CURRENT CONDITIONS AND TRENDS

EMPLOYMENT AND LABOR FORCE

Providing an accurate depiction of current employment and labor force conditions in Sheridan is difficult to assess because of a lack of data for small cities and towns. For the purpose of this Growth Policy, estimates are used to support the planning effort. The 2010 decennial census did not collect economic data; therefore, the 2015 and 2019 estimates were used from the American Community Survey (ACS). When referencing the ACS, the actual value is derived from the average of the five years prior to 2015. According to the 2015 ACS there were 319 people in the Sheridan labor force, 16 years of age or older. Of those 302 people, 54 percent of them are in the active labor force compared to the total population and 46 percent are not in the active labor force. There were 17 unemployed workers making up 5.3 percent of the working population. Similar percentages are reported in the 2019 ACS data, but unemployment dropped to 1.1 percent.

The estimated travel time for commuting to work was 15 minutes in 2019, down from 26 minutes in 2015. It is estimated that the 53 percent of the population that travels less than 10 minutes to work are working in the Sheridan planning area. This is 11 percent more than the 42 percent in 2015. The workers that travel greater than 10 minutes to work are expected to work outside of the planning area. The trend suggests that more residents were employed locally in 2019 vs. 2015.

Many of the jobs inside the town limits are service, management, and sales sector jobs that have limited impact on the community's economic base. The Sheridan community can be considered a small Montana town, in that it is largely residential in character and is without a significant economic base with the exception of area agricultural operations. The only large employers within the community are the school and healthcare systems. The majority of businesses function to support the small population of Sheridan, agriculture, and a very limited amount of transient tourism.

According to the ACS, Sheridan has experienced job growth between 2010 and 2019, a period during which over 48 jobs were added to the economy as illustrated by Figure D-1. Job growth appears to accelerate between 2016 and 2019. It should be noted that the ACS produces estimates only, sometimes with large margins of error. Due to these margins of error in the ACS estimates, the number of jobs created may not be an accurate representation of the economic growth in Sheridan.

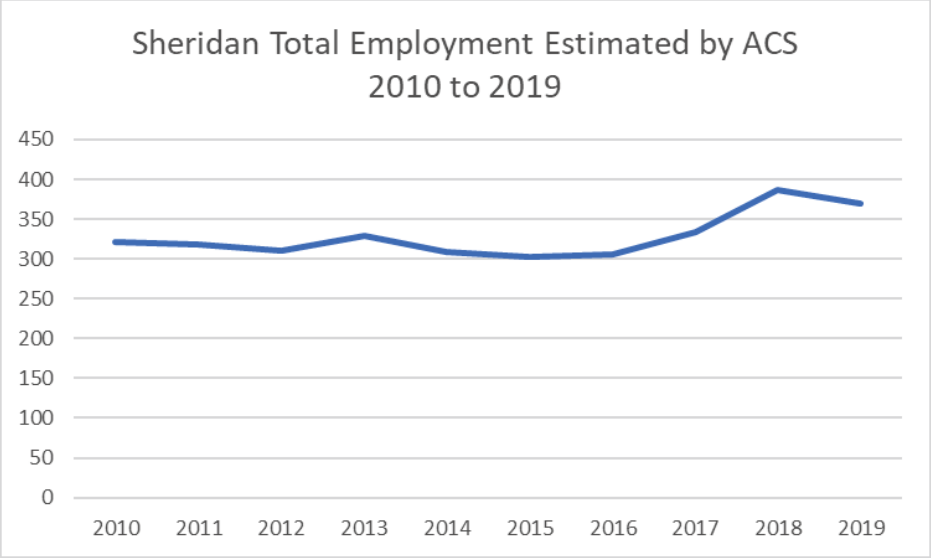

Figure D-1

CLASS OF WORKERS

Most workers in the Sheridan labor force are employed within the town limits. This is supported by the fact that the majority of the labor force have short commutes and that most of the occupations are in the service, management, and sales sector. Most of the service, management, and sales sector jobs are located in the downtown area, which is located within town limits.

In 2015, just over 60 percent of Sheridan workers earned a wage or salary working for a private employee while just five to eight percent were self-employed. Workers employed by the government ranged from 30 to 34 percent (Refer to Figure D-2).

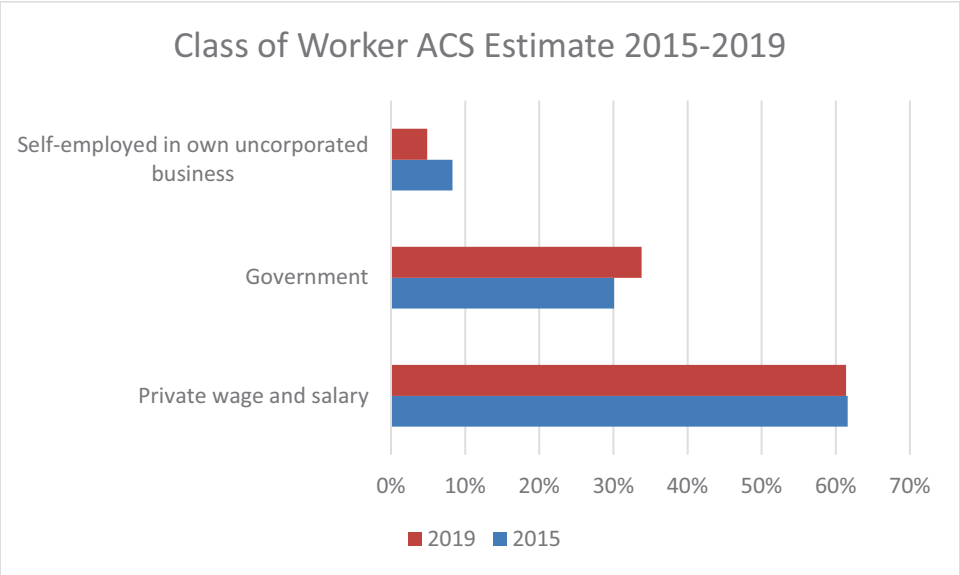

Figure D-2

ECONOMIC INDICATORS

Unemployment - As shown in Table D-1, the unemployment rate in Sheridan trended downward since 2012. The ACS estimates are based on 5-year trends and show that after the great recession began to subside, Sheridan's unemployment rate moved to 1.1% in 2018 and 2019. Comparing Sheridan to the State and the Nation, Sheridan has historically had lower unemployment rates than both in the last six years. While unemployment rates are much lower compared to Montana or the nation, the trend in unemployment rate is similar to both.

Table D-1. Estimated ACS Unemployment Rates

Year	Sheridan (5yr)	Montana (5yr)	Nation (5yr)
2010	3.2%	5.7%	7.9%
2011	5.1%	6.4%	8.7%
2012	7.2%	6.9%	9.3%
2013	7.7%	7.3%	9.7%
2014	3.4%	6.8%	9.2%
2015	2.9%	6.2%	8.3%
2016	0.8%	5.6%	7.4%
2017	1.2%	4.8%	6.6%
2018	1.1%	4.2%	5.9%
2019	1.1%	2.5%	5.3%

Household and Family Income - The decennial census no longer provides data on income, so ACS estimates are used for recent income comparisons and income data. Median 5-year household income in Sheridan was estimated at $57,500 in 2019 which is about $18,500 more than the $38,947 5-year median income in 2015. The figure represents a 32 percent increase over the 2015 income and is 3.9 percent above the national median household income in 2019 ($55,322). The 2010 5-year ACS estimate for median income was $34,688, which is similar to the 2015 estimate. The 2019 ASC median family income was $70,469.

The increased 2019 median household income is likely due to the ACS estimates of the number of households with annual incomes in the planning area in the various income distributions. In 2019, the ACS estimated that the number of households with annual incomes from $50,000 to $74,999 increased 13 percent and $75,000 to $99,999 increased by 10 percent compared to 2015. The median household income increased because high income households increased while middle income households remained stable or decreased since 2010 (Figure D-3). The number of high-income households increased in 2015 and 2019 while low income decreased since 2010.

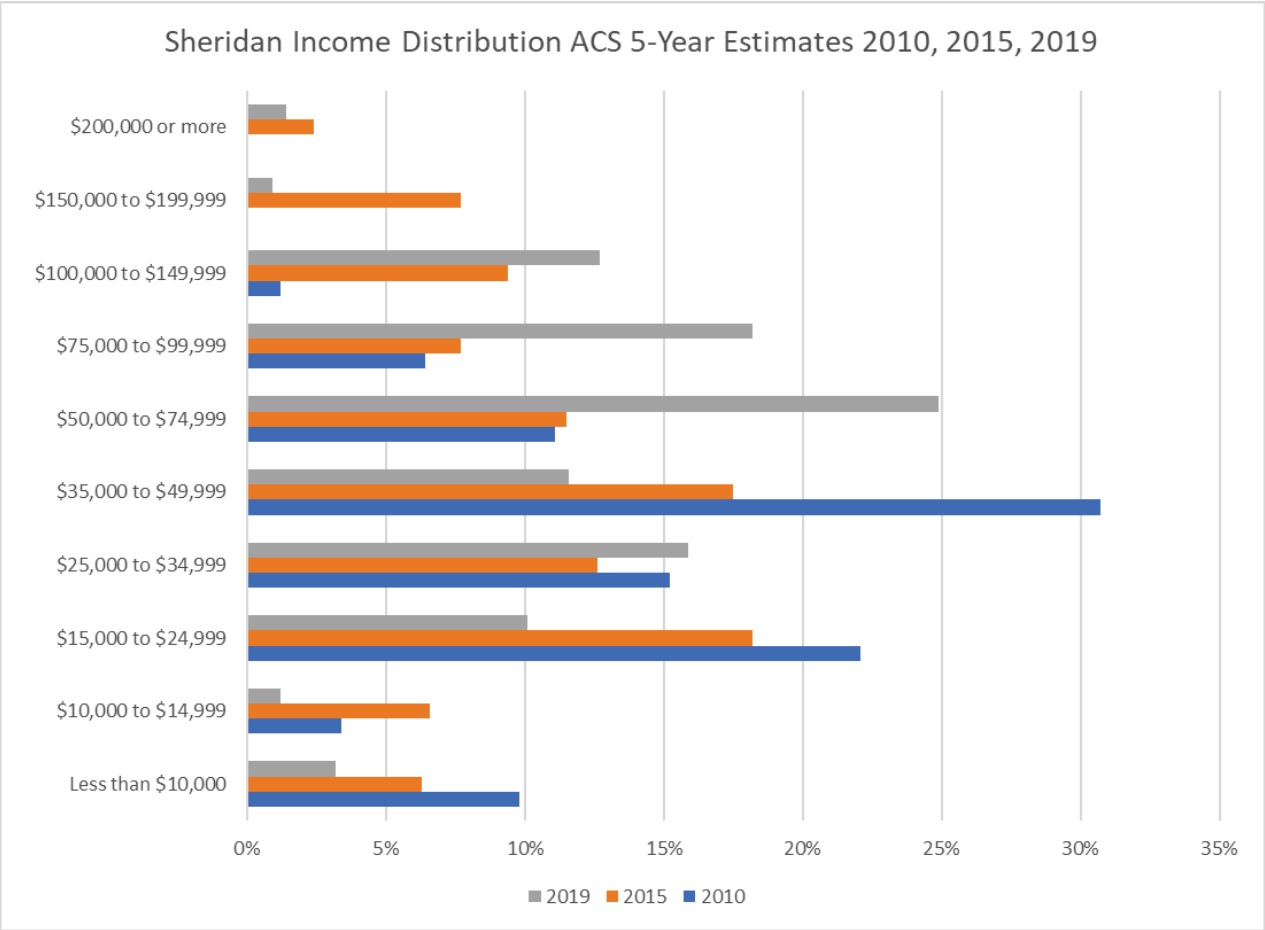

Figure D-3

Forty-two percent of households were in the below $50,000 category according to the 2019 ACS (Refer to Figure D3). This is significant decrease from 81.2 percent in 2010, suggesting higher income in the planning area since 2010.

In addition, a significant number of family households (with two or more members) were considered “low-income” according to standards set forth by the U.S. Department of Housing and Urban Development (HUD). At least 30 percent of family households in 2019 had incomes that were at 80 percent or less of the area median income, thereby qualifying them for assistance through HUD programs.

Poverty - ACS estimate that 3.9 percent of all Sheridan residents are considered to be below the poverty level in 2019. In 2010, the number of residents in the same category was much higher at 13.7 percent of residents. The poverty rate for Sheridan provided by the 2015 ACS was 11.8 percent for this same group. This rate was lower than rates for both the State of Montana (15.2 percent) and Nation (15.5 percent). About five percent of the population was at or below 150 percent of the federal poverty line in 2019, down from about 15 percent in 2015. Those falling below this level are qualified for various types of

public assistance including Low Income Energy Assistance and Home Weatherization services. The child poverty rate, children 18 years or younger, was 11.7 percent in 2019.

ECONOMIC DEVELOPMENT ACTIVITIES

ECONOMIC DEVELOPMENT ORGANIZATIONS

There are no active economic development organizations in the Town of Sheridan. However, the Headwaters RC&D operates out of Butte, Montana and the Town of Sheridan lies within its district.

Headwater RC&D – Headwaters RC&D is a non-profit organization that is supported by funds from local, state, and federal governments and focuses on improving economic and social conditions through conservation, utilization, expansion and development of all accessible resources in the area that includes Sheridan. Headwater RC&D's focus is on community & economic development including feasibility studies, planning grants, infrastructure projects, job creation, job retention, workforce training, business technical assistance (including business start-up, business plans, gap financing) and more.

Appendix E
Land Use

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KEY FINDINGS

- Agriculture and vacant land accounts for approximately 88 percent of land uses within the donut in the Sheridan Planning Area. Within the Town limits, agriculture and vacant land accounts for approximately 58 percent of land uses

- Existing land uses include residential, commercial, recreational/public use, and agricultural/vacant land.

HISTORIC LAND USES

Land use in a community is the cumulative result of many private and public decisions related to the local geography. Sheridan's land use pattern has remained mostly consistent since the first settler arrived. Sheridan has been primarily an agricultural community and the historic land uses reflecting the rural character of these types of communities in Western Montana.

The development of Sheridan revolved around the commercial core of Main Street and surrounding residential lots. This pattern was influenced by many factors: the need for services and employment within a reasonable travel distance when foot or horse was the principal means of transportation, and the need for using natural resources such as water, and the desire of businesses near customers.

Existing land uses in and around Sheridan include established residential areas, parks, and commercial businesses. There have been no new residential subdivisions or lots for home sites in over ten years. Significant agricultural lands surround the town along with an old, now defunct railroad terminal.

EXISTING PLANNING

The Sheridan Planning Area is comprised of the entire municipal limits of the Town of Sheridan and the surrounding area extending one mile in all directions. The Jurisdiction Section of this Growth Policy provides a specific description of the Planning Area. The first comprehensive Policy was prepared in 2003 (Entranco) and an abbreviated Policy Update was completed in 2010 (Great West). Also, the planning area is included in the Madison County Growth Policy and discussed below.

TOWN OF SHERIDAN

This document represents the Town of Sheridan's second comprehensive planning effort, the first being completed by Entranco (2003). While comprehensive planning efforts have been undertaken by Madison County and their planning efforts included the municipal

boundaries of the Town of Sheridan, an updated Policy is needed to focus on the Sheridan Planning Area encompassing the Town limits and one mile in all directions outside the Town limits.

MADISON COUNTY GROWTH POLICY

The Madison County Growth Policy, adopted in March 2013, has limited information on the Town of Sheridan and Sheridan Planning Area. The county Policy referenced the 2010 Growth Policy Update by Great West (2010) for more detailed information and does not present specific land use information for Sheridan. There is no detailed discussion regarding Sheridan residential, commercial, industrial, recreational, or agricultural land use in the Madison County Growth Policy.

LAND USE REGULATIONS

Land use regulation or "zoning" is permitted under the Montana Code Annotated for the purpose of promoting health, safety or the general welfare of a community or area. The governmental jurisdiction is empowered to regulate and restrict items such as: the height, number of stories, and size of buildings and other structures; the percentage of lots that may be occupied; the size of yards, courts, and other open spaces; the density of population; and the location and use of buildings, structures, and land for trade, industry, residence, or other purposes.

The Town of Sheridan does not currently have municipal zoning or municipal subdivision regulations as authorized by MCA. The Town of Sheridan may consider zoning regulations to regulate development of lots with its municipal boundaries. The County does not have any zoning outside the Town limits within the planning area boundary. If the Town were to adopt zoning regulations and wished to regulate land use within the planning area outside the municipal boundaries, this could be accomplished in compliance with 76-2-310, MCA.

The Town can also consider adoption of local subdivision regulations to regulate subdivision development within the municipal boundaries and any property proposed to be subdivided and annexed into the Town. Currently, the Town has an interlocal agreement with Madison County to utilize County Subdivision Regulations and the County Planning Board for reviewing proposed subdivisions within the Town limits. The County Subdivision Regulations may not reflect the development standards that the Town would want for a subdivision development with urban densities such as paved streets, curb and gutter, boulevards, sidewalks, etc. Local subdivision regulations could be developed and adopted to layout requirements for development such as lot and block sizes, road development standards, infrastructure development requirements for water, wastewater, and storm water, and parkland as well as the process required for review of a subdivision

by the Town. Subdivision regulations should be developed in accordance with State statute.

EXISTING LAND USES AND MAPS

Current land uses in the Sheridan Planning Area include established residential areas and commercial businesses, acreage home sites outside the town limits, agricultural lands, and former industrial facilities. The largest landowners within the planning area boundary are private landowners with agricultural lands.

EXISTING LAND USES

Agricultural/Farmstead and Vacant

Agriculture and vacant land accounts for approximately 85 percent of land uses within the Sheridan Planning Area (58 percent in Town limits and 88 percent in the Donut Area). The majority of the agricultural properties are located outside of the Town limits. There is only limited vacant lands located within the Town limits. The surrounding planning area is comprised of rural home development, irrigated agricultural lands, and livestock grazing operations.

Residential

The primary residential development in the planning area includes the southern half-section of the Town limits where most homes are constructed and a limited number of lots developed north of Town along Highway 287. Some open space comprised of mostly agricultural land separates the residential development on the north from the Town center.

Housing in the Town limits has not changed a lot in over ten years. There have been no new housing developments within the Town limits in over ten years. However, residential development skirting Town, especially on south and east boundaries, are increasingly converting agricultural lands to homes with individual wells and septic systems (see Exhibits 1 and 3 through 5 for development changes outside the Town limits from 1995 to 2017). Within the Town limits housing density is higher than what is typical for a small community in Western Montana of less than 1,000 residents. Limited residential development is also located along the commercial corridor Main Street.

Commercial

Commercial development in Sheridan is primarily located in the downtown area of Sheridan along Main Street. Commercial uses include restaurants, a grocery market, motel, churches, bars, brewery, hardware store, bank, retail, post office, government office, office supplies, hairdresser, auto parts, gas station, and a few other types of

businesses. There are other commercial properties scattered throughout the Town limits, but most are concentrated on Main Street and connecting roads near Main Street.

Industrial

There are no industrial land uses in the Town of Sheridan. Historically the Railroad was the only industrial development and was located on the southwest edge of Town. No operational sawmills are currently in Town, but a honey business is present on the east side of Town and considered commercial. The former railroad facility is now commercial, and a feed store occupied the former railroad facility, which has since gone out of busines.

Just outside of Town on the south, a gravel pit and concrete plant are located on Highway 287 near Town. This is the closest operational industrial facility to Sheridan. Other uses in this area including a wood bank and storage for electrical/communication equipment.

Public Use

Public facilities in Sheridan and the Planning Area consist of the Sheridan Public School, the Sheridan Library, the Sheridan Swimming Pool, several parks, tennis courts, ballfields, the Sheridan Town Hall and Fire Hall, the United States Post Office, and the water and wastewater facilities. County owned property is also present within the Town limits.

Existing Land Use Maps

Exhibits 2 and 6 in Appendix K show the existing land uses within the Town of Sheridan and within the Sheridan Planning Area. These maps were developed based on Montana cadastral data. The land use categories shown on the maps represent the primary use identified for the property. Attempts were made to accurately reflect existing land use conditions; however, it is acknowledged that these maps could inadvertently misrepresent or misidentify some current land uses.

Existing land use maps help provide a foundation for establishing zoning and other land use controls within the community.

FUTURE LAND USES AND MAP

Future Land Use Designations

To prepare a land use map for a growth policy, land use designations must be developed. Land use designations are broad and inclusive descriptions of a general type of activity deemed appropriate in a given area. It does not make a determination of the desirability of a specific project nor does it make a determination of when, within the scope of the growth policy, any given parcel should be developed. Those decisions are more specific

and must be made with guidance from the goals and objectives established by the growth policy.

The Sheridan Growth Policy has five (5) land use designations, which are described below. The categories are broad designations which can be implemented by annexation and zoning. Unless specifically stated otherwise, the Town desires that all development within the categories described below outside of the Town limits will proceed only after completion of the annexation process so that it is legally included within the municipal boundaries of the Town of Sheridan. The Town of Sheridan does not have regulatory control over development in areas outside of the municipal boundaries of the Town. The authority to deny or approve development in county areas remains with the Madison County Planning Board and Commissioners.

- **Agricultural.** This category indicates locations outside and within the Town of Sheridan where the land is in large ownership blocks or the development pattern has already been set by low density, large lot rural subdivisions. Subdivisions in this area are generally characterized by lots two to twenty acres in size. This category designates areas where development is considered to be generally inappropriate over the 20-year term of the Sheridan Growth Policy, either because of natural features, negative impacts on the desired development pattern, or significant difficulty in providing utility services.

- **Residential.** This residential category designates places within the Town of Sheridan where the primary activity is residential living quarters. Other uses, which complement residences, are also acceptable such as low intensity home based occupations, fire stations, and churches. The dwelling unit density expected within this classification varies. It is expected that areas of higher density housing would likely be located in proximity to commercial areas to facilitate the broadest range of feasible transportation options for the greatest number of individuals and support businesses within commercial areas. These areas are also located in areas where utility services are more readily developed.

- **Commercial.** This land use category designates places within the Town of Sheridan where activities provide the basic employment and services necessary for a sustainable community. A broad range of functions including retail, education, professional and personal services, offices, public gardens, residences, and general service activities typify this designation. Establishments located within this category draw from the community as a whole for their employee and customer base. Intensification of existing commercial areas within the downtown core, as well as new and/or expansion of commercial areas in proximity to high traffic intersections might be desirable for the Town of Sheridan.

- **Industrial.** This classification designates areas within the Town of Sheridan for the heavy uses that support a community. Development within these areas is intensive and is connected to significant transportation corridors or location of resources. In order to protect the economic base and necessary services represented by industrial uses, uses which would be detrimentally impacted by industrial activities are discouraged. Although use in these areas is intensive, these areas are part of the larger community and should meet basic standards for site design issues and be integrated with the larger community. At this time only area that could be considered industrial is south of the Town limits on Highway 287 where a concrete plant and gravel pit are located. This is identified as a commercial property in the Montana Cadastral data. Industrial land use is reserved for future use and no new future designations are proposed within the Town limits.

- **Public Facilities.** This classification designates areas within the Town of Sheridan needed for municipal services and areas for public uses or recreation. This designation can allow for public uses within the Town such as parks, open space, library expansion, new pool/public meeting center/venue, museums, infrastructure, etc. Development within these areas typically would include a development plan that would be reviewed by the Town and County Planning Board for compatibility with surrounding uses within the Town or outside of town if annexation is planned.

FUTURE LAND USE MAP

The future land use maps provided as Exhibit 7 in Appendix K depict a general pattern of growth and development for the Sheridan Planning Area. The future land use maps indicate the general type of development that is projected to occur. It is not, in most cases, intended to establish precise boundaries of land use or exact locations of future uses. The timing of a particular land use is dependent upon several factors, such as availability of public utilities, provisions for adequate roadways, availability of public services, willing developers, and the demand for a particular land use as determined by market forces.

Based on historic development in the Sheridan Planning Area, it is anticipated that future land uses will likely remain the same as the existing land uses.

Again, it is important to note the future land use designations shown on the map are only applicable when a property is proposed for annexation and do not have any effect on lands under County jurisdiction regarding zoning, density, land use, subdivision or other land use decisions.

IMPLEMENTATION AND ADMINISTRATION

Like the State of Montana and Madison County, it is anticipated that the Sheridan Planning Area will continue to grow in population, therefore the need for public services and facilities will increase correspondingly with the population. How that growth will materialize cannot be accurately predicted. Growth will depend upon the national, state and local economies; employment opportunities; and other influences, not the least of which is the growing popularity of Montana and the Rocky Mountain West as a desirable place to live.

The development of the preferred land use pattern shown above will only result from concerted efforts by private-public partnerships. The construction of buildings and development of commercial and residential projects is almost exclusively done by private individuals and companies. Their willingness to invest money and personal commitment into the development of land will have a huge influence on the community's ability to realize its goals and grow. The public sector, especially the Town of Sheridan, also has a significant role to play through the development of its growth policy and corresponding implementation tools such as zoning, subdivision, and facility planning and maintenance. By identifying actions to further the goals of this plan, and then consistently carrying out those actions, the Town can influence private parties and form effective partnerships to further the achievement of the identified community goals.

The Town has a variety of tools to help implement the Sheridan Growth Policy. Several are specifically authorized and controlled by state law such as annexation, zoning, subdivision, and provision of certain urban services such as water supply, fire protection, and parks. All the tools require periodic review and assessment of their effectiveness or in some cases, like zoning, adoption because they are not yet in place.

Following the adoption of the Sheridan Growth Policy, the implementation of zoning and local subdivision regulations may be considered to guide development. There are many specific issues which those two implementation tools address including street design, open space requirements, and density of development. Directly addressing these potential issues ahead of time have the potential to substantially advance or impede the ideals and goals identified in the Sheridan Growth Policy.

This plan looks at a twenty-year horizon as well as the current situation and some land use, which are not in conformance with the plan, will be identified. This plan recognizes the presence of these uses without specifically mapping or otherwise identifying them. It is desired that these anomalies be resolved over the term of this plan so that the land use pattern identified herein may be completed.

ANNEXATION

A city grows in land area through annexation, a legal process by which unincorporated lands outside of the municipal boundary become part of the city. When annexed to the city, land use and zoning designations are assigned. The main reasons for annexation include, but are not limited to, increasing the efficiency, and reducing the fragmentation in the delivery of municipal services, greater control of land use and service planning within a geographically related area, more logical city boundaries, and the desire of adjacent residents to be part of the city. In the case of Sheridan, residents in housing next to town benefit from the town roads, proximity to businesses, parks, etc. but they do not contribute to the local tax base needed to maintain this infrastructure.

The annexation process, which is governed by state law, provides the mechanism for landowners to seek to have their land included within the city, and in limited circumstances, permits the city to bring land within its jurisdiction. The legal framework for annexation is established in Parts 7-2-42 through 7-2-48 Montana Code Annotated. Part 43, Annexation of Contiguous Lands, is most commonly utilized in processing annexation requests. Generally, annexation is requested by a property owner in order to receive the city's services, such as city water, sanitary sewer, solid waste, police, and fire services. Montana State Statutes (7-2-4210 through 7-2-4761, MCA) establish the methods and processes by which municipalities can annex surrounding properties, but also give municipalities discretionary authority whether or not to annex property, as long as statutes are followed.

Since annexation often precedes development of land and access to urban services strongly influences development densities, annexation can be a powerful tool to help support the Sheridan Growth Policy. Land use is a long-range vision of the community and does not predict when any individual parcel outside of the municipal boundaries may become part of the Town of Sheridan. Case-by-case evaluations will need to be made for each proposed annexation as to whether an individual parcel should be annexed at that time. It is desired that all lands within the Planning Area should be annexed prior to development.

ANNEXATION CONSIDERATIONS FOR THE TOWN OF SHERIDAN

It would be desirable for the Town of Sheridan to prepare written guidelines (a policy) for the logical direction of future growth and to guide decision making regarding future annexations. Such guidelines would also help the Town plan for future expansion in conjunction with Madison County. An annexation policy should be developed after the Town has considered its goals for growth in light of its ability to provide municipal services to additional areas of land. In association with the annexation policy, it would be beneficial for the Town to develop an annexation plan to identify areas where growth would be the

most appropriate for the community and to establish conditions for the annexation of lands.

An annexation policy for the Town of Sheridan would provide guidance to decision-makers and staff about the goals and policies that annexation is intended to advance. The primary intent of the policy would be to permit the annexation of land to provide for orderly growth, adequate provision of municipal services, and equal benefits to both the annexed territory and the existing Town properties.

Some possible annexation goals for the Town of Sheridan are listed below:

- Seek to annex lands contiguous to the Town of Sheridan
- Seek to annex areas that are totally surrounded by the Town of Sheridan
- Seek to annex properties currently contracting with the Town of Sheridan for services such as sanitary sewer services
- Seek to annex other lands within the Planning Area examined in this Growth Policy as appropriate and as opportunities arise

These goals would need to be supported by specific policies that identify the conditions necessary to support a decision to annex land into the town. The policies would also need to elaborate any requirements of those seeking to annex into the town.

In terms of utility services, if the Sheridan public water supply is used in areas outside the current Town limits, annexation will require a change of place of use authorization by Montana Department of Natural Resources. The authorization process is burdensome and requires significant time and cost to process, including potentially mitigating the water use impact in a closed basin. The Town can require this process to be completed by the developer requesting annexation. The Town can also consider allowing property owners who request annexation to develop their own water supply and provide all other services, such as wastewater treatment, but not public water on temporary or permanent basis. The Capital Improvement Plan provides more direction for the Town to implement regarding this likely future work.

AREAS OF INTEREST FOR ANNEXATION

The areas identified below are areas of possible annexation into the Town of Sheridan in the future.

1) **Sheridan Wastewater System and West Side Park**– Currently, the Sheridan wastewater system and Ballfields are located partially within and adjacent to the Town limits on the west side of Town. Annexation of the wastewater treatment lands, and park area would allow the Town to reduce fragmentation in municipal

services. Because the Town owns the property where the wastewater system is located, it makes sense that the property should be within the Town limits.

If owners of areas outside the Town approach the Town regarding the extension of municipal wastewater and water service, the Town should require that they petition to annex the area into the Town of Sheridan or require a waiver of protest to future annexation action.

Appendix F
Facilities

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KEY FINDINGS

- Existing community facilities consist of a public water system, wastewater collection and treatment system, roads and streets, swimming pool, parks, library, post office, Town Hall and combined fire hall, and the public school.

WATER FACILITIES

TOWN OF SHERIDAN FACILITIES

The Sheridan water system provides domestic water for the community and fire protection. The oldest portions of the system were constructed in 1915, most of which has been replaced. Updates were completed in the early 1940's (water mains), in the 1970's (water storage tank), in the late 1980's (supply wells, transmission main, and water mains), in 2003 (replacement of a water well and transmission main), and recent work completed in 2020 (construction of redundant well, transmission line, and distribution lines).

The water system consists of six groundwater wells (three of which are operational), a 300,000-gallon storage reservoir, a 14-inch PVC transmission main, distribution mains and services, chlorination equipment in the manifold building, and water meters. The water system is shown in Exhibit 8.

The three operating water supply wells include Wells #5 and #6 installed in the deep Tertiary aquifer. These are the primary supply wells and are reliable sources of water throughout the year. The two wells are capable of pumping well over a combined 300 gallons per minute (gpm). Well #6 is the newest well completed in 2020 and is located on Carey Lane near a railroad crossing about one mile from Town limits. Improvements made in 2020 greatly increased the capacity and reliability of Sheridan’s water system.

The third operational well is located near #5 in the Ball Field / Kaatz Park on the west side of Town. Each well connects to the manifold building for distribution. Well #1 is developed in the shallow aquifer and available for flow augmentation in the 100 gpm flow range. The remaining three wells (Well #2, #3, and #4) are also nearby and have limited or no production capacity. These wells are currently designated nonoperational and may be replaced with redundant wells or redeveloped to address future flow needs.

All wells supply water directly into the distribution piping via the manifold building where flow can be monitored, water quality tested, wells controlled, and water treatment, if necessary. The manifold building feeds water directly to users on its way to fill the storage

reservoir. Water is used while passing through town and excess is stored to be made available to residents via gravity flow when the pumps are off.

The current storage reservoir consists of a 300,000-gallon on-grade steel tank. A 70,000-gallon concrete tank located near this tank is no longer in use, along with an old water supply located on Indian Creek. A telemetry system enables control of the 300,000-gallon reservoir level and pumping cycles. Gravity fed water feeds the distribution system and consists of 4-inch, 6-inch, 8-inch, and 10-inch mains with associated fittings, gate valves, and fire hydrants.

The Sheridan water system has capacity to provide water to new lots within the Town limits. Current needs identified for the water system are described in the Capital Improvement Plan. While no significant improvements are needed, smaller improvements are required and include quantifying and modeling the current water system supply for both domestic and fire flows, replacing older distribution lines, updating water meters, improved digital pump controls, possible water treatment, reviewing water rights, providing backup power, and increasing flow capacity to meet fire flow need by repairing or replacing nonoperational wells.

Remainder of Planning Area

Outside of the Town limits, there are approximately 170 groundwater wells in the Planning Area, not including six wells owned by the Town of Sheridan that are located outside the Town limits. These 170 wells are mostly domestic; however, there are other uses for agriculture related to irrigation and stock water. There are about 56 individual wells within the Town limits.

WASTEWATER COLLECTION AND TREATMENT FACILITIES

Sheridan Facilities

The Town of Sheridan owns and operates a wastewater collection system and treatment facilities that serves the town. The purpose of the collection system is to collect sewage from homes and businesses and transport it to a central location for treatment and disposal. The wastewater system consists of approximately 27,000 lineal feet of gravity sewer laterals, mains, and interceptors which discharge to an aeriated treatment lagoon and three storage/treatment ponds for land application in the summer months (Exhibits 9 and 10).

Sheridan's wastewater collection system was initially constructed in 1959 and consists of approximately 27,000-feet (over 5 miles) of 8" and 10” clay tile and PVC pipe. An approximate breakdown of the existing collection system follows: 2700-feet of 10" interceptor, 23,900-feet of 8" main and approximately 400-feet of 6" laterals. The majority of the pipe appears to be the original clay tile with the more recent sewer line extensions utilizing PVC pipe.

Groundwater infiltration was and continues to be a problem in the Sheridan collection system. It was first documented by visual inspection and flow monitoring data. During August 1997 (the time of year when groundwater infiltration is usually greatest) the per capita wastewater flow for the estimated 723 residents was 390 gpcd. This is significantly higher than the DEQ's recommended design flow of 100 gpcd. The past assessment indicated a serious groundwater infiltration problem. Improvements to the collection system were completed in 2011 to reduce infiltration. An in-situ epoxy liner method was used to rehabilitate the collection system. Installation of about 6,000 feet of liner helped reduce but did not eliminate infiltration.

The EPA recommendations for collection system evaluations specify that a 125 GPCD flow should be considered the maximum acceptable per capita day flow with allowance for "reasonable" infiltration and inflow. Groundwater can enter the system through pulled gaskets in the clay tile pipe joints, cracks in the pipe itself, and through walls and floors of manholes. Area residences also have groundwater in basements in parts of the Town. Some of the residences may discharge groundwater from sump pumps into the wastewater system. It is not clear how much of the existing flow can still be attributed to this source, but the amount could be significant. Based on a study completed in 2020, wastewater flows increase significantly in the late spring, summer, and early fall when groundwater levels are highest (further discussed in the 2021 CIP).

About one year after the sewer rehabilitation work was completed, the wastewater treatment system was improved in 2012. The former gravity fed treatment pond was replaced with a lift station (LS-1) that discharges wastewater into a replacement treatment lagoon via a 6" diameter force main. The treated effluent is discharged from the treatment lagoon into an 8" transmission main that flows to a second lift station (LS-2). This lift station discharges the wastewater into to three storage lagoons via an 8" diameter force main.

The treatment facility includes an aerated lagoon 1.72 acres in size holding 4.86 million gallons. There is a quiescent area that holds 0.563 million gallons. The lagoon is sealed with a polyvinylchloride (PVC) liner. The three storage, or secondary, lagoons provide both a treatment and storage of wastewater. These lagoons have sufficient capacity to store up to 133 days of wastewater at the design flow. This does not include 1 ft of storage provided for sludge storage. The storage lagoons are scheduled to be completely dewatered to the sludge storage depth every fall to provide full storage capacity through the winter months.

Wastewater is pumped from the storage lagoons by a pump to a center pivot for irrigation during the summer months. The pump and sprinkler irrigation system may be started at a control panel located on the center pivot location. The irrigation force main is 10-inch diameter PVC pipe.

There are two operating conditions where either an irrigation pump (1,100 gpm) and the Town of Sheridan's irrigation pump (750 gpm) run together at rate of 1,850 gpm or the irrigation pump (1,100 gpm) runs alone (and the pivot moves more slowly) and wastewater is stored.

There are some improvements needed for the wastewater system but none of them are major renovations requiring significant capital over the next five years. Based on a 2020 assessment of the wastewater system, there is about 50 percent more capacity available for new service connections. Future work on limiting infiltration, such as more lining rehabilitation or limiting basement pumping is needed increase the system's capacity and avoid having to expand the size of the treatment system. Other improvements include monitoring wastewater flows, improving the sensory control and data acquisition (SCADA) system for the wastewater system, and addressing frequent pump and motor failures currently plaguing the system.

Remainder of Planning Area

The remaining area surrounding Sheridan is served by individual septic systems and wells. It is possible in the future, that some of these property owners, especially those close to the Town limits, may request to connect to the Town's wastewater system. It may be beneficial to the Town to annex these areas in the future in order to increase the tax base and population of Sheridan.

ROAD AND STREET SYSTEM

There are several entities responsible for maintenance of roads within and around the Town of Sheridan. The entities and roads that are within the Town are identified below:

1. The Montana Department of Transportation maintains U.S. Highway 287.
2. Madison County maintains portions of Madison Street within the Sheridan Planning Area.
3. The Town of Sheridan maintains the remainder of streets and alleys within the Town limits.

Town of Sheridan Streets

The Town of Sheridan maintains approximately 6.4 miles of streets with approximately 2.4 miles of the streets paved (Great West 2010). The remaining streets are hard-packed gravel and magnesium chloride is used to control dust and protect the hardpack surface. The Town of Sheridan's goal is to maintain overall transportation safety and convenience for residents within the community. The Town is responsible for providing resources and financial aid to upgrade and maintain of all its facilities. Currently, the Town has limited resources to fund annual maintenance of streets and not enough for reconstruction.

MADISON COUNTY ROADS

Madison County Road Department is responsible for maintaining county roads and bridges in areas outside the Sheridan town limits. During the winter, they provide county residents with snow removal services such as plowing and sanding. They oversee the design and construction of new roads and bridges; perform maintenance projects such as pothole repairs, chip seals, striping, signage, safety modifications, drainage, and storm water improvements. One road is maintained by Madison County within the Sheridan Town limits on one block of Madison Street located between the hospital and Madison County Tobacco Root Mountains Care Center.

MONTANA DEPARTMENT OF TRANSPORTATION ROADWAYS

One major road within the state highway system is located within the Sheridan Planning Area. U.S. Highway 287 is an east-west route that runs through Sheridan. U.S. Highway 287 provides the principal roadway connection between Sheridan nearby towns Twin Bridges and Virginia City. U.S. Highway 287 is part of the National Highway System in Montana. The Montana Department of Transportation (MDT) maintains this roadway. U.S. Highway 287 runs through the Sheridan Planning Area for approximately 2.18 miles. Exhibit 7 in Appendix K shows the roads within the Sheridan Planning Area.

Within the Sheridan Planning Area, MDT is responsible for the maintenance of U.S. Highway 287. MDT is responsible for winter maintenance, pavement maintenance, striping and signing, the maintenance of safety devices, and maintenance of drainage and roadside activities on this roadway.

FUNCTIONAL CLASSIFICATION

A community's transportation system is made up of a hierarchy of roadways, with each roadway being classified according to the function it provides. Some of these parameters are geometric configuration, traffic volumes, spacing within the community transportation grid, speeds, etc. It is standard planning practice to categorize roadways by their primary functions with typical designations being local streets/roads, collectors, minor arterials, and principal arterials. These functional classifications are applied to roadways within both "urban" and "rural" settings. A description of these functional classifications follows.

- **Principal Arterials.** The greatest portion of through travel occurs on principal arterial roadways. Principal arterials are high-volume travel corridors that connect major generators of traffic (e.g., community and employment centers), and are usually constructed with partial limitations on direct access to abutting land uses. Interstate Routes and major U.S Highways and State Routes are typical types of Principal Arterials. Principal Arterials may be multi-lane, high-speed, high-capacity roadways intended exclusively for motorized traffic with all access controlled by interchanges and road crossings separated by bridges. However, such facilities

may include two-lane or multi-lane roadways based on the travel demands they serve and have less restrictive access provisions than Interstate routes.

- **Minor Arterials.** Minor arterials are streets that connect both major arterials and collectors that extend into the urban area, while providing greater access to abutting properties. Direct access is limited to maintain efficient traffic flow. Minor arterials serve less concentrated traffic-generating areas, such as neighborhood shopping centers and schools. Minor arterials often serve as boundaries to neighborhoods and provide linkage to collector roads. Although the predominant function of minor arterials is the movement of through traffic, they also provide for considerable local traffic that originates from, or is destined to, points along the corridor.

- **Major and Minor Collectors.** Collectors provide direct services to residential or commercial areas, local parks, and schools while also providing a high degree of property access within a localized area. In densely populated areas, they are usually spaced at half-mile intervals to collect traffic from local access streets and convey it to the major and minor arterials and highways. Urban collectors are typically one to two miles in length, while rural collectors may be longer (either could be a major or minor). Access may be limited to roadway approaches and major facilities, but some direct access to abutting land may be permitted.

- **Local Access Streets.** Streets not selected for inclusion in the arterial or collector classes are categorized as local or residential streets. They allow access to individual homes, businesses, and similar traffic destinations. Direct access to abutting land is essential, for all traffic originates from, or is destined, to abutting land. Major through traffic should be discouraged.

U.S. Highway 287 and Main Street are the only Principal Arterials in the Sheridan Planning Area. Minor Arterials include Mill Street (Mill Creek Road), Water Street (Duncun District Road), Wisconsin Creek Road, West Poppleton (Silver Springs Road), and East Hamilton. Major Collectors include Madison Street, East Crofoot Street, and East Poppleton Street. The remaining roads in the Planning Area are considered local roads or streets. There are no Minor Collectors in the planning area.

Streets and roads in the planning area have improved some areas over the last few years, but survey data, interviews, and public meeting feedback support more improvements are needed. Target areas include Madison Street in front of the School and Hospital, and East Hamilton, and Mill Street. There are other possible improvement areas for better surface cover and installing or upgrading sidewalks, curbs, and gutter on Madison Street, as identified in the 2021 Capital Improvement Plan.

PARKS, RECREATION FACILITIES, AND OPEN SPACE

Parks, recreational areas, and open space are important components of a community and can improve quality of life for residents. Currently, the residents in the Sheridan Planning Area have access to recreation facilities including the Sheridan Swimming Pool, four parks, and the High School football field. The pool consists of a single cinder block building with dressing rooms and the outside pool area. The only open spaces within the community are the Sheridan High School football field, area around the pool building, three parks, and a narrow corridor between East Poppleton Street and Bieler Lane.

It is important for the Town of Sheridan to maintain its parks and associated facilities, develop new parks when development is proposed, maintain, and improve recreation facilities, and protect open space. High quality facilities can contribute greatly to the overall physical, mental, and emotional health of a community.

Improvements are needed at the four parks including updated playground equipment, better maintained ballfields, turf improvements or new cover, and more walking trails based on survey results, interviews, and public meeting feedback. Other improvements include installing a new boiler and repairing a leak in the Sheridan Pool according to the Sheridan Alder Parks and Recreation District. Residents would also like to see a public outdoor and indoor venue, such as a pavilion at one of the parks for weddings and gatherings, an RV/Campground to encourage traveler stayover in Sheridan, a new indoor pool and exercise facility, and community center. There is limited funding for all these improvements and historically the Sheridan Pool is the benefactor of the Town's available funding.

SHERIDAN PUBLIC SCHOOLS

The Sheridan K-12 School district includes the Sheridan Planning Area. The District includes one school, the Sheridan Public School divided between two campuses next to each other for grade school and high school. The school is responsible for educating grades kindergarten through grade 12. Each grade has one classroom, with the teachers all working together as a team in planning curriculum and programs. In addition to classroom teachers, there are business and physical education teachers, special education teachers, counselors, and a librarian.

According to the local school district the Sheridan School District currently enrolls 93 children in the grade school and 25 students in middle school. Additionally, there are 64 students enrolled in the Sheridan High School, grades 9 through 12. The following table shows the enrollment over the past five school years (Table 1). Improvements related to this Policy and the school campus are identified and include improving the road in front of the school and a land transfer on the east side of the school grounds needed to help

the School expand the football field and construct a state-of-the art High School running track.

Table 2. Sheridan School District Enrollment (K - 12)

Academic Year	Number of Students
2014-2015	171
2015-2016	175
2016-2017	175
2017-2018	179
2018-2019	193

SHERIDAN LIBRARY

The Sheridan Public Library is located between Mill Street and East Hamilton just east of Town Hall at Kiwanis Park. The library hosts various community events and hours of operation vary throughout the year. Community calendars are available at the library for the public. The library also provides local internet services to residents without a computer or internet service.

Appendix G
Services

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LAW ENFORCEMENT

Currently, the Town of Sheridan does not have a police department. The Town falls under the jurisdiction of the Madison County Sheriff's Office. The Madison County Sheriff's Office is committed to serving the public, keeping the peace, enforcing the laws, and protecting all citizens and visitors in Madison County. The County Sheriff's Office is located in the Madison County Courthouse in Virginia City, MT. The Sheriff's Office currently employs 14 full-time officers, three (3) part-time officers, and seven (7) full-time dispatchers and provides service 24-hours a day, 365 days a year. An interlocal agreement is in place between the Town of Sheridan and Sheriff's office to provide law enforcement in the Town limits.

The Bureau of Justice Statistics (BJS), within the Office of Justice Programs (OJP), within the United States Department of Justice (DOJ) publishes Local Police Department reports every three to four years. One aspect of this report is the average ratio of full-time officers per 1,000 residents. The 2016 report shows that the average ratio of full-time officers per 1,000 residents in communities less than 10,000 residents is 2.3. Based on the County's current estimated population of 8,302 from ACS, the County Sheriff's Office maintains an officer to population ratio of about 2.1 full-time equivalent officers per 1,000 residents.

FIRE PROTECTION AND EMERGENCY SERVICES

SHERIDAN EMERGENCY MEDICAL SERVICES

The Sheridan area medical emergency services are provided by Ruby Valley Medical Center (RVMC). The RVMC offers ambulance service 24-hours a day, seven days a week, to the Madison County area including the Town of Sheridan. The RVMC emergency department is fully equipped and staffed every day with a physician, registered nursing staff, and social service coverage. RVMC is a Trauma Receiving Facility and maintains an Emergency Medical Service (EMS) staff and ambulance service that is based in the Town of Sheridan. This service responds to local medical emergencies and treats and transports patients to appropriate medical facilities. The ambulance for this operation is maintained and housed across Madison Street from the Hospital, next to the Senior Center. A heliport is constructed at the Hospital for air ambulance services.

SHERIDAN FIRE DEPARTMENT AND RURAL FIRE DISTRICT

The Sheridan Fire Department and Rural Fire Districts together provide fire protection and emergency services to the Town of Sheridan and surrounding area. The Rural Fire District's jurisdiction includes the Sheridan Town Limits and extends outward to the Twin Bridges and Alder Rural fire district boundaries. The department is operated on a volunteer basis and is currently located at Town Hall on East Hamilton Street in Sheridan.

The fire department often provides mutual aid to the surrounding fire districts and vice versa. Currently, the Town of Sheridan and Rural Fire District are discussing the Rural Fire District annexing the Town of Sheridan into the Rural Fire District. The goal is to create a single Rural Fire District vs. using a using combined department approach to respond to emergencies and operate. A new fire hall is in an early planning stage and eventually planned to house the single Rural Fire District. An undeveloped property is currently owned by a non-profit association and will be used to construct the new fire hall and transfer to the Rural Fire District. The new fire hall will be located on the southern outskirts of Sheridan and is anticipated to take several years to complete the annexation process.

Currently, the Sheridan Fire Department needs Self Contained Breathing Apparatus (SCBA) units with radios so they can communicate in real time with fire fighters and the fire chief. The SCBA units owned by the Town do not have radios and are considered a safety issue for fire fighters entering buildings with smoke and flames because of no direct radio communication.

Madison County Disaster and Emergency Services

Madison County has a Disaster and Emergency Services Department (DES) coordinated by two employees, the DES Coordinator and Deputy Coordinator. The DES office is located in the County Courthouse in Virginia City, MT and they are responsible for the safety of all Madison County residents and visitors. Through planning, preparation, response, recovery, and mitigation, the DES serves the community of Sheridan and its surrounding areas. Madison County has an Emergency Operation Plan (EOP) in place that provides guidelines for managing and coordinating response and recovery activities before, during, and after major emergencies and disaster events. The Town of Sheridan is included in the 2011 EOP along with the other the towns in Madison County. The County also has a Pre-disaster Mitigation Plan (PDM) that was drafted in 2017, includes the Town of Sheridan, but is not finalized. Other planning documents are available on the County website related to emergency services.

SOLID WASTE MANAGEMENT AND DISPOSAL

Town of Sheridan Services

The Town of Sheridan does not currently have a solid waste collection and disposal service for its residents and businesses within the city limits. The nearest transfer station is located about 2.5 miles southeast of Town at the Madison County Transfer Station. The transfer site property is owned by the Town of Sheridan and operated by Madison County through a mutual agreement.

Appendix H
Environmental

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CLIMATE

The area climate is considered to be a Dfc in the Koeppen climate classification system (Lutgens and Tarbuck, 1982). That classification reflects a generally cold, dry climate with somewhat more precipitation in summer months than in winter months. The nearest weather station is station 248430 located approximately 10 miles northwest of Sheridan near Twin Bridges, Montana. Average summer temperatures (May-September) vary between 35.3 degrees F and 83.9 degrees F. Monthly average temperatures for October through March are 11.1 degrees F to 60.4 degrees F.

The total annual average precipitation is 9.57 inches, only two-thirds of the state annual average of 15 inches. Seventy-eight percent of the precipitation comes during the growing season from April to September. The average total snowfall is 10.3 inches. Pan evaporation data are available for the Dillon area. Average evaporation rates (1895-2000) range from a low of 2.84 inches in October to a high of 6.41 inches in July. The average growing season (consecutive frost-free days) is approximately 100 days.

The prevailing winds are generally from the south. The nearest long-term recording station is located in Dillon, Montana, approximately 30 miles southwest of Sheridan. The average annual wind speed at the Dillon station is 9.2 mph. Wind speeds are common at 10-20 mph. Gusts of 50-60 mph and greater are not uncommon.

LANDFORMS, GEOLOGY, AND SOILS

LANDFORMS AND GEOLOGY

The Sheridan area is located on the southwestern flank of the Tobacco Root Mountains on the Mill Creek fluvial plain in southwest Montana. The area is characterized by the Ruby Valley and river to the south and Ruby Mountains bounding the opposite side of the valley. The principal streams in the area Mill Creek that flows through Town, Indian Creek to the west, and The Ruby River to the South. Water sources are associated with the local mountain ranges and water generally flows west towards their confluence with the Beaverhead River. Both Mill Creek and Indian Creek originate in the high mountain glacial canyons and pass through the planning area, cutting through broad alluvial fans that extend southwest to the Ruby River floodplain. The slopes in the town and immediate area generally average about 3%. The alluvial soils of the drainages are used for agriculture, primarily grazing land and irrigated hay. The area along the drainages is characterized by riparian vegetation in the valley.

The terrain is considered to be an alluvial fan with a surface elevation of about 5,000 feet above sea level in the planning area with no steep slopes within a few miles. Slope is not generally a limitation for development within the Planning Area. The mountain ranges on

the North and South rise abruptly to elevations of 9,000 feet to 10,000 feet above sea level.

SOILS

The soils in and around Sheridan have been classified by the USDA Soil Conservation Service (NRCS) and published in the "Soil Survey of Madison County Area, Montana". Attached at the end of this appendix is a custom soils report generated for this project and covers most, but not all of the Planning Area. Local soils are mapped and described in the report.

The NRCS data contains tables showing a list of soils classifications and a corresponding series in tables that give information about the suitability of the soil for specific uses including, pastureland, irrigated and non-irrigated cropland, crop yields, land capability and woodlands. Soils are also rated for their potential to support building foundations, sanitary facilities, as a source of construction materials such as gravel for road building, and water feature embankments. The area soils are typically well drained. Shallow groundwater levels that would affect water system improvements are generally not a problem except in the immediate area of Mill Creek, Indian Creek, and irrigation ditches. The soils are generally well suited for development except in area of very shallow groundwater and wetlands.

Soil mapping is routinely done by NRCS and soils information for the Sheridan area is available on the NRCS's Web Soil Survey (WSS). The Soil Survey document, maps, and soil data can be accessed via the following websites for focused and custom reporting:

http://websoilsurvey.nrcs.usda.gov/app/

A soils map for the planning area is also shown in Exhibit 11 in Appendix K. Soils information shown are also available on the internet at the Montana Natural Resource Information System (NRIS) site and includes maps and detailed tables for the planning area.

GEOLOGIC HAZARDS

Geologically hazardous areas are susceptible to earthquakes, landslides, or other geologic events. Typically, they are not suited for commercial, residential, or industrial development without mitigation.

Seismicity - Sheridan is located in an area with that historically has had moderate to severe seismic activity. Sheridan is considered a high-risk area and the Town's location being fairly near Yellowstone National Park is one of the primary reasons the area is seismically active.

According to the Montana Bureau of Mines and Geology, the Intermountain Seismic Belt extends through western Montana from the Flathead Lake region on the northwest to Yellowstone National Park where the borders of Montana, Idaho, and Wyoming meet, which includes the Sheridan area. Multiple faults are mapped in the Sheridan area and in the last two decades local earthquakes in the 4 to 5 magnitude range were recorded. These include a 5.5 magnitude earthquake at the Hogback north of Dillon, Montana in 2005 and a 4.4 magnitude near Horse Creek just a few miles east of Sheridan in 2007. Both earthquakes caused damage to buildings and were clearly felt by residents.

More recently, On July 6, 2017, a magnitude 5.8 earthquake occurred southeast of Lincoln, MT. This was the highest magnitude earthquake in Montana in 42 years. The earthquake epicenter is approximately 96 miles north of Sheridan, MT. Earthquake intensity measures the strength of shaking at a specific location and is determined from effects on people, structures, and the natural environment. At locations which do not have seismographic instrumentation, such as Sheridan, earthquake intensity is modeled by USGS. For this earthquake, the MMI (Modified Mercalli Intensity Scale) at Sheridan was modeled to be IV. Locations in the adjacent Jefferson River Valley were modeled to have an MMI of V. The Town's water supply was damaged from this earthquake and a new redundant well had to be constructed to replace the damaged well which lost most of its production capacity after the earthquake.

Slope Stability - There are three variables related to slope stability that typically need to be considered when determining the suitability of a particular site: slope, geologic materials, and landslide deposits. The Sheridan Planning Area contains few, if any, areas presenting notable slope stability concerns due to the flat topography in the region. Localized hazards may occur anywhere within the Planning Area. It is the responsibility of those who wish to develop their property to assess the degree of hazard in their selection of development sites.

IMPORTANT FARMLAND

The federal Farmland Policy Protection Act (FPPA) requires special consideration be given to soils that are considered as prime farmland, unique farmland, or farmland of statewide or local importance by the U.S. Department of Agriculture Natural Resources Conservation Services (NRCS). For the purposes of this Growth Policy, these soils are considered together and identified as "Important Farmland."

The FPPA is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or

indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. The FPPA does not apply for projects funded and implemented by the Town of Sheridan. However, this is an important planning consideration because the Town of Sheridan may solicit federal funding assistance for infrastructure improvements and the potential conversion of Important Farmland as a result of the project must be considered.

Web-based soil survey information for the Sheridan area maintained by NRCS was accessed to identify soils in the Planning Area classified as important farmland. This review identified 13 soils within the Sheridan Planning Area that meet Important Farmland classifications including: two soils considered to be Farmland of Statewide Importance and seven soils of considered Farmland of Local Importance. These soils comprise most of the Sheridan Planning Area (70 percent). Soils for the Planning Area are listed at the end of this appendix and online (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1338623.html).

WATER RESOURCES AND QUALITY

SURFACE WATERS

The Sheridan planning area is part of the Ruby Valley watershed which a 973 square mile area beginning at Twin Bridges nine miles to the northwest and extending southeast of town along the Ruby River roughly to the Madison County line. The watershed divide is located on the Ruby Mountains to the south and Gravelly Range mountains on the east. Closer to Sheridan, the Tobacco Roots Mountains are located to the north and east. Local streams from the mountains flow into the Ruby River which by-passes the Planning area by about 2.5 miles southwest of Sheridan. The Ruby River is 75 miles long and is joined by numerous tributaries, including Indian Creek and Mill Creek. Mill Creek passes through the Town Limits of Sheridan and is considered an important natural resource in the planning for not only aesthetics, but also for flooding impacts and recreation. The Vigilante Canal is also an important surface water resource in the project area and is located just on the southwest side of town.

Irrigation, water conveyance, and precipitation are principal re-charge to the basin fill aquifers in the area and has a direct effect on the quality and quantity for the local water supply and depth of groundwater.

Surface Water Quality - Surface water quality is typically assessed according to the amount and kind of substances present in water, by the water's ability to support beneficial uses such as irrigation and recreation, and by the overall health of the aquatic ecosystem. The health of streams and wetlands (and other surface waters) is assessed based on the constituents dissolved in the water, the condition of the banks and

associated riparian zone, and the types and numbers of plants and animals living in the water.

The Montana Department of Environmental Quality (MDEQ) has the responsibility under Section 401 of the Federal Clean Water Act and the Montana Water Quality Act to monitor and assess the quality of Montana surface waters and to identify impaired or threatened stream segments and lakes. The MDEQ sets limits, known as Total Maximum Daily Loads (TMDLs), for each pollutant entering a body of water. TMDLs are established for streams or lakes that fail to meet certain standards for water quality and describe the amount of each pollutant a water body can receive without violating water quality standards. The legislatively mandated TMDL process determines the concentration of pollutants in water bodies and stipulates controls needed to improve water quality and beneficial uses.

Under the Clean Water Act, the Ruby River was evaluated by the MDEQ and a TMDL was prepared in December 2006 for the main stem and selected tributaries, including Mill and Indian Creeks. With the TMDL completed in 2006, an evaluation of implementation and progress towards addressing impairments was completed in May 2020. Indian Creek is listed for having flow and habitat alteration impairment. Mill Creek is identified for having sediment and temperature impairment impacting the local fishery and aquatic life (Table H-1) (https://deq.mt.gov/Portals/112/Water/WQPB/TMDL/PDF/RubyWS/RubyTIE_Final_May2020.pdf).

Table H-1. 2020 TMDL Status Ruby Watershed Mill Creek

Indian Creek, MT41C002_030	Flow and habitat alterations (addressed through sediment TMDL)	DEQ is not aware of any BMP or other restoration activities on this waterbody to address the Flow and habitat alteration (sediment) impairment	Some data available for estimating conditions/trends.	Restorative efforts are needed. Evaluation of water quality and sources assessment is recommended.
Mill Creek, MT41C002_020	Sediment	DEQ is not aware of any BMP or other restoration activities on this waterbody to address the sediment impairment	Some data available for estimating conditions/trends. Insufficient data for reassessment.	Restorative efforts are needed. Evaluation of water quality and sources assessment is recommended.
	Temperature (addressed through sediment TMDL)	DEQ is not aware of any BMP or other restoration activities on this waterbody to address the sediment impairment	Some data available for estimating conditions/trends.	Restorative efforts are needed. Evaluation of water quality and sources assessment is recommended.

GROUNDWATER

Groundwater occurs in the sub-surface pore spaces, fractures, and voids in rocks, soil and sediment formations. Groundwater originates from water infiltrating the ground from snow, rain, irrigation, and natural and manmade watercourses. Groundwater tends to move from the highlands to low areas, where it is discharged to streams, used by plants, or evaporates. The movement, amount, and quality of groundwater at any location

depends on the type of aquifer, climate, landforms, and other natural features. Groundwater is also influenced by human activities but generally to a lesser extent than surface water.

Within the Sheridan Planning Area, groundwater is the primary source for domestic and public drinking water. The principal source of groundwater within the Planning Area is the deep aquifer known as the Tertiary aquifer. Water is also pumped from the shallow Aquifer known as the Quaternary Aquifer.

Groundwater Depth - Depth to groundwater in the Sheridan Planning Area ranges from less than four feet in some areas to about 75 feet deep at Well #6. Depth to groundwater in the shallow aquifer is unconfined and likely influenced by local irrigation practices in the agricultural areas of the planning boundary and by spring snow melt and runoff. The deep aquifer responds to spring snow melt and runoff, but is a confined aquifer system under pressure, isolated from the shallow aquifer by a clay unit, and is less influenced from local surface irrigation practices. The Tertiary Aquifer relies more on regional recharge for replenishment. Groundwater fluctuations of several feet or more are not uncommon. Within the Planning Area, groundwater is generally closer to the surface in the areas near Mill Creek, Indian Creek, and irrigation conveyance and flood irrigated fields.

Groundwater Quality – Groundwater quality in the planning area is excellent and as a result, groundwater is the only source of potable water used by area residents. However, shallow aquifers are susceptible to contamination because coarse-grained alluvial and fluvial deposits may allow for rapid infiltration of surface contaminants. Within the Sheridan area, groundwater contamination from surface sources is an ongoing concern. At this time there are no specific threats or nearby impacts to groundwater quality that could impact the Sheridan water supply. The threat is less of a concern for the deep aquifer because water quality is protected from surface contamination from a clay unit separating the shallow and deep aquifers. Bacteriological impacts are the only current concern for the Town of Sheridan water quality based on historic water quality testing. Infrequently past water quality testing has detected coliform bacteria in the drinking water supply. The Town has used chlorination and flushing the water supply system as needed to address these concerns. The presence of coliform is suspected to be related to temporary system contamination or monitoring issues vs. impacted groundwater.

WATER QUALITY PERMITTING

The MDEQ is the state agency responsible for preserving and maintaining the quality of Montana's water supply. Development activities in or near streams are governed by the Montana Stream Protection Act (SPA 124 permit) and the Montana Natural Streambed and Land Preservation Act (310 permit). An SPA 124 permit is required of all

governmental agencies proposing projects that may affect the beds or banks of any stream in Montana. The purpose of the law is to preserve and protect fish and wildlife resources in their natural existing state. The Montana Department of Fish, Wildlife and Parks administers this law.

A 310 permit is required of all private, non-governmental individuals or corporations that propose to work in or near a stream. The purpose of the law is to minimize soil erosion and sedimentation, maintain water quality and stream channel integrity, and prevent property damage to adjacent landowners. The Ruby Valley Conservation District and the Montana Department of Natural Resources and Conservation (DNRC) administers this permit.

The primary federal regulatory program for safeguarding surface water quality is Section 404 of the Clean Water Act jointly administered by the U.S Army Corp of Engineers and the U.S. EPA. This program regulates discharges of dredge and fill materials into the jurisdictional waters of the United States including perennial and intermittent streams, irrigation ditches with connections to surface waters, and wetlands. Developments within the Planning Area affecting jurisdictional waters or wetlands are subject to 404 permit requirements from the Corp of Engineers – Montana Regulatory Office.

FLOODPLAINS

Floods are typically classified as 2-year, 10-year, 50-year, 100-year and 500-year events to provide an indication of the likelihood for floods of a given size to occur once during the designated period. These re-occurrence intervals above represent the long-term average period between floods of a specific magnitude. The recurrence interval of most interest is the 100-year flood, which has a 0.2 percent chance of being equaled or exceeded during any year. It should be noted that floods can and do occur at shorter intervals and it is possible (although very unlikely) to have several 100-year flood events in the same year.

The Federal Emergency Management Agency (FEMA) and Montana Department Natural Resources and Conservation prepares detailed floodplain maps for various communities through Montana and the United States. Indian Creek is located just outside the very northwest corner of the Town of Sheridan and generally not flooding concern for Sheridan residents. A new flood study is underway for Mill Creek within the Town of Sheridan. Exhibits 12 through 18 show the project area and preliminary hydraulic work maps for the Town of Sheridan. These maps show the 100-year and 500-year floodplains and the floodway. Historically, flooding is generally limited to the area immediately adjacent to the stream channel on Mill Creek and there is no recent record or knowledge reporting local flood impacts. However, preliminary work completed for the new study shows there are multiple structures in the Town that are threatened from flood events south of Highway

287. The new results are important for future planning for lots near Mill Creek. The Town will be invited to participate in upcoming public meetings that will finalize the preliminary work maps.

AIR QUALITY

Overall, air quality within the planning area can be described as good. The MDEQ is responsible for monitoring, permitting, and compliance assistance for air quality matters within the State of Montana. The nearest air quality monitoring site to the Sheridan Planning Area is in Dillon, MT, approximately 25 miles southwest of Sheridan. The site is operated MDEQ for the purposes of mapping air quality and monitoring. The site has been operating since 2012 and measures PM2.5, PM10, ozone, and met data are nearby collected at the airport. There are no non-attainment designations near Sheridan.

VEGETATION

Vegetation types in immediate proximity to Sheridan include agricultural and riparian zones. The agricultural sites are located in the northern and eastern portions of the Town limits and in all directions from Town limits. Alfalfa and grass hay are typical crops. Idle land hosts primarily grassland and range communities adapted to the semi-arid climate. However, local flood irrigation has raised the shallow groundwater table in the project area resulting in some areas with wetlands vegetation species vs. the natural grassland or sage brush cover type. The riparian zones are located along Mill Creek, Indian Creek, and in wet areas where the water table has been raised by local and upgradient flood irrigation. Typical riparian flora consists of willows and other hydric-adapted species. The fringe area is primarily cottonwood.

Lands within the Sheridan Planning Area support a variety of grasses, shrubs, forbs, trees, and noxious weeds. According to the Montana Natural Heritage Program (MNHP), there are approximately 1,138 different plant species within Madison County. The MNHP did not conduct a study for the Town of Sheridan. Common plant communities found in the general area include Kentucky bluegrass, wheatgrass, common juniper, twinflower, Engelmann spruce, Douglas fir, some hardwood species, and many others. Grazing land is found throughout the rural portions of the Planning Area. Some native rangeland exists through this area, although a majority has been disturbed by agricultural practices. Alfalfa production is common in the rural portions of the Planning Area.

Residential landscaping dominates within the Town of Sheridan urban area, which includes various ornamental flowers, native and introduced trees and shrubs, and manicured bluegrass lawns. The primary vegetation type found in rural portions of the Planning Area is semi-arid herbaceous grasses including slender wheatgrass, needle grass, blue gramma, bluebunch wheatgrass, Idaho fescue, and oatgrass. Forbs such as

Yarrow and pussytoes are also present in this general area, among many others. Juniper shrubs and sage brush are also found in the Sheridan Planning Area.

Threatened or Endangered Plants - The United States Fish and Wildlife Service (USFWS) lists Ute ladies'-tress orchid (*Spiranthes diluvialis*) as a threatened plant species in Montana under the Endangered Species Act. Habitat for this species does not occur in the Sheridan Planning Area. Whitebark Pine (*Pinus albicaulis*) is candidate plant species and is present at high elevations in Madison County but not in the Planning Area.

Plant Species of Concern - Species of Concern are native plant species that are at-risk due to declining population trends, threats to their habitats, restricted distribution, and/or other factors. Designation as a Montana Species of Concern or Potential Species of Concern is based on the Montana Status Rank and is not a statutory or regulatory classification.

The Montana Natural Heritage Program identified nine plant species of concern within Planning Area. Table H-1 provides the common names of the species and their current status.

Invasive Plants/Noxious Weeds - The Montana Department of Agriculture has classified noxious weeds in the state based on the number of acres affected and identified management criteria. Priority 1A weeds are not present in Montana or have a limited presence. Management criteria will require prevention, education, and eradication if detected. Priority 1B weeds have limited presence in Montana. Management criteria will require eradication or containment, where present, and prevention and education elsewhere. Priority 2A Category III noxious weeds have not been detected in the state or may be found only in small, scattered, localized infestations. Management criteria include awareness and education, early detection, and immediate action to eradicate infestations. These weeds are known pests in nearby states and are capable of rapid spread and render land unfit for beneficial uses. Priority 2A Category IV noxious weeds are invasive plants and may cause significant economic or environmental impacts if allowed to become established in Montana. Management criteria include prohibition from sale by the nursery trade. Research and monitoring may result in the plant being listed in a different category.

Table H-1. Plant Species of Concern Town of Sheridan Planning Area.

Species_Subgroup	S_Sci_Name	S_Com_Name	S_Rank_Reasons	COUNTY	MT Status	Habitat
Gymnosperm (Conifers)	Pinus albicaulis	Whitebark Pine	Whitebark pine is a common component of subalpine forests and a dominant species of treeline and krummholtz habitats. It occurs in almost all major mountain ranges of western and central Montana. Populations of whitebark pine in Montana and across most of western North America have been severely impacted by past mountain pine beetle outbreaks and by the introduced pathogen, white pine blister rust. The results of which have been major declines in whitebark pine populations across large areas of its range. Additionally, negative impacts associated with encroachment and increased competition from other trees, primarily subalpine fir have occurred as a result of fire suppression in subalpine habitats.	Beaverhead, Broadwater, Carbon, Cascade, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland	SOC	Subalpine forest, timberline
Flowering Plants - Dicots (Magnoliopsida)	Aquilegia formosa	Sitka Columbine	Known from several areas in southwest Montana. However, only four of these are large, high quality populations. Effects of human disturbance, such as logging, on the species are uncertain.	Beaverhead, Madison, Park	SOC	Forest (Mesic)
Flowering Plants - Dicots (Magnoliopsida)	Castilleja exilis	Annual Indian Paintbrush	Annual Indian Paintbrush is known from a half dozen counties in southwest Montana with the majority of documented locations on private lands. Many areas of suitable habitat have been converted to agricultural uses and/or are used for livestock grazing. Additionally, populations are susceptible to hydrologic changes and may negatively impacted by invasive weeds.	Broadwater, Deer Lodge, Fergus, Gallatin, Jefferson, Madison, Park	SOC	Wetland/Riparian
Flowering Plants - Dicots (Magnoliopsida)	Castilleja gracillima	Slender Indian Paintbrush	This plant is a regional endemic, known in Montana from a limited number of populations, with most being relatively small. No threats have been observed, though it could be vulnerable to hydrologic alterations or noxious weeds. 	Beaverhead, Gallatin, Madison, Park, Sweet Grass	SOC	Wetland/Riparian
Flowering Plants - Dicots (Magnoliopsida)	Castilleja nivea	Snow Indian Paintbrush	Currently known from a few collections from the Beartooths, Crazy Mtns, Tobacco Root Mtns and the Centennial Range. It is very likely that additional occurrences exist in the known mountain ranges as well as additional mountain ranges. Additionally, the high elevation habitat generally limits the potential for impacts to the species.	Carbon, Fergus, Golden Valley, Madison, Park, Sweet Grass	SOC	Alpine
Flowering Plants - Dicots (Magnoliopsida)	Draba ventosa	Wind River Draba	Draba ventosa is known from one site in the Madison Range and has been reported from a second site in the Snowcrest Range. Current population levels and trends are unknown. However, its high-elevation habitat is relatively inaccessible, and there are no obvious threats. Additional sites are likely to be documented.	Madison	SOC	Alpine
Flowering Plants - Dicots (Magnoliopsida)	omatium attenuatu	Taper-tip Desert-parsley	Lomatium attenuatum is restricted to northwest Wyoming and southwest Montana, with most of its range in Montana. It is known from several locations in Beaverhead and Madison counties. Some populations may be vulnerable to impacts from mining activities and noxious weed invasion.	Beaverhead, Madison, Mineral	SOC	Slopes and Scree (Dry)
Flowering Plants - Dicots (Magnoliopsida)	Primula incana	Mealy Primrose	Primula incana is known from a few dozen extant occurrences in Montana, including several moderate to large populations. However, most known populations are small, and the status of several populations is uncertain. Ownership of the occupied areas is varied and includes federal, state and private lands, including several locations managed or protected for their conservation values. However, unprotected private lands host many occurrences. Cattle grazing may have some negative effects on the species including the direct effects of herbivory and trampling. The species is also vulnerable to activities that alter the hydrology of the wetlands it occupies. Continued threats and potentially declining trends, particularly in regards to habitat quality make the species' vulnerable to local extirpation.	Beaverhead, Broadwater, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Meagher, Powell, Sheridan, Silver Bow, Teton	SOC	Wetland/Riparian
Flowering Plants - Monocots (Liliopsida)	Spiranthes diluvialis	Ute Ladies'-tresses	Spiranthes diluvialis is known from a small number of occurrences in southwest and south-central Montana. Plants occur in the valleys of the Missouri, Jefferson, Beaverhead, Ruby, and Madison River drainages where it is restricted in area by specific hydrologic requirements. Many populations have less than 100 individuals, though a couple have over 500 plants. Sites are susceptible to hydrologic changes and weed invasion. Large areas of habitat have been converted to agricultural uses. Agricultural practices can hinder or promote plants depending upon their timing with critical reproductive stages. A few populations occur along highway right-of-ways. Most populations occur on private lands and only one occurrence is currently provided some potential protection or management for its conservation value.	Beaverhead, Broadwater, Gallatin, Jefferson, Madison	SOC	Wetland/Riparian

Source: MNHP Species of Concern Reports for Sheridan, Montana. Accessed January 16, 2021

Priority 2A weeds found in Madison County include:

Common Name	Scientific Name
Yellow Starthistle	Centaurea solstitialis
Common Crupina	Crupina vulgaris
Eurasian Watermilfoil	Myriophyllum spicatum
Dyer's Woad	Isatis tinctoria
Flowering Rush	Butomus umbellatus
Japanese Knotweed	Complex Polygonum cuspidatum, sachalinense and polystachyum
Scotch Broom	Cytisus Scoparius

Priority 2B weeds are abundant in Montana and widespread in many counties. Management criteria will require containment and suppression where abundant and widespread, and eradication or containment, prevention, and education where less abundant. Management shall be prioritized by local weed districts. According to Montana's noxious weed list, Priority 2B noxious weeds that may be found in Madison County include:

Common Name	**Scientific Name**
Spotted Knapweed	Centaurea stoebe
Houndstongue	Cynoglossum officinale
Canada Thistle	Cirsium arvense
Oxeye Daisy	Leucanthemum vulgare
Whitetop	Cardaria draba, Lepidium draba
Hoary Alyssum	Berteroa incana
Diffuse Knapweed	Centaurea diffusa
Field Bindweed	Convolvulus arvensis
Leafy Spurge	Euphorbia esula
Common Tansy	Tanacetum vulgare
Dalmatian Toadflax	Linaria dalmatica
Yellow Toadflax	Linaria vulgaris
Sulfur Cinquefoil	Potentilla recta
Russian Knapweed	Acroptilon repens, Rhaponticum repens
Salt Cedar	Tamarix ramosissima, T. chinensis
St. Johnswort	Hypericum perforatum

Common Buckthorn	Rhamnus cathartica L
Curlyleaf Pondweed	Potamogeton crispup

Priority 3 weeds are not noxious weeds, but regulated plants that have potential for significant negative economic and ecological impact. Intentional spread or sale of regulated plants other than as a contaminant in agricultural products is prohibited. Research, education, prevention, and control programs, where appropriate, are recommended to minimize the spread of these weeds. Control of Priority 3 weeds is not mandated.

THREATENED AND ENDANGERED SPECIES

Threatened and endangered species include those species listed or proposed for listing by the U.S. Fish and Wildlife Service (USFWS) as threatened or endangered. Under Section 7 of the Endangered Species Act, activities conducted, sponsored, or funded by federal agencies must be reviewed for their effects on species federally listed or proposed for listing as threatened or endangered.

The USFWS online summary of listed species (accessed via the Montana Fish Wildlife and Parks website on January 17, 2021) shows the following species that as occurring in Madison County:

Canada Lynx (*Lynx Canadensis*) **– Listed Threatened**

Grizzly Bear (Ursus arctos horribilis) – **Listed Threatened**

Wolverine (*Gulo gulo luscus*) **– Proposed Threatened**

Red Knot (*Calidris canutus rufa*) – **Listed Threatened**

Ute Ladies' -Tresses (Spiranthes diluvialis) **– Listed Threatened**

Whitebark Pine (*Pinus albicaulis*) **– Candidate**

The potential occurrence of these species in the Sheridan Planning Area is discussed below.

Canada Lynx - Canada lynx typically occur in mesic coniferous boreal, sub-boreal, and western montane forests that are subject to cold, snowy winters and support a prey base of snowshoe hare. In Montana, lynx is most frequently found in thick stands of lodgepole, or in stands of Douglas fir or western larch between 4,920 and 7,380 feet in elevation.

The Sheridan Planning Area does not sit at an elevation where lynx typically occur and does not contain any coniferous forest habitat favored by lynx. For these reasons,

development activities within the Planning Area would be unlikely to impact the Canada lynx or its habitat.

Grizzly Bear - In Montana, Grizzly Bears primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, sidehill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals (Servheen 1983, Craighead and Mitchell 1982, Aune et al. 1984). Grizzly Bears have been observed in portions of the Tobacco Root and Ruby Mountains, near but outside the Planning Area.

No true migration occurs, although Grizzly Bears often exhibit discrete elevational movements from spring to fall, following seasonal food availability (LeFranc et al. 1987). They are generally at lower elevations in spring and higher elevations in mid-summer and winter. Grizzly Bears are generally observed in elevations higher than the Planning Area in Southwest Montana and it is possible that on rare occasions the bears may move from one mountain range to another. However, development activities within the Planning Area would be unlikely to impact the Grizzly Bear or its habitat.

Wolverine - Wolverines are limited to alpine tundra, and boreal and mountain forests (primarily coniferous) in the western mountains, especially large wilderness areas. However, dispersing individuals have been found far outside of usual habitats. They are usually in areas with snow on the ground in winter. Riparian areas may be important winter habitat. When inactive, Wolverines occupy dens in caves, rock crevices, under fallen trees, in thickets, or similar sites. Wolverines are primarily terrestrial but may climb trees.

Like the Canada Lynx, the wolverine is not likely to inhabit the Sheridan Planning Area due to lack of appropriate wolverine habitat. Development activities within the Planning Area would be unlikely to impact the Wolverine or its habitat.

Red Knot - Annually migrate between arctic tundra breeding grounds and marine wintering habitats as far south as Tierra del Fuego, an annual migration distance of up to 30,000 km (Baker et al. 2013). Migratory stopovers in Montana are rare but are most common stopovers for the Red Knot are at larger wetlands. About 60 percent of documented migratory stopovers in Montana are at Freezeout Lake, Benton Lake National Wildlife Refuge, and Lake Bowdoin National Wildlife Refuge (Montana Natural Heritage Program Point Observation Database 2016).

Madison County has had a few observations of the Red Knot in the Ennis Lake area, but not on the Ruby side of the county (http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNNF11020). In the absence of

Red Knot observations and their habitat focused on large wetlands, it is unlikely the planning area will impact the Red Knot.

Ute Ladies' -Tresses - Ute Ladies'-Tresses occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers. In Montana plants grow in calcareous wetlands, swales, and old meander channels that are outside of the active stream channel (Heidel 2001; Lesica et al. 2012). Within these habitats plants often grow at the wetland edges or in areas that dry by mid-summer. Plants can occupy small, fragmented parcels of habitat. It also is found in wetland and seep areas near freshwater lakes and springs. This type of habitat may be present but is not common in the Sheridan Planning Area proper. The plant is observed in the Ruby Valley and the Sheridan area and the plants range includes the Planning Area.

Development of natural wetlands in the Planning Area is unlikely because they are generally protected habitat and cannot be destroyed without a replacement plan. Development near and within mapped wetlands should include an assessment of the presence of Ute Ladies' -Tresses.

Whitebark Pine – Whitebark Pines are small trees that grow up to 25 meters tall with ascending branches and a rounded or flat-topped crown. The trees have smooth bark and are light gray. Leaves are typically yellow-green in color, are two to six centimeters long, and have five leaves per fascicle. Whitebark pine habitat consists of subalpine and krummholtz habitats in most mountain ranges.

The Whitebark Pine is not likely to inhabit the Sheridan Planning Area due to lack of appropriate habitat and elevation. The nearest Whitebark Pine habitat is located in the Tobacco Root Mountains, Northeast of Sheridan. Development activities within the Planning Area would be unlikely to impact the Whitebark Pine or its habitat.

WILDLIFE AND FISHERIES

Wildlife habitat within the Sheridan Planning Area is limited to the rural areas surrounding the Town. Residential and commercial development within the Town limits has reduced habitat for the many species found in the Sheridan area excluding white-tailed deer, which may be increasing inside the Town limits. The agricultural lands surrounding the Town provide habitat for a variety of wildlife species. White-tailed deer, pronghorn antelope, fox, mule deer, coyote, elk, birds of prey, songbirds, and various species of waterfowl are often observed in the areas surrounding town. The Ruby River drainage provides a major area of wetland and riparian habitat within the Planning Area. Water conveyance in the Valley has also created riparian and wetland habitat once dominated by sagebrush.

Wildlife species associated with these habitats include various songbirds, birds of prey, mule and white-tailed deer, elk, and small mammals, and herptiles.

Amphibians likely to occur near wetland and riverine habitats near the project area include the western tiger salamander, western toad, boreal chorus frog, Columbia spotted frog, and northern leopard frog. Painted turtle, prairie rattlesnake, racer snake, gopher snake, and the common and terrestrial garter snakes are reptiles likely to inhabit the area.

According to the MNHP, there are 277 different species of birds within Madison County. An extensive list of possible species occurring in the Planning Area is not presented here. However, birds commonly seen within the Planning Area include species of eagle, hawk, flycatcher, warbler, finch, grouse, western meadowlark, sparrow, robin, magpie, bluebird, blackbird, and many others.

Fisheries - According to the Montana Fisheries Information System (MFISH) maintained by the Montana Department of Fish, Wildlife, and Parks, reaches of the lower Ruby River support rainbow trout, brook trout, brown trout, mountain whitefish, mountain sucker, white sucker, and longnose dace.

Species of Concern - The MNHP database query identified an occurrence of 25 wildlife species of concern as potentially occurring on lands within the Sheridan Planning Area. It should be noted that this search was conducted for only the Town of Sheridan. These species are identified in Table H-2.

WETLANDS

The United States Fish and Wildlife Service (USFWS) defines wetlands as “lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. For the purposes of the definition, wetlands must have one or all of the following three attributes:

- At least periodically, the land supports a prevalence of vegetation typically adapted for life in saturated soil conditions.
- The substrate is predominately undrained hydric soils; and
- The substrate is non-soil and is saturated with water or covered by shallow water during the growing season each year.

Table H-2 Animal Species of Concern Town of Sheridan Planning Area

Subgroup	Name	Common Nam	Family	Habitat
Mammals	Corynorhinus townsendii	Townsend's Big-eared Bat	Bats	Caves in forested habitats
Mammals	Gulo gulo	Wolverine	Weasels	Boreal Forest and Alpine Habitats
Mammals	Lasiurus cinereus	Hoary Bat	Bats	Riparian and forest
Mammals	Myotis lucifugus	Little Brown Myotis	Bats	Generalist
Mammals	Myotis thysanodes	Fringed Myotis	Bats	Riparian and dry mixed conifer forest
Mammals	Ursus arctos	Grizzly Bear	Bears	Conifer forest
Birds	Aquila chrysaetos	Golden Eagle	Hawks / Kites / Eagles	Grasslands
Birds	Ardea herodias	Great Blue Heron	Bitterns / Egrets / Herons / Night-Herons	Riparian forest
Birds	Athene cunicularia	Burrowing Owl	Owls	Grasslands
Birds	Buteo regalis	Ferruginous Hawk	Hawks / Kites / Eagles	Sagebrush grassland
Birds	Catharus fuscescens	Veery	Thrushes	Riparian forest
Birds	Charadrius montanus	Mountain Plover	Plovers	Grasslands
Birds	Coccothraustes vespertinus	Evening Grosbeak	Finches	Conifer forest
Birds	Dolichonyx oryzivorus	Bobolink	Blackbirds	Moist grasslands
Birds	Falco peregrinus	Peregrine Falcon	Falcons	Cliffs / canyons
Birds	Haemorhous cassinii	Cassin's Finch	Finches	Drier conifer forest
Birds	Ixoreus naevius	Varied Thrush	Thrushes	Moist conifer forests
Birds	Leucosticte atrata	Black Rosy-Finch	Finches	Alpine
Birds	Nucifraga columbiana	Clark's Nutcracker	Jays / Crows / Magpies	Conifer forest
Birds	Numenius americanus	Long-billed Curlew	Sandpipers	Grasslands
Birds	Oreoscoptes montanus	Sage Thrasher	Thrashers / Mockingbirds / Catbirds	Sagebrush
Birds	Pipilo chlorurus	Green-tailed Towhee	New World Sparrows	Shrub woodland
Birds	Rhynchophanes mccownii	McCown's Longspur	Longspurs and Snow Buntings	Grasslands
Birds	Spizella breweri	Brewer's Sparrow	New World Sparrows	Sagebrush
Fish	Oncorhynchus clarkii lewisi	Westslope Cutthroat Trout	Trout	Mountain streams, rivers, lakes

Source: MNHP Species of Concern Reports for Sheridan, Montana. Accessed January 16, 2021

Wetlands provide economic benefit; improve water quality, and support fish and wildlife. The most noticeable benefits of wetlands include flood and storm water damage protection, erosion control, water supply, groundwater recharge, scenic open space, and recreation. Destruction of wetlands eliminates or severely minimizes their functions and values. Drainage of wetlands prevents surface water storage and reduces their water quality enhancement function, while accelerating the flow of water downstream, which may cause increased flood damages. Wetland filling has similar impacts and destroys vital habitats for fish and wildlife species.

The USFWS is the principal federal agency providing information to the public and other agencies on the extent and status of the Nation’s wetlands. The agency has developed

and currently maintains National Wetlands Inventory (NWI) maps with digitized wetland site information for many areas of the country. NWI mapping for the Sheridan Planning Area is shown on Figure H-1.

The USFWS's classification system groups wetlands into five systems according to their ecological characteristics. Wetlands associated with two of these systems— Riverine and Freshwater—are found within the Sheridan Planning Area. The Riverine system is limited to freshwater river and stream channels. It is mainly a freshwater, deep-water habitat system, but has non-persistent marshes and aquatic beds along its banks. The Freshwater system encompasses the vast majority of non-tidal wetlands, such as swamps, bogs, swales, and ponds. Figure H-1 shows the presence of wetlands along Mill Creek and Indian Creek in the Sheridan Planning Area. Riparian areas are also shown.

Recent experience mapping wetlands was recently completed for a Rural Development Grant application and preliminary engineering report for construction of Sheridan Well #6 in 2020. The wetlands inventory was completed between Well #6, the railroad track corridor, and the Town of Sheridan Ball Field's Park where the Manifold Building is located. Wetlands were mapped in the area and while common along the route, the inventory differentiated between natural and anthropogenic wetlands where near Indian Creek and Mill Creek, wetlands were natural and fairly limited in extent. In between the two streams wetlands were also present but are anthropogenic resulting from local flood irrigation practices.

The primary federal regulatory program covering wetlands is Section 404 of the Clean Water Act. The program regulates discharges of dredge and fill materials into the jurisdictional waters of the United States, including wetlands. The U.S Army Corp of Engineers and the U.S. EPA jointly administers the Section 404 program. Developments within the Planning Area affecting jurisdictional waters or wetlands are subject to 404 permit requirements from the Corp of Engineers, Montana Regulatory Office. The Montana Department of Fish, Wildlife and Parks and the MDEQ Water Quality Bureau have permitting requirements for projects and actions affecting the beds and banks of streams and other surface waters.

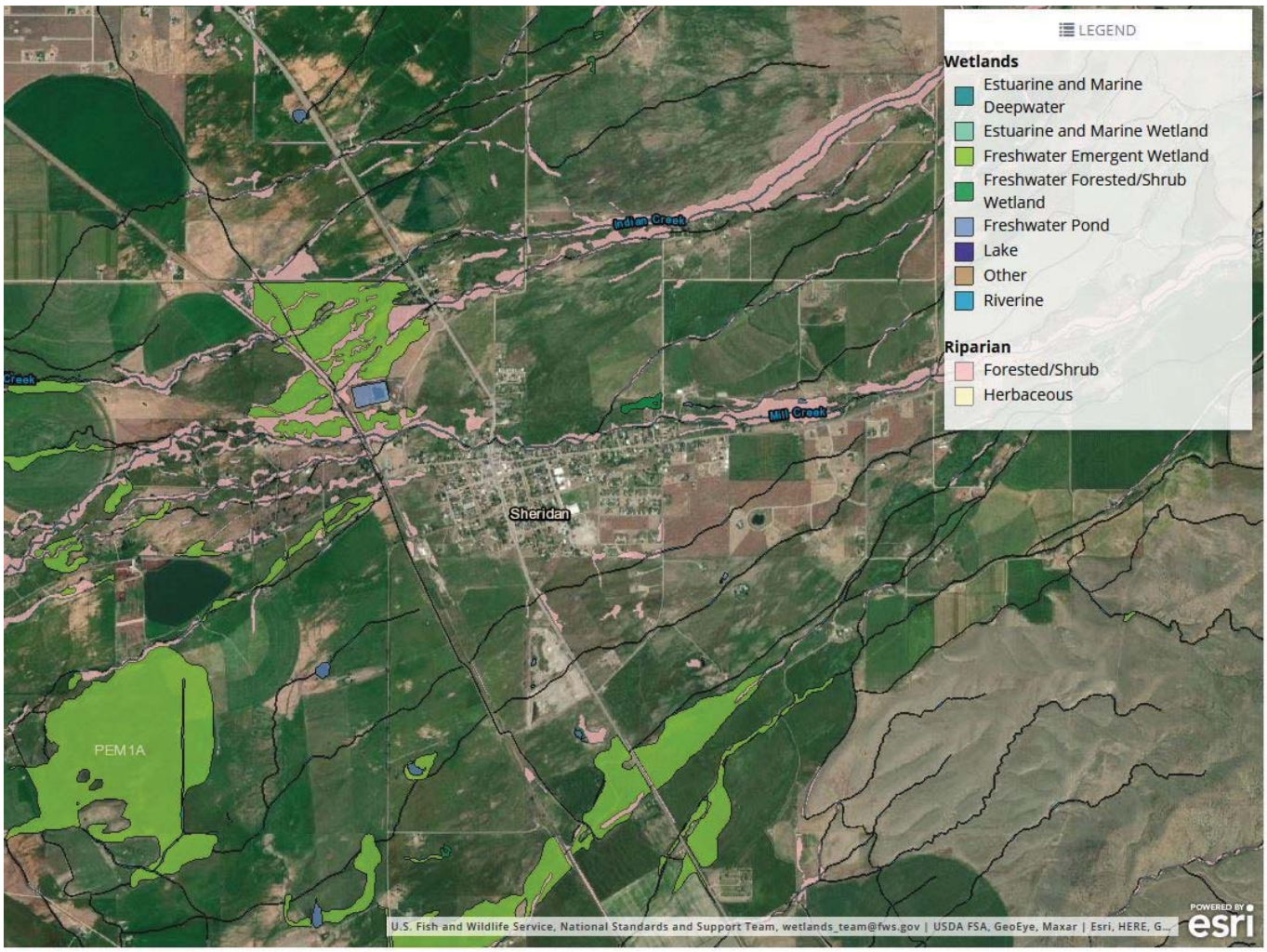


Figure H-1. Sheridan Planning Area Wetlands Map

CULTURAL RESOURCES

Within the Sheridan Planning Area there have been several cultural resources inventories conducted in accordance with state and federal statutes. These inventories include historic, archeological, and paleontological sites. Properties that contain sensitive archeological and paleontological resources are discussed generally but all identified cultural resources are not identified in this document. Specific projects require site-specific cultural resource inventories prior to the start of construction.

An example inventory recently completed by the Montana State Historic Preservation Office (SHPO) targeted cultural resources in the area and construction of Well #6 and the associated pipeline. Their search shows that two historic sites are located in the project area, including the historic railroad and the historic Vigilante Canal. SHPO noted that any structure over 50 years of age is considered historic and is potentially eligible for listing on the National Historic Register.

A variety of individual sites are evaluated for their status with respect to the National Register of Historic Places. The following sites, which are within or near the planning area, are listed on the National Park Services' National Register of Historic Places:

Christ Episcopal Church and Rectory - The Christ Episcopal Church and Rectory in Sheridan, Montana is a property listed on the National Register of Historic Places. It includes a one-story church built of local granite, with two gables facing onto Main Street. The church has an open bell tower that was added in 1901. To its west is a two-story gambrel roofed rectory built in 1906, also of the local granite. The first services were held in this Gothic style Episcopal church in October 1890. Built at a time when Bozeman hoped to become the capital of Montana, the church reflects the optimism and prosperity that came on the heels of the gold rush in 1863 and statehood in 1889. Episcopalians were among the first to gather in the fledgling settlement of Bozeman when Bishop Daniel Tuttle held services on July 5, 1868. By 1876, a wood frame church stood near the present site. Groundbreaking for the new stone church took place on September 13, 1889. Architect George Hancock of Fargo, North Dakota, provided the building plans; James S. Campbell was general contractor. Built of grey stone from the local Esler quarry, the church features a stately bell tower crowned with a copper cross. Prior to completion of the bell tower, the 500-pound, five-tone bell, donated in 1883 by Rosa (Mrs. W. J.) Beall, was housed on a platform in front of the wood frame church. The church interior reflects the same craftsmanship as the structure. The trussed ceiling is finished in natural oiled Norway pine paneling. Softly blended colors of cathedral glass in the windows reflect the Art Nouveau style of the period. The adjacent rectory, constructed in 1883, was remodeled to its present Colonial Revival style in 1930. The parish hall connecting the rectory and church was designed in 1940 by Fed Wilson St. James symbolized the solid foundations laid by her pioneer congregation.

Rossiter, H. D., Building - The H. D. Rossiter Building is a masonry commercial store building constructed of red brick in 1897. The building is a large rectangular mass, one story in height with an elaborately pedimented and corbelled cornice. In style, the store reflects a popular Western Commercial form of architecture which proliferated in Montana during early history of the state. Early in 1872 a mercantile store was established on this corner under the name of Hamilton & Sweet. On February 15, 1884, Henry Douglas Rossiter bought a share of the store and the name was changed to the H. D. Rossiter General Store. For more than a decade, Rossiter worked hard in the store six days a week, and on Sundays he would load a wagon and head for the mountains to sell his goods at one of the mining camps. Probably because H. D. Rossiter was also a miner, he could not help but "grub stake" other miners as they headed for the hills. In 1898, Rossiter leased the dry goods business to Ogden Brothers so that he could concentrate on the construction of this brick building. It was completed in October of 1899. Rossiter built the first bank in Sheridan, became the town's mayor, and later, a state

representative. J. M. Maddison bought into the business in October 1902. In its heyday, the business included seven other buildings: a granary, tack shop, grocery warehouse, glass house, pipe shed, icehouse, and a powder-dynamite house, which is still standing by the cemetery. Maddison and later his son, Jim, operated the store for over seventy years. Thus, the prominent Sheridan landmark with its classic Western Commercial style façade continues to anchor the business district. As H. D. Rossiter used to say, “STILL DOING BUSINESS AT THE OLD STAND.” Come on in!

O'Brien, William, House - William O’Brien arrived in the gold-mining and ranching town of Sheridan, Montana, in 1881 and began selling liquor from a small sixteen-by-twenty-foot building. He was one of the town’s three suppliers of “wet groceries” (liquor), the quality of which, according to the October 13, 1894, Madisonian, was “as good as ever painted landscapes on the brain of man.” Sales were brisk, his business flourished, and O’Brien assumed increasing prominence in the community. He served as a school trustee, as one of Sheridan’s original aldermen, and as a member of the Montana legislature. In 1889, O’Brien purchased a large, corner lot (100 x 200 feet) for $160 from the estate of early Sheridan pioneer Hugh Duncan. Five years later he built this two-story, brick residence, where he lived with his wife, Mary, and their three daughters. The home’s size, design, and materials spoke to O’Brien’s political and financial success. Most homes in Sheridan—a town of 350 people in 1893—were built of wood; thus, the brick O’Brien residence, with its standing-seam metal roof, stood out. The irregularly shaped residence reflects the Italian Renaissance style, as seen in the building’s two-story, three-bay façade, its small, restrained porch, and its wide projecting cornice that draws attention to the hipped roof. Segmental brick arches and stone lintels grace the windows, which are set in walls three bricks deep. Although William died of Bright’s disease in 1901 at age forty-five, the home remained in the O’Brien family until 1927.

Ferris-Hermsmeyer-Fenton Ranch – The ranch is located at 144 Duncan District Rd. in Sheridan, Montana, in Madison County, Montana, was listed on the National Register of Historic Places in 2008. The listing includes a 160-acre area with nine contributing buildings, a contributing structure and two contributing sites. The ranch was established in 1872 by Jane Ferris. It is located in the heart of the Ruby River valley. Ferris' application described an original c.1866 barn which still exists. Jane Ferris was a widow with two small children. She seems to have been the only woman in the Sheridan area who was successful in using preemption to secure land and a home, for herself and her heirs. The lower Ruby Valley was opened for settlement in 1863, soon after gold discoveries in Bannack and in Alder Gulch nearby, and before there was any government survey of the land which could have led to sale of the land to the public. By the 1841 Preemption Act, any 160-acre area of unsurveyed land was open for settlement, essentially by squatters who lived on the land for 14 months, by heads of households being either a man over age 21 or a widow. The property that she claimed included an 1866 cabin, which became a

portion of the main residence, and an 1866 barn. These were described by Ferris in her 1872 application for preemption. The property was farmed by her daughter and her family in the late 1870s and early 1880s. Later, the Frederick and George Hermsmeyer families further improved the property with additional buildings related to farming. Various owners held the property after World War I, then in 1937 the Fenton family took ownership. The Fentons brought the ranch back into prosperity and improved it, especially during and after World War II when agricultural prices were better. The ranch had stayed among Fenton descendants for 70 years when it was nominated for listing on the National Register in 2007, at which time it was owned in the Wuelfing last name. The ranch was deemed significant for its "association with women's history and the use of federal public land law for settlement in southwest Montana during the formation of Montana territory."

SAND AND GRAVEL RESOURCES

HB 486, signed into law in May 2009, requires growth policies to include maps and text addressing sand and gravel resources as part of the discussion of existing characteristics and features of the planning area. The 2009 Legislature determined that this inventory requirement will help ensure local governments have the information necessary to create regulations for the separation of incompatible uses such as residential housing and gravel pits, while ensuring an economically viable source of gravel to facilitate future development.

Sand and gravel particles are created by the actions of water, heat, cold and wind on exposed rock. These particles wash downhill, ending up in streams and rivers where they are swept along until deposited in slow-moving sections of the watercourse. Streams meander within a floodplain, sometimes depositing material and sometimes cutting through earlier deposits. Stream action naturally sorts sand and gravel by size. Coarser gravel particles settle out first, while finer sand is carried further downstream. Sand and gravel beds within the active portion of a streambed are called floodplain deposits. Terrace deposits occur above floodplain levels and generally are remnants along valley sides of previous floodplains.

Sand and gravel are "high-weight, low-value" resources and are extremely sensitive to handling and transportation costs. Sand and gravel are in constant demand in growing urban areas but cannot be transported economically for great distances. Therefore, it is not uncommon to find gravel pits close to urban markets. Gravel that meets asphalt or concrete mix specifications has the highest commercial value to producers. Clean and fairly uniform gravel requiring little processing is particularly attractive. Gravel with excess silt must be cleaned and graded to industry standards for high specification use resulting in increased production costs. Clean sand is a valuable resource, but it has a limited market outside of construction. Sand is used primarily to complete required gradations for concrete and asphalt mixes.

During the Quaternary Period, the Sheridan Planning Area was located on an alluvial fan of the Tobacco Root Mountains. The fan is formed from various deposits related to alluvial outwash, debris flows, and fluvial processes on Mill and Indian Creek that deposited sand, gravel and cobbles. These materials form a relatively coarse geologic layer with limited amounts of fines. As a result, considerable portions of the Sheridan Planning Area are underlain by materials consisting of alluvial sands, gravels and cobbles that can be used for sand and gravel operations. According to the NRCS WSS, the source gravel rating within the Sheridan Planning Area ranges from mostly fair and a lessor area of poor.

Following the custom NRCS soils report at the end of this Appendix, separate sand and gravel resource reports map and describe areas comprising sand and gravel resources within the approximate Sheridan Planning Area. The two reports include maps showing the NRCS soil rating for sand and gravel operations.

It is noted that a sand and gravel operation is currently active in the planning area next to Sheridan on Highway 287 just south of Town. Approximately 77 percent of the Sheridan Planning Area has a gravel source rating of fair, with 23 percent being poor.

In Montana, sand and gravel operations are subject to various permitting and regulatory oversight procedures at both the state and local levels. These regulatory processes include:

- Montana open cut mining laws that regulate sand and gravel operations (MCA Title 82- Ch. 4) and require guidelines for reclamation procedures (ARM Title 17-Ch 24).
- The Montana Environmental Policy Act, which requires the Montana Department of Environmental Quality (MDEQ) to conduct environmental assessments on proposed sand and gravel operations.
- MDEQ-issued permits for all gravel operations, which specify the “conditions” under which they operate.
- Zoning and land use regulations approved by local governments that can impose conditions on gravel operations.

Attached are the following:

NRCS Custom Soils Report for Planning Area

NRCS Sand Source Report for Planning Area

NREC Gravel Source Report for Planning Area

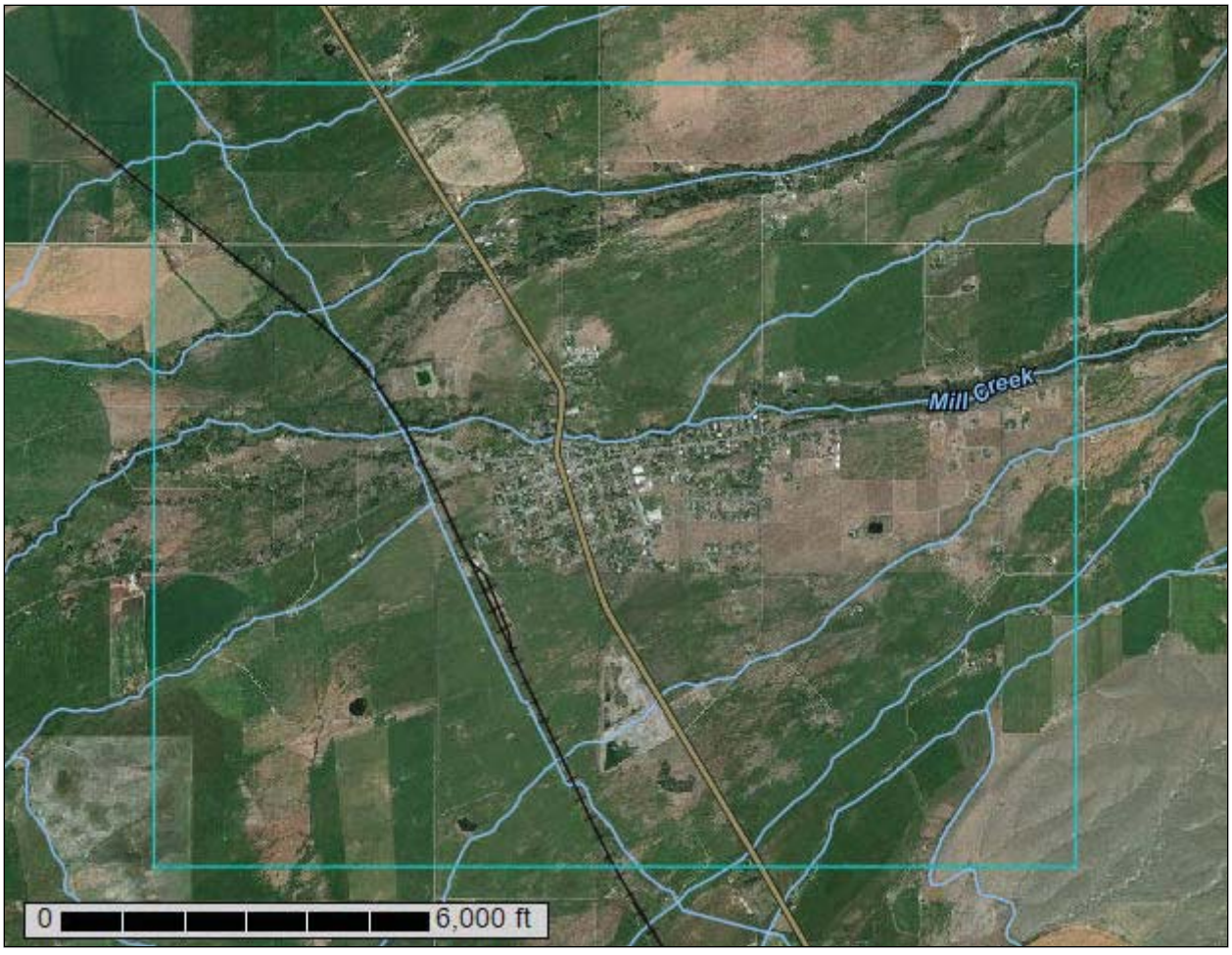
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Madison County Area, Montana



January 17, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

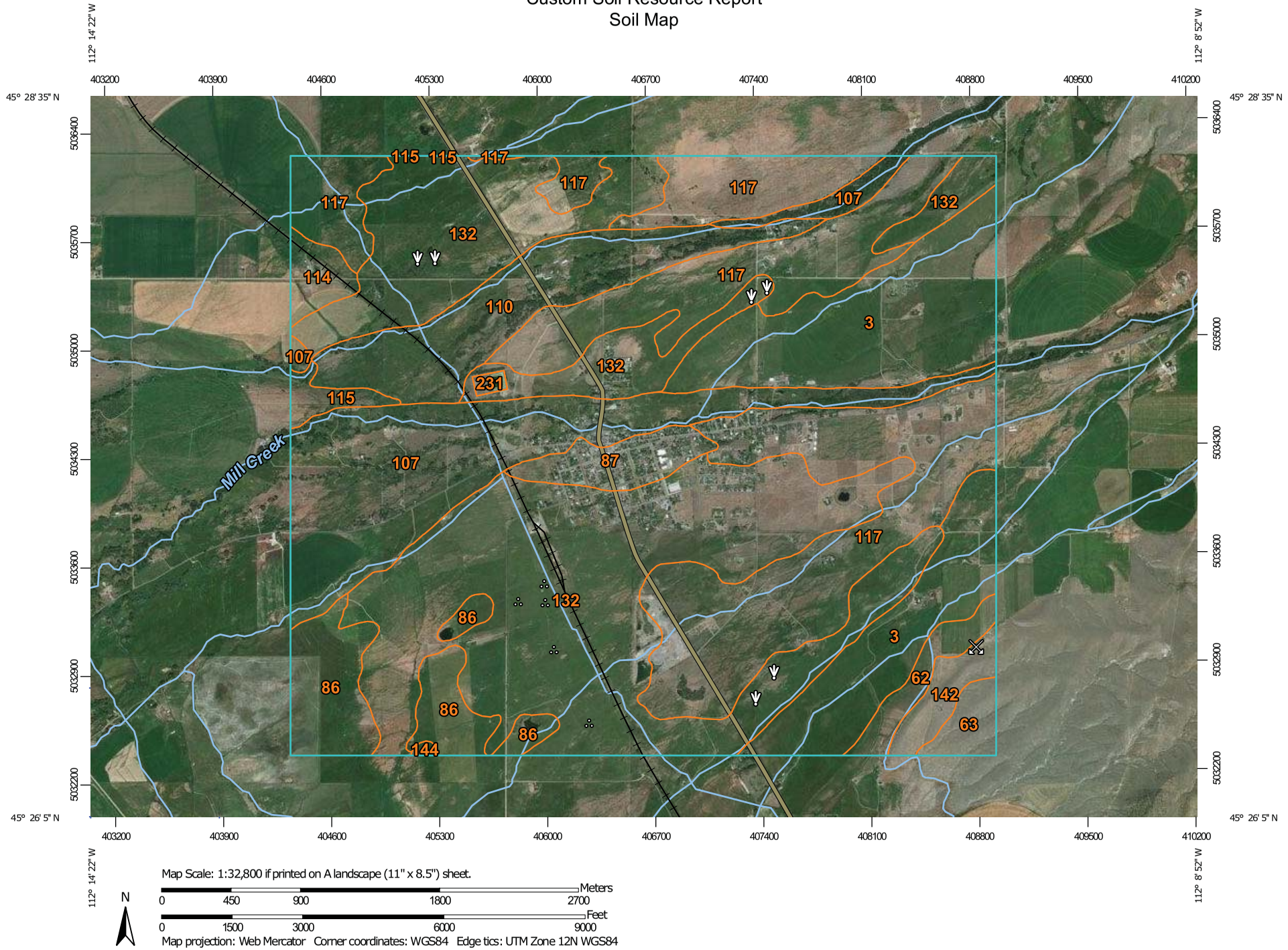
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:32,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 450 900 1800 2700

Feet: 0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County Area, Montana
Survey Area Data: Version 23, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 24, 2016—Aug 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Amesha loam, cool, 2 to 8 percent slopes	571.2	13.0%
62	Kalsted sandy loam, 2 to 8 percent slopes	54.4	1.2%
63	Kalsted sandy loam, 8 to 15 percent slopes	39.5	0.9%
86	Neen silty clay loam, 0 to 2 percent slopes	203.6	4.6%
87	Neen silty clay loam, drained, 0 to 2 percent slopes	78.8	1.8%
107	Rivra-Ryell-Havre complex, cool, 0 to 2 percent slopes	522.4	11.9%
110	Ryell-Rivra complex, cool, 0 to 2 percent slopes	278.8	6.4%
114	Scravo sandy loam, cool, 2 to 8 percent slopes	42.5	1.0%
115	Scravo very cobbly sandy loam, cool, 0 to 4 percent slopes	29.2	0.7%
117	Scravo-Thess complex, cool, 0 to 4 percent slopes	1,012.6	23.1%
132	Thess loam, cool, 2 to 8 percent slopes	1,494.8	34.1%
142	Trimad-Kalsted complex, 8 to 45 percent slopes	52.1	1.2%
144	Trudau loam, slightly saline, 2 to 8 percent slopes	3.0	0.1%
231	Water	6.3	0.1%
Totals for Area of Interest		**4,389.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without

including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Madison County Area, Montana

3—Amesha loam, cool, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xd8
Elevation: 2,700 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 70 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Amesha and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amesha

Setting

Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from calcareous siltstone

Typical profile

A - 0 to 7 inches: loam
Bk - 7 to 60 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R044BA032MT - Loamy (Lo) LRU 44B-A
Hydric soil rating: No

Minor Components

Musselshell

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS341MT - Limy (Ly) 9-14" p.z.

Hydric soil rating: No

Kalsted

Percent of map unit: 5 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS335MT - Sandy (Sy) 9-14" p.z.
Hydric soil rating: No

Crago

Percent of map unit: 5 percent
Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS341MT - Limy (Ly) 9-14" p.z.
Hydric soil rating: No

62—Kalsted sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xff
Elevation: 4,200 to 6,490 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Kalsted and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kalsted

Setting

Landform: Stream terraces, fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or slope alluvium

Typical profile

A - 0 to 7 inches: sandy loam
Bk1 - 7 to 30 inches: sandy loam
Bk2 - 30 to 37 inches: loamy sand
Bk3 - 37 to 44 inches: gravelly sandy loam
Bk4 - 44 to 51 inches: loamy sand
Bk5 - 51 to 59 inches: gravelly sandy loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.13 to 7.09 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R044BA030MT - Limy (Ly) LRU 44B-A
Hydric soil rating: No

Minor Components

Crago

Percent of map unit: 5 percent
Landform: Fan remnants, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA031MT - Limy Droughty (Lydr) LRU A (9-14 PZ)
Hydric soil rating: No

Scravo

Percent of map unit: 5 percent
Landform: Drainageways on stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA020MT - Gravelly (Gr) LRU 44B-A
Hydric soil rating: No

63—Kalsted sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 4xfg
Elevation: 4,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kalsted and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kalsted

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 7 inches: sandy loam
Bk1 - 7 to 30 inches: sandy loam
Bk2 - 30 to 60 inches: stratified loamy sand to gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R044BA030MT - Limy (Ly) LRU 44B-A
Hydric soil rating: No

Minor Components

Scravo

Percent of map unit: 5 percent
Landform: Stream terraces, drainageways
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

Crago

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS342MT - Limy-Droughty (LyDr) 9-14" p.z.
Hydric soil rating: No

86—Neen silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 4xg8
Elevation: 2,000 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Neen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Neen

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Az - 0 to 9 inches: silty clay loam
Ckz - 9 to 32 inches: silty clay loam
Ckg - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water capacity: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: R044BY092MT - Saline Subirrigated (SSb) LRU 44B-Y
Hydric soil rating: No

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS349MT - Wet Meadow (WM) 9-14" p.z.
Hydric soil rating: Yes

Ryell

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS339MT - Silty (Si) 9-14" p.z.
Hydric soil rating: No

Well drained soils

Percent of map unit: 5 percent
Ecological site: R044XS339MT - Silty (Si) 9-14" p.z.
Hydric soil rating: No

87—Neen silty clay loam, drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 4xg9
Elevation: 2,000 to 6,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Farmland of local importance

Map Unit Composition

Neen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Neen

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Az - 0 to 7 inches: silty clay loam
Ckz - 7 to 32 inches: silty clay loam
Ckg - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: NoneRare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water capacity: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R044BP801MT - Bottomland
Hydric soil rating: No

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS349MT - Wet Meadow (WM) 9-14" p.z.
Hydric soil rating: Yes

Ryell

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS339MT - Silty (Si) 9-14" p.z.
Hydric soil rating: No

Scravo

Percent of map unit: 5 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

107—Rivra-Ryell-Havre complex, cool, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 4x9w
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Farmland of local importance

Map Unit Composition

Rivra and similar soils: 40 percent
Ryell and similar soils: 25 percent
Havre and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rivra

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium

Typical profile

A - 0 to 5 inches: gravelly sandy loam
C1 - 5 to 9 inches: gravelly loamy sand
C2 - 9 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 42 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A/D
Ecological site: R044BA134MT - Shallow to Gravel (SwGr) LRU 44B-A
Hydric soil rating: No

Description of Ryell

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly alluvium

Typical profile

A - 0 to 7 inches: loam
C1 - 7 to 23 inches: loam
2C2 - 23 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R044BA032MT - Loamy (Lo) LRU 44B-A
Hydric soil rating: No

Description of Havre

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 9 inches: loam
C1 - 9 to 14 inches: fine sandy loam
C2 - 14 to 36 inches: loam
C3 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R044BA032MT - Loamy (Lo) LRU 44B-A
Hydric soil rating: No

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS333MT - Saline Subirrigated (SSb) 9-14" p.z.
Hydric soil rating: Yes

Rivra, sandy loam

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

Moderately well drained soils

Percent of map unit: 5 percent
Ecological site: R044XS333MT - Saline Subirrigated (SSb) 9-14" p.z.
Hydric soil rating: No

110—Ryell-Rivra complex, cool, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 4xb0
Elevation: 4,200 to 6,000 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 115 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ryell, rarely flooded, and similar soils: 60 percent
Rivra, rarely flooded, and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ryell, Rarely Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly alluvium

Typical profile

A - 0 to 7 inches: loam
C1 - 7 to 23 inches: loam
2C2 - 23 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneRare
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R044BA031MT - Limy Droughty (Lydr) LRU A (9-14 PZ)
Hydric soil rating: No

Description of Rivra, Rarely Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium

Typical profile

A - 0 to 5 inches: gravelly sandy loam
C1 - 5 to 9 inches: gravelly loamy sand
C2 - 9 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 42 inches
Frequency of flooding: NoneRare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A/D
Ecological site: R044BA020MT - Gravelly (Gr) LRU 44B-A
Hydric soil rating: No

Minor Components

Havre, rarely flooded

Percent of map unit: 8 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS341MT - Limy (Ly) 9-14" p.z.
Hydric soil rating: No

Rivra, rarely flooded, wet

Percent of map unit: 7 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS331MT - Gravel (Gr) 9-14" p.z.
Hydric soil rating: No

Wetsand, rarely flooded

Percent of map unit: 5 percent
Landform: Drainageways on flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS333MT - Saline Subirrigated (SSb) 9-14" p.z.
Hydric soil rating: No

114—Scravo sandy loam, cool, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xb4
Elevation: 3,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 70 to 135 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scravo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scravo

Setting

Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous sandy and gravelly alluvium

Typical profile

A - 0 to 7 inches: sandy loam
Bk - 7 to 16 inches: very gravelly sandy loam
2C - 16 to 60 inches: very gravelly sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R044BA134MT - Shallow to Gravel (SwGr) LRU 44B-A
Hydric soil rating: No

Minor Components

Crago

Percent of map unit: 3 percent
Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS341MT - Limy (Ly) 9-14" p.z.
Hydric soil rating: No

Kalsted

Percent of map unit: 3 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS334MT - Sands (Sa) 9-14" p.z.
Hydric soil rating: No

Scravo, gravelly

Percent of map unit: 2 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.

Hydric soil rating: No

Scravo, cobbly

Percent of map unit: 2 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

115—Scravo very cobbly sandy loam, cool, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xb5
Elevation: 3,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Scravo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scravo

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous sandy and gravelly alluvium

Typical profile

A - 0 to 5 inches: very cobbly sandy loam
Bk - 5 to 17 inches: very gravelly sandy loam
2C - 17 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: R044BA020MT - Gravelly (Gr) LRU 44B-A
Hydric soil rating: No

Minor Components

Crago

Percent of map unit: 5 percent
Landform: Alluvial fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA031MT - Limy Droughty (Lydr) LRU A (9-14 PZ)
Hydric soil rating: No

Thess

Percent of map unit: 5 percent
Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA030MT - Limy (Ly) LRU 44B-A
Hydric soil rating: No

117—Scravo-Thess complex, cool, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xb7
Elevation: 3,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scravo and similar soils: 65 percent
Thess and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scravo

Setting

Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous sandy and gravelly alluvium

Typical profile

A - 0 to 4 inches: cobbly sandy loam

Bk - 4 to 14 inches: very gravelly sandy loam
2C - 14 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R044BA134MT - Shallow to Gravel (SwGr) LRU 44B-A
Hydric soil rating: No

Description of Thess

Setting

Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly alluvium

Typical profile

A - 0 to 6 inches: loam
B - 6 to 30 inches: loam
2C - 30 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R044BA030MT - Limy (Ly) LRU 44B-A
Hydric soil rating: No

132—Thess loam, cool, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xbs
Elevation: 3,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 70 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Thess and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thess

Setting

Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly alluvium

Typical profile

A - 0 to 6 inches: loam
B - 6 to 30 inches: loam
2C - 30 to 60 inches: very gravelly sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R044BA030MT - Limy (Ly) LRU 44B-A
Hydric soil rating: No

Minor Components

Kalsted

Percent of map unit: 4 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS335MT - Sandy (Sy) 9-14" p.z.
Hydric soil rating: No

Scravo

Percent of map unit: 3 percent
Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

Thess, cobbly

Percent of map unit: 3 percent
Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS341MT - Limy (Ly) 9-14" p.z.
Hydric soil rating: No

142—Trimad-Kalsted complex, 8 to 45 percent slopes

Map Unit Setting

National map unit symbol: 4xc4
Elevation: 2,000 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 70 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Trimad and similar soils: 60 percent
Kalsted and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Trimad

Setting

Landform: Hills, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium

Typical profile

A - 0 to 6 inches: cobbly loam
Bw - 6 to 9 inches: gravelly loam
Bk1 - 9 to 18 inches: very gravelly loam
Bk2 - 18 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 8 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R043BP819MT - Upland Sagebrush Shrubland
Hydric soil rating: No

Description of Kalsted

Setting

Landform: Hills, drainageways
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 7 inches: sandy loam
Bk1 - 7 to 30 inches: sandy loam
Bk2 - 30 to 60 inches: stratified loamy sand to gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A

Ecological site: R043BP805MT - Limy Sagebrush Shrubland
Hydric soil rating: No

Minor Components

Ryell

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XC455MT - Silty (Si) 10-14" p.z.
Hydric soil rating: No

Rivra

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS338MT - Shallow to Gravel (SwGr) 9-14" p.z.
Hydric soil rating: No

144—Trudau loam, slightly saline, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xc6
Elevation: 2,500 to 6,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Farmland of local importance

Map Unit Composition

Trudau and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Trudau

Setting

Landform: Stream terraces, alluvial fans, hills
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from sandstone and siltstone

Typical profile

A - 0 to 7 inches: loam
Bw - 7 to 27 inches: loam
Bkx - 27 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water capacity: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R044BA032MT - Loamy (Lo) LRU 44B-A
Hydric soil rating: No

Minor Components

Soils with dense-clay subsoils

Percent of map unit: 5 percent
Hydric soil rating: No

Amesha

Percent of map unit: 5 percent
Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS339MT - Silty (Si) 9-14" p.z.
Hydric soil rating: No

Varney

Percent of map unit: 5 percent
Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044XS339MT - Silty (Si) 9-14" p.z.
Hydric soil rating: No

231—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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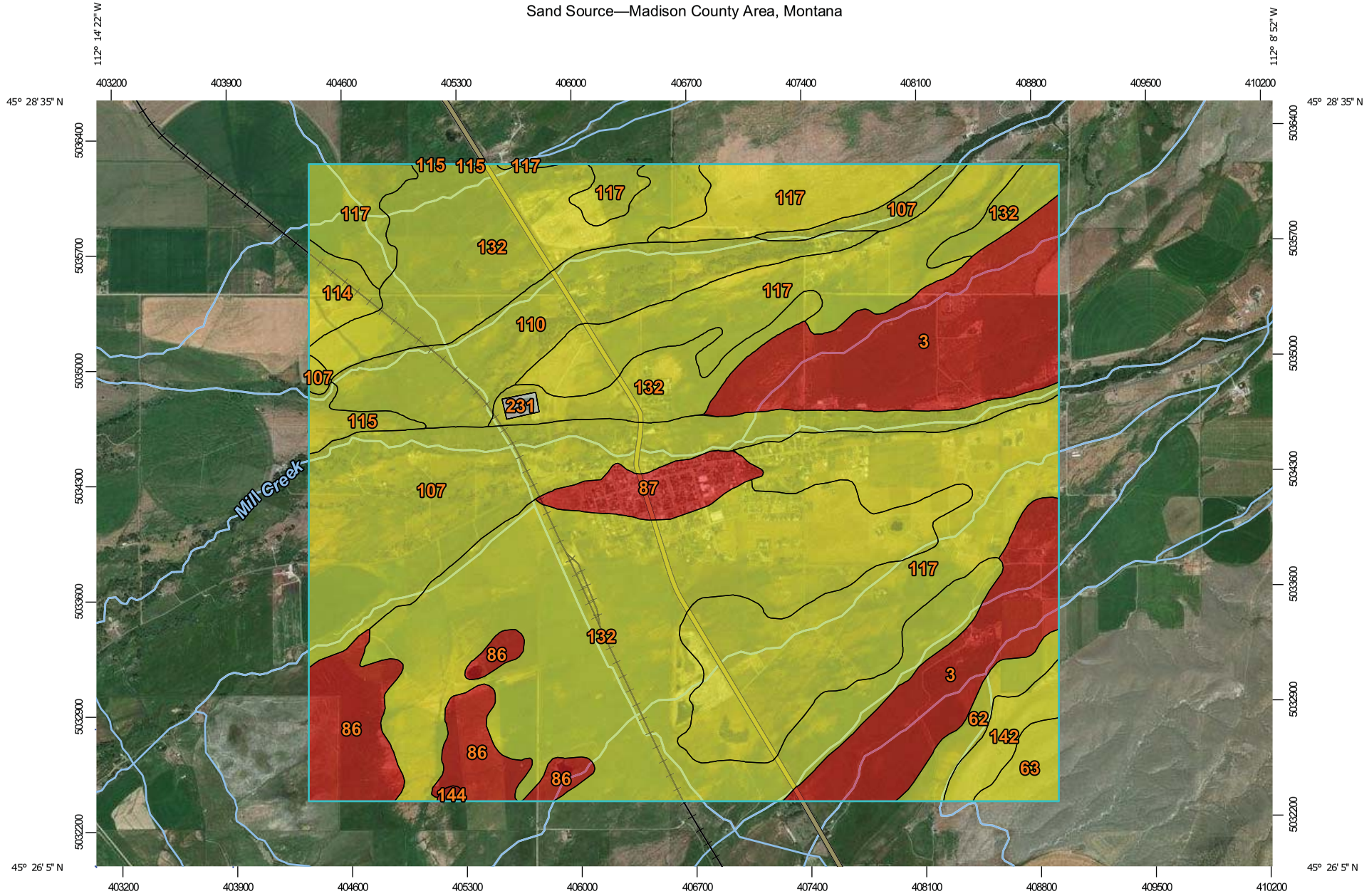


Map Scale: 1:32,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Poor

Fair

Good

Not rated or not available

Soil Rating Lines

Poor

Fair

Good

Not rated or not available

Soil Rating Points

Poor

Fair

Good

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County Area, Montana
Survey Area Data: Version 23, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 24, 2016—Aug 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Sand Source

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
3	Amesha loam, cool, 2 to 8 percent slopes	Poor	Amesha (85%)	Bottom layer (0.00)	571.2	13.0%
				Thickest layer (0.00)		
62	Kalsted sandy loam, 2 to 8 percent slopes	Fair	Kalsted (90%)	Bottom layer (0.09)	54.4	1.2%
				Thickest layer (0.12)		
			Crago (5%)	Thickest layer (0.05)		
				Bottom layer (0.10)		
			Scravo (5%)	Thickest layer (0.60)		
				Bottom layer (0.65)		
63	Kalsted sandy loam, 8 to 15 percent slopes	Fair	Kalsted (90%)	Bottom layer (0.04)	39.5	0.9%
				Thickest layer (0.09)		
			Scravo (5%)	Thickest layer (0.42)		
				Bottom layer (0.65)		
			Crago (5%)	Thickest layer (0.06)		
				Bottom layer (0.10)		
86	Neen silty clay loam, 0 to 2 percent slopes	Poor	Neen (85%)	Bottom layer (0.00)	203.6	4.6%
				Thickest layer (0.00)		
			Poorly drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Well drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
87	Neen silty clay loam, drained, 0 to 2 percent slopes	Poor	Neen (85%)	Bottom layer (0.00)	78.8	1.8%
				Thickest layer (0.00)		
			Poorly drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
107	Rivra-Ryell-Havre complex, cool, 0 to 2 percent slopes	Fair	Rivra (40%)	Bottom layer (0.34)	522.4	11.9%
				Thickest layer (0.41)		
			Ryell (25%)	Bottom layer (0.08)		
				Thickest layer (0.08)		
			Havre (20%)	Thickest layer (0.02)		
				Bottom layer (0.03)		
			Poorly drained soils (5%)	Bottom layer (0.08)		
				Thickest layer (0.16)		
			Rivra, sandy loam (5%)	Bottom layer (0.34)		
				Thickest layer (0.39)		
110	Ryell-Rivra complex, cool, 0 to 2 percent slopes	Fair	Ryell, rarely flooded (60%)	Bottom layer (0.08)	278.8	6.4%
				Thickest layer (0.08)		
			Rivra, rarely flooded (20%)	Bottom layer (0.34)		
				Thickest layer (0.41)		
			Havre, rarely flooded (8%)	Thickest layer (0.02)		
				Bottom layer (0.03)		
			Rivra, rarely flooded, wet (7%)	Bottom layer (0.34)		
				Thickest layer (0.37)		
			Wetsand, rarely flooded (5%)	Bottom layer (0.08)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Thickest layer (0.11)		
114	Scravo sandy loam, cool, 2 to 8 percent slopes	Fair	Scravo (90%)	Thickest layer (0.61)	42.5	1.0%
				Bottom layer (0.65)		
			Crago (3%)	Thickest layer (0.06)		
				Bottom layer (0.10)		
			Kalsted (3%)	Bottom layer (0.04)		
				Thickest layer (0.10)		
			Scravo, gravelly (2%)	Thickest layer (0.60)		
				Bottom layer (0.64)		
			Scravo, cobbly (2%)	Thickest layer (0.48)		
				Bottom layer (0.49)		
115	Scravo very cobbly sandy loam, cool, 0 to 4 percent slopes	Fair	Scravo (90%)	Thickest layer (0.43)	29.2	0.7%
				Bottom layer (0.49)		
			Thess (5%)	Thickest layer (0.10)		
				Bottom layer (0.77)		
117	Scravo-Thess complex, cool, 0 to 4 percent slopes	Fair	Scravo (65%)	Thickest layer (0.48)	1,012.6	23.1%
				Bottom layer (0.49)		
			Thess (35%)	Thickest layer (0.10)		
				Bottom layer (0.77)		
132	Thess loam, cool, 2 to 8 percent slopes	Fair	Thess (90%)	Thickest layer (0.10)	1,494.8	34.1%
				Bottom layer (0.77)		
			Kalsted (4%)	Bottom layer (0.04)		
				Thickest layer (0.09)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Scravo (3%)	Thickest layer (0.61)		
				Bottom layer (0.65)		
			Thess, cobbly (3%)	Thickest layer (0.10)		
				Bottom layer (0.77)		
142	Trimad-Kalsted complex, 8 to 45 percent slopes	Fair	Trimad (60%)	Bottom layer (0.04)	52.1	1.2%
				Thickest layer (0.06)		
			Kalsted (30%)	Bottom layer (0.04)		
				Thickest layer (0.09)		
			Ryell (5%)	Bottom layer (0.07)		
				Thickest layer (0.10)		
			Rivra (5%)	Bottom layer (0.08)		
				Thickest layer (0.19)		
144	Trudau loam, slightly saline, 2 to 8 percent slopes	Poor	Trudau (85%)	Bottom layer (0.00)	3.0	0.1%
				Thickest layer (0.00)		
			Amesha (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
231	Water	Not rated	Water (100%)		6.3	0.1%
Totals for Area of Interest					**4,389.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Fair	3,526.2	80.3%
Poor	856.5	19.5%
Null or Not Rated	6.3	0.1%
Totals for Area of Interest	**4,389.1**	**100.0%**

Description

Sand is a natural aggregate (0.05 millimeter to 2 millimeters in diameter) suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand, the soil is considered a likely source regardless of thickness. The assumption is that the sand layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

The soils are rated "good," "fair," or "poor" as potential sources of sand. A rating of "good" or "fair" means that sand is likely to be in or below the soil. The bottom layer and the thickest layer of the soil are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand. The number 0.00 indicates that the layer is a "poor source." The number 1.00 indicates that the layer is a "good source." A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

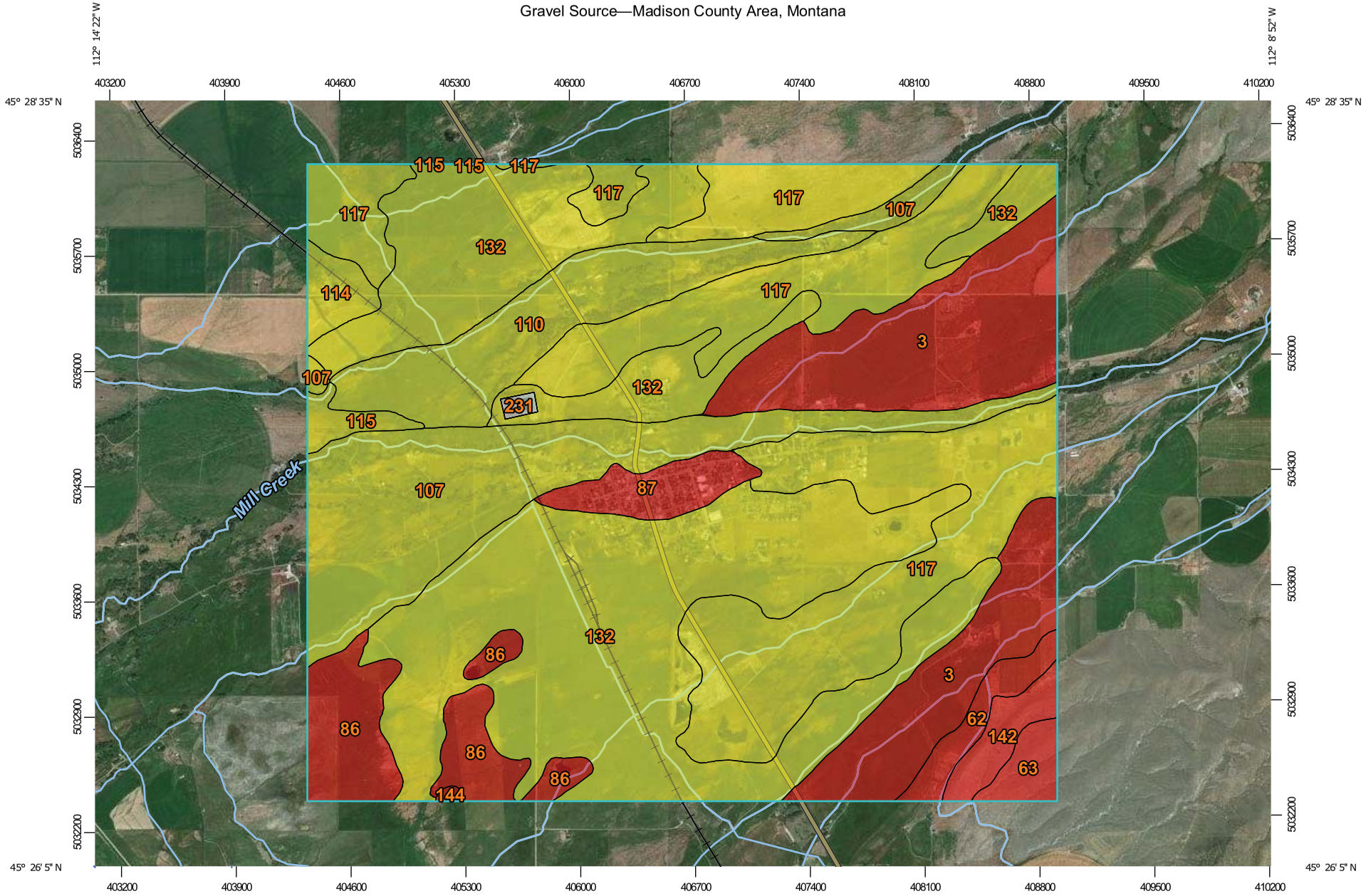
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower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112° 8' 52" W
45° 28' 35" N
45° 26' 5" N
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403900
404600
405300
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407400
408100
408800
409500
410200
5036400
5035700
5035000
5034300
5033600
5032900
5032200
115
115
117
117
117
117
107
132
132
114
117
110
3
107
132
231
115
Mill Creek
107
87
117
132
86
3
86
62
142
86
63
86
144
Map Scale: 1:32,800 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
450
900
1800
2700
Feet
0
1500
3000
6000
9000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Poor

Fair

Good

Not rated or not available

Soil Rating Lines

Poor

Fair

Good

Not rated or not available

Soil Rating Points

Poor

Fair

Good

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County Area, Montana
Survey Area Data: Version 23, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 24, 2016—Aug 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Gravel Source

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
3	Amesha loam, cool, 2 to 8 percent slopes	Poor	Amesha (85%)	Bottom layer (0.00)	571.2	13.0%
				Thickest layer (0.00)		
			Musselshell (5%)	Thickest layer (0.00)		
				Bottom layer (0.00)		
			Kalsted (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
62	Kalsted sandy loam, 2 to 8 percent slopes	Poor	Kalsted (90%)	Bottom layer (0.00)	54.4	1.2%
				Thickest layer (0.00)		
			Crago (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
63	Kalsted sandy loam, 8 to 15 percent slopes	Poor	Kalsted (90%)	Bottom layer (0.00)	39.5	0.9%
				Thickest layer (0.00)		
86	Neen silty clay loam, 0 to 2 percent slopes	Poor	Neen (85%)	Bottom layer (0.00)	203.6	4.6%
				Thickest layer (0.00)		
			Poorly drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Well drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
87	Neen silty clay loam, drained, 0 to 2 percent slopes	Poor	Neen (85%)	Bottom layer (0.00)	78.8	1.8%
				Thickest layer (0.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Poorly drained soils (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
107	Rivra-Ryell-Havre complex, cool, 0 to 2 percent slopes	Fair	Rivra (40%)	Thickest layer (0.00)	522.4	11.9%
				Bottom layer (0.25)		
			Ryell (25%)	Thickest layer (0.00)		
				Bottom layer (0.31)		
			Poorly drained soils (5%)	Thickest layer (0.00)		
				Bottom layer (0.31)		
			Rivra, sandy loam (5%)	Thickest layer (0.00)		
				Bottom layer (0.25)		
110	Ryell-Rivra complex, cool, 0 to 2 percent slopes	Fair	Ryell, rarely flooded (60%)	Thickest layer (0.00)	278.8	6.4%
				Bottom layer (0.31)		
			Rivra, rarely flooded (20%)	Thickest layer (0.00)		
				Bottom layer (0.25)		
			Rivra, rarely flooded, wet (7%)	Thickest layer (0.00)		
				Bottom layer (0.25)		
			Wetsand, rarely flooded (5%)	Thickest layer (0.00)		
				Bottom layer (0.19)		
114	Scravo sandy loam, cool, 2 to 8 percent slopes	Fair	Scravo (90%)	Bottom layer (0.56)	42.5	1.0%
				Thickest layer (0.56)		
			Crago (3%)	Bottom layer (0.25)		
				Thickest layer (0.38)		
			Scravo, gravelly (2%)	Bottom layer (0.56)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Thickest layer (0.56)		
			Scravo, cobbly (2%)	Bottom layer (0.06)		
				Thickest layer (0.06)		
115	Scravo very cobbly sandy loam, cool, 0 to 4 percent slopes	Fair	Scravo (90%)	Bottom layer (0.06)	29.2	0.7%
				Thickest layer (0.06)		
			Thess (5%)	Thickest layer (0.00)		
				Bottom layer (0.56)		
117	Scravo-Thess complex, cool, 0 to 4 percent slopes	Fair	Scravo (65%)	Bottom layer (0.06)	1,012.6	23.1%
				Thickest layer (0.06)		
			Thess (35%)	Thickest layer (0.00)		
				Bottom layer (0.56)		
132	Thess loam, cool, 2 to 8 percent slopes	Fair	Thess (90%)	Thickest layer (0.00)	1,494.8	34.1%
				Bottom layer (0.56)		
			Scravo (3%)	Bottom layer (0.56)		
				Thickest layer (0.56)		
			Thess, cobbly (3%)	Thickest layer (0.00)		
				Bottom layer (0.56)		
142	Trimad-Kalsted complex, 8 to 45 percent slopes	Poor	Trimad (60%)	Bottom layer (0.00)	52.1	1.2%
				Thickest layer (0.00)		
			Kalsted (30%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
144	Trudau loam, slightly saline, 2 to 8 percent slopes	Poor	Trudau (85%)	Bottom layer (0.00)	3.0	0.1%
				Thickest layer (0.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Amesha (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Varney (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
231	Water	Not rated	Water (100%)		6.3	0.1%
Totals for Area of Interest					**4,389.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Fair	3,380.3	77.0%
Poor	1,002.5	22.8%
Null or Not Rated	6.3	0.1%
Totals for Area of Interest	**4,389.1**	**100.0%**

Description

Gravel consists of natural aggregates (2 to 75 millimeters in diameter) suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains gravel, the soil is considered a likely source regardless of thickness. The assumption is that the gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be gravel.

The soils are rated "good," "fair," or "poor" as potential sources of gravel. A rating of "good" or "fair" means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix I
Fire & Wildland Fire Hazard

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FIRE AND WILDLAND FIRE HAZARD

Wildfire risk is the potential for a wildfire to adversely affect things that residents' value-lives, homes, or ecological functions and attributes. Wildfire risk in a particular area is a combination of the chance that a wildfire will start in or reach that area and the potential loss of human values if it does. Human activities, weather patterns, wildfire fuels, values potentially threatened by fire, and the availability (or lack) of resources to suppress a fire all contribute to wildfire risk. Reducing wildfire risk is a complex task involving efforts to prevent fires from starting, and activities to reduce the amount and arrangement of fuels that allow fires to grow and spread once they start.

Sheridan, like many communities in Montana, is at a moderate risk of wildfire during the fire season due to its proximity to the area Mountains, history of wildfire near the Planning Area, moderately low amount of annual precipitation, and availability of fuel. Wildfires are a concern for nearly all southwest Montana communities.

The majority of the Planning Area is either urban, grassland or irrigated hayfields that pose a moderate to low wildland fire threat based on the Madison County Community Wildfire Protection Plan, which can be seen in Figure I-1 and in Exhibit 12 (https://madisoncountymt.gov/DocumentCenter/View/87/Community-Wildfire-Protection-Plan-PDF?bidId=). While the Sheridan Town/Rural Fire District areas includes wildland-urban interface areas, the Planning Area does not have areas with rural residences and other development co-existing with forest areas and significant wildfire fuels.

The County Wildfire Protection Plan is the primary information source for fire and wildfire protection outside the city limits and should be reviewed for all development planned within the donut area.

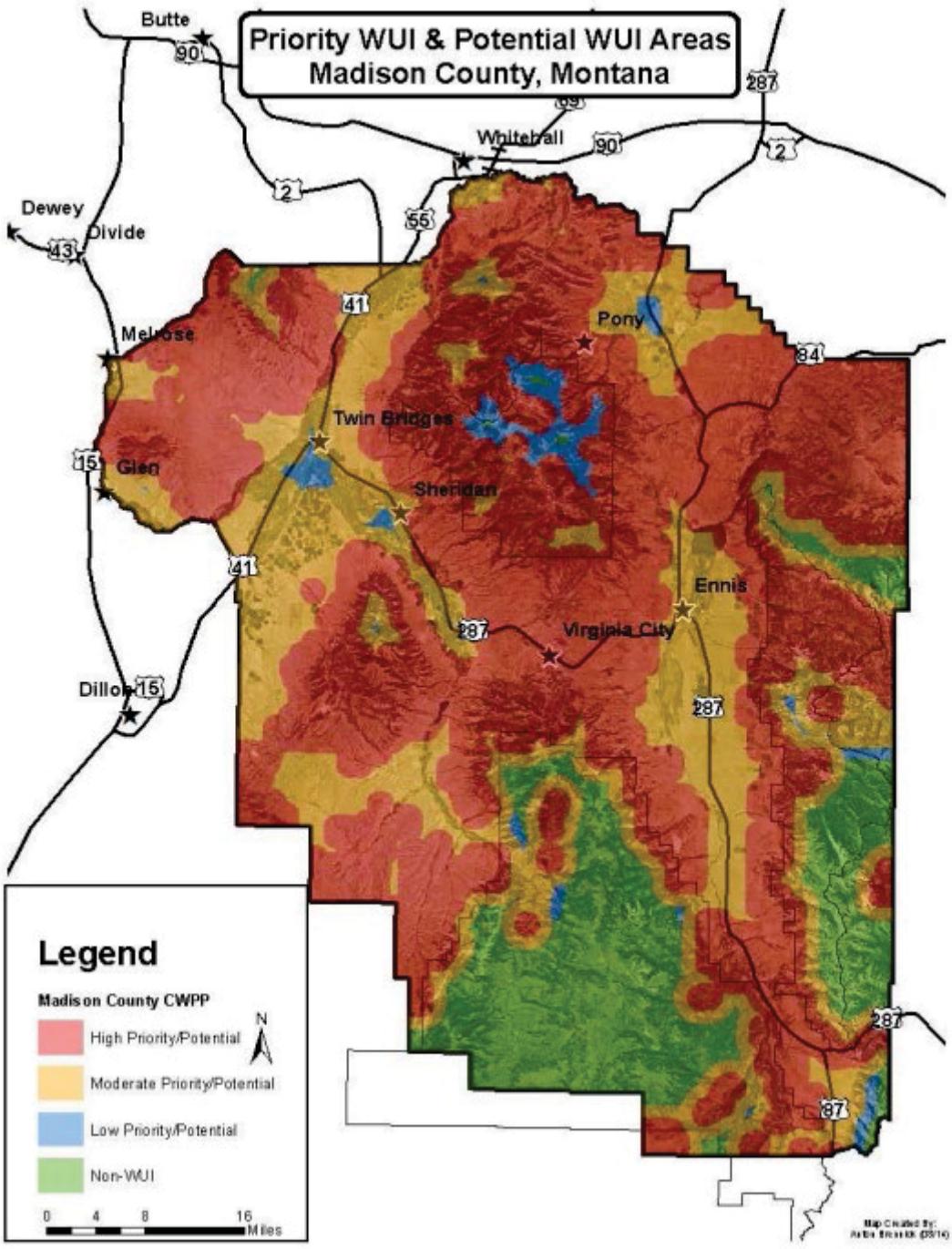

Figure I-1. Priority WUI & Potential WUI Areas Madison County, Montana

Appendix J
Subdivision Review

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SUBDIVISION REVIEW CRITERIA PER 76-3-608(3)(A), MCA

State and local subdivision statutes regulate the process of dividing land and providing public facilities and services to the newly created lots. The platting and creation of lots is not only the first phase of development, but the action establishes long-term patterns of land use for the community. Therefore, proper public review of proposed land division is vital. In Montana, local government subdivision regulations must evaluate a proposed subdivision's impact on the natural environment, wildlife, public health and safety, local services, and other factors.

The Montana Subdivision and Platting Act requires all units of local government to adopt and enforce subdivision regulations, and to review and decide on development proposals. Also, in reviewing subdivision proposals, local officials must issue written findings of fact that consider the effect the development would have on a series of criteria set forth in 76-3-608(3)(a) of the Montana Code Annotated (MCA). These include agriculture, agricultural water user facilities, the natural environment, wildlife and wildlife habitat, local services and public health and safety. Local officials must prepare written findings of fact that detail the impacts, the proposed subdivision has on each of these elements.

The Town of Sheridan adopted the Madison County Subdivision Regulations for development within the Town Limits. The Madison County Planning Board is the primary local reviewing board for all planning and development within the Town of Sheridan. The Sheridan Town Council provides final decision making for development within the Town limits.

According to 76-1-601, MCA, the community's Growth Policy must include a series of statements as to how the criteria will be defined and used to evaluate proposed subdivisions within its jurisdiction. More particularly, per 76-1-601(3)(h), MCA, a growth policy must include a statement explaining how the governing body will:

- Define the criteria in 76-3-608(3)(a)
- Evaluate and make decisions regarding proposed subdivisions with respect to the criteria in 76-3-608(3)(a) and
- A statement explaining how public hearings regarding proposed subdivisions will be conducted

This section of the Growth Policy addresses the requirements of this statute.

REVIEW CRITERIA DEFINITIONS

The basis upon which the local governing body makes a decision to approve, conditionally approve, or disapprove a subdivision is whether the preliminary plat, environmental assessment, hearing and planning board recommendations demonstrate that development of the subdivision meets the requirements of the Montana statute as set forth in 76-3-608, MCA. The statute requires that subdivisions must undergo review under a set of criteria as delineated in 76-3-608(3)(a), MCA. Local governments must define the criteria within the growth policy. Per this requirement, Madison County Town of Sheridan will use the following definitions for each of the criteria listed:

Agriculture: Montana Code Annotated contains definitions for the words “agriculture” and “agricultural” as follows:

- 41-2-103, MCA. Definitions: As used in this part, the following definitions apply: (1) “Agriculture” means: (a) all aspects of farming, including the cultivation and tillage of the soil; (b)(i) dairying; and (ii) the production, cultivation, growing, and harvesting of any agricultural or horticultural commodities, including commodities defined as agricultural commodities in the federal Agricultural Marketing Act (12 U.S.C. 1141j(g)); (c) the raising of livestock, bees, fur-bearing animals, or poultry; and (d) any practices, including forestry or lumbering operations, performed by a farmer or on a farm as an incident to or in conjunction with farming operations, including preparation for market or delivery to storage, to market, or to carriers for transportation to market.

- 81-8-701, MCA. Definitions: Unless the context requires otherwise, in this part the following definitions apply: (1) “Agricultural and food product” includes a horticultural, viticultural, dairy, livestock, poultry, bee, other farm or garden product, fish or fishery product, and other foods.

Agricultural Water User Facilities: Those facilities which provide water for agricultural land as defined in 15-7-202, MCA, or which provide water for the production of agricultural products as defined in 15-1-101, MCA including, but not limited to, ditches, pipes, and head gates.

Local Services: Any and all services or facilities that local government entities are authorized to provide directly or through a contractor.

Natural Environment: The physical conditions which exist within a given area, including land, air, water, mineral, flora, fauna, noise, and objects of historic, prehistoric, cultural, or aesthetic significance.

Public Health and Safety: A condition of optimal well-being, free from danger, risk, or injury for a community at large, or for all people, not merely for the welfare of a specific individual or a small class of persons.

Wildlife: Living things, which are neither human nor domesticated.

Wildlife Habitat: Place or type of site where wildlife naturally lives and grows.

EVALUATION METHODOLOGY

The Madison County Planning Board will evaluate and make recommendations to the Sheridan Town Council. The council will approve, approve with conditions, or deny plans for proposed subdivisions with respect to the criteria identified in 76-3-608(3)(a) as follows:

- Subdivision applications will include written documentation as to whether and to what extent the proposed subdivision will impact agricultural, agriculture water user facilities, local services, natural environment, wildlife, wildlife habitat and public health and safety, as defined in this Policy.

- The Madison County Planning Board will evaluate each proposed subdivision with respect to the criteria set forth in 76-3-608(3)(a), MCA, and as defined in this Growth Policy. The evaluation will be based upon the extent of any and all expected impacts to each of the elements, and the degree to which the applicant proposes to mitigate any adverse impacts. In turn, the local governing body will evaluate the proposed subdivision with respect to the findings of fact as prepared by the Madison County Planning Board, public hearings, Town Council, and other information as appropriate.

- Upon completion of its review and evaluation, the Town Council will render a decision on the proposed subdivision with respect to the requirements of the Subdivision Regulations, the outcome of the public hearing(s) and the Town of Sheridan Growth Policy.

PUBLIC HEARINGS ON PROPOSED SUBDIVISIONS

The Town of Sheridan will conduct public hearings on proposed subdivisions in a manner that will assure that members of the public, the local government and the applicant have adequate opportunity to express their interests and concerns. Such opportunity will be afforded in a manner that complies with the time constraints set forth in the Subdivision Regulations of Madison County or if developed and adopted in the future, Town of Sheridan Subdivision Regulations.

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Appendix K
Maps

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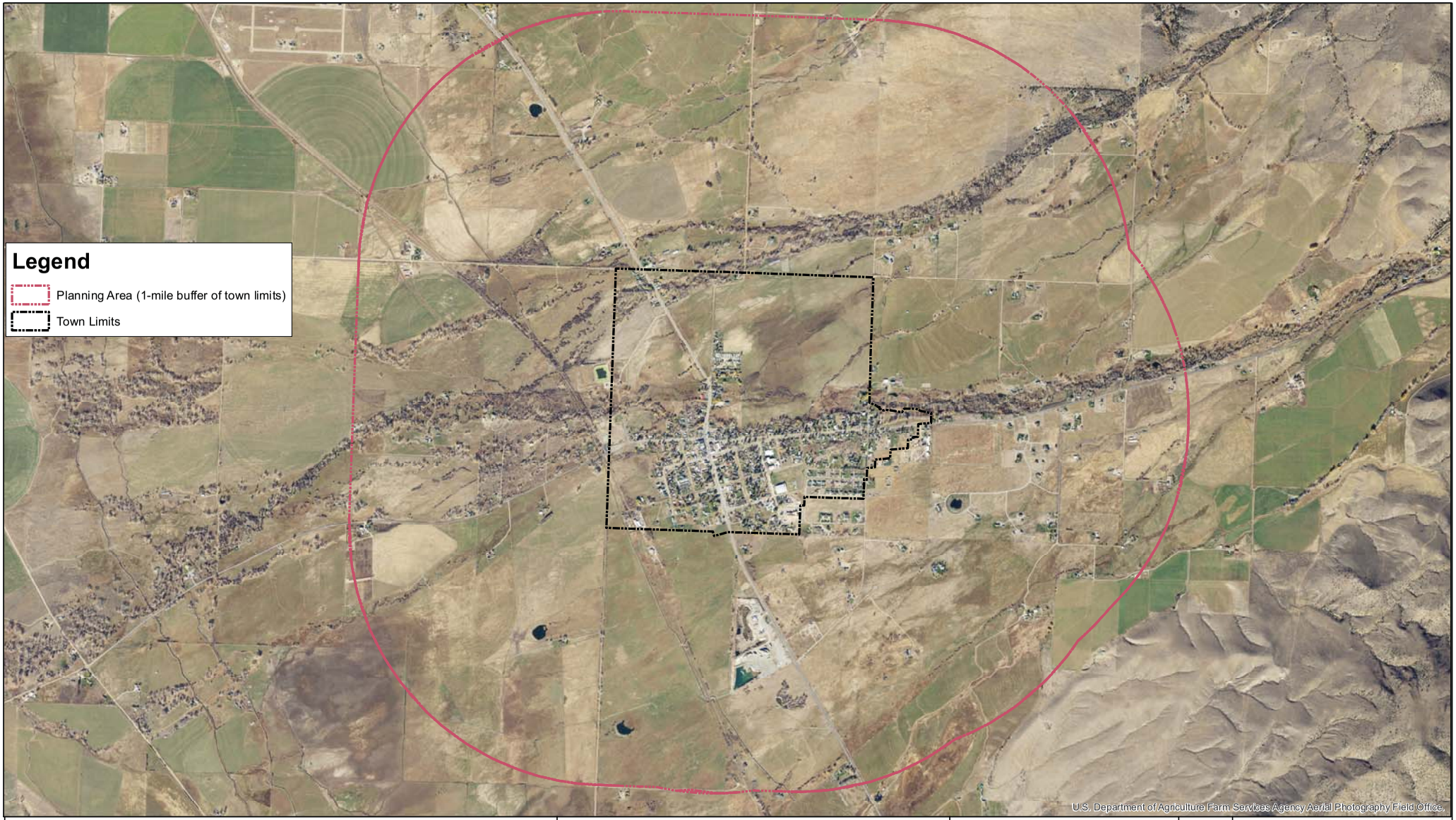

Exhibit 1. Sheridan Planning Area

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 2017 airphoto.

0 0.5 1 Miles

1 inch = 1,800 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

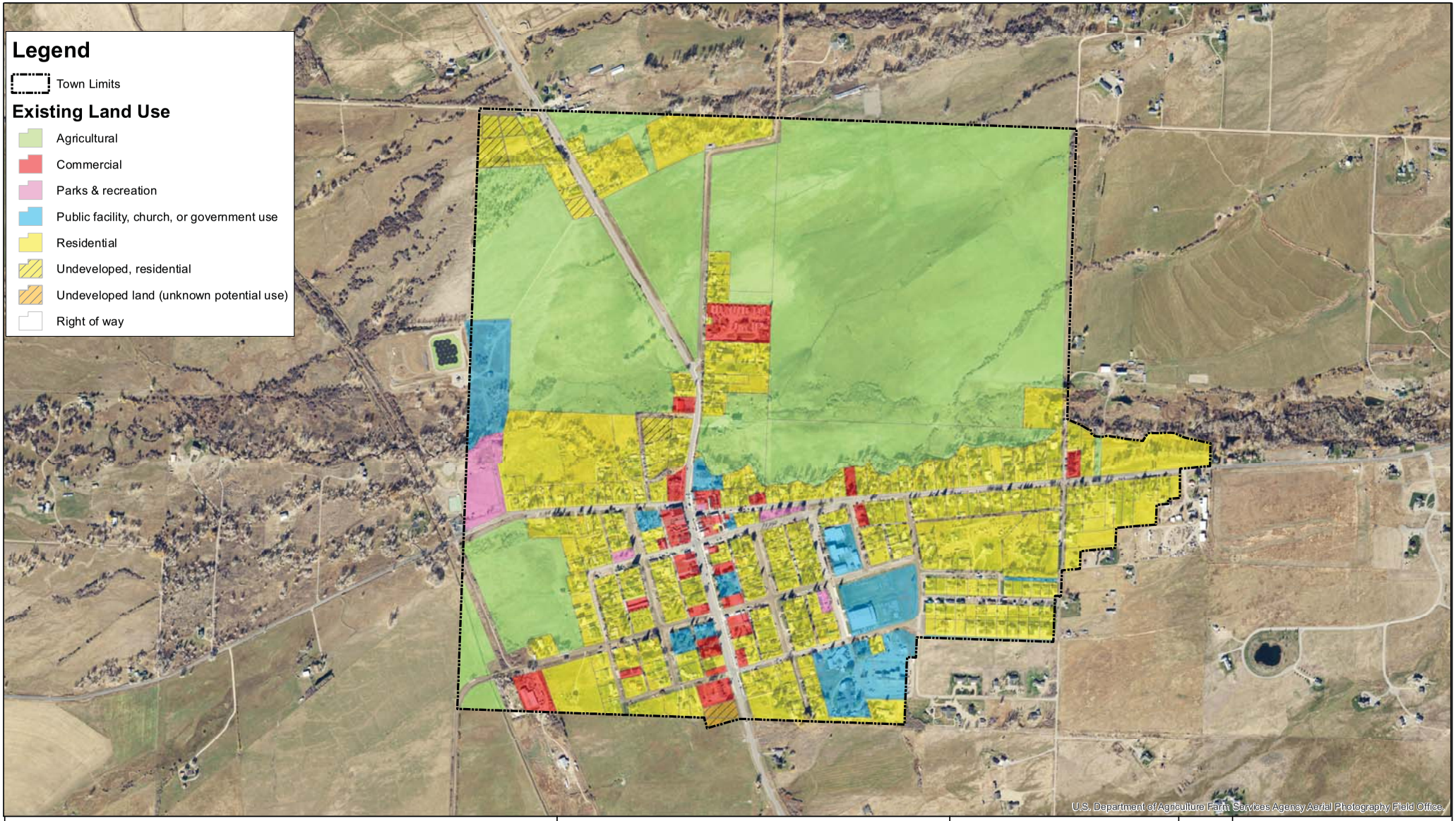

Exhibit 2. Sheridan Planning Area, Existing Land Use

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 2017 airphoto.

0 0.25 0.5 Miles

1 inch = 776 feet

Northern Rockies Engineering, Inc.

Sheet No.	1
Designed By:	Samantha Kopeck
Checked by:	Scott Payne
Date:	4/16/2021
Other info:	

Exhibit 3. Sheridan Planning Area

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 1995 airphoto.

0 0.5 1 Miles

1 inch = 1,800 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

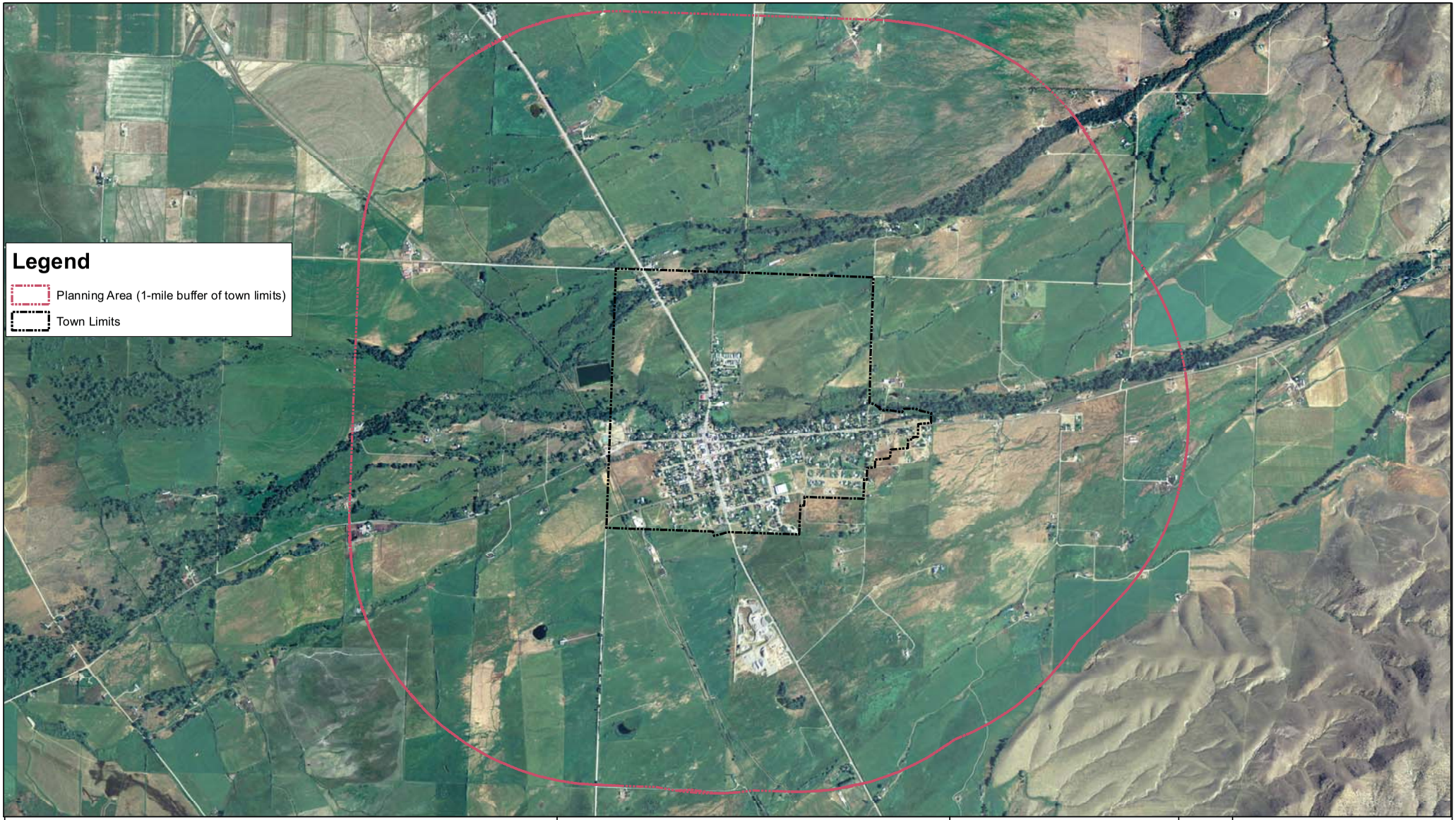

Exhibit 4. Sheridan Planning Area

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 2005 airphoto.

0 0.5 1 Miles

1 inch = 1,800 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

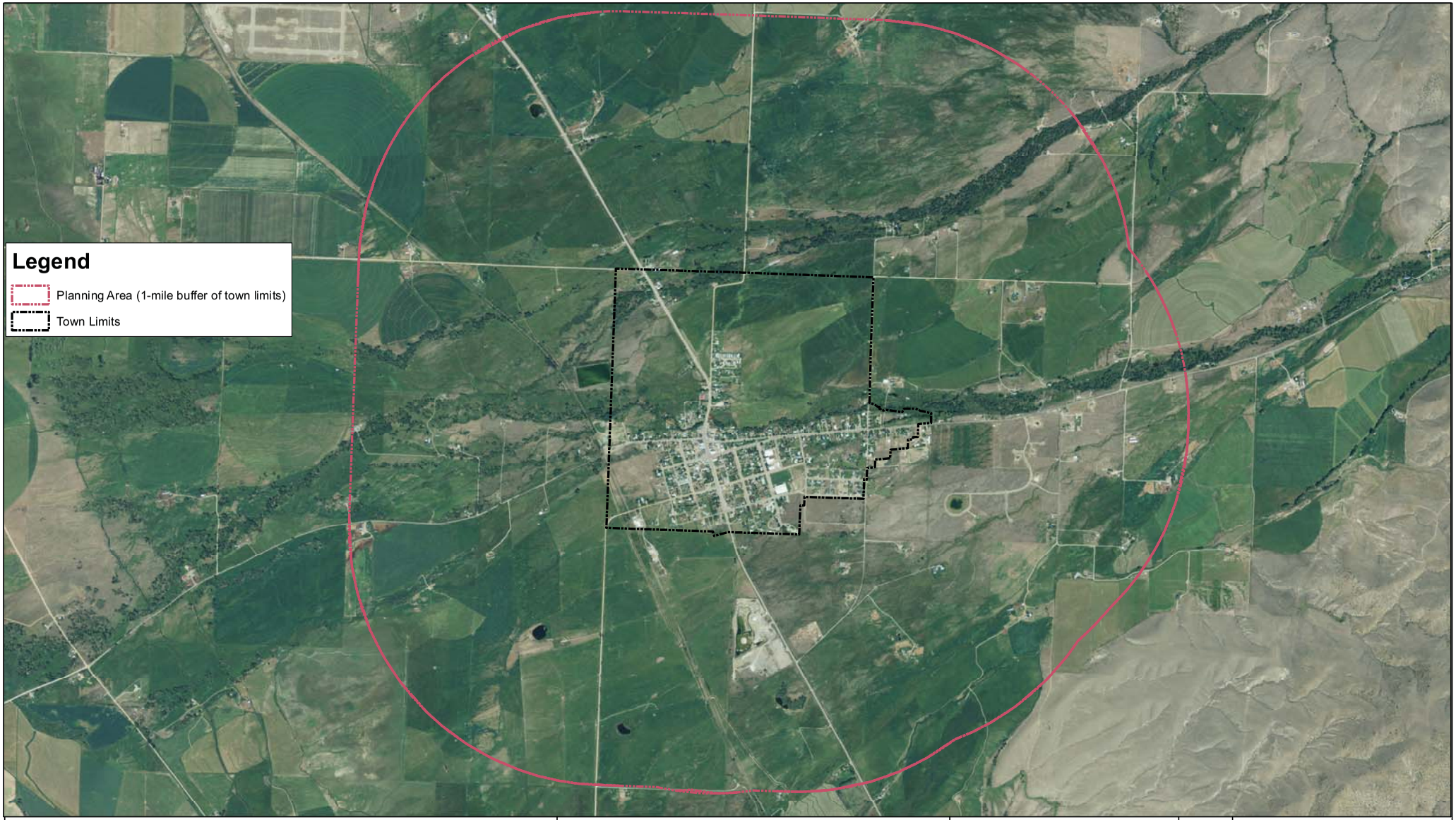

Exhibit 5. Sheridan Planning Area

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 2009 airphoto.

0 0.5 1 Miles

1 inch = 1,800 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

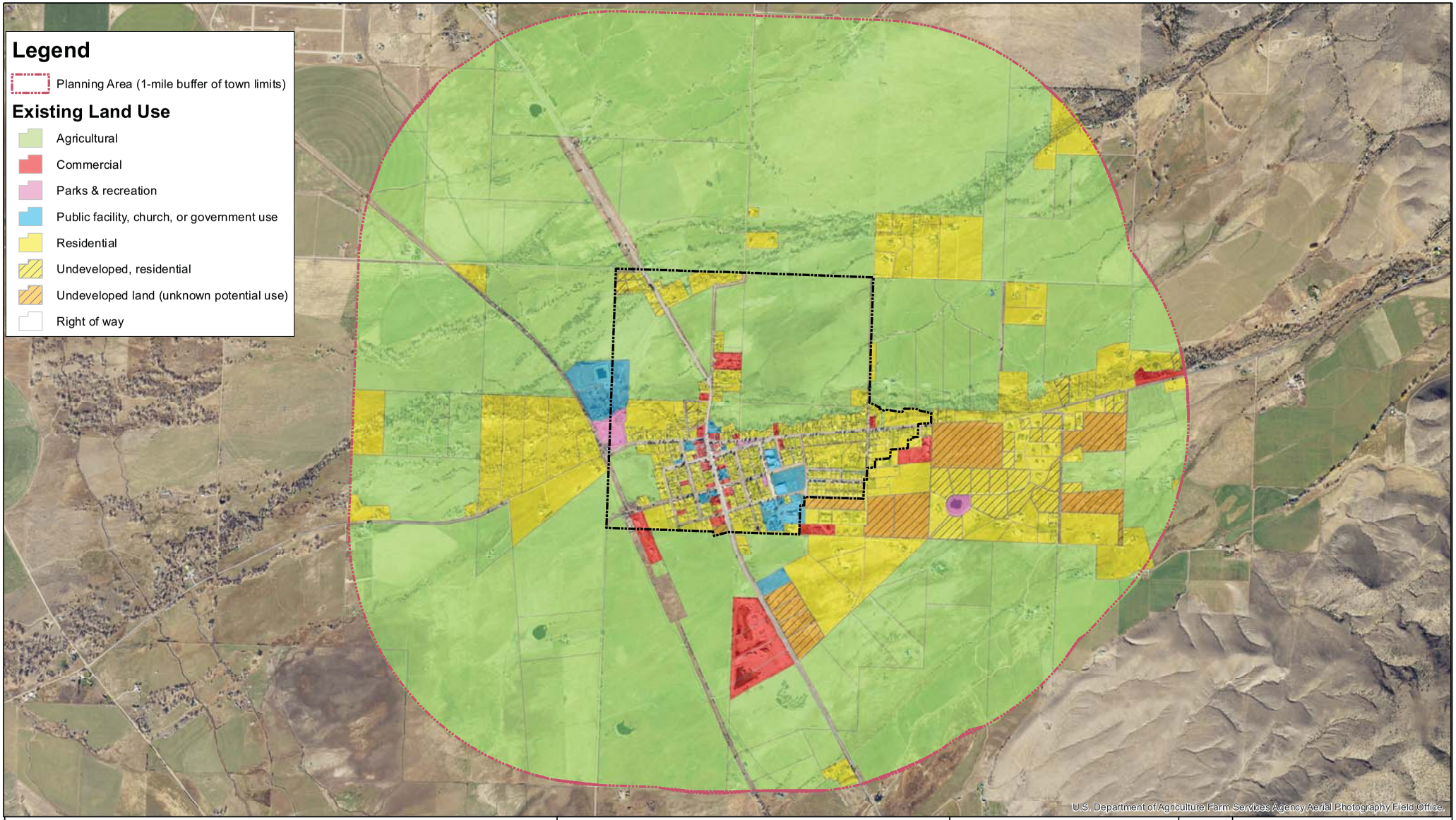

Exhibit 6. Sheridan Planning Area, Existing Land Use

Notes:
Land use determined from Montana Department of Revenue cadastral information and airphoto.
Properties which intersect the planning area are catergorized.
Background is 2017 airphoto.

0 0.5 1 Miles

1 inch = 1,800 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

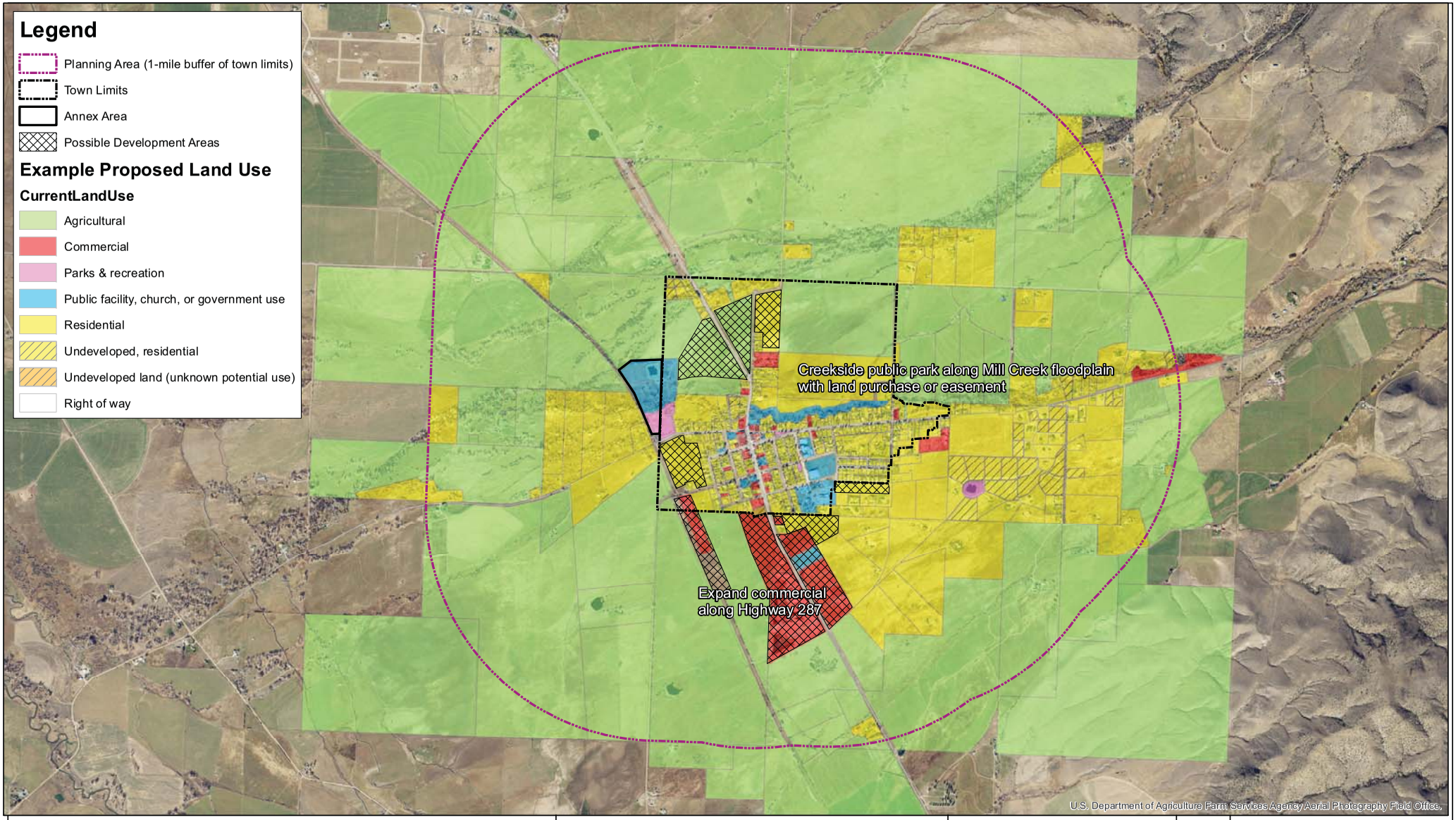

Exhibit 7. Sheridan Planning Area, Land Use Plan

Map shows one example of how future land use could be designated.

0 0.5 1 Miles

1 inch = 2,000 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck

Checked by: Scott Payne

Date: 3/30/2021

Other info:

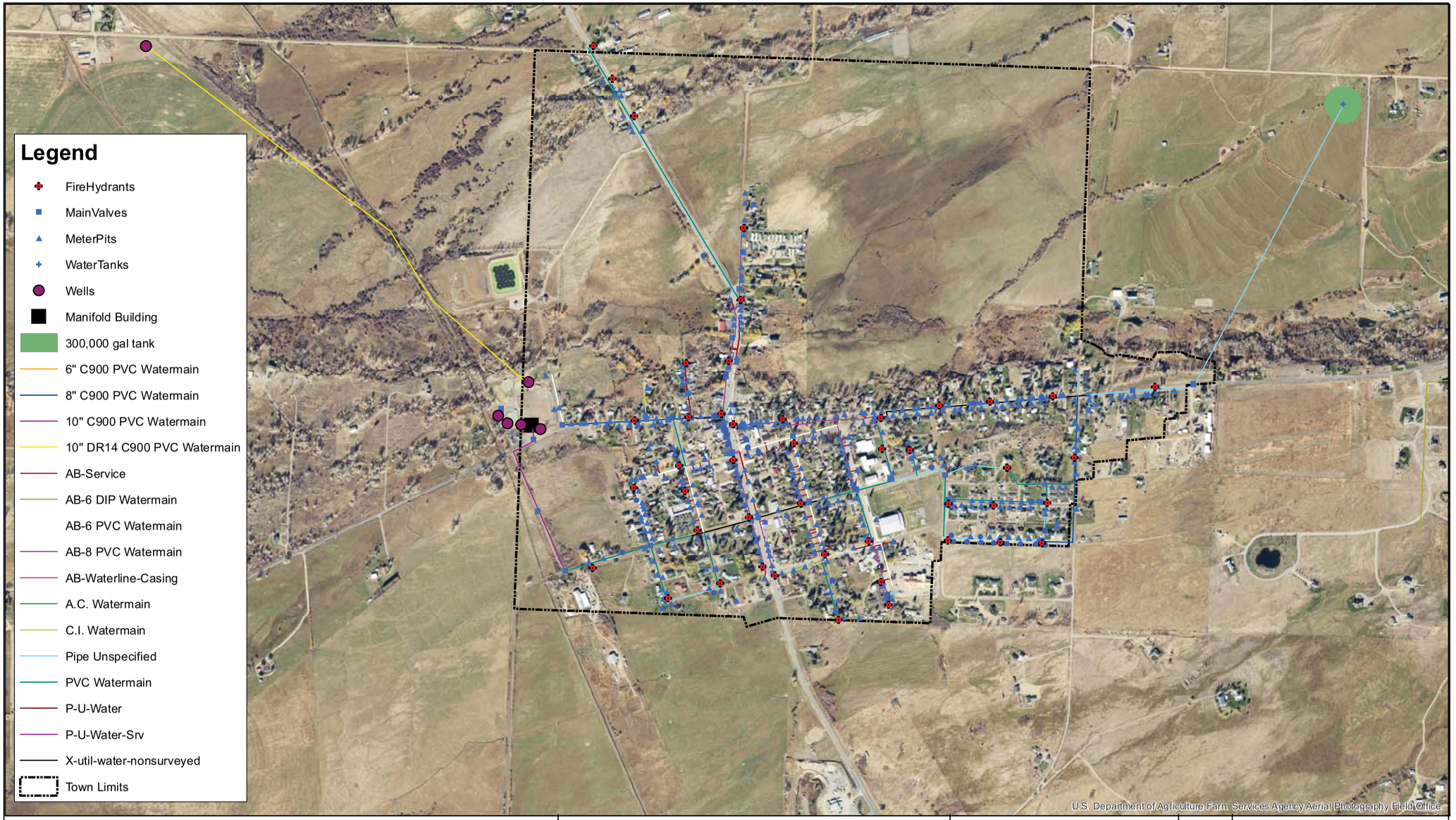

Exhibit 8. Town of Sheridan Municipal Water Supply

Map shows the Town of Sheridans Municipal Water Supply system

0 0.125 0.25 0.5 Miles

1 inch = 833 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck

Checked by: Scott Payne

Date: 2/10/2021

Other info:

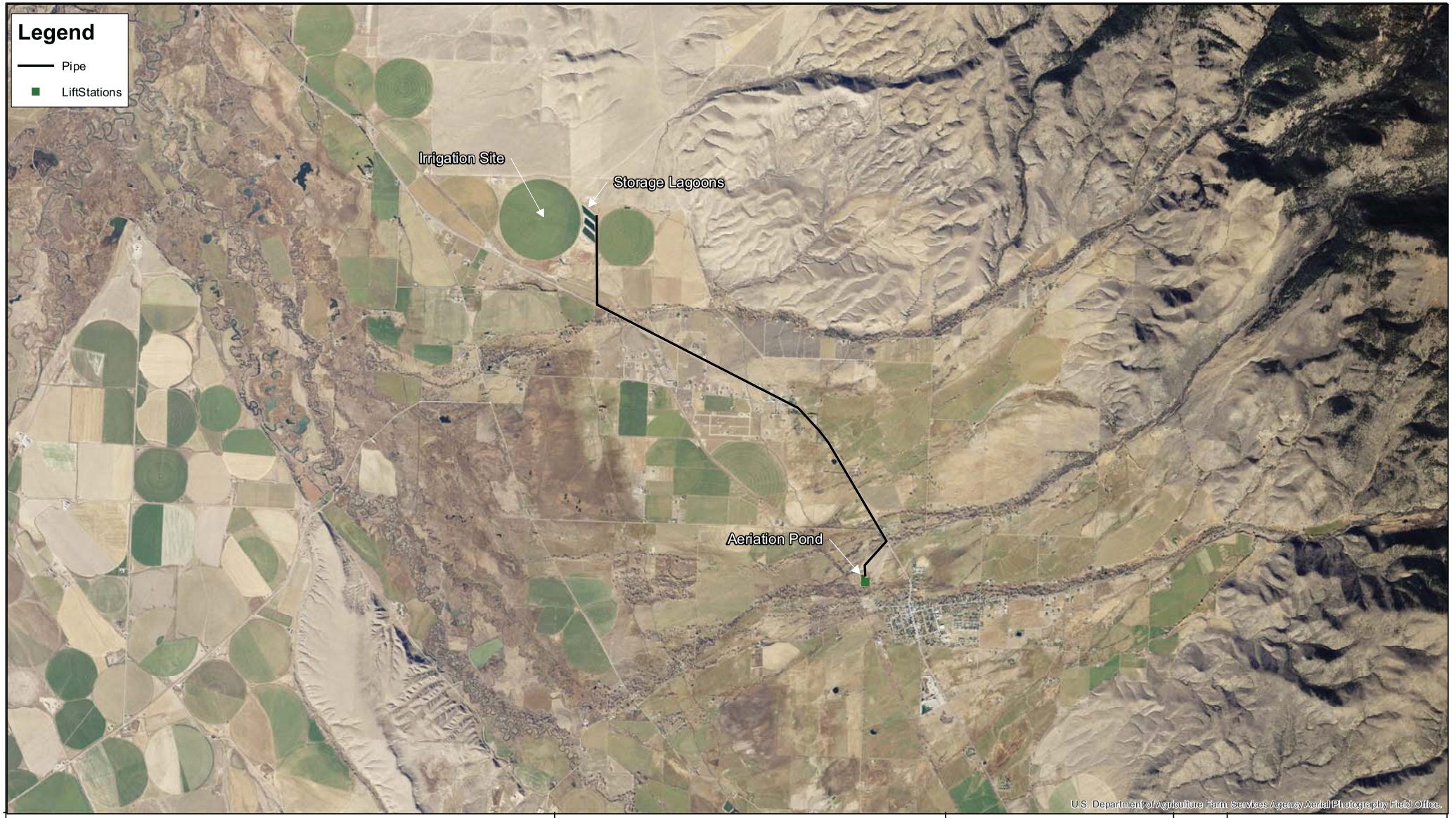

Exhibit 9. Sheridan Wastewater Pipe Line

Map shows the pipe line for towns wastewater system.

0 0.5 1 2 Miles

1 inch = 4,090 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck

Checked by: Scott Payne

Date: 4/16/2021

Other info:

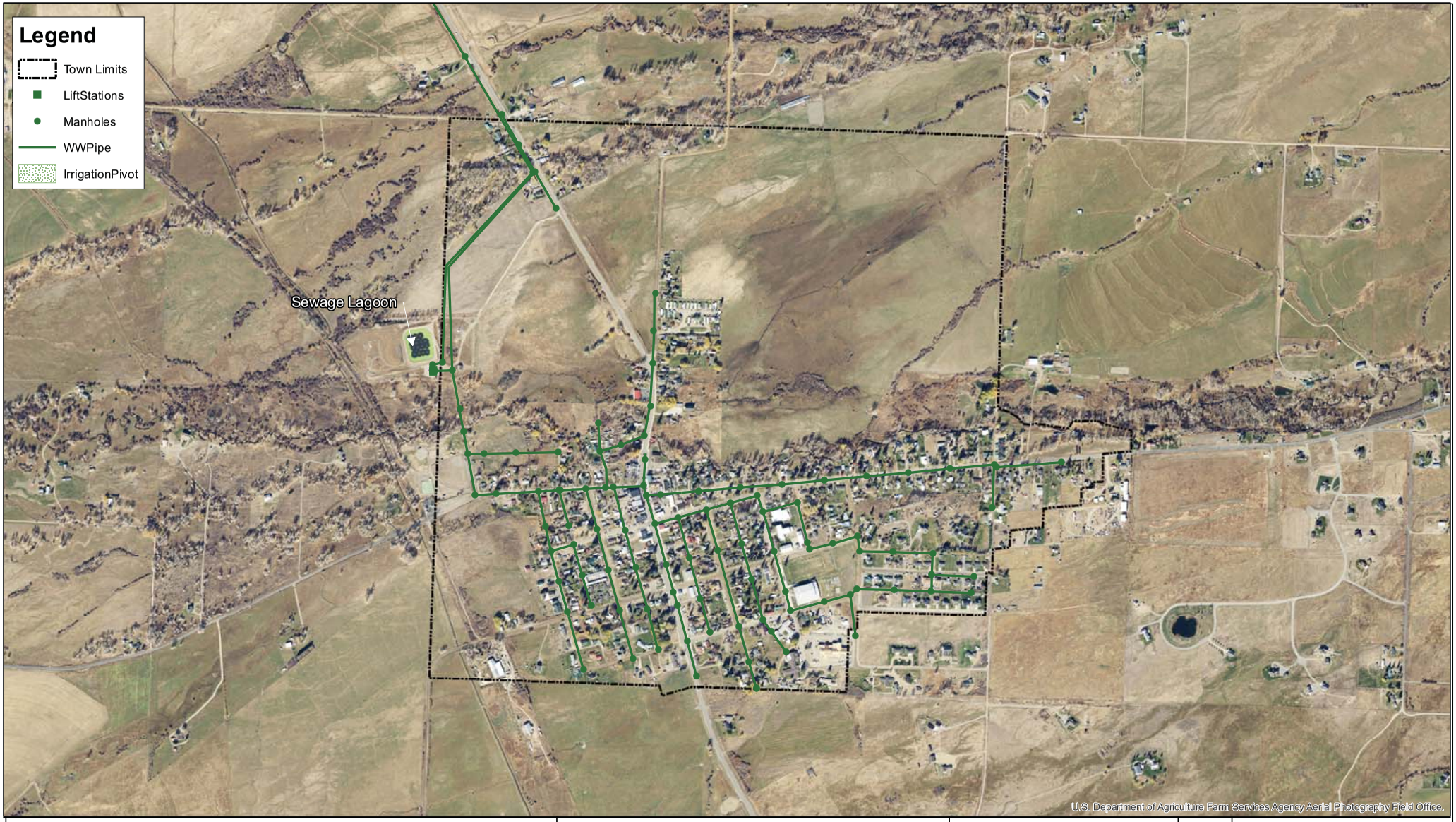

Exhibit 10. Sheridan Existing Sewer System

Notes:
Map shows the existing sewer system for the Town of Sheridan.
Background is 2017 airphoto.

0 0.25 0.5 Miles

1 inch = 833 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne, PHD
Date: 10/5/2020
Other info:

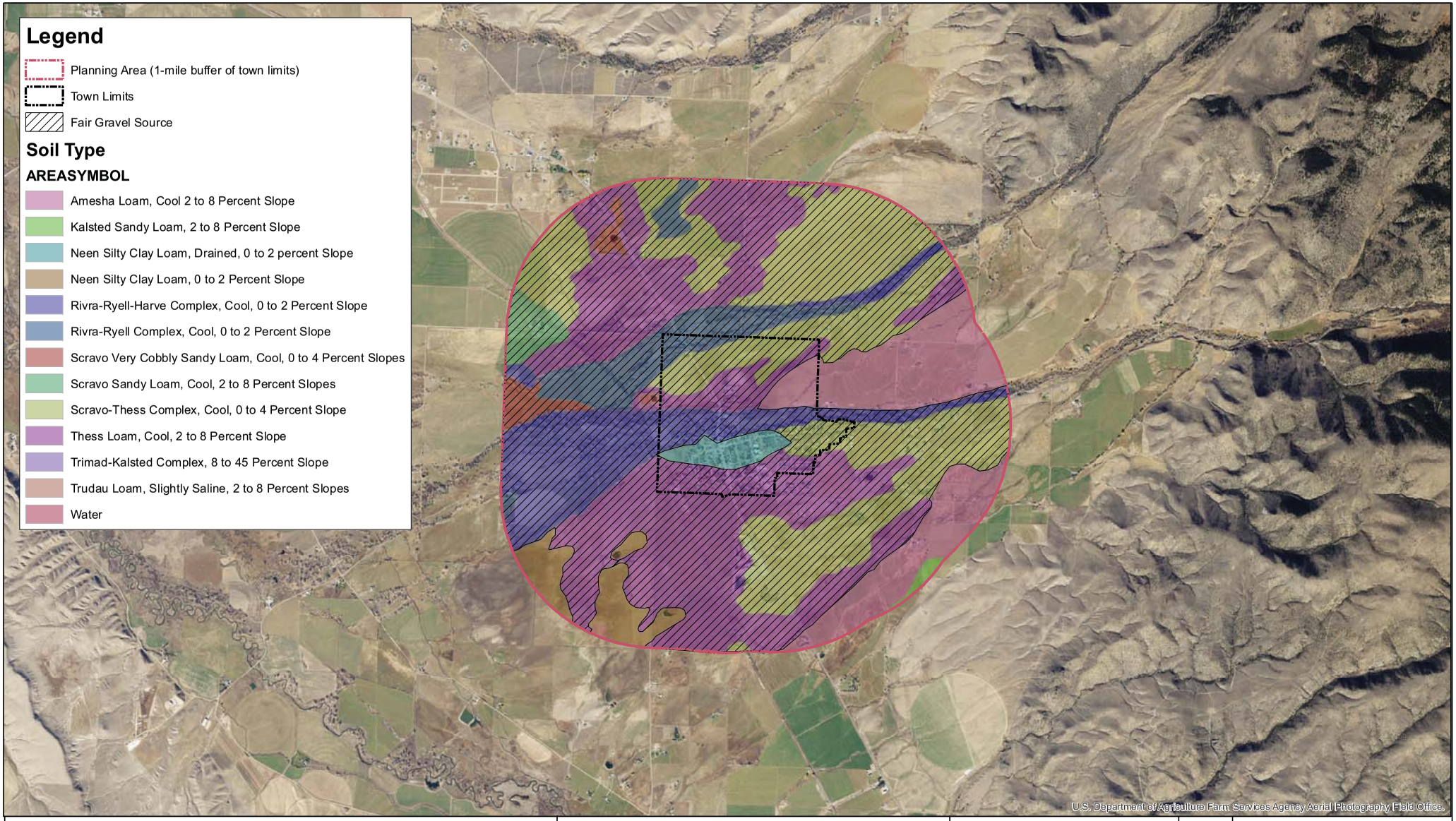

Exhibit 11. Sheridan Planning Area, Soils

Notes:
Soil types determined from United States Department of Agriculture Natural Resource Conservation Service Web Soil Survey. Soils which intersect the planning area are catergorized.
Background is 2017 airphoto.

0 0.5 1 Miles

1 inch = 2,963 feet

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

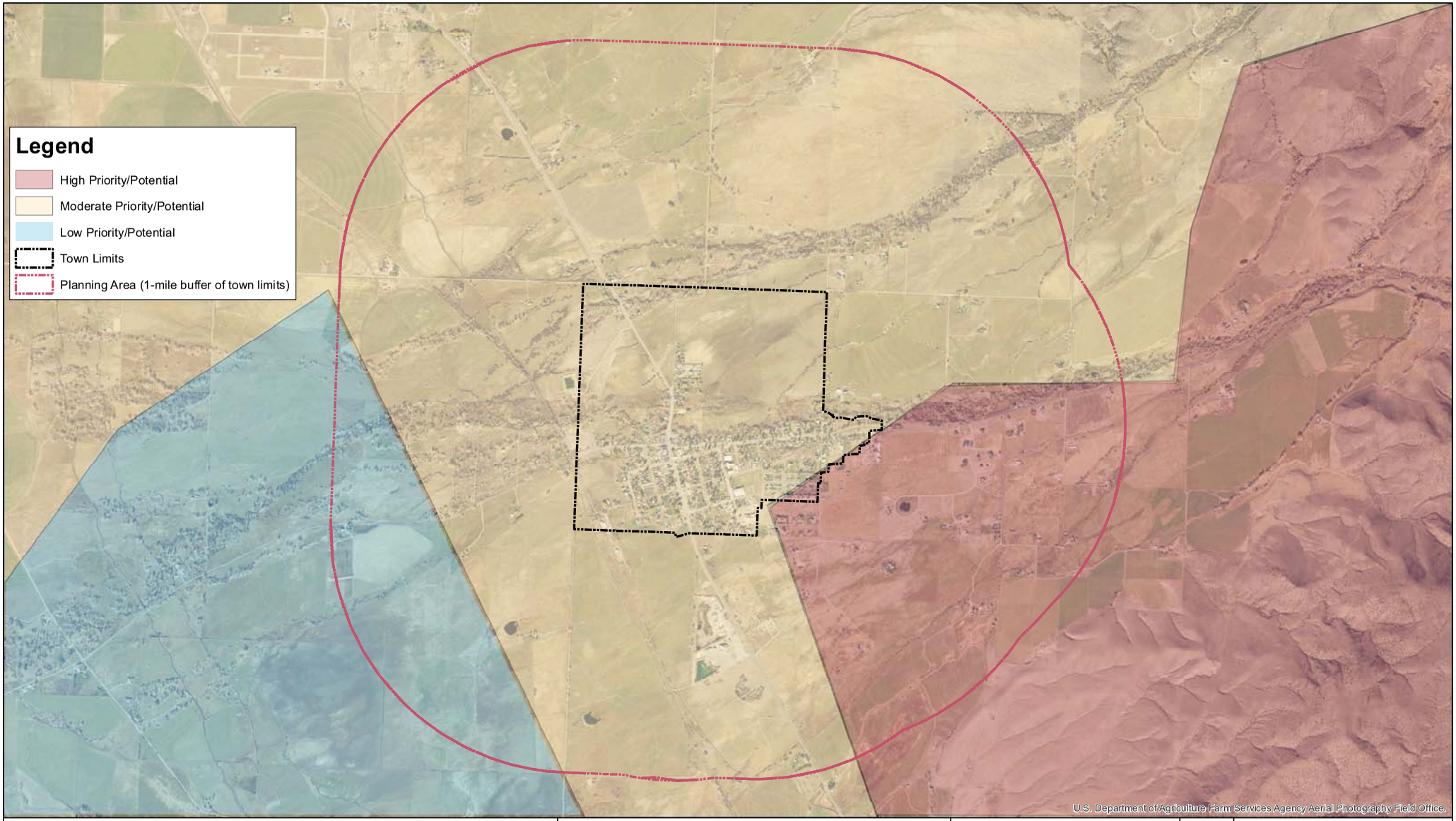

Exhibit 12. Wildland Urban Interface Map

Notes:
Map made from information from the Madison County, Montana Community Wildfire Protection Plan
Background is 2017 airphoto.

0 0.25 0.5 Miles

Northern Rockies Engineering, Inc.

Sheet No. 1

Designed By: Samantha Kopeck
Checked by: Scott Payne
Date: 4/16/2021
Other info:

Appendix L
References

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Appendix M
Resolution

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Resolution No. 2021-3 to Adopt
Town of Sheridan Growth Policy

WHEREAS, the Town of Sheridan has developed the Town of Sheridan Growth Policy according to the standards set forth by the State of Montana; and

WHEREAS, the Town of Sheridan has participated in Growth Policy planning meetings, published notice, held public hearings, and provided the citizens of the Town with opportunities to comment on the goals, objectives, and future of the Town of Sheridan and it's Growth Policy; and

WHEREAS, a public meeting, advertised in accordance with State Statute, was held on October 7, 2020 at the Senior Center in Sheridan, Montana to gather public input; and

WHEREAS, the Madison County Planning Board held a public meeting, advertised in accordance with State Statute, on March 29, 2021 at Madison County Planning Office to gather public comment on the draft Growth Policy; and

WHEREAS, the Madison County Planning Board on March 29, 2021 recommended adoption of the draft Growth Policy to the Sheridan Town Council;

WHEREAS, the Sheridan Town Council held a public hearing, advertised in accordance with State Statute, on May 10, 2021 to gather public comment on the draft Growth Policy; and

THEREFORE BE IT RESOLVED, the Sheridan Town Council hereby approves the Town of Sheridan Growth Policy as recommended by the Madison County Planning Board and hereby formally adopts the Town of Sheridan Growth Policy as a guide for future planning and development for the Town of Sheridan.

PASSED AND ADOPTED by the Town Council of the Town of Sheridan, Montana council meeting, after a public hearing held on the 10th day of May 2021.

Signed: Robert C. Stump

Name: Bob Stump

Title: Mayor

Date: 5/10/2021

Attested: Ginger Haliger

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