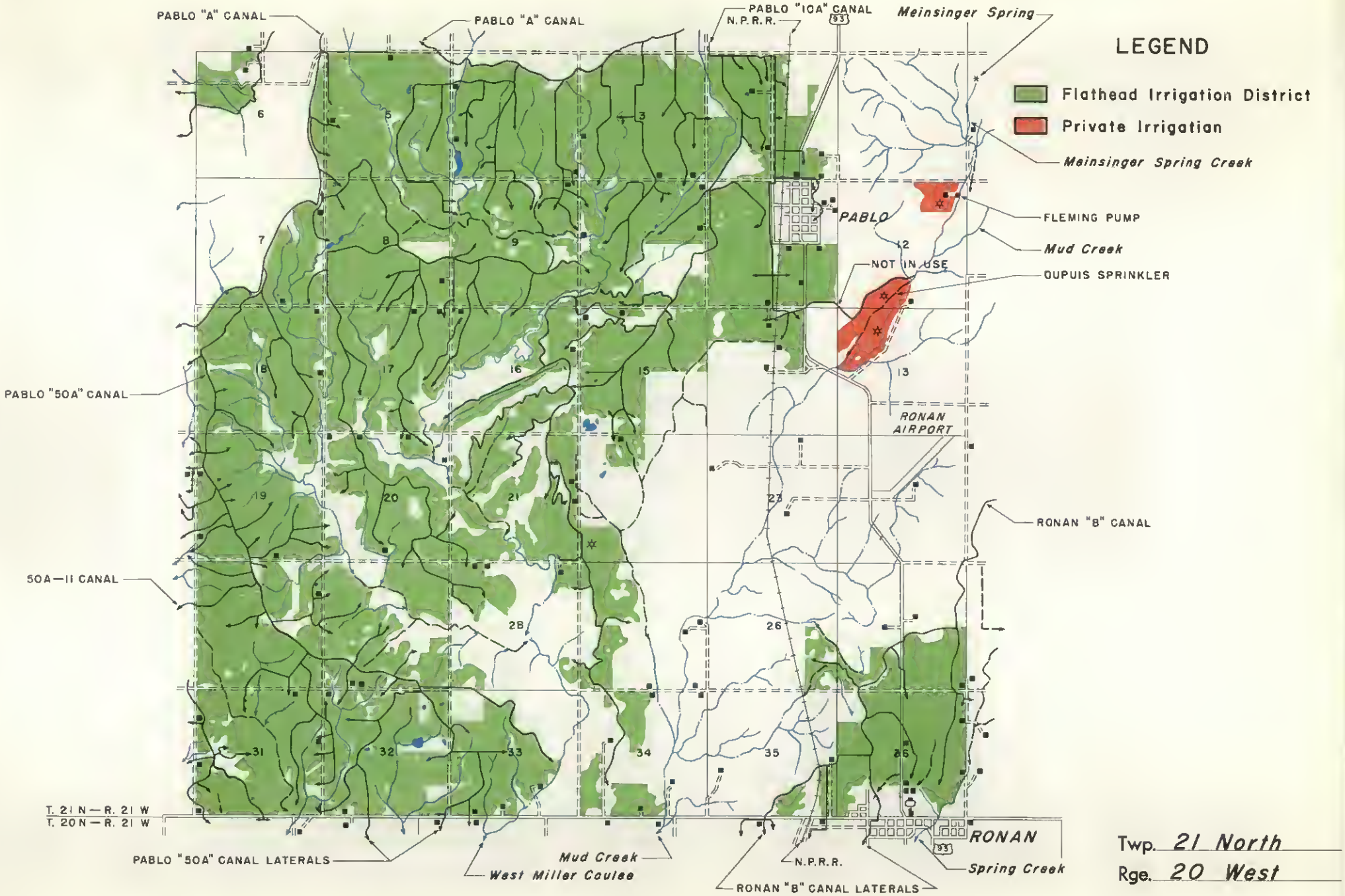


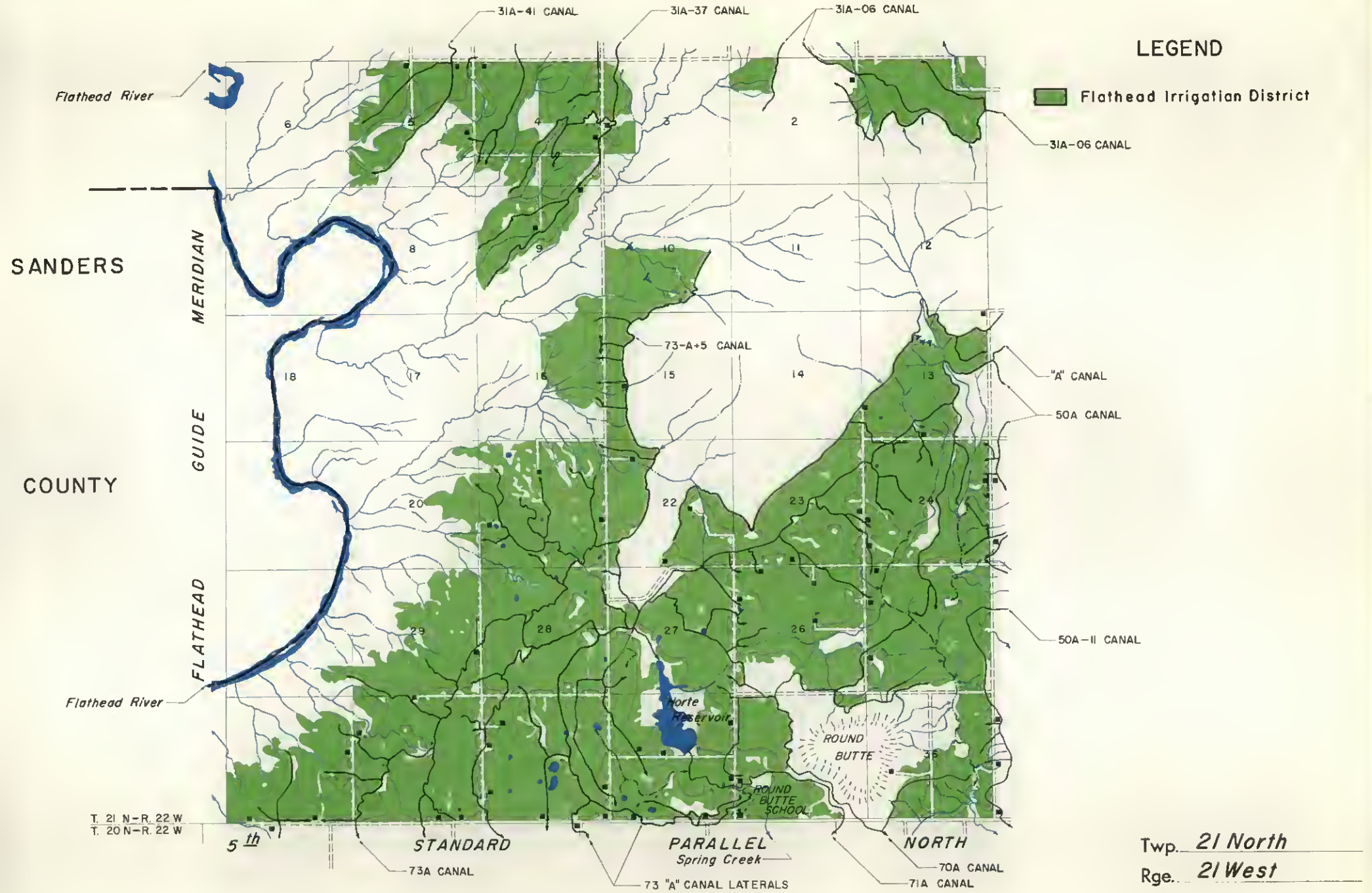
LEGEND

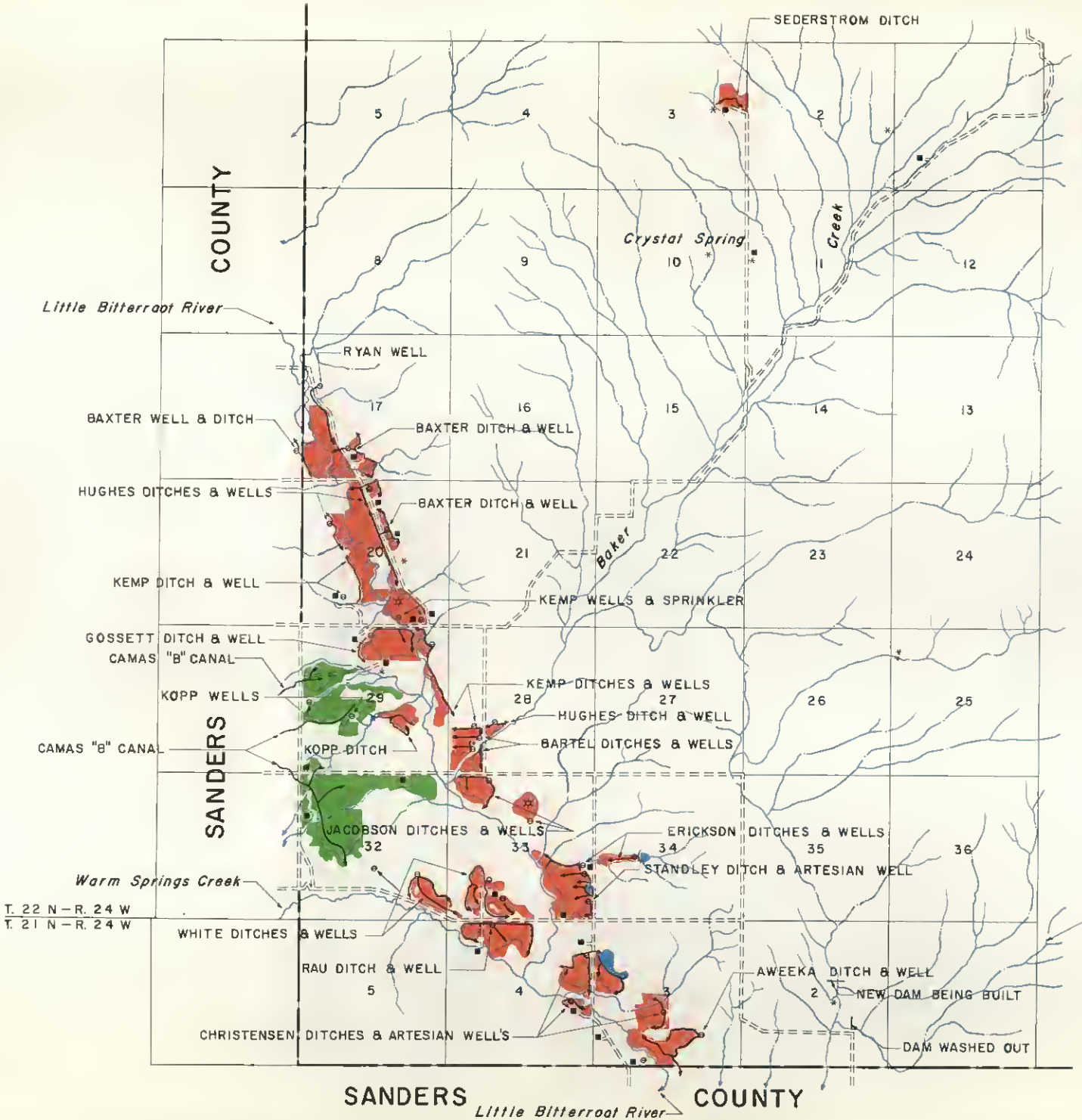
- Flathead Irrigation District
- Private Irrigation

Twp. 21 North

Rge. 19 West


PABLO "A" CANAL
PABLO "A" CANAL
PABLO "10A" CANAL
N.P.R.R.
93
Meinsinger Spring
LEGEND
Flathead Irrigation District
Private Irrigation
Meinsinger Spring Creek
FLEMING PUMP
Mud Creek
OUPUIS SPRINKLER
PABLO
NOT IN USE
PABLO "50A" CANAL
RONAN AIRPORT
RONAN "B" CANAL
50A—11 CANAL
T. 21 N — R. 21 W
T. 20 N — R. 21 W
PABLO "50A" CANAL LATERALS
Mud Creek
West Miller Coulee
N.P.R.R.
RONAN "B" CANAL LATERALS
RONAN
Spring Creek
Twp. 21 North
Rge. 20 West


LEGEND
Flathead Irrigation District
31A-41 CANAL
31A-37 CANAL
31A-06 CANAL
Flathead River
SANDERS
COUNTY
MERIDIAN
GUIDE
FLATHEAD
73-A+5 CANAL
"A" CANAL
50A CANAL
50A-11 CANAL
Flathead River
Horte Reservoir
ROUND BUTTE
ROUND BUTTE SCHOOL
T. 21 N-R. 22 W
T. 20 N-R. 22 W
5th
STANDARD
PARALLEL
NORTH
Spring Creek
73A CANAL
73 "A" CANAL LATERALS
70A CANAL
71A CANAL
Twp. 21 North
Rge. 21 West

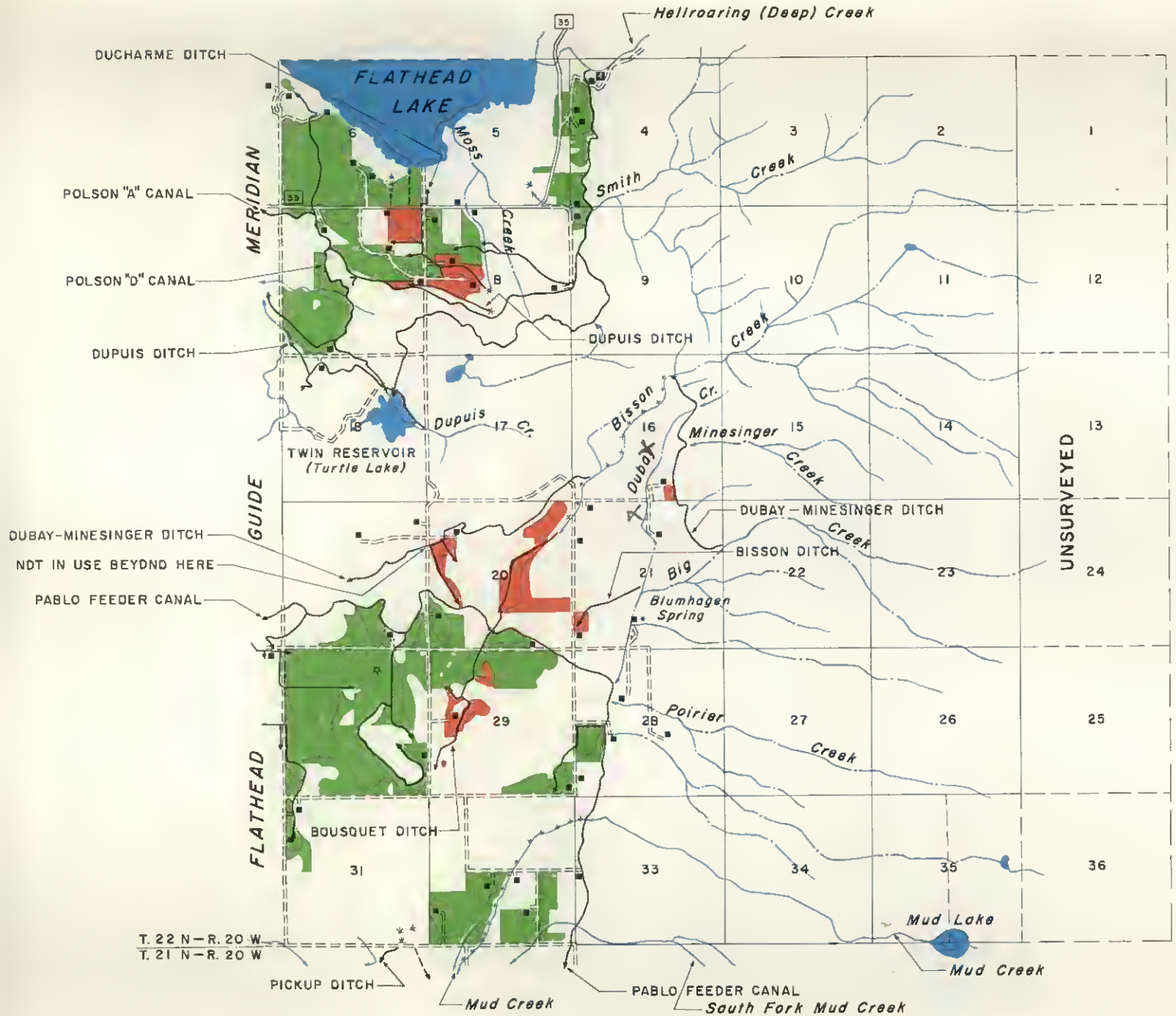


LEGEND

- Flathead Irrigation District
- Private Irrigation

Twp. 21 & 22 North

Rge. 23 West

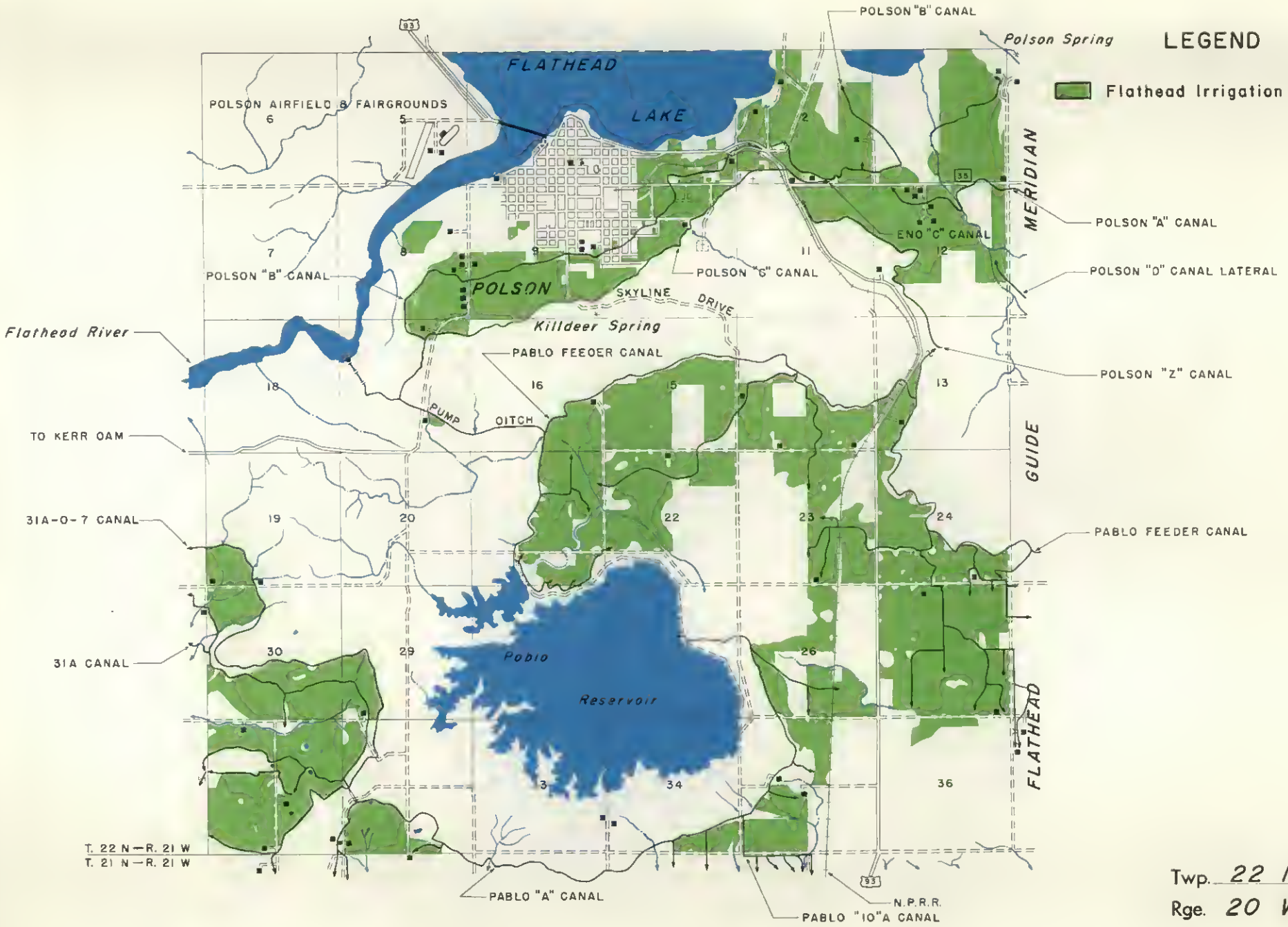


LEGEND

- Flathead Irrigation District
- Private Irrigation

Twp. 22 North

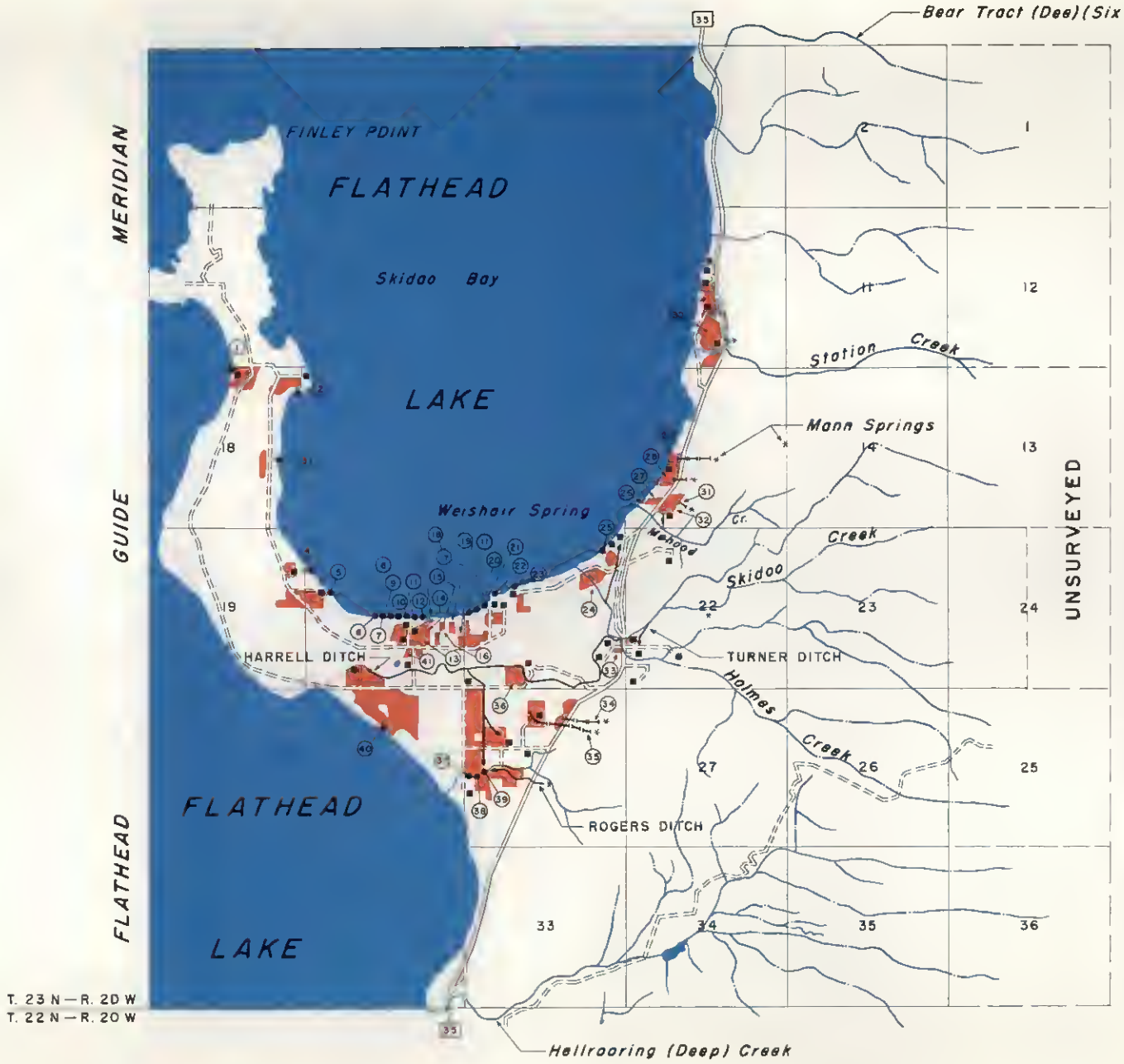
Rge. 19 West



Twp. 22 North

Rge. 20 West


LEGEND
Flathead Irrigation District
MERIDIAN
GUIDE
FLATHEAD
Flathead River
POWER PLANT
KERR DAM
PENSTOCK
Flathead River
BUFFALO CROSSING
Flathead River
TRACE OF DITCH
31A-0-7 CANAL
31A CANAL
VOSS PUMP
END 31A CANAL
31A-14-8 CANAL
T. 22 N—R. 22 W
T. 21 N—R. 22 W
31A-41 CANAL
31A-37 CANAL
31A-06 CANAL
Twp. 22 North
Rge. 21 West



LEGEND

Private Irrigation

1. W. Stoves (Pump)
2. M. Madsen (Pump)
3. M. Hansen (Pump)
4. J. Torgerson (Pump)
5. S. Thurston (Pump)
6. R. Wollin (Pump)
7. B. Burfening (Pump)
8. H. Hart (Pump)
9. A. Culver (Pump)
10. I. Foreman (Pump)
11. R. Lawin (Pump)
12. H. Welch (Pump)
13. G. Lewis
14. L. Heddon
15. E. Cartmell
16. C. Adams
17. D Moser
18. J. Hosking
19. M. Goldston
20. Union Bank & Trust Co.
21. V. Hintzman (Pump)
22. A. Hamilton (Pump)
23. E. Bloke (Pump)
24. E. Klepetko (Pump)
25. L. Sheridan (Pump)
26. M. Leigh (Pump)
27. T. Marlowe (Pump)
28. C. Lindsey (Pipe)
29. M. Mann
30. A. Hoefert, H. Tanglin, J. Richards, R. Benson, M. Anderson (Pipe)
31. W. Lane
32. V. Vanhee (Pipe)
33. F. Leinard
34. G. Scott — W. McNeil (Pipe)
35. O. Buchman (Pipe)
36. L. Wise (Pump)
37. G. Rogers (Pump)
38. B. Gilman (Pump)
39. R Grimm (Pump)
40. G. Herzel (Pump)
41. L. Heddon (Pump)

Note: ☼ All Above Hove Sprinkler Systems

Twp. 23 North

Rge. 19 West

LEGEND

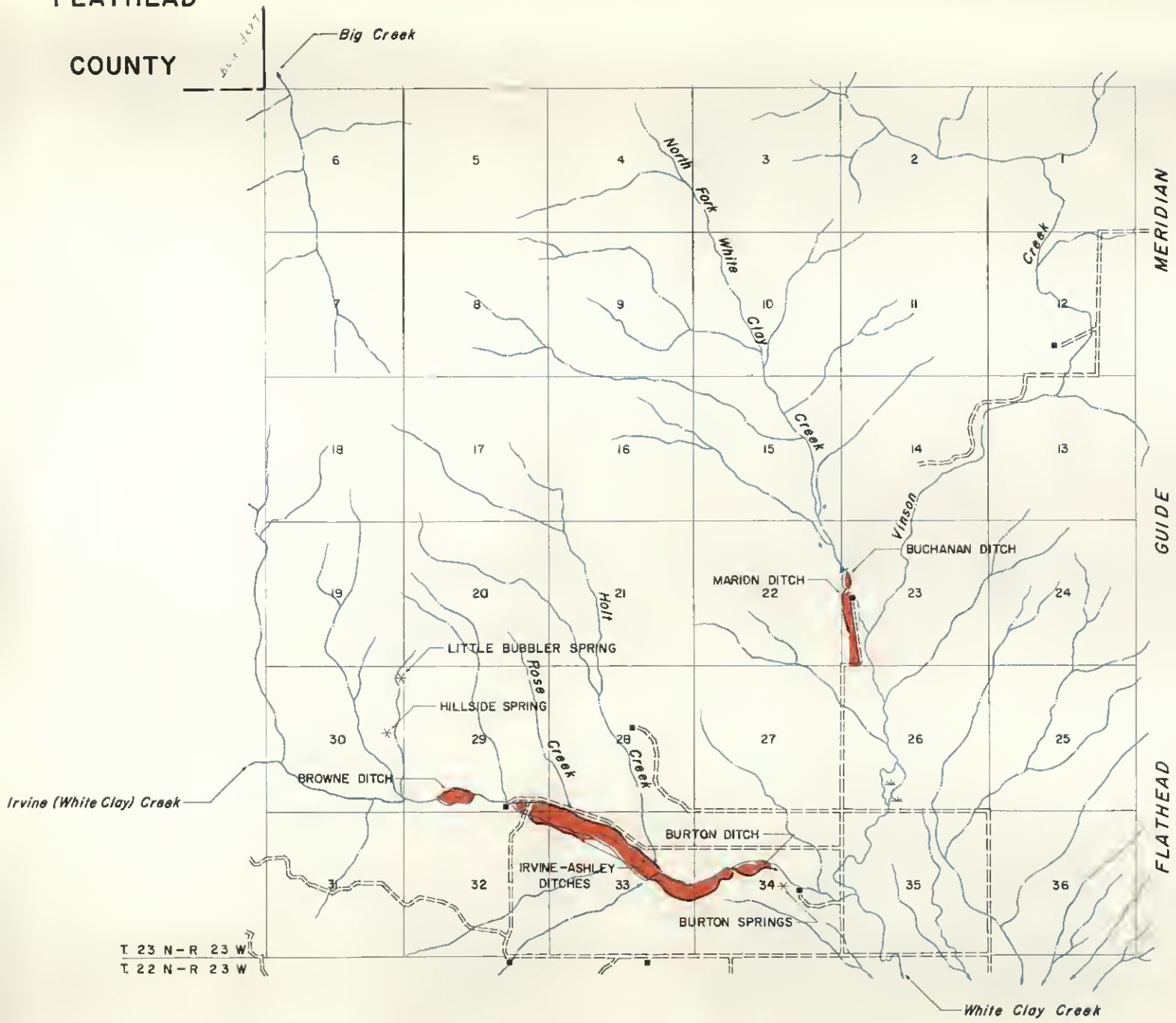
Private Irrigation

Twp. 23 North

Rge. 20 West

FLATHEAD

COUNTY

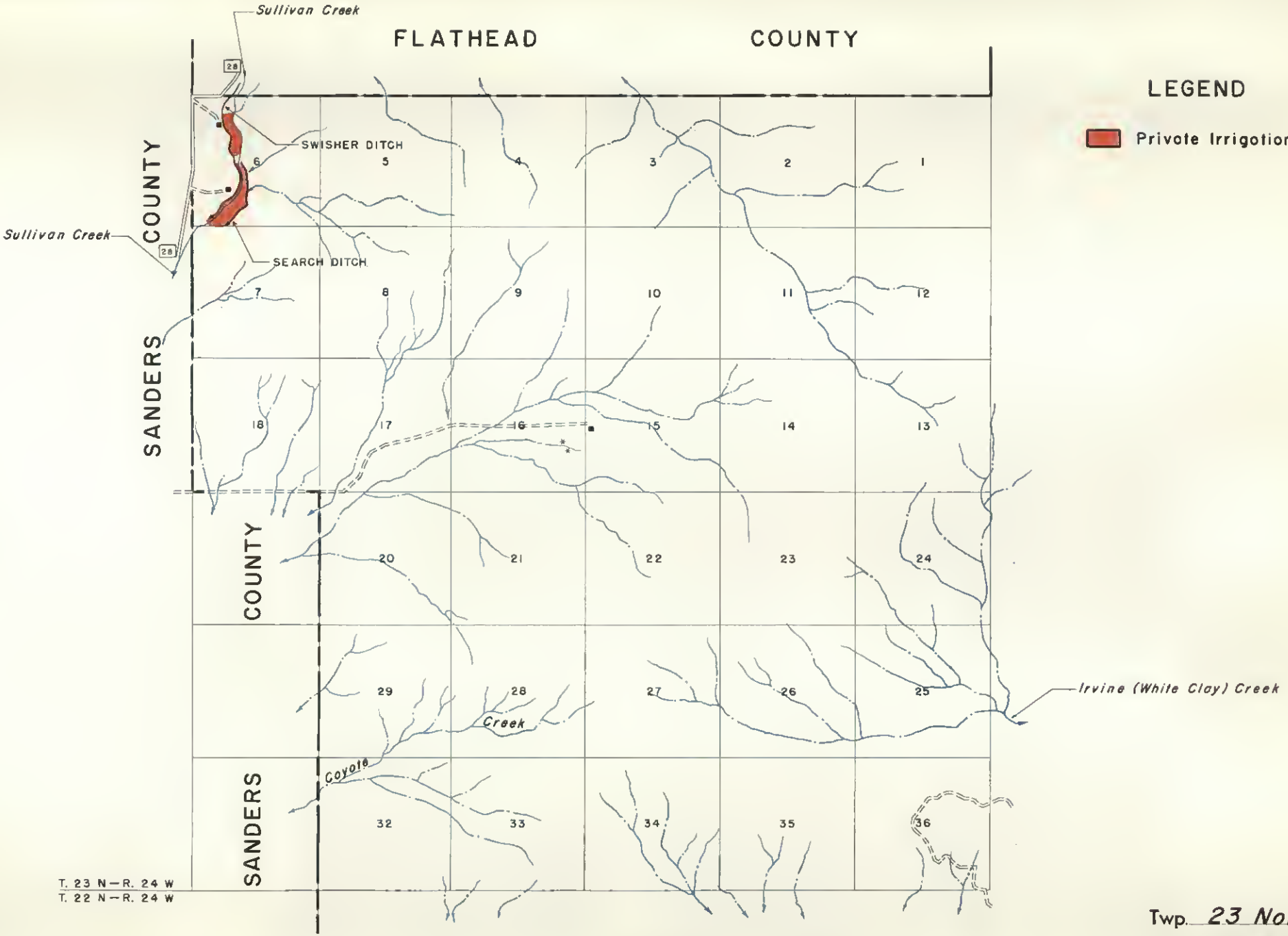


LEGEND

Private Irrigation

Twp. 23 North

Rge. 22 West


Sullivan Creek
FLATHEAD
COUNTY
28
SWISHER DITCH
6
5
4
3
2
1
Sullivan Creek
28
SEARCH DITCH
SANDERS
COUNTY
7
8
9
10
11
12
18
17
16
15
14
13
COUNTY
20
21
22
23
24
29
28
27
26
25
Irvine (White Clay) Creek
Creek
Coyote
SANDERS
32
33
34
35
36
T. 23 N—R. 24 W
T. 22 N—R. 24 W
LEGEND
Private Irrigation
Twp. 23 North
Rge. 23 West

LEGEND

Private Irrigation

Twp. 24 North

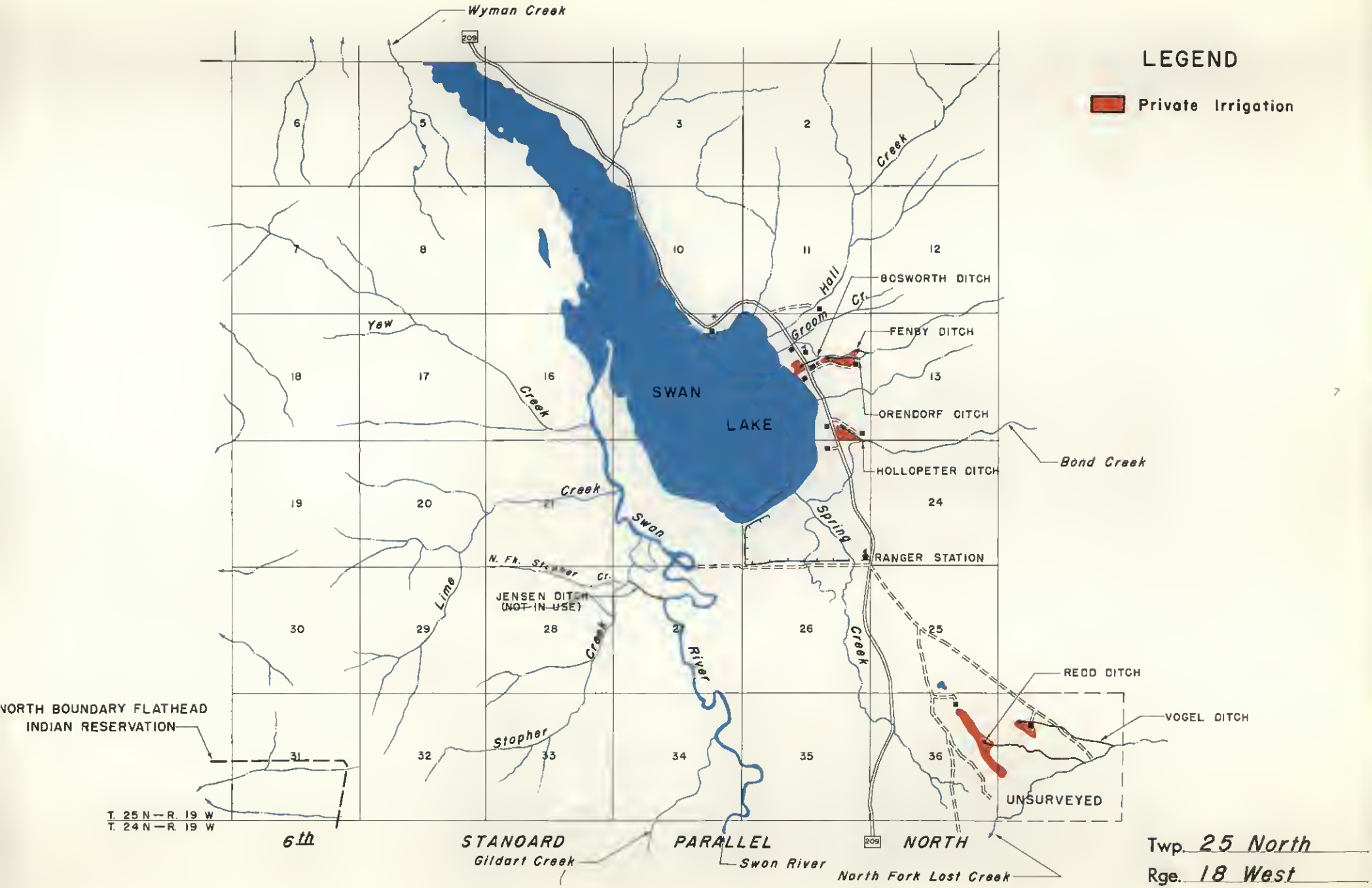
Rge. 19 West

LEGEND

Private Irrigation

Twp. 24 North

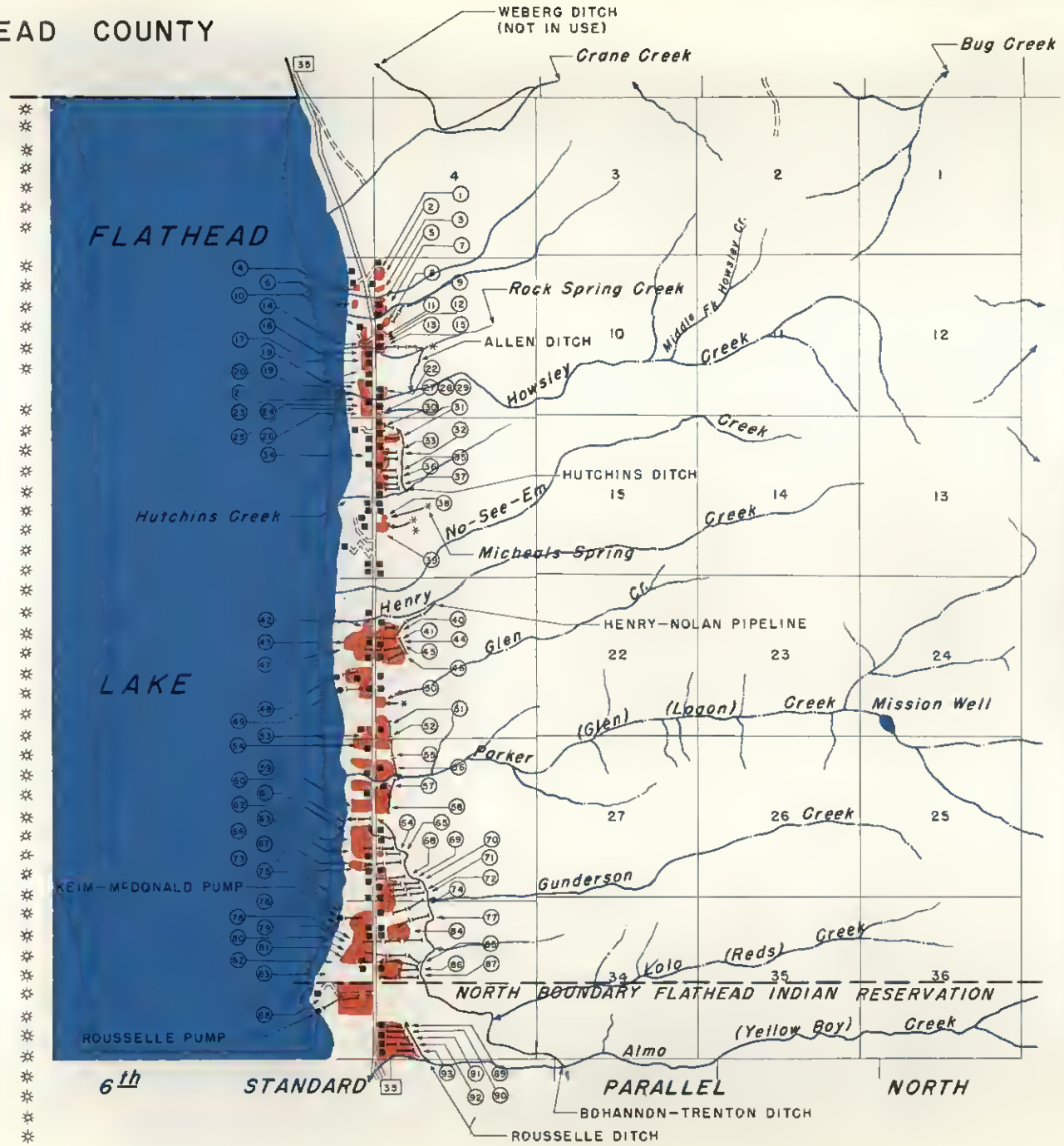
Rge. 21 West



Twp. 25 North

Rge. 18 West

FLATHEAD COUNTY



1. Perry Beebe Pipeline ✲
2. Adams & Gregoire Pipeline ✲
3. Lyons & Greenup Pipeline ✲
4. Henry Vanderpas Pipeline ✲
5. Harry Thompson Pipeline ✲
6. Ben Stranahan Pipeline ✲
7. Mabel Tesky Pipeline ✲
8. Geo. Bruffey & — E. Hinderman Pipeline ✲
9. Pruden Felton Pipeline ✲
10. Robert Stacking Pipeline ✲
11. Maude Larson Pipeline ✲
12. A.V. Lake Pipeline ✲
13. Allen Seymour Pipeline ✲
14. Denton Deedan
15. Heber Magnuson Pipeline ✲
16. W.S. Sanders Pipeline ✲
17. N.E. Solander Pipeline ✲
18. Ronald Dundas Pipeline ✲
19. Marjorie McKenzie Pipeline ✲
20. Henry Larson Pipeline ✲
21. Sylvia Johnson Pipeline ✲
22. G.C. Allen Pipeline ✲
23. Louis Ratterman ✲
24. J.G. Webber Pipeline ✲
25. Jerome Padbielski Pipeline ✲
26. Marshall McConnell Pipeline ✲
27. Henry D. Brown Pipeline ✲
28. I.H. Rodgers Pipeline ✲
29. L. Diestler Pipeline ✲
30. Chris Evenson ✲
31. Adam Bowman ✲
32. Eby Bowman ✲
33. Paul Beebe ✲
34. Leonard Ehlang ✲
35. Ernest Townsley ✲
36. Harold Orr ✲
37. Walter Jennison ✲
38. Harold Olson Pipeline ✲
39. C.F. Shade Pipeline ✲
40. Floyd Walker Pipeline ✲
41. Ione Shidler Pipeline ✲
42. C. Dixon Pipeline ✲
43. L. Larson Pipeline ✲
44. B. Baerner Pipeline ✲
45. Nat Boyd Pipeline ✲
46. E. Nalon Pipeline ✲
47. Jim Browne Pipeline ✲
48. D. Milliren Pipeline, Pump ✲
49. J. McIntire Pipeline, Pump ✲
50. J. Hubbard Pipeline ✲
51. Fred Larson Jr. Pipeline ✲

LEGEND

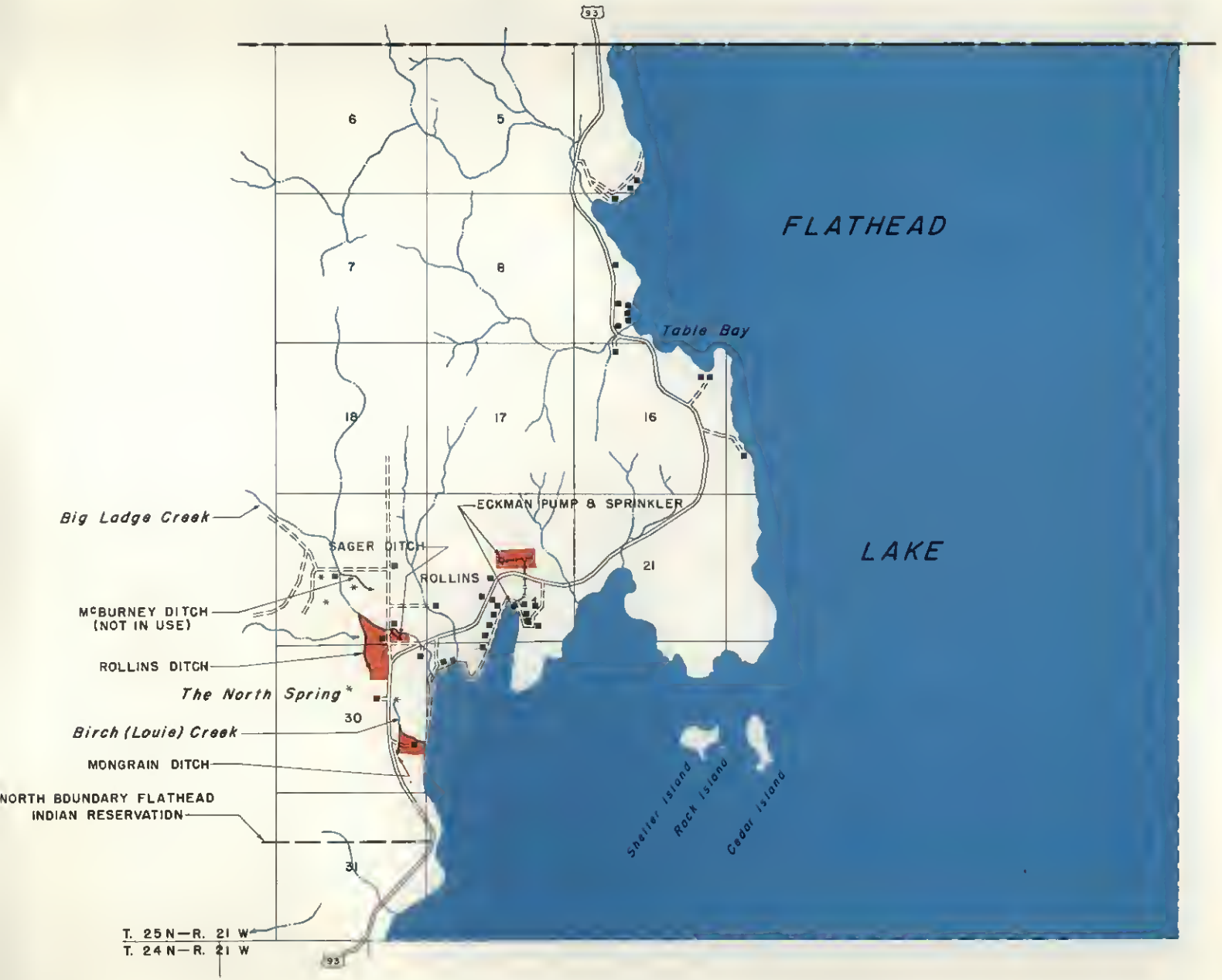
Private Irrigation

52. Maude Bolton Pipeline ✲
53. Cecil Miller Pipeline ✲
54. John Malone Pipeline ✲
55. E.J. Ober Pipeline ✲
56. Mary Orser Pipeline ✲
57. Nael Dalven Pipeline ✲
58. B.J. Krogstad Pipeline ✲
59. T. Moore Jr. Pipeline ✲
60. R. Wilder McDonald ✲
61. Harriet Rabbin
62. Rudy Rabbin
63. Albert Hixon ✲
64. Iva Darnall ✲
65. Ernest Allen ✲
66. George Britton ✲
67. Covington B Butler ✲
68. John Olsen ✲
69. Linda Nixon ✲
70. Fred Kelso ✲
71. John Shields ✲
72. Swan Swanson ✲
73. Leonard Kahlmier ✲
74. Donaven Ragnlie ✲
75. Chas. Keim Pipeline, Pump ✲
76. McDonald Pipeline, Pump ✲
77. Geo. Gilpin ✲
78. T.R. Willsan ✲
79. Anna Walchi ✲
80. Anna Starfa ✲
81. Darthy Robbin ✲
82. Edna Rabbin ✲
83. Delia Dickerson ✲
84. L. Ratterman & E. Lake ✲
85. Thomas Cahill ✲
86. Carl Carlsan ✲
87. William Bolton ✲
88. Rousselle & Vagt Pipeline, Pump ✲
89. Mary E. Sullivon
90. Dorothy Schermerham ✲
91. Robert Elliott ✲
92. Leonard Tiensvoid ✲
93. John W. DeYoung ✲

Twp. 25 North

Rge. 19 West

FLATHEAD COUNTY



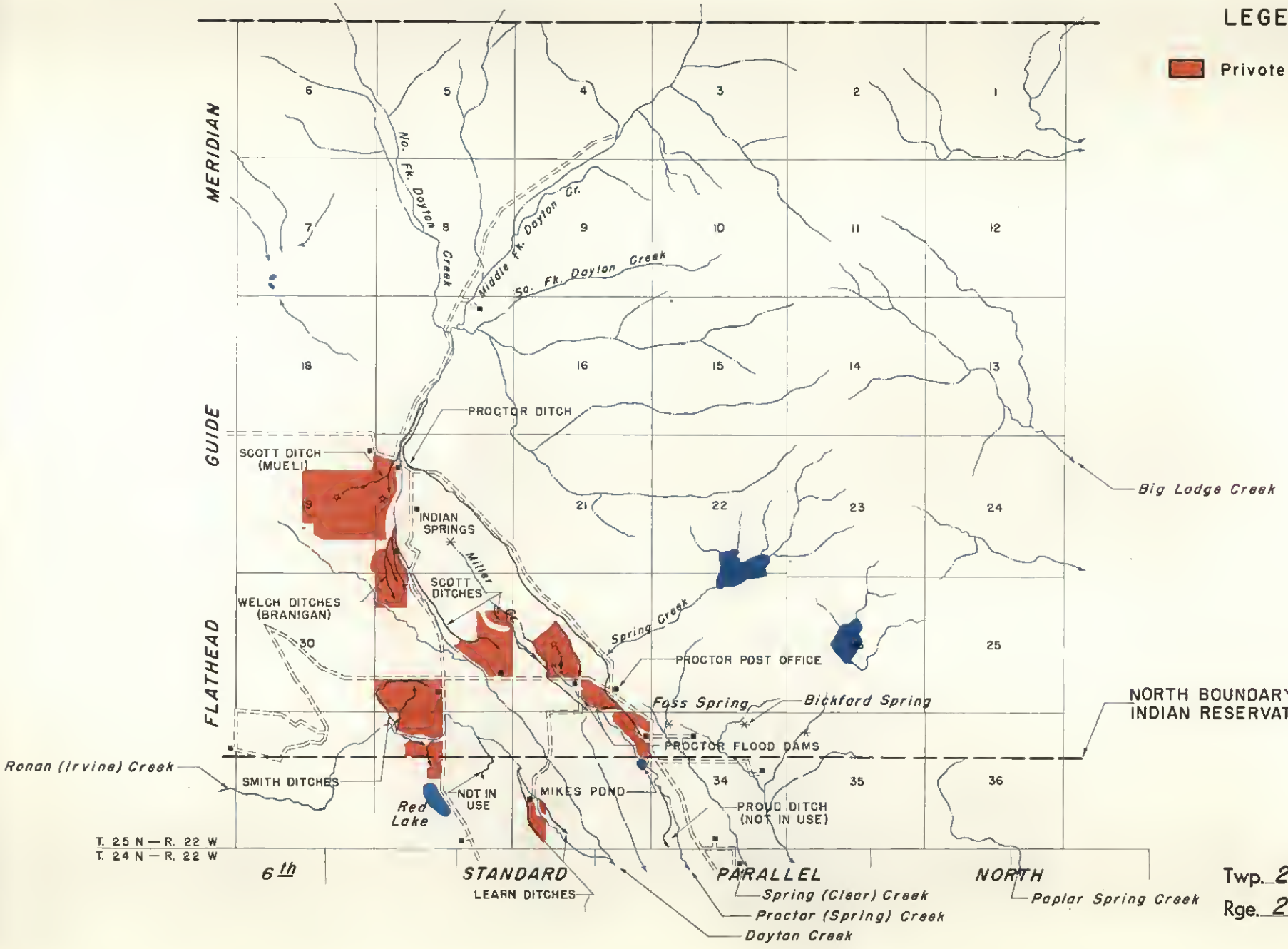
LEGEND

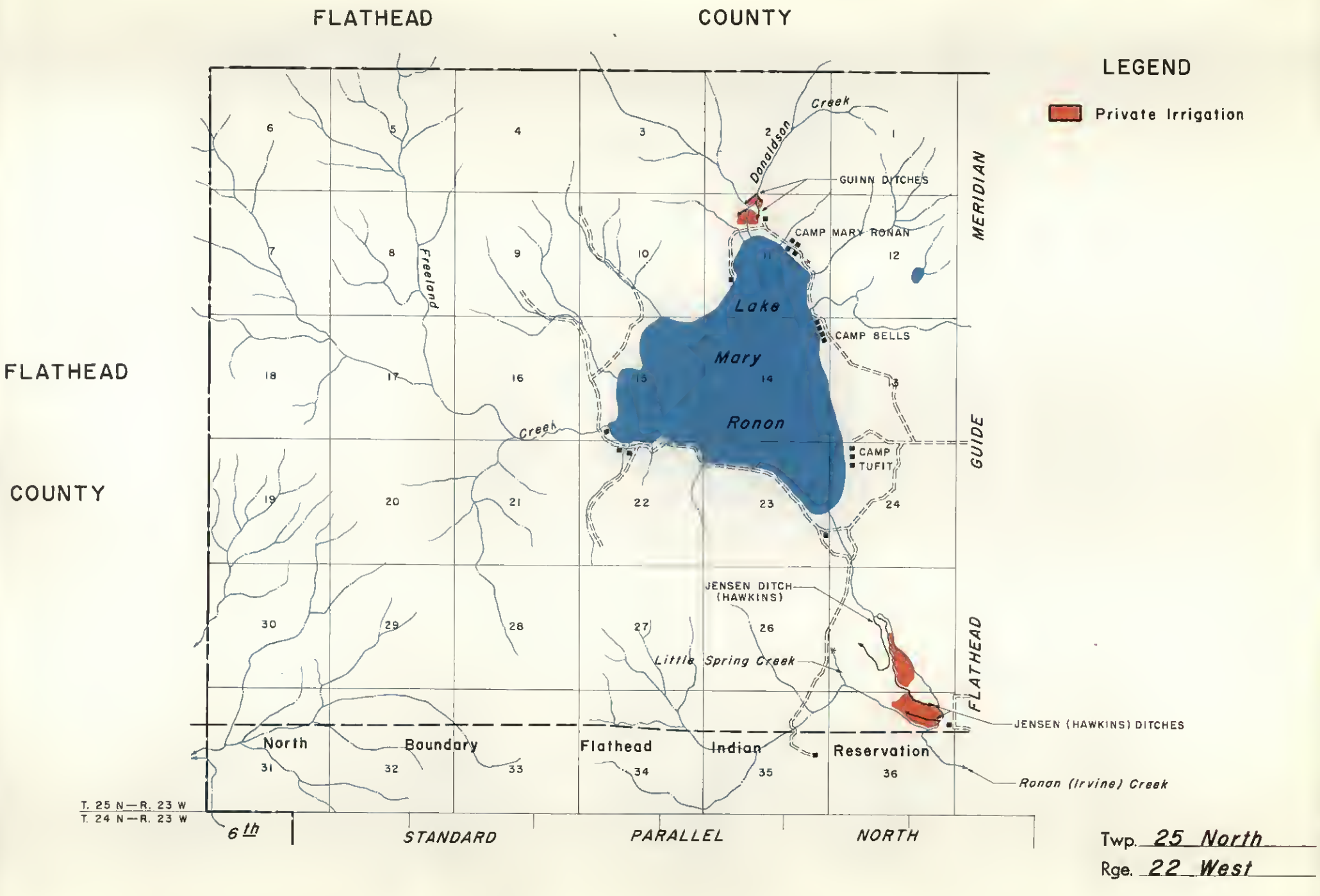
Private Irrigation

Twp. 25 North

Rge. 20 West

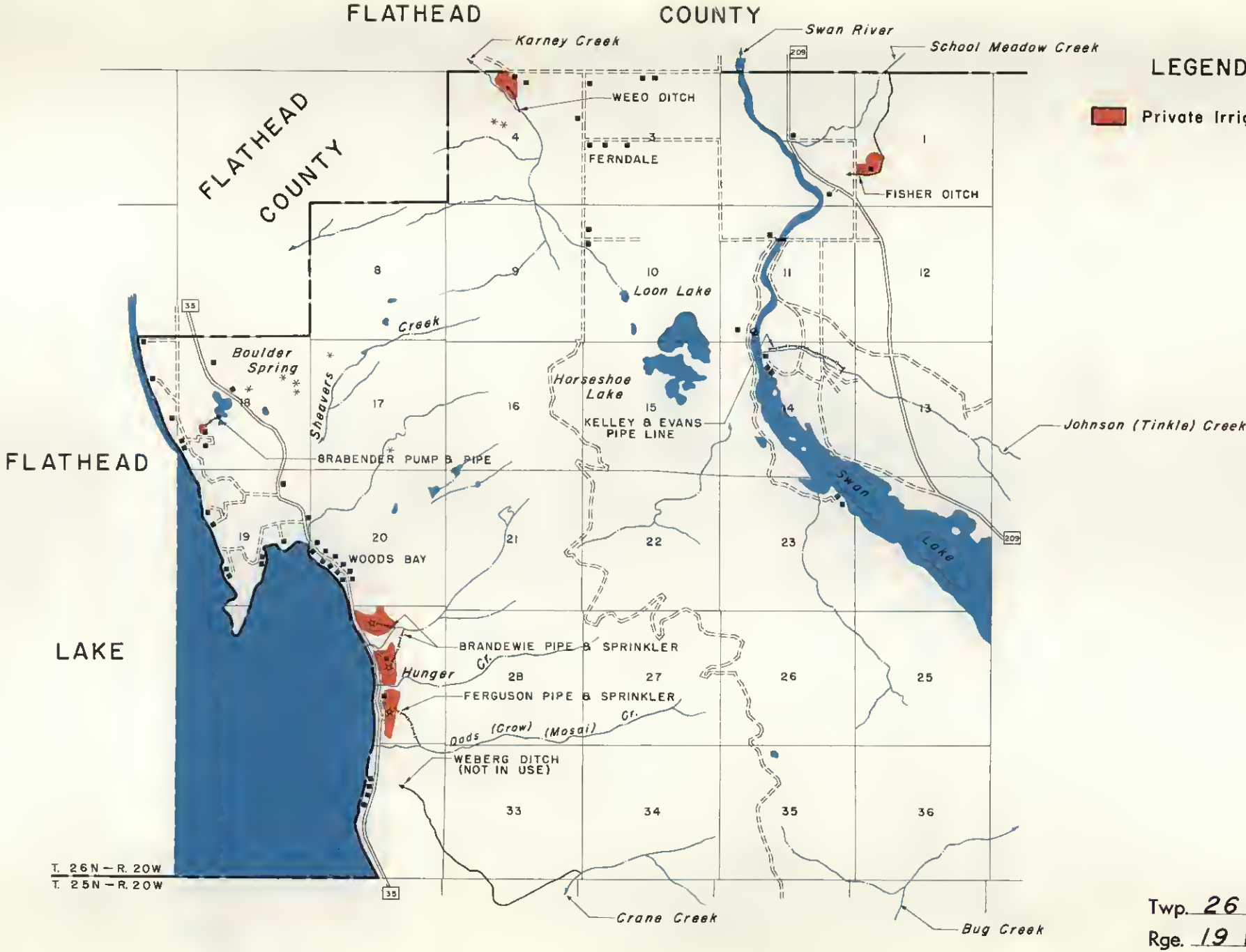
FLATHEAD COUNTY





Twp. 25 North

Rge. 22 West



Twp. 26 North
Rge. 19 West