

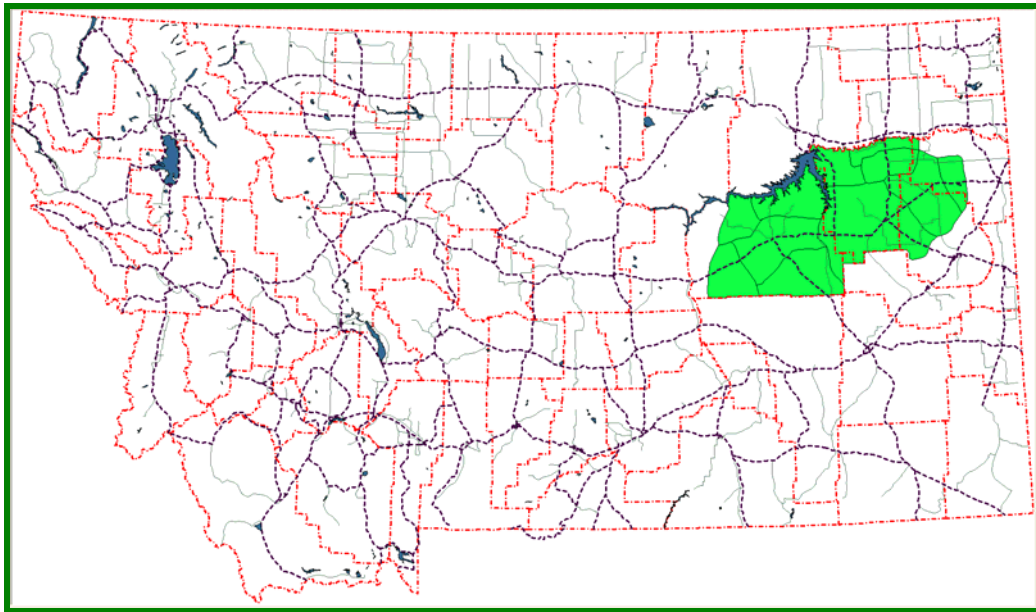
# CHAPTER 1 INTRODUCTION

## 1.1 PURPOSE

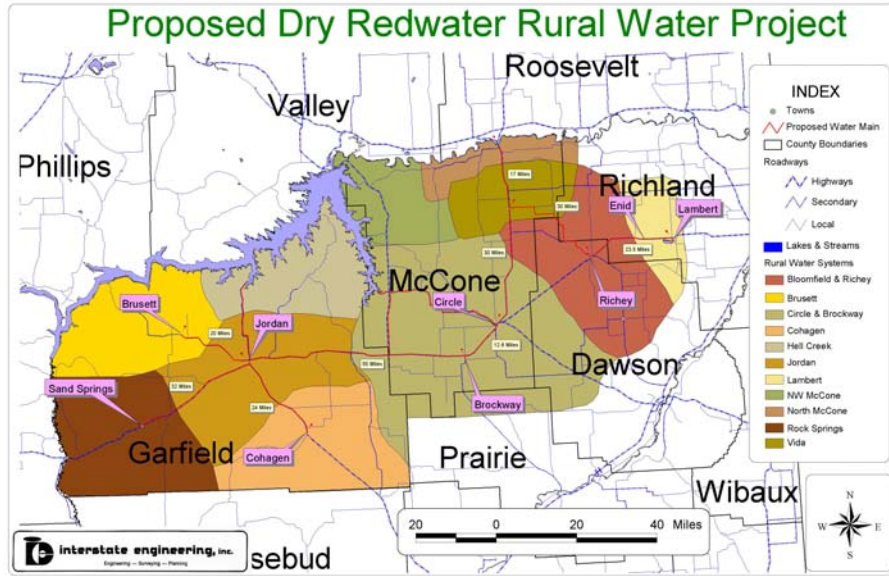
The Dry-Redwater Water Authority (DRWA) began in 2003 as a steering committee working in cooperation with the McCone County Conservation District office, to explore the possible feasibility of constructing a regional rural water system to serve both rural users and communities located in Garfield and McCone Counties.

The steering committee was to:

- (1) Work together towards identifying feasible water supplies and distribution systems.
- (2) Provide prudent management of all available funding to be used in the feasibility phase and future phases required to fully develop a regional water system.
- (3) Set aside consideration of system boundaries between member systems whenever and wherever necessary in order to accomplish identified goals.



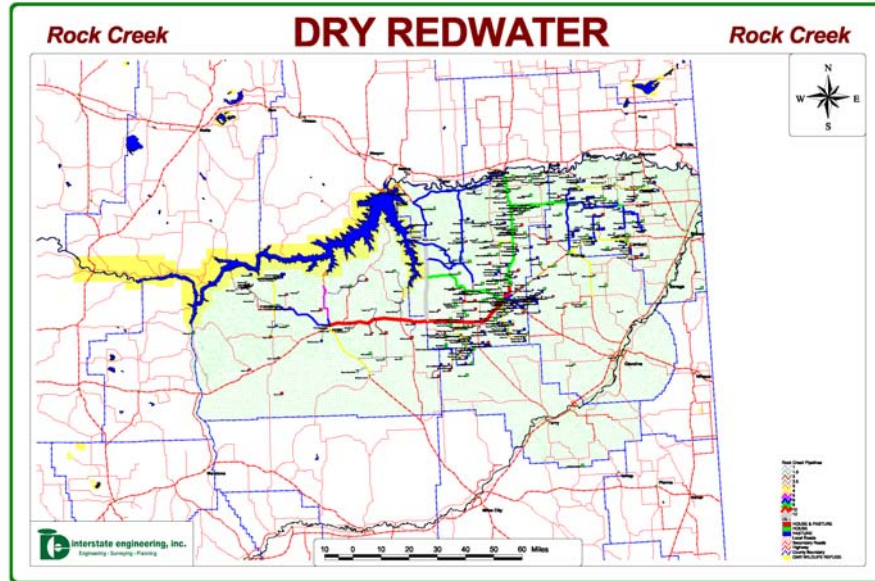
**Figure 1.1.1**  
**Study Area's Relative Location**



**Figure 1.1.2  
Original Study Boundary**

The DRWA will strive to keep costs affordable to the users by utilizing existing facilities to the fullest extent possible. The DRWA will review and assess existing facilities in the area, and will either use existing member services or contract with non-members to provide those services to all customers rather than relying on duplication of storage and/or distribution facilities in a given area. These potential cost savings are not included in the feasibility level cost estimates. The cost savings for reuse of the existing facilities will be determined in the final design phase of the project.

The reuse of existing facilities could result in a more efficient development of operations, and thus a more affordable rate to all customers. The regional water supply is intended to be used primarily for potable water consumption for residential and commercial entities, including the rural user that may utilize the water for livestock operations if other resources are not available.



**Figure 1.1.3**  
**Signed Up Users Location Map**

## 1.2 NEED FOR THE PROJECT

The rural residents in the proposed project area currently obtain their water, in the majority of instances, from private wells drilled into shallow aquifers, gravel pockets or deep confined aquifers. Some rural residents are hauling water either because their well water is undrinkable or there is not a sufficient quantity to be usable. Many rural residents do report water quality and/or quantity problems, which is evidenced by the chart of private well water quality found in Chapter 2 of the study. The majority of the proposed communities to be served are currently operating their own municipal water systems; all of the communities are using wells as a source of water. Three communities must treat their water because of high levels of fluoride which is a health hazard and a regulated contaminant. The fourth community – Jordan – does not treat its water but it is high in sodium and total dissolved solids which are not currently regulated, but has detrimental effects on those drinking it.

Based upon preliminary review of the water quality in the wells of rural users in the proposed service area it indicated that the majority of them do not have access to a quality of water needed for a healthy existence. Table 2.3.2 shows a sampling of water well quality is found in Chapter 2 along with tables showing the National Drinking Water Standards. One of the wells on that list serves Garfield County School District No. 15 and it shows that the sodium level is 447 ppm which exceeds the recommended level of 250 ppm, the fluoride is 3.35 ppm which exceeds the recommended level of 2 ppm and it has 1049 ppm of total dissolved solids which is over twice the recommended level of 500 ppm. This well and the other private wells are not regulated by National Drinking Water Standards but the detrimental effects of the water on their users are not any less because they are not regulated. The treatment of water in a private well is costly and sometimes complicated depending on what is

in the water. A regional rural water system will allow the rural user to have access to a reliable, safe, high quality water supply. The public water systems in the service area are regulated by Drinking Water Standards and must treat the water they provide to their user to these standards. The use of a membrane type water treatment facility (reverse osmosis or nano-filtration) are not typical systems found in smaller towns, but due to the limited alternatives to remove the regulated contaminants (fluoride) Circle, Richey and Lambert were forced to use this energy intensive system. The requirements for safe drinking water are getting more stringent every year and these increased regulations equal increased costs to all public water systems. A small system that currently treats their water such as Circle, Richey and Lambert will be greatly impacted financially for even minor modifications needed to meet new drinking water treatment standards. These costs will be in treatment, distribution and operator certification costs. The Town of Jordan currently does not treat its ground water source but does provide disinfection by means of chlorination. The Town of Jordan, like other public drinking water systems, must publish an annual drinking water report and following is an excerpt from the latest report: *“We’re pleased to report that our drinking water is safe and meets federal and state requirements. However, as many of you know, although our water is labeled as safe to drink under the Safe Drinking Water Act, some of the unregulated parameters affect the taste and may affect the health of a limited population. The concerns are sodium and the total dissolved solids in the water. The sodium level is high enough that people with high blood pressure may want to consider a separate source of drinking water. The total dissolved solids are high enough to have a laxative effect on people that have not become conditioned to the water. We are aware of these problems with our source of drinking water, but have been unable to find a solution that is financially feasible.”* The drinking water standards for sodium and total dissolved solids will be addressed in future regulations and the Town of Jordan will need to address these regulation changes and the costs that will be associated with meeting those new regulations. By belonging to a regional water system these small systems will be part of a larger user base, so future improvements will not have as great of financial impact to the individual user. In the proposed regional water system there is one source of water treatment which will replace 3 existing water treatment systems. This will reduce the number of certified operators needed and will reduce a duplication of salary costs currently occurring with multiple treatment facilities. A regional water system also mitigates the potential negative impacts of migration from one small community. For example, if 15 users leave Richey that is 10% of their user base, but if Richey joins the DRWA project, and they still lose 15 users it is less than 1% of the user base.

### **Town of Circle**

The Town of Circle has a municipal water distribution system which consists of 2 deep ( $\pm 1,500$  ft) water wells, an elevated 50,000 gallon water storage tank, a 250,000 gallon on-ground water storage tank and a reverse osmosis water treatment plant with a 50,000 gallon clearwell. The Town has experienced bacterial growth in their wells that has required extensive rehabilitation work and replacement of one well. This well problem is chronic and is on going. The raw water supply is over the MCL for

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fluoride and above the secondary limit for sodium that is why the Town of Circle utilizes an energy intensive reverse osmosis treatment process. If the current treatment process has mechanical problems the Town would be forced to put water into the distribution system that is a documented health hazard. The Town of Circle will benefit in the long term by connecting to the DRWA. The uncertainty of the life of their wells, the cost to replace a well and the cost to treat the water are all items that strengthen their commitment to this project.

### **Town of Jordan**

The Town of Jordan has a municipal water distribution system which consists of 2 water wells and a 200,000 gallon on-ground water storage reservoir. There is no treatment of the water but it is disinfected by being chlorinated. The quality of the water exceeds many of the secondary limits, such as sodium and total dissolved solids, of the clean water act. The potential for increased regulation of the groundwater rule (GWR) and disinfection by products rule would cause an additional cost to each user in Jordan. The Town of Jordan will benefit from the DRWA project by having a water supply that is treated to the most current water quality standards and delivered at a consistent volume and pressure.

### **Town of Richey**

The Town of Richey has a municipal water system that consists of two deep water wells ( $\pm$  1400 ft), an on-ground 40,000 gallon on-ground concrete water storage reservoir and a reverse osmosis water treatment facility. The Town water storage reservoir is over 40 years old and has been a maintenance issue for the past two years. The water source for the Town exceeds the MCL for fluoride and the secondary limits for sodium that is why the Town of Richey utilizes an energy intensive reverse osmosis treatment process. If the current treatment process has mechanical problems the Town would be forced to put water into the distribution system that is a documented health hazard. The water treatment facility reduces the levels of each contaminant to below the limits. The Town of Richey will benefit from inclusion in the DRWA project since its current raw water source is in violation of the drinking water standards if not treated and the current system has a fairly high cost to operate when compared with conventional treatment. The replacement costs of membranes and increased electrical costs in the future will also make connecting to the regional system more economical.

### **Lambert County Water and Sewer District**

Lambert County Water and Sewer District has a central water distribution system. This unincorporated town has two deep water wells ( $\pm$  1,200 ft), a 50,000 gallon on-ground steel water storage tank and a nano-filtration (membrane) water treatment facility. The water supply exceeds the MCL for fluoride and exceeds the secondary limit for sodium that is why the District utilizes an energy intensive nano-filtration treatment process. If the current treatment process has mechanical problems the

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Town would be forced to put water into the distribution system that is a documented health hazard. The District will benefit from connection to the DRWA for the same reasons as Circle and Richey.

**New Rural Users**– New users would include rural residents who have not had the opportunity to be connected to a high quality treated source of water as provided by a regional water system. These residents use individual wells for domestic and agricultural needs, haul water from other sources or purchase bottled water for drinking purposes. The water quality varies greatly throughout the project area but generally has levels exceeding the U.S. EPA Secondary Health Standards with high levels of total dissolved solids, hardness, sulfates, sodium, iron, manganese and areas of high fluoride. Chapter 4 has a table showing the actual water quality of wells being used. The majority of these wells are constructed in glacial till materials typical of the project area, resulting in wells which have varying abilities to provide a sufficient quantity and adequate quality of water supply. The cost to install a new water well has been determined, based on information provided by NRCS, to be over \$90 / month when you factor in the replacement cost of the various components of a well system. The box below shows how this cost was determined:

Drill and case well: \$35.00/ft average depth 200-250 ft Cost: \$7,000-\$8,750  
If a well lasts 15 years the monthly cost is \$39.00 to 48.00 per month.  
Pump and Motor: \$1,000.00 If a pump lasts 5 years the monthly cost is \$16.70.  
Control pit/pressure tank: \$2,800 with a 15 years life has a monthly cost of \$15.60.  
Annual stock well electrical rate is \$240.00 per year or \$20.00/month before electrical use.  
The cost to run electricity to a new well site is \$17,160.00/mile or \$3.25/ft. This cost was provided by McCone Electric.  
For a new well that already has electric service the monthly costs before any water is pumped is \$91.30 to \$100.30.

### 1.3 AUTHORIZATION AND FUNDING

This feasibility study to investigate specific aspects of a regional water system was completed in 2006. The 2003 Montana Legislature authorized a \$30,000 Department of Natural Resources and Conservations (DNRC) Grant to fund a portion the study with \$40,000 being provided by an Economic Development Grant from the Federal Government, \$15,000 from the Montana Department of Commerce and \$10,000 from local donations. The McCone Conservation District was the original sponsoring agent that received and disbursed these funds.



## 1.5 BACKGROUND

The first steering committee to discuss the potential for a regional water system was held October 1, 2002. The Dry-Redwater Rural Water System steering committee, held its first community meetings in 2005 to provide the public preliminary information about the proposed system. Meetings were well attended in Jordan, Circle and Vida with about 150 community residents from Garfield and McCone County attending. The need for quality water in a sufficient quantity by those in attendance was evident by the questions. The paragraphs below are examples of the information provided by the steering committee during the initial public meeting.

**What is the Dry-Redwater Rural Water System?** *It is a potential long term solution to provide good quality and quantity of household and livestock water to the area. The study area is proposed to include as many of the residents and towns in McCone and Garfield Counties and the areas surrounding Richey and Lambert. The potential service area is the area covered by Dawson, Garfield, Richland and McCone counties. The system would consist of a buried pipeline network. The water intake pipe would be located somewhere in the Big Dry Arm of Fort Peck Lake. Water from the intake would pass through a water treatment plant and then be pumped through a network of underground water lines to the users. The lines would probably utilize utility or county road right-of-ways. The water would be treated as per state and federal guidelines. A network of pumping stations and storage tanks would insure reliability and flexibility to the system.*

The water can be used in residential, commercial, household and livestock watering systems. These rural water systems are very possible. There are many of these rural water systems designed and operating in our neighboring states. Financially, they are feasible because the federal and state governments have always used tax money to help pay for the majority of the costs of these water systems throughout the United States.

The rural water system is very similar to the cooperative efforts that brought electricity and telephones to rural America. Almost all of North Dakota and South Dakota are served by rural water systems.

After the Circle meeting, an area resident commented, “I am sure that when a group of people sat down at a table some years ago, and started to discuss how they were going to get electricity or telephone to the rural areas, they had the same questions and concerns we heard at the meeting today. Well look at where we are now, through a cooperative effort, electrical and telephone service was feasible. We need to look at this rural water project in the same way, as a utility.”

## 1.6 PROJECT SPONSORS

The McCone County Conservation District was the original sponsor for the DNRC grant. There was a formal Board of Directors of the regional water authority formed

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in December of 2005. The Dry-Redwater Regional Water Authority is registered with office of the Secretary of State of Montana as a Regional Water Authority, an official political subdivision. The DRWA is a cooperative effort between Dawson, Garfield, McCone, Prairie and Richland Counties. By-Laws & Rules were written to augment and clarify the Agreement Forming the Dry-Redwater Regional Water Authority that was signed by all of the Initial Member Entities and recorded in Dawson County, June 3, 2005 under document #425633; McCone County, June 2, 2005, under document #182385; Richland County, June 3, 2005, under document #530717 and Garfield County, June 7, 2005, under document #180448. Copies of these documents are found in the appendix.

### **1.7 USER INTEREST**

According to Ralph Pakaluk of the North Central Water Consortium in North Dakota, the goal of the government agencies that fund all rural water projects is to see these projects as commonplace in the state as Rural Electricity and Rural Telephone. They have urged cooperative efforts between communities in order to fill the voids that exist. The DRWA shares the same goal and will cooperate with the funding agencies for the benefit of the residents throughout the respective distribution areas of the consortium.

Approximately 10 public meetings have been held, several mailings to a majority of the rural residents were completed and numerous personal contacts have been made throughout the proposed project area.

As of May 10, 2006 over 902 sign-ups have been received. The communities of Circle, Jordan, Richey and Lambert have also agreed to participate in the study. The total number of sign-ups is 1,849 representing over 5,000 individuals. Table 1.7.1 provides a summary of the sign-ups.

Table 1.7.1  
(As of May 10, 2006)

	Richland	McCone	Prairie	Garfield	Dawson	TOTAL
Houses	97	326	2	82	35	542
Pasture Taps	87	191	12	52	18	360
Total Rural:	184	517	14	134	53	902
Jordan Users				250		250
Circle Users		360				360
Richey Users					147	147
Lambert Users	80					80
Total City Users:	80	360	0	250	147	837
Cabin Users		60		50		110
<b>TOTAL:</b>	<b>264</b>	<b>937</b>	<b>14</b>	<b>434</b>	<b>200</b>	<b>1849</b>

## 1.8 CURRENT WATER USAGE

The water usage by each community is shown in Table 1.1 and is calculated from individual survey forms, and community usage records.

Table 1.8.1 – ESTIMATED WATER USAGE BY COMMUNITY

<u>Community</u>	<u>Million Gallons per Year</u>
Circle	57
Jordan	30
Richey	14
Lambert	11
<b>TOTAL ANNUAL USE</b>	<b>112</b>

## 1.9 CURRENT SITUATION

The list of towns or water districts that have expressed intentions to purchase water from the DRWA include:

1. Circle
2. Jordan
3. Richey
4. Lambert County Sewer and Water District

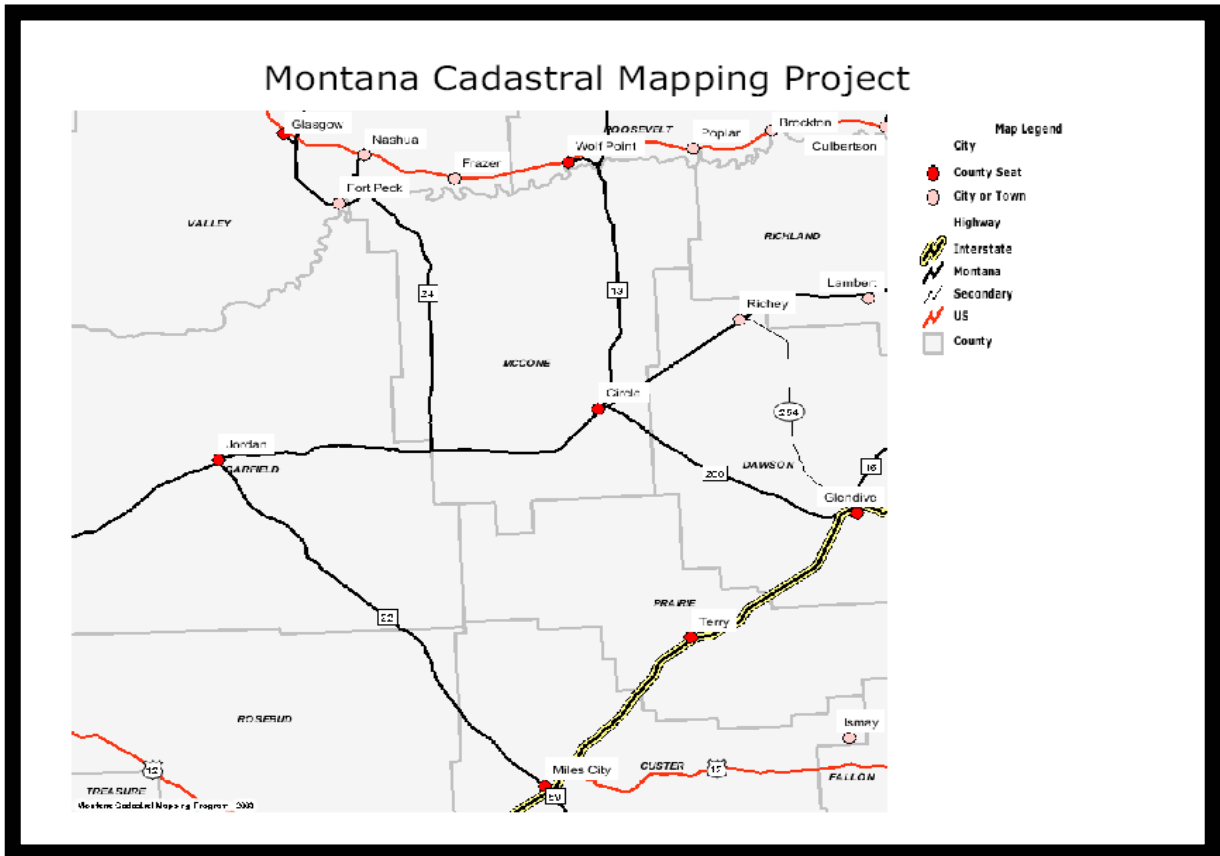
## **1.10 ECONOMIC, SOCIAL AND DEMOGRAPHIC DATA**

Many rural areas face economic and community development issues of a very different character than communities whose needs are mainly defined by poverty. Often, the defining features are geographic isolation of communities separated by long distances, absence of large metropolitan centers, low-density settlement, out migration, and economic upheaval or economic distress.

The local economy is considered agricultural for the majority of the project area. There is planning and permitting going on in western McCone County to develop a coal mine and power generation facility. Because of this energy producing area, the Circle and Jordan areas could experience significant residential growth during the construction phase of this project and a long term increase based on the jobs created to operate and support the facility.

According to the 2000 census, the population of the project area was approximately 16,500. The projected population for the area in 2015 is 17,200. The median household income ranges from \$25,451 to \$32,110 per year with an average of \$28,920, as identified in the 2000 census date, but varies widely from county to county. A regional rural water system will spur economic development in the DRWA service area first by creating 50 to 200 construction jobs during the installation of the system and then by allowing access to a high quality reliable water source through a 4 county region. This availability of water will allow relocation or redistribution of the population base, development of support industries for the agricultural and energy development community.

Figure 1.10.1  
Area Roadways



The highway system serving the project area includes a combination of US and state highways and county roads (paved and gravel). There is one railroad passing through the project area, which is Burlington Northern Sante Fe. This line is currently not in operational condition and is not currently used. The railroad is evaluating this track segment in regards to the potential for the coal development in McCone County. This information comes from newspaper articles as no official statement has been provided by BNSF. Additional transportation is provided by small airports serving the Circle, Richey and Jordan.

Public school districts with Kindergarten through Grade 12 classes are found in the 4 communities in the project area. Some districts are supported by the individual communities and surrounding area. Facilities providing medical care for the area residents include the McCone County Health Center (CAH) and Garfield County Health Center (CAH).